The Social Costs of Financial Crises

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June 2013

Abstract

This paper studies the impact of financial crises on society. Using data on 187 banking crises in 126 countries over the period 1970-2009, I examine the impact of a crisis not only on the economy and the financial sector, but also on health, education, poverty, and gender issues. A wider-angle lens exposes broad-ranging implications for society. For example, in the six years following a crisis, average life expectancy declines by nine months, primary school enrolment drops by 3.5%, and fertility falls by 5.5% (but adolescent fertility rises by 4.5%). I also find a considerable short-run worsening of poverty and income equality, and a lasting 50% increase in outbound refugees and inbound foreign aid. Although output and employment suffer at least as much for developed countries, the social costs of financial crises are much greater for less-developed countries.

The global financial crisis has spurred tremendous interest in the consequences of financial crises. Recent studies show that financial crises are commonplace throughout history and across rich and poor countries (Reinhart and Rogoff, 2010) and that their impact on output, unemployment, inflation, and the financial sector can be huge (among others, Dell'Ariccia, Detragaiche, and Rajan, 2008; Claessens, Kose, and Terrones, 2009; Reinhart and Rogoff, 2009). However, we know far less about the impact of financial crises on society at large. The aim of this paper is to extend our understanding of the consequences of financial crises beyond their economic effects and provide a comprehensive analysis of their social costs.

I use the Reinhart and Rogoff (2010, 2011) and Laeven and Valencia (2012) databases to identify 187 banking crises in 126 countries over the period 1970-2009. I collect data on a wide range of economic, financial, health, education, poverty, and gender issues indicators and estimate panel models of these indicators on an indicator variable for banking crises. All panel models include country fixed effects, a time trend, and control variables for political system, natural disasters, and violence. Several panel models also control for economic conditions. I investigate the effects of banking crises on these indicators in the same year, in the subsequent year, and over the following six years.

All but two of the 126 countries in my sample experience at least one banking crisis over the sample period 1970-2009. On average, these countries face 1.5 crisis episodes over this period and are in a crisis for five years out of forty.

Consistent with prior research, I find substantial economic effects of financial crises. For example, the cumulative effect of the banking crisis indicator over the six following years is -2% for GDP growth, +2% for unemployment, and +30% for inflation. I also document considerable effects on the financial sector. The capital to assets ratio and profitability of the banking sector

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decline sharply during a crisis, though these effects are relatively short-lived. The fraction of non-performing loans on the banks' balance sheets and the lending risk premium increase markedly and are still elevated after six years.

In addition to these economic effects, my analysis exposes large social consequences of financial crises. Perhaps the most striking result is that average life expectancy declines by more than nine months in the six years following a crisis, relative to the sample mean of 64 years. This result indicates serious adverse consequences of financial crises on health. I also find a large increase in HIV prevalence, and a considerable decrease in fertility.

Financial crises also affect education. Primary school enrollment decreases by 3.5% over the six years following a crisis. This suggests that parents keep their young children out of school in crisis times, perhaps to save money or to let them help in making a living.

Poverty increases considerably in crisis years. The poverty gap (the mean shortfall from the poverty line expressed as a percentage of the poverty line of $1.25) increases by 12% relative to the sample mean and the income share of the poorest 20% of the population falls by 5%. These effects do not last long; there is no evidence of a long-run impact on poverty or income equality. However, both the number of refugees originating from the country hit by the crisis and the amount of foreign development aid flowing into the country increase by around 50% in the six years following a crisis.

Although overall fertility falls after a crisis, adolescent fertility increases markedly, by 4.5% relative to the mean of 62 births per 1,000 women aged between 15 and 19. Reducing adolescent fertility is one of the Millennium Development Goals formulated by the United Nations (point 5.4 of Goal 5: "Improve maternal health"). Several other gender issues indicators are also affected.

Taken together, these analyses uncover broad-ranging consequences of financial crises for society. Experiencing a banking crisis has lasting effects on people's health and education. Crises tend to increases poverty (at least in the short run) and outbound refugees, and have a material impact on gender issues.

When I distinguish between different groups of countries, I find that the impact of a banking crisis on GDP growth and unemployment is at least as large for developed relative to less-developed countries. However, most of the social costs documented in this paper are concentrated in less-developed countries. These countries thus seem to lack the mechanisms to prevent the economic consequences of a crisis from directly spilling over to health, education, poverty, and gender issues. When I classify countries based on the concentration of the banking sector, I find evidence that highly concentrated banking sectors are less suited to help the population cope with the consequences of a financial crisis.

My analysis is relevant for a number of reasons. Economic indicators (such as output, unemployment, and inflation) are important barometers of the income and consumption ability of the people in a society, but do not directly assess other vital aspects of a society's well-being (such as health and education). Investigating the development of social indicators around financial crises broadens our understanding of how societies are affected by such crises. Furthermore, focusing on general economic indicators could mask differences in the impact of crises on different aspects of society. A better understanding of what parts of society are hit hardest by financial crises will help governments to develop policies aimed at alleviating the societal impact of a crisis.

Studying the social impact of financial crisis is not entirely untrodden territory. Prior work has concentrated on documenting the effect of individual crises on particular aspects of

society.[1] The contribution of this paper is to examine a much larger set of crises in many different countries and to include a much wider range of social indicators. This approach allows for a more comprehensive assessment of the social costs of financial crises.

1. Data and methodology

Data on banking crises are taken from the Reinhart and Rogoff (2010, 2011) database, which contains annual time-series of various types of crises for 70 countries over 1800-2010. I use their "banking crisis" indicator, where "a banking crisis is marked by two types of events: (1) bank runs that lead to the closure, merging, or takeover by the public sector of one or more financial institutions; (2) if there are no runs, the closure, merging, takeover, or large-scale government assistance of an important financial institution (or group of institutions), that marks the start of a string of similar outcomes for other financial institutions." For countries not in the Reinhart-Rogoff database, I supplement their data with those of Laeven and Valencia (2012), who identify "systemic banking crises" using the following two conditions: "1) Significant signs of financial distress in the banking system (as indicated by significant bank runs, losses in the banking system, and/or bank liquidations); 2) Significant banking policy intervention measures in response to significant losses in the banking system." Their paper describes in detail how these criteria are assessed. My final sample consists of 187 banking crises in 126 countries over the period 1970-2009.

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[1] For example, Cutler, Knaul, Lozano, Méndez, and Zurita (2002) report that mortality rates increase after financial crises in Mexico in the 1980s and 1990s. Stuckler, Basu, Suhrke, Coutts, and McKee (2009) find that mortality rates increase after economic crises in OECD countries. Knowles, Pernia, and Racelis (1999) document reduced public spending on education and health care after the 1997 Asian crisis. Jacoby (1994) shows that primary school attendance drops after a financial crisis in Peru. Cruces and Wodon (2003) and Suryahadi, Sumarto, and Pritchett (2003) present evidence of a marked increase in poverty after financial crises in Argentina and Indonesia.

I collect annual data on economic, financial, health, education, poverty, and gender issues indicators from the World Bank, the OECD, and Beck and Demirgüç-Kunt (2009). The Appendix provides an overview of all variable definitions and data sources.

As *economic indicators*, I use GDP growth, unemployment (as a percentage of the total labor force), consumer price inflation, government debt (as a percentage of GDP), foreign direct investments (as a percentage of GDP), exports (as a percentage of GDP), R&D expenditure (as a percentage of GDP), and CO_2 emissions (metric tons / capita). *Financial indicators* include the capital to assets ratio and return on assets of the banking sector, the fraction of non-performing loans, the lending risk premium, domestic credit (as a percentage of GDP), bank concentration, as well as bank deposits, savings, and remittance (all as a percentage of GDP). As *health indicators*, I take life expectancy (in years), infant mortality (per 1000), fertility (births per woman), HIV prevalence (% of the population aged between 15 and 49), and private and public health expenditure (as a percentage of GDP).

I use the following *education indicators*: primary school enrollment, the primary school completion rate, literacy (percentage of people aged 15 and over), and education spending (as a percentage GDP). I obtain data on the following *poverty indicators*: the poverty gap (mean shortfall from the poverty line at $1.25 a day), the poverty headcount at $1.25 a day (as a percentage of the population), the income shares of the lowest 10% and 20% of population in terms of income, the refugee population by country of origin (as a percentage of the population), and official development aid (as a percentage of gross national income or GNI). As *gender issues indicators*, I collect information on adolescent fertility (births per 1,000 women aged between 15 and 19), the ratio of girls to boys in primary and secondary education, female unemployment (as a percentage of the female labor force), the share of women employed in the non-agricultural

sector (as a percentage of total nonagricultural employment), and the proportion of seats held by women in national parliaments.

I estimate panel models of each variable in these six categories of socioeconomic indicators on the indicator variable for banking crises. All panel models include country fixed effects to account for (unobserved) time-invariant country characteristics that could influence the dependent variable. In other words, the effects I measure stem from time-series variation in the dependent variables by country, rather than from average effects in the cross-section of countries. The panel models also contain a time trend, and control variables for the country's political system (from the Database of Political Institutions), the occurrence of natural disasters (from the Center for Research on the Epidemiology of Disasters' EMDAT database), and the occurrence of violence or war (from the Polity IV Dataset) in each country-year.

Naturally, developments in the economic and social indicators examined in this paper have many determinants. It is impossible to control for all of these, but in several panel specifications I will additionally control for the overall economic conditions in a country. I follow the approach of Yeyati and Panizza (2011), who investigate the impact of sovereign debt default on economic growth. Just as in their "standard growth regression," I include one-year lagged gross capital formation (as a percentage of GDP), population growth, government consumption (as a percentage of GDP), the change in the terms of trade, and a measure of trade openness (the sum of exports and imports as a percentage of GDP) in these panel models. I supplement these control variables with one-year lagged GDP growth. I refer to the Appendix for detailed variable definitions.

Controlling for economic conditions involves a trade-off since most of the indicators in this paper are likely to be influenced by the state of the economy. Hence, controlling for

economic conditions during financial crises can lead to an underestimation of their social costs. For example, it may be the case that both public and private health expenditure are reduced in the wake of a financial crisis, since a crisis results in lower output growth, which in turn leads to lower tax revenues for governments and lower disposable income for households. The economic control variables would then absorb any effect on public and private health expenditure that arises as a result of deteriorating economic conditions during the crisis. In other words, fully controlling for economic conditions could lead to the spurious conclusion that financial crises have no effect on health expenditure.

To account for this issue, during crisis years I set the economic control variables equal to their values in the year before the crisis. The rationale is that this approach attempts to control for the economic conditions that would have prevailed had no crisis occurred. This approach is still likely to yield a conservative estimate of the impact of the crisis since the economic conditions may already have started to worsen before the crisis is identified as such and since I use actual values again as soon as the crisis is over, which means that the long-run estimates of the social costs of a crisis are in part based on actual post-crisis economic conditions, even if these are worse than in the year before the crisis.

For each variable in these six categories of socioeconomic indicators, I estimate six different panel models. The first model includes the contemporaneous crisis dummy and thus assesses the immediate impact of a crisis, while the second model only includes a one-year lag of the crisis dummy to measure the impact in the subsequent year. The third model includes the crisis dummy both contemporaneously and with one- through five-year lags, and thus assesses the impact over the six years following the crisis. My choice for this lag length to estimate the

long-run social effects of financial crises is based on Reinhart and Rogoff (2009), who document that the average duration of the downturn following major crises is 4.8 years.

The fourth model adds one-year lagged economic control variables to the third model, in the way described above. The fifth and sixth models have the same specification as the second model, but allow the coefficient on the crisis dummy to be different for different groups of countries, based on the overall level of development (using the advanced country classification by the IMF) and based on the concentration of the banking sector, respectively.

To mitigate the influence of outliers, I winsorize all variables (with the exception of the dummy variables) at the 1% and the 99% level based on the pooled distribution across all country-years. The effects of the winsorization on the economic and statistical significance of the coefficients are minimal, with the exception of inflation, which assumes some very high values in my sample (with a maximum of 23,773% per annum for the Democratic Republic of Congo in 1994 – which Laeven and Valencia, 2012, classify as a systemic banking crisis year).

Table 1 presents summary statistics for all variables. The average value for the crisis dummy is 0.13, which indicates that for the average country in my sample, one in every eight years can be characterized as a banking crisis year. For most of the variables, several thousands of country-year observations are available, but the coverage is notably lower for some variables (including several of the financial and poverty indicators, as well as literacy).

2. Results

For each of the economic, financial, health, education, poverty, and gender issues indicators, Table 2 presents the results of four different panel models to estimate the impact of financial crises. The table shows the coefficient on the contemporaneous (Year 0) and one-year lagged

(Year 1) banking crisis dummy (obtained from two separate panel models) as well as the cumulative coefficient on the contemporaneous up to and including five-year lagged (Years 0-5) banking crisis dummy (obtained from panel models with and without economic control variables). For the Years 0-5 panel models, the table also reports the economic significance of the cumulative coefficients (expressed as a fraction of the standard deviation of the dependent variable), the R^2, and the number of observations.

The impact of financial crises is statistically and economically significant for many of the economic and financial indicators in Panels A and B of Table 2. In the six years following a crisis, GDP growth tends to be lower by 2%, unemployment rises by 2%, and inflation increases by 30%. Crises tend to have an immediate impact on output and inflation, while the effect on unemployment is more protracted. For each of these variables, the economic significance indicates that a crisis year is associated with a substantial change in the dependent variable over the following six years that is equal to around 40% of its sample standard deviation. Nonetheless, the nominal effects on output and unemployment are smaller than those reported in Reinhart and Rogoff (2009), which is likely due to their focus on major post-war banking crises (supplemented by the historical crisis episodes of Norway in 1899 and the U.S. in 1929) for a total of 11 different crises in 22 countries. My study examines a much broader set of crises.

That said, I note that the economic significance reported in Table 2 understates the true impact of a banking crisis, since it is based on the cumulative impact of a single crisis year, while the average banking crisis in my sample lasts approximately 3.5 years. However, I caution against multiplying the economic effects by 3.5 to obtain an estimate of the effect of a full crisis episode, since the impact of the first crisis year may be greater than that of later years.

Somewhat surprisingly, there is only weak evidence of an impact of financial crises on government debt. Only when including economic controls do I find evidence of a significant (at the 10% level) increase of approximately 8%, relative to the unconditional sample mean of 66.3% (see Table 1). There is an immediate and lasting effect of a crisis on foreign direct investment (as a percentage of GDP) of around -0.5% over the six years following the crisis, corresponding to a 15% decrease relative to the sample mean of 2.95%. The panel model that includes economic controls shows some evidence that exports increase following a crisis, possibly as a result of a weaker currency. One of the few potentially beneficial consequences of a financial crisis is the small but significant drop in CO_2 emissions.

The capital buffers and profitability of the banking sector deteriorate considerably during financial crises. Panel B documents that the capital to assets ratio and ROA of the banking sector decline by, respectively, 5.5% and almost 30% relative to their sample means. The banking sector tends to recover quickly as there is no significant longer-term effect on either of these indicators. However, both the fraction of non-performing loans on the banks' balance sheets and the lending risk premium remain higher for a prolonged period. Non-performing loans more than double relative to the sample mean, and the lending risk premium rises by around 3%, or a 60% increase relative to its mean of 5%. Remarkably, both domestic credit and bank deposits increase significantly in the first two years. These effects are too large to be explained by the decrease in the denominator (GDP) of these variables, but do not persist. I further find a large and lasting effect on savings of -15% relative to the sample mean.

In addition to these large economic effects of financial crises, Panel C of Table 2 shows a pronounced impact on the health of a country's people. Most notably, I find a significant effect of the banking crisis dummy on average life expectancy of -0.24 years in Year 0, -0.29 in Year 2,

and -0.71 over Years 0-5. These effects correspond to a long-run decrease in life expectancy of more than nine months, where the sample mean is around 66 years. This effect arises gradually over the years following a crisis and survives controlling for economic conditions. There is no significant effect on infant mortality, but I do find a long-run effect on fertility at around -0.2 over Years 0-5, which translates into a 5% decline relative to its mean of 3.8 births per woman. Furthermore, the prevalence of HIV increases by 20-25% over the six years following a crisis, as measured relative to the mean of 1.5% of the population aged between 15 and 49. The root causes of these remarkably large effects on health could range from heightened stress levels to reduced health care quality and outright food shortage. The last two rows of Panel C provide some pointers on what could contribute to the effects. Although there is short-lasting positive effect on public health expenditure, the effect of a crisis on private health expenditure is negative and is longer-lasting, which suggests that financial crises may undercut people's ability to care for their own health.

Not only people's health is undermined in a country hit by a crisis, but also their access to education. Panel D shows that primary school enrollment decreases significantly in the years following a financial crisis. In the year of a crisis, 1.3% fewer children of the relevant age group enter primary school compared to normal times. In the following five years, the effect grows to almost -4% (-2.6% when controlling for economic conditions). The inability of these children to go to school likely has long-lasting effects on their lives. Panel D shows no significant effects on primary school completion and literacy, possibly because these effects take longer to materialize. There is also no effect on public education expenditure.

The poorest people in a society are hit hard during crises. Panel E of Table 2 reveals that the poverty gap is 0.8% lower during crisis years, or a 12% decrease relative to the sample mean

of 6.64%. The poverty headcount also increases, but not significantly so. The income share of the poorest 10% and 20% of the population drop by around 5-6% relative to their means of 2.22% and 5.67%. Although the magnitudes of these short-run changes in poverty and income distribution are substantial, the long-run effects are not significant. In contrast, the fraction of the population recognized as refugee does increase markedly over longer horizons. When controlling for economic conditions (as well as controls for political system, natural disasters, and violence), I find a cumulative effect of a crisis year on refugees of +0.25%, which corresponds to an almost 50% increase relative to the mean of 0.53%. The impact on foreign development aid flowing into the country is equally pronounced. In the six years following a crisis, foreign aid (as a percentage of GNI) grows by close to 3.8%, which is about 50% of the sample mean of 6.8%.

Financial crises also affect gender issues. Panel F shows that despite an overall decrease in fertility (see Panel C), the number of births per 1,000 women aged between 15 and 19 increases following a crisis. The Years 0-5 effect is 2.9, or roughly a 4.5% increase relative to the mean of 61.9 births. This effect disappears when controlling for economic conditions, although I argue in Section 1 that this might lead to an underestimation of the effect. Female unemployment increases significantly, but does so at a similar rate as overall unemployment. There is a slight increase in the fraction of female workers in the non-agricultural sector. Strikingly, the proportion of seats held by women in parliament drops considerably, by 1.2% (2.3%) with (without) economic controls, or a 10-15% drop relative to mean of only 14%.

Overall, Table 2 presents evidence of large social costs associated with financial crises. Not only do local economies and financial sectors suffer, so do health, education, poverty, and gender issues. In the next section, I examine which groups of countries experience greater social consequences of financial crises.

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3. Results for different groups of countries

The economic and social effects of financial crises presented so far are based on panel models that exploit the power obtained from the large cross-section of countries and long time period, but conceal the rich variation in financial crisis experiences in my sample. In this section, I explore differences across countries in the economic and social costs of financial crises.

Table 3 reports the results of panel models to estimate the impact of financial crises on select socioeconomic indicators in which the coefficient on the banking crisis dummy is allowed to be different for different groups of countries. To be conservative, I only report results for the panel models with the one-year lagged banking crisis dummy.

In Panel A, we categorize countries into developed and less-developed based on the "advanced country" classification by the IMF; 28 of the 126 countries in my sample are developed according to this classification. The results indicate that the impact of financial crises on output and unemployment is at least as large for developed countries as for less-developed countries. In the year after the crisis, GDP growth is reduced by 1.9% for developed countries and by 1.4% for less-developed countries. Unemployment rises by 1.5% for developed countries and by 1.0% for less-developed countries. The Wald test indicates that the differences in these effects are not statistically significant (although the p-value is 0.11 for unemployment). The impact of financial crises on inflation is much greater for less-developed countries. Inflation increases by 21.9% (which represents a doubling relative to the unconditional sample mean of 22%) for less-developed countries, and by less than 2% (statistically indistinguishable from zero) for developed countries. The difference in the effects on inflation is highly significant. The consequences of banking crises for the financial sector are larger for less-developed countries. The decline in bank profitability and the increase in the lending risk premium are only significant

for these countries, although the fraction of non-performing loans on the banks' balance sheets rises by approximately 5-6% in the year following a crisis year for both groups of countries.

The remainder of Panel A shows that the main social costs of financial crises are concentrated in less-developed countries. These countries experience a significant reduction in life expectancy, fertility, and school enrollment, as well as a significant rise in HIV prevalence, refugees, and adolescent fertility in the subsequent year. None of these effects is significant for developed countries. Despite the clear differences in the statistical and economic effects of financial crises on these social indicators, only one of the differences (fertility) is statistically distinct from zero based on the Wald test, which points at considerable variation in the effects within each group of countries.

In sum, these results suggest that although developed countries suffer at least as much from financial crises in terms of a reduction in output and employment as less-developed countries, people in developed countries have better mechanisms at their disposal to prevent the economic damage of a crisis to spillover to health, education, poverty, and gender issues. More research is needed to understand why the people in some countries are better positioned to mitigate the social impact of financial crises than in others.

Ironically, although many of the crises in my sample originate from the banking sector, this sector may also play a vital role in helping people to cope with the crisis. After all, an important way for households to deal with income shocks and smooth their consumption over time is through borrowing and saving. And although access to banking services may be limited for many of the poorest households in various countries in my sample, for the majority of households in most countries the banking system is likely to be a major mechanism through which to adjust to the consequences of a crisis. I would thus like to examine whether more

developed banking systems are better able to help households deal with the social consequences of a crisis. However, as outlined by Čihák, Demirgüç-Kunt, Feyen, and Levine (2012), common empirical proxies for a country's financial system development are measures of the size of the banking sector (such the ratio of outstanding bank deposits to GDP) that could have a first-order effect on the depth of the banking crisis itself. Instead, I therefore focus on another aspect of the banking sector whose bearing on the functioning of the banking system is highly debated: bank concentration (see Beck, Demirgüc-Kunt, and Levine, 2006, for a discussion).

For 117 of the 126 countries in my sample, I am able to obtain annual data on bank concentration (assets of three largest banks as a share of assets of all commercial banks in a country) from Beck and Demirgüç-Kunt (2009). These data start in 1988, although coverage is limited for some countries. For each country, I compute the mean bank concentration over the sample period based on the available data and classify this country as having a low (high) bank concentration if this mean is below (above) the median across all countries. Since bank concentration is very stable over time, this procedure is likely to yield a fairly reliable classification of countries with a concentrated vs. dispersed banking sector. I note that the correlation between the country group classification based on the overall level of development (in Panel A of Table 3) and based on bank concentration is low at 0.16.

Panel B of Table 3 reports the results of panel models for select socioeconomic indicators that allow the coefficient to vary across countries with high and low bank concentration. There is no significant difference in the effects of financial crises on the main economic indicators (output, unemployment, and inflation) across the two groups of countries. The financial indicators show mixed results. However, several of the key social indicators are more heavily affected for countries where a small number of banks hold a large fraction of the assets of the

entire banking sector. These countries suffer a significantly greater decline in life expectancy and school enrollment and a significantly greater increase in refugees and adolescent fertility.

Hence, although countries with more concentrated banking sectors are less likely to experience a banking crisis (Beck, Demirgüc-Kunt, and Levine, 2006), they are also less successful in enabling their people to limit the social impact once a crisis occurs, which reinforces public policy concerns about the global trend of consolidation in banking systems (Bank for International Settlements, 2001; International Monetary Fund, 2001).

4. Conclusions

The economics profession traditionally measures the welfare of a society by its GDP, or by other economic indicators such as unemployment and inflation. However, focusing on these indicators fails to do justice to the wealth of different aspects of a society's well-being (Stiglitz, Sen, and Fitoussi, 2010). When evaluating the consequences of a financial crisis for society (as well as potential ways to alleviate these consequences), it is therefore important to look beyond traditional economic variables and consider a wide range of other indicators of societal welfare.

This paper takes a first step in that direction. Based on information on a large number of banking crises in many different countries over a long time period, I investigate the impact of crises on a host of socioeconomic indicators. My analysis shows that financial crises tend to come at a great cost to society. Not only are the economy and banking sector of a country hit by a crisis, so are the health, education, poverty, and gender equality of its people.

Future research should focus on identifying the channels through which these various consequences for society arise, and on analyzing which policies help to reduce the social costs of financial crises.

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Table 1: Summary statistics

This table presents summary statistics (the mean, minimum, median, maximum, standard deviation as well as the number of country-year observations in the sample over which these statistics are computed) for the banking crisis variable and the control variables (Panel A), the economic indicators (Panel B), the financial indicators (Panel C), the health indicators (Panel D), the education indicators (Panel E), the poverty indicators (Panel F), and the gender issues indicators (Panel G). The full sample consists of 126 countries over the period 1970-2009. All variables have been winsorized at the 1% and 99% level (based on the pooled distribution), except for the first five variables in Panel A (which are dummy variables). Variable definitions are in the Appendix.

	Mean	Min	Median	Max	St. Dev.	# Obs.
Panel A: Banking crisis and control variables						
Banking crisis	0.13	0	0	1	0.33	4824
Assembly	0.13	0	0	1	0.34	4067
Parliamentary	0.32	0	0	1	0.47	4067
Presidential	0.54	0	1	1	0.50	4067
Natural disaster	0.20	0	0	1	0.40	4824
Violence	1.73	0	1	37	3.36	4824
Gross capital formation (% GDP)	22.27	5.30	21.76	46.23	7.52	4189
Population growth (%)	1.64	-1.42	1.70	5.02	1.23	4780
Government consumption (% GDP)	15.48	4.51	14.81	35.76	6.01	4137
Δ Terms of trade ($\times 10^9$)	409.26	-1272	2.23	22185	2582.79	3595
Trade openness (% GDP)	71.49	10.73	61.50	279.48	43.76	4265
Panel B: Economic indicators						
GDP growth (%)	3.50	-14.24	3.82	19.19	4.99	4256
Unemployment (%)	8.58	0.83	7.60	30.50	5.50	1927
Inflation (%)	22.18	-2.79	7.19	574.87	68.73	3773
Government debt (% GDP)	66.30	1.91	50.64	173.71	52.18	1423
FDI (% GDP)	2.95	-1.87	1.18	40.07	5.67	3927
Exports (% GDP)	33.31	4.05	27.95	142.80	22.85	4265
R&D expenditure (% GDP)	1.03	0.03	0.67	4.22	0.96	928
CO_2 emissions (metric tons / capita)	3.87	0.03	1.49	23.02	4.81	4447
Panel C: Financial indicators						
Bank capital (%)	8.99	3.11	8.50	21.49	3.74	807
Bank ROA (%)	1.19	-10.53	1.07	8.90	2.24	1982
Non-performing loans (%)	6.99	0.30	4.00	31.36	7.17	830
Lending risk premium (%)	5.52	-3.56	3.74	46.88	7.29	1467
Domestic credit (% GDP)	56.52	2.47	43.04	231.97	45.82	4122
Bank concentration (%)	69.34	22.21	71.51	100.00	20.91	1978
Bank deposits (% GDP)	39.40	3.23	30.21	183.24	32.05	3482
Savings (% GDP)	19.45	-4.37	19.38	52.83	9.71	3463
Remittance (% GDP)	3.01	0.01	0.95	24.31	4.82	3049

	Mean	Min	Median	Max	St. Dev.	# Obs.
Panel D: Health indicators						
Life expectancy (years)	63.96	38.79	67.72	80.76	11.33	4784
Infant mortality (per 1000)	52.11	3.00	38.60	166.93	43.87	4680
Fertility (births per woman)	3.81	1.21	3.27	7.78	2.00	4782
HIV prevalence (% population 15-49)	1.48	0.10	0.30	19.18	3.23	2249
Private health expenditure (% GDP)	2.77	0.48	2.44	8.56	1.57	1864
Public health expenditure (% GDP)	3.54	0.22	3.12	8.24	1.99	1864
Panel E: Education indicators						
School enrollment (%)	94.90	22.95	100.51	136.34	22.28	4034
Completion rate (%)	74.43	9.57	85.88	110.18	28.00	2559
Literacy (% people>15)	75.65	11.81	86.75	99.74	23.84	348
Education spending (% GDP)	4.38	1.05	4.48	8.30	1.60	2197
Panel F: Poverty indicators						
Poverty gap (mean shortfall, %)	6.64	0.00	2.89	45.03	9.65	692
Poverty headcount (%)	16.50	0.00	7.96	83.78	21.26	692
Income share lowest 10% (%)	2.22	0.21	2.25	4.56	1.14	710
Income share lowest 20% (%)	5.67	1.50	5.64	10.43	2.35	710
Refugees (% population)	0.53	0.00	0.01	11.84	1.84	2332
Foreign aid (% GNI)	6.77	-0.01	3.11	50.38	9.25	2974
Panel G: Gender issues indicators						
Adolescent Fertility (per 1000)	61.93	4.61	44.34	212.25	52.11	1625
Girls/boys in education (%)	91.02	43.66	98.46	109.33	15.73	3028
Female unemployment (%)	10.20	1.02	8.50	37.09	7.19	1819
Female empl. share non-agr. (%)	41.02	11.39	43.50	55.43	9.99	1487
Female MPs (%)	14.39	0.00	12.00	41.47	9.63	1615

Table 2: Panel models to measure the impact of banking crises on economic and social indicators

This table present the results of panel models of economic (Panel A), financial (Panel B), health (Panel C), education (Panel D), poverty (Panel E), and gender issues (Panel F) indicators on the banking crisis dummy for 126 countries over the period 1970-2009. For each indicator, four different panel models are run to measure the impact of banking crises in the same year (Year 0), in the subsequent year (Year 1), and the cumulative impact in the following six years (Years 0-5). All panel models include country fixed effects, a time trend, and control variables for political system, natural disasters, and violence. The fourth panel model (Years 0-5 "including economic controls") also includes one-year lagged *GDP growth*, *Gross capital formation*, *Population growth*, *Government consumption*, *Δ Terms of trade*, and *Trade openness* − where in crisis years the values in the year before the crisis are taken to control for economic conditions before the start of the crisis. The table reports the coefficients and their significance (***, **, and * indicate significance at the 1%, 5%, and 10% level). For the Years 0-5 panel models, the table reports the cumulative coefficients on the banking crisis dummy and their economic significance (expressed as a fraction of the standard deviation of the dependent variable). Variable definitions are in the Appendix. The final two columns report the R^2 and the number of observations for the Year 0-5 panel models without economic controls.

	Effects of banking crisis over:				*Including economic controls:*			
	Year 0	Year 1	Years 0-5	Economic significance	Years 0-5	Economic significance	R^2	# Obs.
Panel A: Economic indicators								
GDP growth	-2.415 ***	-1.491 ***	-1.820 ***	-0.37	-1.886 ***	-0.38	0.14	3764
Unemployment	0.635 ***	1.202 ***	2.131 ***	0.39	2.660 ***	0.48	0.77	1900
Inflation	21.263 ***	16.756 ***	30.504 ***	0.44	28.819 ***	0.42	0.27	3377
Government debt	0.102	1.448	5.406		8.255 *	0.16	0.55	1405
FDI	-0.400 **	-0.505 ***	-0.662 **	-0.12	-0.595 **	-0.10	0.56	3610
Exports	0.050	0.284	-0.461		1.664 ***	0.07	0.86	3768
R&D expenditure	0.015	0.025	0.012		-0.015		0.97	924
CO_2 emissions	-0.149 ***	-0.154 ***	-0.267 ***	-0.06	-0.124 *	-0.03	0.96	3830
Panel B: Financial indicators								
Bank capital	-0.503 **	-0.324	-0.132		0.028		0.82	803
Bank ROA	-0.354 ***	-0.333 **	-0.317		-0.363		0.28	1950
Non-performing loans	5.498 ***	5.846 ***	8.453 ***	1.18	7.646 ***	1.07	0.67	825
Lending risk premium	2.262 ***	2.736 ***	2.834 ***	0.39	3.407 ***	0.47	0.52	1414
Domestic credit	8.586 ***	4.133 ***	2.505		0.444		0.76	3672
Bank concentration	0.725	-0.191	-1.955		-2.206		0.62	1946
Bank deposits	3.074 ***	1.771 ***	0.626		0.686		0.88	3148
Savings	-1.695 ***	-1.699 ***	-3.472 ***	-0.36	-3.085 ***	-0.32	0.60	3346
Remittance	-0.124	-0.069	-0.177		-0.228		0.72	2934

Table 2, continued

	Effects of banking crisis over:				Including economic controls:			
	Year 0	Year 1	Years 0-5	Economic significance	Years 0-5	Economic significance	R^2	# Obs.
Panel C: Health indicators								
Life expectancy	-0.237 **	-0.285 ***	-0.752 ***	-0.07	-0.708 ***	-0.06	0.96	3992
Infant mortality	0.433	0.020	-0.245		-0.198		0.95	3964
Fertility	-0.026	-0.075 ***	-0.216 ***	-0.11	-0.210 ***	-0.11	0.94	3990
HIV prevalence	0.148 **	0.108	0.421 ***	0.13	0.288 **	0.09	0.89	2197
Private health expenditure	-0.094 **	-0.124 ***	-0.105 *	-0.07	-0.060		0.90	1825
Public health expenditure	0.102 **	0.041	-0.091		0.007		0.93	1825
Panel D: Education indicators								
School enrollment	-1.309 ***	-1.542***	-3.594 ***	-0.16	-2.654 ***	-0.12	0.78	3491
Completion rate	-0.302	-0.676	-1.423		-1.004		0.90	2259
Literacy	-0.185	0.679	1.341		-0.388		0.96	338
Education spending	0.002	0.025	-0.054		0.045		0.73	2006
Panel E: Poverty indicators								
Poverty gap	0.785 **	0.427	0.390		-0.120		0.88	676
Poverty headcount	0.775	0.895	0.612		-0.021		0.92	676
Income share lowest 10%	-0.139 ***	-0.045	-0.079		-0.038		0.88	694
Income share lowest 20%	-0.271 ***	-0.114	-0.227		-0.207		0.89	694
Refugees	0.070	0.155***	0.379 ***	0.21	0.253 ***	0.14	0.74	2259
Foreign aid	1.875 ***	1.897***	3.748 ***	0.41	3.876 ***	0.42	0.62	2624
Panel F: Gender issues indicators								
Adolescent Fertility	1.291 ***	1.396***	2.847 ***	0.05	0.103		0.99	1603
Girls/boys in education	-0.101	0.003	-0.179		0.101		0.91	2674
Female unemployment	0.334	0.918***	2.010 ***	0.28	2.715 ***	0.38	0.79	1798
Female empl. share non-agr.	0.258 **	0.303***	0.540 ***	0.05	0.561 ***	0.06	0.98	1454
Female MPs	-0.415	-0.893 **	-2.267 ***	-0.24	-1.169 **	-0.12	0.84	1597

Table 3: Panel models to measure the impact of banking crises on economic and social indicators:
Developed vs. less-developed countries

This table present the results of panel models of selected economic, financial, health, education, poverty, and gender issues indicators on the one-year lagged banking crisis dummy (Year 1) for 126 countries over the period 1970-2009. The coefficient on the banking crisis dummy is allowed to be different for different groups of countries. We categorize countries into two groups in the following ways: developed and less-developed countries (based on the advanced country classification by the IMF) in Panel A and countries with a high/low concentration of the banking sector in Panel B. The correlation between the two country group classifications is 0.16. All panel models include country fixed effects, a time trend, and control variables for political system, natural disasters, and violence. The table reports the estimated coefficients for each group of countries and their significance (***, **, and * indicate significance at the 1%, 5%, and 10% level) as well as the results of Wald tests on the equality of the coefficients across the two groups of countries. Variable definitions are in the Appendix.

	Panel A: developed vs. less-developed countries			**Panel B: countries with high vs. low bank concentration**		
	Effects of banking crisis over: Year 1			*Effects of banking crisis over: Year 1*		
	Developed countries	**Less-developed countries**	**p-value Wald test for equality of coefficients**	**High bank concentration**	**Low bank concentration**	**p-value Wald test for equality of coefficients**
GDP growth	-1.907 ***	-1.367 ***	0.302	-1.510 ***	-1.328 ***	0.680
Unemployment	1.543 ***	0.988 ***	0.113	1.230 ***	1.189 ***	0.911
Inflation	1.874	21.806 ***	0.005 ***	17.710 ***	8.984 **	0.151
Bank ROA	-0.103	-0.441 ***	0.236	0.034	-0.517 ***	0.048 **
Non-performing loans	5.219 ***	6.391 ***	0.313	8.488 ***	4.914 ***	0.006 ***
Lending risk premium	0.358	4.135 ***	0.000 ***	3.120 ***	2.482 ***	0.438
Life expectancy	-0.076	-0.348 ***	0.283	-0.913 ***	0.199	0.000 ***
Fertility	0.026	-0.105 ***	0.013 **	-0.077 **	-0.101 ***	0.605
HIV prevalence	0.054	0.126 *	0.632	-0.019	0.144	0.220
School enrollment	-0.719	-1.821 ***	0.346	-3.649 ***	0.349	0.000 ***
Poverty gap	-1.302	0.476	0.434	1.425 *	0.076	0.144
Income share lowest 10%	0.234	-0.053	0.278	-0.120	-0.027	0.410
Refugees	0.010	0.189 ***	0.162	0.315 ***	0.019	0.001 ***
Adolescent Fertility	0.693	1.650 ***	0.316	2.196 ***	0.414	0.034 **

Appendix: Variable definitions and data sources

This appendix present the variable definitions and data source of the banking crisis variable and the control variables (Panel A), the economic indicators (Panel B), the financial indicators (Panel C), the health indicators (Panel D), the education indicators (Panel E), the poverty indicators (Panel F), and the gender issues indicators (Panel G).

Variable	Definition	Data source
Panel A: Banking crisis and control variables		
Banking crisis	Banking crisis indicator taken from Reinhart and Rogoff (2010): a banking crisis is marked by two types of events: (1) bank runs that lead to the closure, merging, or takeover by the public sector of one or more financial institutions; (2) if there are no runs, the closure, merging, takeover, or large-scale government assistance of an important financial institution (or group of institutions), that marks the start of a string of similar outcomes for other financial institutions. For countries not in the Reinhart-Rogoff data, I use data from Laeven and Valencia (2012), who identify "systemic banking crises" based on: 1) significant signs of financial distress in the banking system (as indicated by significant bank runs, losses in the banking system, and/or bank liquidations), and 2) significant banking policy intervention measures in response to significant losses in the banking system.	Reinhart & Rogoff (2010) Laeven and Valencia (2012)
Assembly / Parliamentary / Presidential	Political system indicator; each country is categorized as being ruled by either a parliamentary system, an assembly-elected president, or a presidential system.	Database of Political Institutions
Natural disaster	Cumulative number of natural disasters in a country-year; events that are included are: droughts, epidemics, extreme temperatures, floods, insect infestations, mass movements of the population, storms, volcanic activity, and wildfires.	Center for Research on the Epidemiology of Disasters' EM-DAT database
Violence	Indicator variable for the occurrence of violence or war in a country-year capturing national ethnic violence and unrest, outright national wars (such as civil wars), and full-scale international conflicts and wars.	Polity IV Dataset
Gross capital formation	Gross capital formation consists of outlays on additions to the fixed assets of the economy plus net changes in the level of inventories (% of GDP).	World Bank
Population growth	Population growth (% per annum).	World Bank
Government consumption	General government final consumption expenditure includes all government current expenditures for purchases of goods and services (including compensation of employees). It also includes most expenditures on national defense and security, but excludes government military expenditures that are part of government capital formation (% of GDP).	World Bank
Δ Terms of trade	Year-on-year change in exports as a capacity to import, defined as the current price value of exports of goods and services deflated by the import price index (expressed in billions of constant local currency units).	World Bank
Trade openness	Sum of exports and imports of goods and services (% of GDP).	World Bank

Variable	Definition	Data source
Panel A: Economic indicators		
GDP growth	Gross Domestic Product growth (% per annum).	World Bank
Unemployment	Unemployment, total (% of total labor force).	World Bank
Inflation	Inflation, consumer prices (% per annum).	World Bank
Government debt	Central government debt, total (% of GDP).	World Bank / OECD
FDI	Net inflows of foreign direct investment (% of GDP).	World Bank
Exports	Exports of goods and services (% of GDP).	World Bank
R&D expenditure	Research and development expenditure (% of GDP).	World Bank
CO_2 emissions	CO2 emissions (metric tons per capita).	World Bank
Panel B: Financial indicators		
Bank capital	Bank capital to assets ratio (%).	World Bank
Bank ROA	Average return on assets (Net Income/Total Assets).	Beck & Demirgüç-Kunt (2009)
Non-performing loans	Bank nonperforming loans to total gross loans (%).	World Bank
Lending risk premium	Risk premium on lending (prime rate minus treasury bill rate, %).	World Bank
Domestic credit	Domestic credit provided by banking sector (% of GDP).	World Bank
Bank concentration	Assets of three largest banks as a share of assets of all commercial banks.	Beck & Demirgüç-Kunt (2009)
Bank deposits	Demand, time and saving deposits in deposit money banks (% of GDP).	Beck & Demirgüç-Kunt (2009)
Savings	Gross savings (% of GDP); gross savings are calculated as gross national income less total consumption, plus net transfers.	World Bank
Remittance	Net remittance inflows as a (% of GDP).	Beck & Demirgüç-Kunt (2009)
Panel C: Health indicators		
Life expectancy	Life expectancy at birth, total (years).	World Bank
Infant mortality	Mortality rate, infant (per 1,000 live births).	World Bank
Fertility	Fertility rate, total (births per woman); the number of children that would be born to a woman if she were to live to the end of her childbearing years and bear children in accordance with current age-specific fertility rates.	World Bank
HIV prevalence	Prevalence of HIV, total (% of population ages 15-49).	World Bank
Private health expenditure	Health expenditure, private (% of GDP).	World Bank
Public health expenditure	Health expenditure, public (% of GDP).	World Bank

Appendix, continued

Variable	Definition	Data source
Panel D: Education indicators		
School enrollment	Total enrollment in primary education, expressed as a percentage of the population of official primary education age; can exceed 100% due to the inclusion of over- and under-aged students because of early or late school entrance and grade repetition	World Bank
Completion rate	Total number of new entrants in the last grade of primary education, expressed as percentage of the total population of the theoretical entrance age to the last grade of primary; can exceed 100% due to over-aged and under-aged children who enter primary school late/early and/or repeat grades.	World Bank
Literacy	Literacy rate, adult total (% of people ages 15 and above).	World Bank
Education spending	Public spending on education, total (% of GDP).	World Bank
Panel E: Poverty indicators		
Poverty gap	Poverty gap at $1.25 a day (PPP) (%); Poverty gap is the mean shortfall from the poverty line (counting the non-poor as having zero shortfall), expressed as a percentage of the poverty line. This measure reflects the depth of poverty as well as its incidence.	World Bank
Poverty headcount	Poverty headcount ratio at $1.25 a day (PPP) (% of population).	World Bank
Income share lowest 10%	Income share held by lowest 10% of population in terms of income.	World Bank
Income share lowest 20%	Income share held by lowest 20% of population in terms of income.	World Bank
Refugees	Refugee population by country or territory of origin (% of population).	World Bank
Foreign aid	Net official development aid received (% of gross national income or GNI).	World Bank
Panel F: Gender issues indicators		
Adolescent Fertility	Adolescent fertility rate (births per 1,000 women ages 15-19).	World Bank
Girls/boys in education	Ratio of girls to boys in primary and secondary education (%).	World Bank
Female unemployment	Unemployment, female (% of female labor force).	World Bank
Female empl. share non-agr.	Share of women employed in the non-agricultural sector (% of total non-agricultural employment).	World Bank
Female MPs	Proportion of seats held by women in national parliaments (%).	World Bank