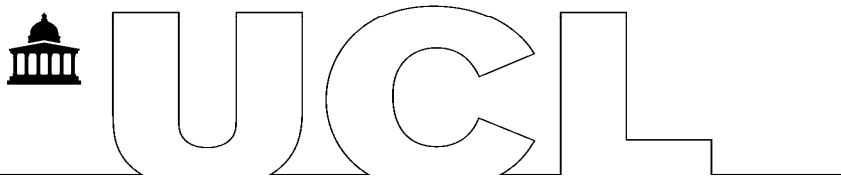

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Impact of financial crises on poverty in developing world: an empirical approach

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"Impact of financial crises on poverty in developing world: an empirical approach"

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Abstract: In this paper, we adopt a cross-country perspective to analyze the short term effects of currency, banking and debt crises on poverty. We employ multivariate fixed effects panel data analysis in order to examine whether and to what extent different types of financial crises impact the poverty headcount ratio and the poverty gap (as measured by the World Bank). Our findings suggest that out of the three categories of financial crises we identify, it is currency crises that most significantly exacerbate both the incidence and depth of poverty in the short run. We find evidence that banking crises are associated with an increase in the depth of poverty but not the incidence (however this effect tends to be short-lived), while, our analysis shows no direct effect of sovereign debt crises on short term poverty.

Keywords: poverty, currency crises, banking crises, debt crises, developing countries

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1. Introduction

The current global financial crisis, which has evolved into a global financial *and* economic crisis, is another reminder of the effect of financial (and economic) crises on poverty. According to a recent World Bank publication released around its annual spring meetings (World Bank (2009)), this crisis will push some 35 million more people in the Europe and Central Asia region below the poverty line. Needless to say, the current financial crisis has renewed the interest among researchers for further exploring the relationship between financial crises and poverty and for unearthing the links and the channels through which the two variables are connected. In this spirit, this paper empirically estimates the relationship between financial crises (disaggregated over banking, currency and debt crises) and poverty in the developing world.

The paper adds to the existing knowledge in the area of financial crises and poverty in a few crucially important ways. Firstly, it uses a comprehensive panel dataset on 90 low and middle income countries to estimate the aggregate impact of financial crises on poverty. While doing so, it employs a new and improved measure of financial crises, disaggregated over banking, currency and debt crises. In particular, our paper is distinct from most of the available cross-country studies that deal with the impact of financial crises on selected macroeconomic variables, as they tend to use the term financial crises as a synonym for a currency crisis (Baldacci et al. (2002)) or as a synonym for a banking crisis (Cecchetti et al. (2009))[i]. In contrast, our paper represents the first attempt to comprehensively estimate the impact of disaggregated financial crises on poverty while giving equal weights to the banking, currency and sovereign debt crises.

Our central findings, while confirming the existing theoretical and empirical knowledge that aggregate financial crises are bad for the poor, outline three important subtleties. First, we find that currency crises are always associated with short-run increases in the depth and incidence of poverty and that the effect on the incidence of poverty tends to be longer lived. Second, in contrast, banking crises tend to be associated only with exacerbating the short-run depth of poverty. Third, we find that debt crises do not impact upon poverty, a result which needs to be interpreted with care, given the low number of debt crises episodes in our sample.

However, any cross-country study of this nature comes with caveats attached. First, poverty is experienced at the level of the individual. Additionally, cross country studies of poverty throw up myriad data, survey and measurement complications, including issues of income versus consumption, in-kind income, informal income, equivalence scales, regional price variations and so on. Thus, although micro data can shed more light on individual transmission mechanisms, the cross-country approach is not without its own advantages. By analyzing over a longer time period, purging the country-specific effects and by focusing on within-group variation, a cross country study can reveal much about the general forces linking macro events, such as financial crises, and poverty. In exploring these links our specifications are robust to the inclusion of additional macroeconomic variables as well as to a range of lags of the independent variables.

As mentioned above, so far, there have been only a few cross-country studies that deal with the impact of financial crises on poverty. Baldacci et al. (2002) estimate the effect of currency crises on poverty for a selected sample of emerging economies. While noting their small sample size as an important caveat they find that financial crises are bad for poverty and income inequality. Cline (2002) also makes an attempt to estimate the effects of the financial crises (mainly currency and balance of payments crises) that happened in the 1990s. Although his study is limited to only eight emerging market economies, he finds that the crises were significantly damaging to the poor. However, the impact of the crisis on levels of poverty was different depending on how a particular country dealt with the problem at hand. What emerges from this fledgling research is a consensus that, inevitably, crises matter for aggregate welfare and yet, constrained by data availability and quality, a comprehensive and systematic study of the aggregate relationship between the two variables remains elusive.

Our paper is organized as follows: in section 2 we account for the main macro channels through which financial crises affect poverty, while in section 3 we take stock of the empirical literature that has been focused on examining the links between the two variables. In section 4 we present the data as well as some basic stylized facts, while section 5 contains the econometric methodology, results, and discussion and robustness checks. Section 6 concludes.

2. How financial crises impact on poverty

Slump in economic activity

A slump in economic activity is the main indirect channel through which financial crises may impact upon poverty. Most of the extant research (Ravallion (2001), Cline (2002)), has been focused on determining the "poverty elasticity" of growth, i.e. to what extent incomes of the poor people rise with growth (and to what extent they fall with contraction), finding that for every one percent increase in the mean income, the percentage of people living in absolute poverty decreases by 2.5 percent[ii]. We do argue, however, that financial crises have an additional and independent impact on levels and depth of poverty – something that we explore at the end of this section[iii].

Decrease in earnings and labour market implications

An occurrence of a financial crisis puts pressures on informal sector workers and changes the sectoral composition of employment, which in turn may exacerbate poverty levels. Financial crises lead to a fall in earnings of both formal and informal sector workers due to job losses in the formal sector and reduced demand for services in the informal sector. It has been previously shown that the entry of unemployed formal-sector workers into the informal sector puts additional pressure on the informal labour market, resulting with an increase in levels of poverty (Bourguignon and Morrisson (1992), Morley (1995), Walton and Manuyelan (1998), Lustig and Walton (1998)).

In addition, an occurrence of financial crises increases levels of unemployment and decreases real wages. Fallon and Lucas (2002), for example, cited the example of worsening unemployment in Korea following the Asian crisis. More importantly, however, the effects of the crisis were effectuated through decrease of wages rather than changes in the levels of employment. For example, in Indonesia and Turkey, inflation dramatically undermined manufacturing wages: real wages fell 44 percent in Indonesia and 31 percent in Turkey in a single year. In Malaysia, real wages declined only slightly in 1998 but the effect was intensified because the decline followed a period of high real wage growth.

Relative price change

After currency depreciation, the price of tradables (relative to non-tradables) rises, leading to a fall in earnings for those employed in the non-tradables sector. At the same time, there may be an increase in the demand for exports and consequently, employment and earning in the sectors producing exportables increase, thereby offsetting some of the losses due to the decline in GDP. Furthermore, the exchange rate may influence the price of imported food, increasing domestic food prices. This increase, in turn, hurts poor individuals and households that are net consumers of food (Baldacci et al. (2002)).

In general, currency and debt crises are associated with hyperinflation, which has been shown numerous times to hurt the poor much more than the middle or the upper classes (Easterly and Fischer (2000)). As poor people spend most of their incomes on consumption, surging prices hurt their budgets thus forcing them to spend more money on consumption or to curtail their consumption patterns. Evidence from other contexts indicates that the poor may be less able to smooth consumption (Fallon and Lucas (2002)), resulting in declines in consumption with repercussions on long-term nutrition and health.

Financial channel

Financial crises could also impact upon poverty through the financial channel. According to Agenor (2002), the poor often lack the means to protect themselves from adverse income and employment shocks. They lack assets, such as bank deposits and land, and often have no direct access to credit markets (or face prohibitive borrowing costs when they do), to smooth the impact of these shocks (Fallon and Lucas (2002), Morduch (1995)). For those near the poverty threshold, borrowing to smooth consumption becomes even more expensive due to rising interest rates (Cecchetti et al (2009)). In these conditions, many families turn to less formal sources for borrowing funds, though there is little evidence on the impact of crises on such borrowing. A recent survey found that deposits to microfinance institutions continued to rise during the East Asian crisis, possibly because they were sounder institutions and rural savers were shifting out of smaller rural banks (Atinc and Walton (1999)). This could imply easier access to credit from such sources during a crisis, though recent evidence raises serious questions about whether microcredit institutions actually lend to poorer households (Rai, Topa and Amin

(1999)). Up to date, however, microcredit has played a limited role and there is a lack of sufficient cross-country data to check hypotheses related to it.

Fiscal retrenchment and spending on health, social services and education

Spending cuts affect the volume of publicly provided critical social services, including social assistance outlays, and limit the access of the poor to these services at a time when their incomes are declining (Lanjouw and Ravallion (1999)). Agenor (2002) argues that indirect sources of income and public transfers may decline during crises because during such episodes the ability of relatives or communities to engage in income redistribution may be reduced and government may be forced to drastically adjust their fiscal account with across-the-board cuts in expenditure. The public expenditure fell in absolute terms during the Asian crisis. In Thailand, for example, the long-term implications of health spending cuts for the AIDS epidemic raised concerns (Lucas and Fallon (2002)). In Mexico, public spending on health and labour declined 11.6 percent in real terms in 1995 and by a further 5 percent in 1996, though these cuts were less deep than overall cuts in social spending (Lustig (2000)).

Although the public spending in most of the countries in crises fell, they still kept some sizeable level of social safety nets in order to shelter the poor. In Mexico, the government shifted resources out of other anti-poverty programs to a short-term employment program in 1995, creating an estimated half a million jobs. Some 70 percent of these jobs were in rural areas and paid about 80 percent of the minimum wage (Lustig (2000)). Similar social safety nets were introduced in other Latin American countries (Argentina and Ecuador), as well as in Russia during the financial crisis from 1998.

How different financial crises impact the levels of poverty

Banking crises are expected to be associated with increases in the incidence and depth of poverty. As indicated by Baldacci et al. (2002), banking crises erode savings and deposits and are associated with changes in assets and real estate prices as well as changes in interest rates. In certain instances, banking crises put further strain on the financial system and on the ability of poor people to borrow money for the purpose of consumption smoothing (Lucas and Fallon (2002)). However, given that most poor people are on the fringes of the banking systems (and are sometimes sheltered by microcredit institutions during periods of crises), the direct impact of the banking crises should be limited in magnitude.

Currency crises are also expected to increase the depth and incidence of poverty. Almost all currency crises are accompanied by relative price changes (especially of food), which as argued above, hurts the poor disproportionately more than the rich. Currency crises are also accompanied by a slowdown in economic activity and with pressures on the labour markets that further exacerbate the conditions of the poor (Baldacci et al. (2002)).

Given the incidence of occurrence, we argue that debt crises do not have a direct impact on poverty. However, sovereign debt crises are expected to increase levels of poverty

indirectly via some of the channels suggested below (for example, a debt crisis could force a government to curtail its public spending)[iv]. In some cases, however, a debt default could free up some additional funds that could be targeted towards helping the poor especially in the periods of crisis (Cecchetti et al. (2009)), thus acting in opposite direction to some of the other financial crises.

3. The Empirical literature

Individual country studies

Most of the empirical evidence on the impact of financial crises on poverty emerges from country level studies. In the case of Indonesia, Suryahadi and Sumarto (2003) evidence that poverty after the crisis rose by about 70 percent, mainly driven by the increase in the poverty gap. Particular increases were registered among the chronic poor, who suffered from increasing vulnerability to poverty. As a result, the proportion of the total vulnerable group jumped from less than one-fifth of the population before the crisis to more than one-third after the crisis (Said and Widyanti (2002)). Zin (2002) analyzed the impact of the financial crisis on poverty and inequality in Malaysia and as in previous studies evidenced that rural households were hurt less than urban ones. However, the process of recovery of urban households was smoother than that of rural ones. Natenuj (2002) presents a similar account of the impact of the Asian financial crisis on poverty and inequality in Thailand. She argues that, as the economy slid into recession, most of the benefits achieved in the previous decade were washed away, with serious repercussions on the poor. As in the case of other Asian countries, the ultra poor were hurt the most during the crisis. Similar widening of poverty rates was registered in China (Chen and Wang (2002)).

World Bank's rich database on poverty assessment studies proves useful when studying the impact of the financial crises on poverty rates in Latin America. The 2002 crisis in Argentina increased poverty rates from 37 to 58 percent. In addition, the income distribution worsened suggesting that lower socio-economic strata suffered more than the rest of the population (World Bank (2003)). In Ecuador, in addition to increase in poverty, worsening of the health and education outcomes was also reported. Both governments responded with significant increases in the social safety nets. The Argentine government mitigated the effect of the crisis by introducing the *Bonos Jefes* (which helped the public sector employees who lost their jobs due to the crisis). Similarly, the Ecuadorian government introduced *Bono Solidario* in order to compensate those who were hit by the crisis (World Bank (2000)).

Lokshin and Ravallion (2000), examining the welfare effects of the 1998 financial crisis in Russia, find that it was not felt only by those poor prior to 1998 but impacted upon individuals across the income distribution. According to them, the welfare effects were "on balance, poverty reducing", driven largely by effective welfare targeting. Offering a counter-view, Lokshin and Yemtsov (2004) argue that the formal social safety net was of little value for most Russians. Skoufias (2003) focuses more on the ways in which individual families coped with the crises and he finds that certain attitudes such as

reduction of non-food expenditure acted as complements to the standard insurance strategies. Abridging the studies above Gerry and Li (2008) report that married individuals living in small households, with educated heads in urban environment, weathered the crisis better. Similarly to Lokshin and Yemtsov (2004) they find that outside of pension payments, the formal social safety net did facilitate consumption smoothing, thus heightening the importance of informal coping institutions, principally in the form of increased home production.

Cross – country studies

The availability of cross country studies that analyze the impact of crises on poverty is limited. To the best of our knowledge, there is currently one study by Baldacci et al. (2002) that analyzes the impact of financial crises on poverty and inequality. The general finding of the study is that the financial crises increased the incidence of poverty and inequality in their sample of emerging countries. The authors however, attach two caveats to their paper: (i) limited number of countries (as they focus on a handful of emerging economies); and (ii) low number of data points which drives the magnitude and significance of coefficients.

4. Data and stylized facts

Data

Data on poverty comes from the World Development Indicators. We use four measures of poverty: poverty headcount ratio at 1.25 USD a day, poverty gap at 1.25 USD a day, poverty headcount ratio at 2 USD a day and poverty gap at 2 USD a day[v]. Data on banking, currency and debt crisis comes from Laeven and Valencia (2008), which consists of three dummy variables which take value of 1 for the year when a crisis happens and 0 otherwise. A more detailed description of the data is provided in Appendix 1.

When we define the crises, it is important to note that this is the first attempt to analyze the disaggregated *individual* effects of financial crises on the level and depth of poverty. Previous studies have used the term *financial crisis* as a synonym for banking crisis (Cecchetti et al. (2009)) or as a synonym for currency crisis (Baldacci et al. (2002)).

Basic stylized facts

A sense of the basic relationship between the financial crises and poverty variables could be gauged from the table below. The following few observations could be discerned: (i) all poverty indicators jumped by at least couple of percentage points following a currency crisis; (ii) poverty indicators increased following a debt crisis; (iii) the observations are mixed vis-à-vis the banking crises – while the relative poverty headcount ratio jumped by one percentage point, the absolute poverty headcount ratio and the poverty gap measures dropped.

Table 1. Aggregate measures of poverty before, at onset and after a specific financial crisis

	Number of crises	Poverty headcount ratio at 1. 25 USD a day, t-1	Poverty headcount ratio at 1. 25 USD a day, t+1	Poverty gap at 1.25 USD a day, t-1	Poverty gap at 1.25 USD a day, t+1
Banking Crisis	44	22.71	20.93	10.33	7.81
Currency Crisis	40	15.40	17.86	6.18	6.69
Debt Crisis	13	7.81	7.62	2.27	2.80
		Poverty headcount ratio at 2 USD a day, t-1	Poverty headcount ratio at 2 USD a day, t+1	Poverty gap at 2 USD a day, t-1	Poverty gap at 2 USD a day, t+1
Banking Crisis	44	34.68	35.52	17.04	15.50
Currency Crisis	40	27.04	31.36	11.71	13.36
Debt Crisis	13	17.10	19.37	5.95	6.22

Source: World Development Indicators and Laeven and Valencia (2008)

Similar conclusions could be drawn from the panel charts below. Whenever a financial crisis occurs in a situation where the poverty levels are stable (like in Argentina for example), the poverty measure jumps up, while when a financial crisis strikes where a poverty is on a downward trend (like in the case of Brazil or Mexico), the measure of poverty increases.

5. Econometric modelling, results and robustness checks

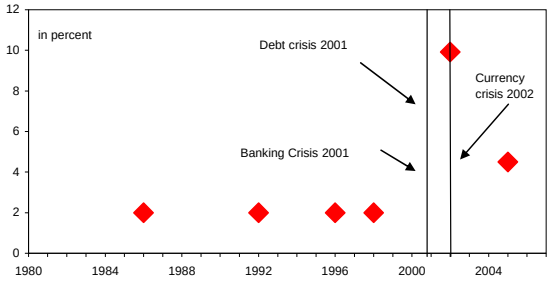
Given that a solid and sound theoretical model in the area of financial crises and poverty is lacking, following Cecchetti et al (2009), we argue that the best way to empirically capture the impact of financial crises on poverty involves culling from the literature the most commonly used control variables in other poverty related empirical studies. When selecting the control variables, we also considered to control for the additional transmission channels that we enumerated above (change in relative price, government spending and levels of GDP per capita). In addition, we control for openness and institutional quality.

In order to gauge the impact of financial crises on poverty, we estimate the following empirical model[vi]:

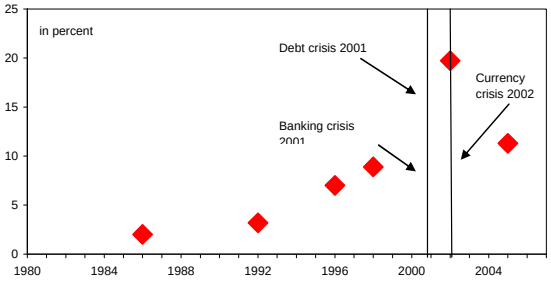
POVERTY MEASURE $_{i,t} = \alpha + \beta$CRISIS VARIABLE $_{i,t} + \gamma$CRISIS VARIABLE $_{i,t-1} +$ δCRISIS VARIABLE $_{i,t-2} + \zeta X_{i,t}$ + error term

Panel 1. Selected financial crises and poverty levels

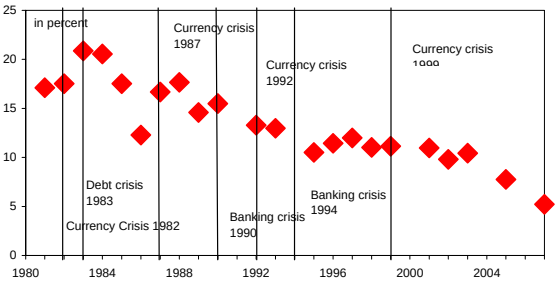
Argentina - Poverty headcount ratio at 1.25 USD a day



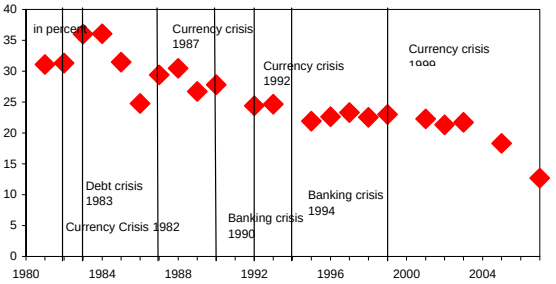
Argentina - Poverty headcount ratio at 2 USD a day



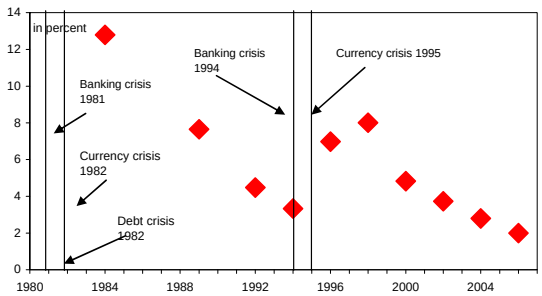
Brazil - Poverty headcount ratio at 1.25 USD a day



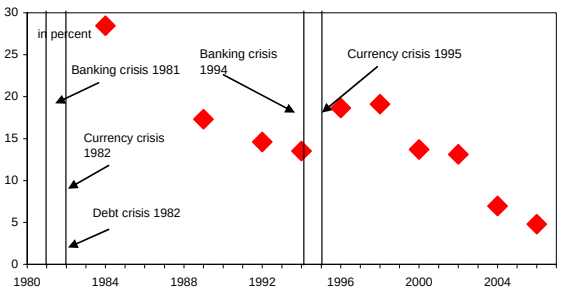
Brazil - Poverty headcount ratio at 2 USD a day



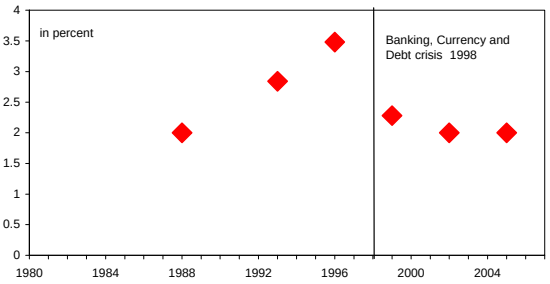
Mexico- Poverty headcount at 1.25 USD a day



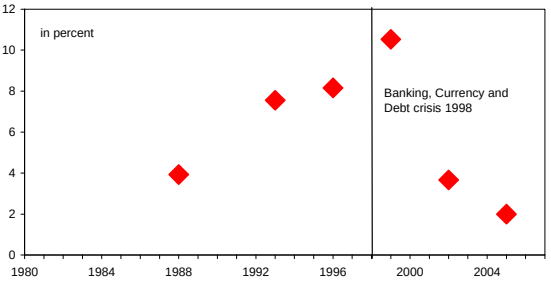
Mexico- Poverty headcount at 2 USD a day



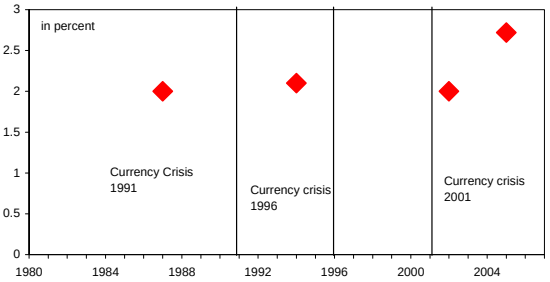
Russia- Poverty headcount at 1.25 a day



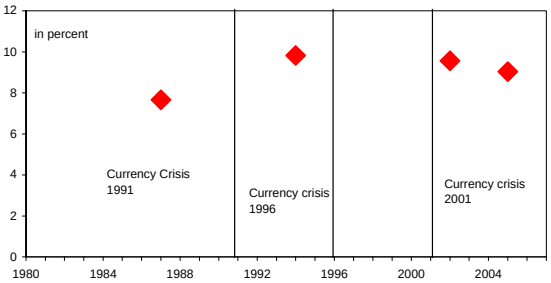
Russia- Poverty headcount at 2 USD a day



Turkey- Poverty headcount ratio at 1.25 USD a day



Turkey- Poverty headcount ratio at 2 USD a day



POVERTY MEASURE is the dependent variable, while CRISIS VARIABLE, and a vector of control variables X, are the independent variables. The vector of control variables encompasses: economic development (captured by the log of GDP per capita)[vii], the level of institutional development (using Polity IV), the level of trade openness (using the ratio of total trade to GDP), as well as inflation and government spending[viii]. The dataset consists of yearly data for 90 countries spanning the period between 1970 and 2007[ix]. We also thought about including the informal sector economy in the estimations however this strategy ran into a few problems: (i) data on informal sector economy is available only from mid 1990s onwards; (ii) the within-country variability is low, which would have produced insignificant results; (iii) in light of our labour market transmission channel it is not convincing to argue the impact of the financial crisis would have been lower in countries with sizeable informal sector. We also considered controlling for the mitigation impact of social safety nets. Unfortunately, the social safety nets in terms of design and target vary from a country to a country, which renders it difficult to use them in a cross-country regression. A cross-country dataset on types, effectiveness and ultimately, coverage, of social safety nets is still lacking.

We estimate the model using fixed effects. There are a few reasons for using fixed effects. First and foremost, due to data availability (and gaps in the poverty data in particular) estimating the effect of crises on cross country *changes* in poverty becomes a difficult task. Hence, estimating the impact of financial crises on levels of poverty, while controlling for other changes, seems a better approach. In addition, we assume a correlation between some of the independent variables and the time-invariant portion of the error term, which would render the OLS estimates inconsistent. Thus, fixed effects on panel data allow us to remove the above-mentioned form of endogeneity while providing consistent estimates for other mildly endogenous time-varying variables. Unfortunately, fixed effects do not permit us to control for important time invariant effects (such as for example initial conditions) which is one of the caveats that we attach to our findings. Also, most of the studies dealing with panel data take into account a possible reverse causality or endogeneity of the regressors and regressands. However, we argue that poverty does not have a significant impact on the possibility of a financial crisis occurring – indeed, as evidenced from our empirical examples above, financial crises happen in different types of countries across the board – low, lower middle and upper middle income countries (all of them with different levels of poverty gap and poverty headcount ratio). This latter point is emphasized in some of the latest empirical research (Cecchetti et al. (2009)). In that respect, our choice of estimation method becomes clear.

A snapshot of the main summary of the data used in this study is provided in the table below.

Table 2 - Summary of Observations

Variable	*Number of Observations*	*Mean*	*Standard Deviation*	*Minimum*	*Maximum*
Poverty headcount ratio at 1.25 USD a day	417	20.76	23.19	2.00	88.52
Poverty gap at 1.25 USD a day	417	7.99	11.14	0.50	56.96
Poverty headcount ratio at 2 USD a day	417	34.30	29.17	2.00	96.56
Poverty gap at 2 USD a day	417	15.57	16.69	0.50	68.36
Banking crisis	417	0.05	0.21	0.00	1.00
Currency crisis	417	0.04	0.19	0.00	1.00
Debt crisis	417	0.01	0.10	0.00	1.00
Log of GDP per capita PPP	417	8.22	0.92	5.78	10.02
Openness	417	73.93	39.10	13.64	210.37
Polity2	417	2.51	12.29	-88.00	10.00
Inflation	417	63.19	413.24	-4.48	7481.68
Government expenditure	417	13.93	4.92	2.98	31.82

Correlations

Correlations between data are presented in Table 2. Banking and debt crises are negatively correlated with some of the poverty variables. Currency crises are consistently positively correlated with all of the poverty variables. In addition, Table 3 provides simple correlations of demeaned variables where similar conclusions emerge. Both tables suggest some behavioural patterns that we explore more closely in the next section.

Results and discussion

Table 5 below presents our results when using the poverty headcount ratio at 1.25 USD a day as the dependent variable. When estimating the effect of different financial crises on poverty we proceed in the following way: the first three models use only one type of financial crisis at a time; models 4, 5 and 6 use pairs of two crises, while model 7 uses all three types of financial crises. In order to capture lagged effects of the crises on poverty we employ first and second lags as well[x].

We first observe that only the currency crises and only the contemporaneous values appear positive and significant. In view of the results, an occurrence of currency crisis is associated with an increase in the poverty headcount ratio by 4 percent. We would have also expected some impact of the banking crises on the poverty headcount ratio (i.e. we would have expected to see some percentage of the people that teeter around the poverty line to be sliding towards poverty as a banking crisis occurs). This however depends on many factors, such as for example, the availability of banking accounts for the citizens of the lower classes and how well they are protected (and inversely how badly they are hit) during a period of crisis, the extent to which these people use banking services etc. It could also be speculated that many of the vulnerable people may be sheltered by some of the microcredit institutions. However, given the scope of our study as well as the data we use, some of these questions cannot be answered.

Table 3 - Correlation table for the variables used in the model

	Poverty gap at 1.25 USD a day	Poverty headcount ratio at 1.25	Poverty headcount ratio at 2	Poverty gap at 2 USD a day	Banking crisis	Currency crisis	Sovereign debt crisis	Trade openness	Polity IV	GDP per capita (ppp)	Inflation	Government expenditure
Poverty gap at 1.25 USD a day	1.000											
Poverty headcount ratio at 1.25 USD a day	0.956	1.000										
Poverty headcount ratio at 2 USD a day	0.864	0.962	1.000									
Poverty gap at 2 USD a day	0.967	0.997	0.963	1.000								
Banking crisis	0.025	-0.014	-0.024	-0.003	1.000							
Currency crisis	0.104	0.088	0.076	0.092	0.014	1.000						
Sovereign debt crisis	-0.024	-0.019	-0.008	-0.017	0.108	0.208	1.000					
Trade openness	-0.214	-0.266	-0.283	-0.261	0.045	-0.083	0.034	1.000				
Polity IV	-0.148	-0.185	-0.201	-0.180	-0.009	0.024	0.026	0.086	1.000			
GDP per capita (ppp)	-0.766	-0.854	-0.900	-0.857	0.028	-0.058	0.015	0.189	0.402	1.000		
Inflation	0.051	0.014	-0.009	0.022	0.079	0.191	0.064	-0.156	0.026	0.009	1.000	
Government expenditure	-0.052	-0.117	-0.188	-0.120	0.028	-0.005	-0.008	0.226	-0.040	0.163	-0.052	1.000

Table 4. Correlation table between the main variables used in the model (demenaed)

	Poverty Gap at 1.25 USD a day	Poverty ratio at 1.25 USD a day	Poverty ratio at 2 USD a day	Poverty Gap at 2 USD a day	Banking crisis dummy	Currency crisis dummy	Debt crisis dummy	GDP per capita (PPP)	Trade Openness	Polity	Government Expenditure	Inflation
Poverty Gap at 1.25 USD a day	1.000000											
Poverty ratio at 1.25 USD a day	0.955800	1.000000										
Poverty ratio at 2 USD a day	0.863000	0.962100	1.000000									
Poverty Gap at 2 USD a day	0.966900	0.996500	0.962200	1.000000								
Banking crisis dummy	0.027600	-0.012500	-0.023700	-0.001100	1.000000							
Currency crisis dummy	0.102500	0.086400	0.074400	0.091300	0.016000	1.000000						
Debt crisis dummy	-0.024500	-0.019500	-0.008500	-0.018000	0.112800	0.207800	1.000000					
GDP per capita (PPP)	-0.589800	-0.680500	-0.773600	-0.694800	0.019600	-0.062700	-0.010900	1.000000				
Trade Openness	-0.219800	-0.271500	-0.287300	-0.265700	0.064200	-0.087900	0.032800	0.167400	1.000000			
Polity	-0.145800	-0.183300	-0.199100	-0.177500	-0.014500	0.024700	0.026500	0.193000	0.090000	1.000000		
Government Expenditure	-0.057000	-0.127400	-0.200800	-0.129200	0.011900	-0.001500	-0.012800	0.190000	0.235200	-0.041300	1.000000	
Inflation	-0.036800	-0.056500	-0.065600	-0.052400	0.054000	0.173300	0.031600	0.066400	-0.103300	0.030700	0.035000	1.000000

Table 6 gives the results of our specifications when using the poverty gap at 1.25 USD a day as a measure of poverty. The estimation strategy here is the same as in Table 5. There are two main conclusions that could be drawn vis-à-vis the banking crisis dummy variable. First, when analyzing the cumulative effect of the banking crises on the incidence of poverty, we could see that the overall effect is positive, though it diminishes over time. Second, the impact of banking crises upon poverty incidence is ephemeral, i.e. while banking crisis is associated with increases in poverty depth contemporaneously, its first lag is associated with decreases in poverty. Given that most poor people are on the fringes of the banking systems in most developing countries (and hence take up only a small percentage of the financial sector), this result does not come as a surprise.

The currency crisis dummy is also positive and significant, and with a magnitude which is much higher than the magnitude of the banking crisis variable. Currency crises however appear positive and significant only contemporaneously. As indicated in our transmission channels section, currency crises are almost always associated with a downturn of economic activity as well as relative price changes, which invariably hurt the poor, hence pushing them further down below the poverty line.

The debt crises dummy appears insignificant across all specifications. The results suggest that sovereign debt default crises may not affect the welfare of the existing poor as much as the banking or the currency crises. Even though, they may trigger additional banking or currency crises, they in themselves are not associated with significant changes in the levels of poverty. Our result in a way is similar to the one obtained by Cecchetti et al (2009) who find that debt crises do not matter for the slowdown of economic activity as much as banking and currency crises do. Finally, one has to be careful when interpreting the effect of the debt crises as the result could be driven by the low number of debt crisis episodes in our sample.

The control variables appear to comply with the existing knowledge in the area of poverty research. Trade openness is associated with lower levels of poverty, as previously confirmed by many studies such as the one by Dollar and Kraay (2001). In addition, our findings regarding democracy confirm the findings by Ross (2006). Unsurprisingly, higher levels of development are associated with a lower depth of poverty[xi]. The variables that capture the two additional transmission channels (inflation and government spending) appear insignificant.

The results that we have obtained when using relative measures of poverty as dependent variables (poverty headcount ratio at 2 USD a day and poverty gap at 2 USD a day) are quite similar (in terms of significance and magnitude) to the results obtained when using the measures of absolute poverty. Table 7 gives the results when using the poverty headcount ratio at 2 USD as a dependent variable. As in the case of using the poverty headcount ratio at 1.25 USD a day, here as well, only the currency crisis dummy is positive and significant. In addition, the variable is significant in its first lag as well, suggesting that the effect of the currency crisis is not only immediate but could also be felt for some time after the beginning of the crisis. We would have expected the banking

crises to have a more pronounced impact on the levels of poverty, however, again most of the poor (even in relative terms) are on the fringes of the financial systems in most developing countries and hence, a banking crisis could not impact much upon their situation.

Finally, table 8 summarizes the results when using the poverty gap at 2 USD a day as a dependent variable. As in the case when using the poverty gap at 1.25 USD a day, banking crisis is contemporaneously positive and significant (albeit at 10 percent level of significance). The magnitude of the banking crises however is smaller (and it also decreases with time), which confirms our previous finding – i.e. that banking crises matter less for poverty than currency crises and that their impact over time decreases. The results regarding the currency crises are somewhat different. Here, we can observe that the effect of currency crises is bigger than that of banking crises and lasts longer. To summarise, there are five key findings that stem from this first attempt to measure the cross-country impact of disaggregated financial crises on poverty:

(i) currency crises are associated with higher levels of poverty as well as higher depth of poverty (which for some measures of poverty could also be felt for some time after the beginning of the crisis).
(ii) Banking crises are associated with higher depth of poverty but they do not seem to matter for the incidence of poverty;
(iii) Banking crises, to the extent that they are significant at all, tend to be rather ephemeral in nature (i.e. their effect diminishes over time).
(iv) Debt crises are not associated with any changes in poverty.
(v) Results i-iv are robust to the inclusion of standard control variables (level of development, trade openness, institutional development, inflation and government spending) which in turn produce estimates consistent with the literature.

Robustness checks

In order to confirm our finding that different types of financial crises have an independent impact upon poverty, we created two new variables, called double and triple crises (which capture the occurrence of a double and a triple crisis respectively) and we re-examined the specification from above (the results are reported in Tables 9 and 10). While the results when using the double crisis variable are positive and significant across all specifications (albeit only contemporaneously), the results when using the triple crisis are rather weak in terms of significance and inconsistent in terms of sign. Moreover, their impact tend to decrease over time. These results should not come as a surprise. The number of triple crisis episodes in our sample is relatively small and in addition, crisis transmission mechanisms could often act in opposing way, thus driving the magnitude and significance of the final results. Furthermore, these results could represent an additional evidence for the independent impact of the different types of financial crises.

Our second robustness check consists in running a difference-in-difference estimation on the dataset above. The results are reported in tables 11, 12 and 13. The results that we

obtain are consistent with our findings from above, i.e. that of the three types of crises, it is the currency crises which matter the most for poverty, while banking and debt crises tend to be mute in most cases (our banking crisis variable does appear positive and significant when using poverty gap at 1.25 USD a day as a dependent variable)[xii].

Finally, in order to see whether our findings would differ if conducted on separate sub-samples (based on level of income or geographical area) we conducted the same analysis as above but on separate sub-groups of countries (divided on low, lower middle and upper middle income countries and on Europe Central Asia, Latin America, Middle East North Africa, East Asia and the Pacific, South Asia and Africa), while also testing for the equality of coefficients across different income and geographical groups. Our analysis strongly confirmed the intuition that the impact of different financial crises is consistent across countries. The same analysis provided further evidence for the poolability of the series.

6. Conclusion and directions for further research

The current financial crisis, which has slowly evolved into a global economic crisis, has rekindled interest among social scientists for re-examining the link between financial crises and poverty. In this paper, we empirically analyze this relationship by using a panel dataset for 90 developing countries across the world. By using a newly created dataset which contains data on financial crises (disaggregated into banking, currency and debt) and by employing fixed effects in order to deal with the unobserved heterogeneity, we derive several new findings. We confirm the established notion that crises are bad for the poor but more subtly, that the type of crisis matters. In particular, we observe that currency crises are associated with higher levels of both the poverty headcount ratio and the poverty gap (measured both at 1.25 USD and 2 USD a day). In addition we find that banking crises are associated with higher values only for the depth of poverty (rather than the incidence of poverty) and when they are significant in our specifications they tend to be ephemeral in nature. Finally, we find no direct relationship between debt crises and poverty.

There is however a caveat that we attach to our findings. While there is internationally comparable data on poverty, poverty is an individual experience, so using this kind of data would be the best way forward in analyzing the impact of any variable on poverty. Notwithstanding this deficiency of our data, there are many useful things that could be drawn from a cross-country study that examines the impact of financial crises on poverty. By purging the country-specific effects, we could arrive at a few generalizations that, coupled with individual case studies, could shed further light onto the issue of financial crises and poverty.

Finally, in case data permits it, we advise introducing an auto-regressive term into our model, which would shed further light onto the medium- and long-term impact of financial crises on poverty. Indeed, crises come and go and poverty levels increase and decrease over time. However, a necessary policy solution should be found in case

recurrent financial crises over longer periods of time significantly impede the process of poverty alleviation.

Table 5 - Fixed effects regression results while using Poverty Headcount ratio at 1.25 USD a day

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Banking crisis	2.11 (1.40)			1.93 (1.44)	1.85 (1.43)		1.85 (1.47)
Banking crisis (lagged)	-1.13 (1.32)			-1.71 (1.42)	-1.10 (1.32)		-1.79 (1.82)
Banking crisis (second lag)	-0.43 (0.93)			-0.67 (1.10)	-0.33 (0.93)		-0.74 (1.09)
Currency crisis		4.44* (2.29)		4.56** (2.31)		4.22* (2.40)	4.39* (2.45)
Currency crisis (lagged)		2.07 (1.49)		2.29 (1.50)		1.98 (1.50)	2.19 (1.53)
Currency crisis (second lag)		-0.66 (1.28)		-0.050 (1.32)		-0.74 (1.32)	-0.64 (1.35)
Debt crisis			4.56 (3.46)		4.08 (3.61)	2.58 (3.18)	2.02 (3.64)
Debt crisis (lagged)			0.67 (2.10)		1.32 (2.16)	-0.025 (2.46)	0.77 (2.46)
Debt crisis (second lag)			0.53 (2.17)		0.73 (2.26)	1.15 (2.23)	1.39 (2.33)
Openness	-0.039* (0.022)	-0.045** (0.022)	-0.043* (0.022)	-0.045** (0.022)	-0.042* (0.022)	-0.047** (0.022)	-0.046** (0.022)
Polity IV	-0.031 (0.023)	-0.030 (0.021)	-0.023 (0.025)	-0.032 (0.023)	-0.030 (0.023)	-0.029 (0.023)	-0.032 (0.023)
Log of GDP per capita	-15.77*** (2.43)	-14.58*** (2.57)	-15.30*** (2.45)	-14.57*** (2.57)	-15.64*** (2.43)	-14.55*** (2.57)	-14.89*** (2.58)
Government expenditure	-0.068 (0.15)	-0.045 (0.14)	-0.063 (0.15)	-0.038 (0.15)	-0.068 (0.15)	-0.047 (0.14)	-0.039 (0.14)
Inflation	0.032 (1.02)	-0.45 (0.94)	0.048 (0.96)	-0.048 (1.00)	0.018 (1.02)	-0.44 (0.94)	-0.49 (1.14)
Number of observations	417	417	417	417	417	417	417
Number of groups	90	90	90	90	90	90	90

*Note: Standard errors are reported in parentheses. * indicates significance at 10 percent, ** indicates significance at 5 percent, *** indicates significance at 1 percent level of significance respectively*

Table 6 - Fixed effects regression results while using Poverty Gap at 1.25 USD a day as a dependent variable

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Banking crisis	2.21* (1.17)			2.12* (1.17)	2.13* (1.19)		2.14* (1.17)
Banking crisis (lagged)	-0.947 (0.66)			-1.30* (0.75)	-1.11 (0.71)		-1.41* (0.81)
Banking crisis (second lag)	-0.352 (0.45)			-0.59 (0.54)	-0.33 (0.47)		-0.61 (0.54)
Currency crisis		2.79* (1.47)		2.88* (1.49)		2.74* (1.55)	2.86* (1.56)
Currency crisis (lagged)		1.32 (1.041)		1.49 (1.049)		1.29 (1.06)	1.47 (1.07)
Currency crisis (second lag)		-0.0166 (0.789)		0.15 (0.82)		-0.017 (0.83)	0.09 (0.85)
Debt crisis			1.83 (1.63)		1.31 (1.83)	0.61 (1.50)	-0.001 (1.74)
Debt crisis (lagged)			0.55 (0.886)		1.13 (0.91)	0.037 (1.19)	0.69 (1.14)
Debt crisis (second lag)			-0.149 (0.830)		0.056 (0.86)	0.085 (0.89)	0.32 (0.93)
Openness	-0.0279 (0.0139)	-0.0321** (0.014)	-0.030** (0.014)	-0.031** (0.014)	-0.030* (0.014)	-0.032** (0.015)	-0.032** (0.014)
Polity IV	-0.018 (.0015)	-0.015 (0.015)	-0.014 (0.015)	-0.018 (0.016)	-0.016 (0.015)	-0.015 (0.016)	-0.017 (0.015)
Log of GDP per capita	-5.297*** (1.460)	-4.397*** (1.555)	-4.896*** (1.516)	-4.65*** (1.55)	-5.17*** (1.48)	-4.39*** (1.62)	-4.64*** (1.57)
Government expenditure	0.0860 (0.112)	0.099 (0.106)	0.0875 (0.109)	0.10 (0.11)	0.087 (0.114)	0.09 (0.10)	0.10 (0.11)
Inflation	0.703 (0.289)	0.426 (0.586)	0.776 (0.649)	0.36 (0.69)	0.71 (0.67)	0.42 (0.59)	0.36 (0.61)
Number of observations	417	417	417	417	417	417	417
Number of groups	90	90	90	90	90	90	90

*Note: Standard errors are reported in parentheses. * indicates significance at 10 percent, ** indicates significance at 5 percent, *** indicates significance at 1 percent level of significance respectively*

Table 7 - Fixed effects regression results while using Poverty headcount ratio at 2 USD a day

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Banking crisis	1.81 (1.47)			1.55 (1.48)	1.48 (1.50)		1.38 (1.53)
Banking crisis (lagged)	-0.31 (1.47)			-1.11 (1.55)	-0.64 (1.52)		-1.34 (1.67)
Banking crisis (second lag)	0.29 (1.66)			-0.012 (1.87)	0.18 (1.69)		-0.18 (1.87)
Currency crisis		4.30* (2.61)		4.36* (2.63)		3.90 (2.73)	3.99 (2.75)
Currency crisis (lagged)		3.36** (1.67)		3.73** (1.72)		3.37** (1.73)	3.50** (1.77)
Currency crisis (second lag)		-1.43 (1.78)		-1.36 (1.71)		-1.76 (1.74)	-1.72 (1.76)
Debt crisis			6.96 (4.52)		6.63 (4.67)	4.77 (4.27)	4.37 (4.40)
Debt crisis (lagged)			2.25 (3.30)		2.60 (3.50)	1.53 (3.55)	2.15 (3.73)
Debt crisis (second lag)			2.31 (2.94)		2.36 (3.06)	3.21 (3.19)	3.32 (3.30)
Openness	-0.038 (0.025)	-0.049* (0.025)	-0.044* (0.025)	-0.048* (0.025)	-0.044* (0.025)	-0.051** (0.025)	-0.051** (0.025)
Polity IV	-0.018 (0.022)	-0.020 (0.021)	-0.010 (0.021)	-0.023 (0.021)	-0.012 (0.022)	-0.016 (0.021)	-0.019 (0.021)
Log of GDP per capita	-21.87*** (2.52)	-20.37*** (2.62)	-21.45*** (2.53)	-20.58*** (2.63)	-21.61*** (2.53)	-20.42*** (2.61)	-20.61*** (2.63)
Government expenditure	-0.28* (0.16)	-0.24 (0.16)	-0.26 (0.16)	-0.024* (.0.16)	-0.26* (0.16)	-0.23 (0.16)	-0.23 (0.17)
Inflation	-0.67 (0.89)	1.22(0.92)	-0.66 (0.92)	-1.27 (0.99)	-0.73 (0.98)	-1.27 (0.93)	-1.29 (0.99)
Number of observations	417	417	417	417	417	417	417
Number of groups	90	90	90	90	90	90	90

*Note: Standard errors are reported in parentheses. * indicates significance at 10 percent, ** indicates significance at 5 percent, *** indicates significance at 1 percent level of significance respectively*

Table 8 - Fixed effects regression results while using Poverty Gap at 2 USD a day

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Banking crisis	2.05* (1.12)			1.91* (1.12)	1.90* (1.14)		1.87 (1.14)
Banking crisis (lagged)	-0.82 (0.90)			-1.31 (0.99)	-1.020 (0.96)		-1.44 (1.87)
Banking crisis (second lag)	-0.23 (0.70)			-0.48 (0.91)	-0.24 (0.71)		-0.54 (0.81)
Currency crisis		3.39* (1.75)		3.47** (1.76)		3.24* (1.85)	3.36* (1.85)
Currency crisis (lagged)		1.90* (1.14)		2.07* (1.15)		1.82 (1.17)	1.99* (1.18)
Currency crisis (second lag)		-0.44 (0.98)		-0.30 (1.01)		-0.52 (1.011)	-0.43 (1.03)
Debt crisis			3.29 (2.54)		2.83 (2.69)	1.74 (2.31)	1.19 (2.47)
Debt crisis (lagged)			0.97 (1.49)		1.50 (1.58)	0.39 (1.77)	1.05 (1.79)
Debt crisis (second lag)			0.42 (1.45)		0.59 (1.52)	0.87 (1.53)	1.07 (1.60)
Openness	-0.032***(0.016)	-0.038** (0.016)	-0.036** (0.017)	-0.038** (0.016)	-0.036** (0.016)	-0.039** (0.017)	-0.039** (0.017)
Polity IV	-0.020 (0.016)	-0.012 (0.017)	-0.015 (0.016)	-0.022 (0.017)	-0.017 (0.016)	-0.018 (0.016)	-0.020 (0.016)
Log of GDP per capita	-10.75*** (1.70)	-9.69*** (1.83)	-10.33*** (1.74)	-9.94*** (1.80)	-10.59*** (1.72)	-9.75*** (1.80)	-9.94*** (1.82)
Government expenditure	-0.0.17 (0.12)	0.006 (0.11)	-0.007 (0.11)	0.008 (0.11)	-0.007 (0.12)	0.008 (0.11)	0.016 (0.12)
Inflation	0.30 (0.73)	-0.068 (0.67)	0.35 (0.70)	-0.12 (0.70)	0.29 (0.74)	-0.081 (0.67)	-0.12 (0.71)
Number of observations	417	417	417	417	417	417	417
Number of groups	90	90	90	90	90	90	90

*Note: Standard errors are reported in parentheses. * indicates significance at 10 percent, ** indicates significance at 5 percent, *** indicates significance at 1 percent level of significance respectively*

Table 9 - Fixed effects regression results while using double crisis as an independent variable

	Model 1 - Absolute poverty gap	Model 2 - Absolute Poverty ratio	Model 3 - Relative Poverty Gap	Model 4 - Relative Poverty Ratio
Double crisis	5.89*** (.507)	12.707*** (.739)	9.539*** (.552)	18.443*** (.750)
Double crisis (lagged)	-1.178 (1.169)	-1.891 (3.056)	-1.419 (2.333)	-1.714 (4.747)
Double crisis (second lag)	.772 (1.160)	3.095 (2.344)	1.624 (2.144)	2.779 (6.180)
Openness	-0.029** (0.014)	-0.042* (0.022)	-0.035** (0.016)	-0.042* (0.024)
Polity IV	-0.014 (.0015)	-0.026 (.0023)	-0.017 (.0016)	-0.015 (.0021)
Log of GDP per capita	-4.91*** (1.505)	-15.199*** (2.460)	-10.313*** (1.737)	-21.330*** (2.525)
Government expenditure	0.083 (0.108)	-0.068 (0.150)	-0.015 (0.117)	-0.286* (0.162)
Inflation	0.792 (0.652)	0.079 (0.973)	0.381 (0.711)	-0.580 (0.928)
Constant	49.125*** (12.168)	149.899*** (20.182)	102.855*** (14.193)	49.125*** (12.168)
Number of observations	417	417	417	417
Number of groups	90	90	90	90

*Note: Standard errors are reported in parentheses. * indicates significance at 10 percent, ** indicates significance at 5 percent, *** indicates significance at 1 percent level of significance respectively*

Table 10 - Fixed effects regression results while using tripple crisis as an independent variable

	Model 1 - Absolute poverty gap	Model 2 - Absolute Poverty ratio	Model 3 - Relative Poverty Gap	Model 4 - Relative Poverty Ratio
Tripple crisis	.667 (1.012)	3.554 (2.195)	2.226 (1.484)	5.218* (3.043)
Tripple crisis (lagged)	-1.177* (.615)	-3.472*** (1.282)	-.952 (.717)	2.032 (1.575)
Triple crisis (second lag)	.562 (.754)	3.44** (1.551)	2.143** (1.076)	5.495* (2.165)
Openness	-0.028** (0.014)	-0.037* (0.022)	-0.032** (0.016)	-0.037 (0.025)
Polity IV	-0.015 (.0015)	-0.027 (.0023)	-0.017 (.0016)	-0.015 (.0021)
Log of GDP per capita	-5.099*** (1.539)	-15.867*** (2.487)	-10.690*** (1.771)	-22.012*** (2.567)
Government expenditure	0.083 (0.108)	-0.075 (0.151)	-0.016 (0.118)	-0.283* (0.163)
Inflation	0.761 (0.660)	-0.020 (0.984)	0.316 (0.719)	-0.707 (0.942)
Constant	50.581*** (12.475)	155.237*** (20.411)	105.824*** (14.473)	222.487*** (21.251)
Number of observations	417	417	417	417
Number of groups	90	90	90	90

*Note: Standard errors are reported in parentheses. * indicates significance at 10 percent, ** indicates significance at 5 percent, *** indicates significance at 1 percent level of significance respectively*

Table 11. Difference in difference estimator for banking crises

	Model 1 - Absolute poverty gap	Model 2 - Absolute Poverty ratio	Model 3 - Relative Poverty Gap	Model 4 - Relative Poverty Ratio
Joint variable (treatment group and post-effect)	-1.792 (1.138)	-1.435 (1.770)	-1.121 (1.328)	.580 (1.722)
Banking crisis	2.31* (1.37)	1.950 (1.605)	1.997 (1.368)	1.346 (1.837)
Treatment group	-2.649 (3.582)	-10.164 (8.491)	-7.241 (5.981)	-17.891* (9.851)
Constant	12.803*** (3.582)	34.623*** (7.992)	25.201*** (5.569)	55.384 (9.267)
Number of observations	479	477	477	479
Number of groups	97	97	97	97

*Note: Standard errors are reported in parentheses. * indicates significance at 10 percent, ** indicates significance at 5 percent, *** indicates significance at 1 percent level of significance respectively*

Table 12. Difference in difference estimator for currency crises

	Model 1 - Absolute poverty gap	Model 2 - Absolute Poverty ratio	Model 3 - Relative Poverty Gap	Model 4 - Relative Poverty Ratio
Joint variable (treatment group and post-effect)	1.996* (1.029)	4.332*** (1.601)	3.482*** (1.202)	7.067*** (1.864)
Currency crisis	4.258*** (1.538)	7.842*** (2.451)	5.711*** (1.814)	7.981*** (2.535)
Treatment group	4.817 (3.229)	11.216 (6.996)	9.028* (4.903)	18.954** (8.325)
Constant	6.246** (2.775)	16.287** (6.307)	11.238** (4.354)	24.169** (7.550)
Number of observations	479	477	477	479
Number of groups	97	97	97	97

*Note: Standard errors are reported in parentheses. * indicates significance at 10 percent, ** indicates significance at 5 percent, *** indicates significance at 1 percent level of significance respectively*

Table 13. Difference in difference estimator for debt crises

	Model 1 - Absolute poverty gap	Model 2 - Absolute Poverty ratio	Model 3 - Relative Poverty Gap	Model 4 - Relative Poverty Ratio
Joint variable (treatment group and post-effect)	.693 (.943)	2.262 (2.336)	1.932 (1.646)	4.834 (3.450)
Debt crisis	1.854 (1.660)	4.703 (3.55)	3.284 (2.625)	6.438 (4.892)
Treatment group	-.279 (2.998)	-3.985 (5.611)	-2.493 (4.168)	-7.901 (6.576)
Constant	10.833*** (2.023)	28.457*** (4.126)	20.657 (2.977)	45.012 (5.132)
Number of observations	479	477	477	479
Number of groups	97	97	97	97

*Note: Standard errors are reported in parentheses. * indicates significance at 10 percent, ** indicates significance at 5 percent, *** indicates significance at 1 percent level of significance respectively*

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[i] Although Checcetti et al (2009) do make distinction between the three different types of financial crises, they give the biggest weight to the banking crises and treat the other two only as an auxiliary to the banking crises.

[ii] In relative terms however, this will depend on the level of the initial inequality as well as whether there are growth induced distributional changes.

[iii] If we were to believe that the impact of financial crises on levels of poverty goes only through economic activity, then it would have sufficed to analyze the impact of financial crises on economic activity only and infer from that the indirect effect of financial crises on poverty.

[iv] It is important to note that a debt crisis occurring on its own (not coupled with a currency crisis – Latin American style) is fundamentally different than a combination of a debt and a currency crisis. In our dataset described below more than half of the debt crisis episodes belong to the former category. In any case, we explore both hypotheses (independent debt crisis and a twin crisis in our empirical section).

[v] Further description of the poverty data (including a note on the shortfalls of using aggregate poverty data) is featured in Appendix 1.

[vi] In building the model, we employ a gradual approach, i.e. we start with a Ravallion-like simple relationship between poverty and GDP per capita and slowly introduce the other variables.

[vii] In order to control for the additional channel of crisis transmission (slowdown in economic activity) we also experiment with using changes in per capita GDP (PPP), while also controlling for GDP per capita levels. We however find that the changes in GDP per capita are insignificant.

[viii] A more detailed description of the control variables (including the sources of data and data availability) is presented in Appendix 2. It is also worth to point out that we had considered including levels of unemployment and remittances as independent variables (which though decimate the dataset due to data

unavailability). We have also controlled for the level of financial sector development (credit to the private sector in percent of GDP), however, the variable appears insignificant.

[ix] We also experimented with controlling for the level of inequality (in order to examine whether countries with lower levels of inequality tend to weather the financial crisis better, vis-à-vis their poverty indicators) however the results were not robust.

[x] We also explore the impact of including third, fourth and fifth lag of the crisis variables, however, these appear insignificant across all of our specifications.

[xi] It is also worth to mention that in addition to these specifications, we also introduce an interactive term between GDP per capita (PPP) and the crises variables. The variable however appears insignificant (the same could be concluded by post-estimation testing of a linear combination between the two variables).

[xii] In addition, we conducted a robustness check which consisted in running system GMM (while also including lagged dependent variable as a regressor). The obtained results however were weak, mainly driven by the unavailability of poverty data. In addition the specification did not pass the Hansen test (basic diagnostic test in using system GMM).

Appendix 1 – Detailed description of the data

Poverty headcount ratio

The poverty headcount ratio is the proportion of the national population whose incomes are below the official threshold (or thresholds) set by the national government. National poverty lines are usually set for households of various compositions to allow for different family sizes. Where there are no official poverty lines, they may be defined as the level of income required to have only sufficient food or food plus other necessities for survival. Here we use two measures for the poverty headcount ratio as defined by the World Development Indicators – poverty headcount ratio at 1.25 USD (characterized broadly as 'absolute' poverty) a day and poverty headcount ratio at 2 USD a day (characterized broadly as 'relative' poverty).

Poverty gap

The poverty gap is the mean shortfall of the total population 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. According to the World Bank, the indicator is often described as measuring the per capita amount of resources needed to eliminate poverty, or reduce the poor's shortfall from the poverty line to zero, through perfectly targeted cash transfers. In the WDI database, data reported with a value of 0.5 signify a poverty gap of less than 0.5 percent.

Banking crises

In Laeven and Valencia (2008)'s view, in a systemic banking crisis, a country's corporate and financial sectors experience a large number of defaults and financial institutions and corporations face great difficulties repaying contracts on time. As a result, non-performing loans increase sharply and all or most of the aggregate banking system capital is exhausted. This situation may be accompanied by depressed asset prices (such as equity and real estate prices) on the heels of run-ups before the crisis, sharp increases in real interest rates, and a slowdown or reversal in capital flows. In some cases, the crisis is triggered by depositor runs on banks, though in most cases it is a general realization that systemically important financial institutions are in distress. Using this broad definition of a systemic banking crisis that combines quantitative data with some subjective assessment of the situation, they identify the starting year of systemic banking crises around the world since the year 1970. Unlike prior work (Caprio and Klingebiel, 1996, and Caprio, Klingebiel, Laeven, and Noguera, 2005), they exclude banking system distress events that affected isolated banks but were not systemic in nature. As a cross-check on the timing of each crisis, they examine whether the crisis year coincides with deposit runs, the introduction of a deposit freeze or blanket guarantee, or extensive liquidity support or bank interventions. This way they were able to confirm about two-thirds of the crisis dates. Alternatively, they require that it becomes apparent that the banking system has a large proportion of non-performing loans and that most of its

capital has been exhausted. This additional requirement applies to the remainder of crisis dates. In sum, they identify 124 systemic banking crises over the period 1970 to 2007. This list is an updated, corrected, and expanded version of the Caprio and Klingebiel (1996) and Caprio, Klingebiel, Laeven, and Noguera (2005) banking crisis databases.

Given that they do not identify the length of most of the crises, when we code the banking crisis variable, we assume value 1 for the beginning year of the crisis and 0 for all other years. In sum, we use 96 banking crises that occurred across the developing world from 1970 until 2007.

Currency crises

Building on the approach in Frankel and Rose (1996), Laeven and Valencia (2008) define a "currency crisis" as a nominal depreciation of the currency of at least 30 percent that is also at least a 10 percent increase in the rate of depreciation compared to the year before. In terms of measurement of the exchange rate depreciation, they use the percent change of the end-of-period official nominal bilateral dollar exchange rate from the World Economic Outlook (WEO) database of the IMF. For countries that meet the criteria for several continuous years, they use the first year of each 5-year window to identify the crisis. This definition yields 208 currency crises during the period 1970-2007. It should be noted that this list also includes large devaluations by countries that adopt fixed exchange rate regimes. As in the previous case, the currency crisis variable is a dummy variable which takes values 1 for the beginning year of the crisis and 0 otherwise. Of the 208 currency crises that they identify, we use 147 currency crises that occurred across the developing countries from 1970 until 2007.

Sovereign Debt crises

Finally, Laeven and Valencia (2008) identify and date episodes of sovereign debt default and restructuring by relying on information from Beim and Calomiris (2001), World Bank (2002), Sturzenegger and Zettelmeyer (2006), and IMF Staff reports. The information compiled includes year of sovereign defaults to private lending and year of debt rescheduling. Using this approach, they identify 63 episodes of sovereign debt defaults and restructurings since 1970. Again, as in the previous two cases, the sovereign debt crisis variable takes values 1 for the beginning year of the crisis and 0 otherwise. Out of the 63 identified sovereign debt crises, we use 52 that struck the developing countries in the period from 1970 until 2007.

Appendix 2 – Description of the control variables

Growth and development

While the debate on pro-poor or anti-poor growth is not over yet (see for example Ravallion and Chen (2001)), there is a burgeoning literature which suggests that poverty decreases with the level of economic development. The incidence of absolute poverty in developing countries tends to fall with growth. (for a survey of the literature see Bruno et al. (1998)).

Trade openness

Dollar and Kraay (2001) revisit the relationship between openness and growth and openness and poverty. They conclude that globalization leads to faster growth and poverty reduction in poor countries. In the same token Dollar (2001) argues that the only developing countries that have registered significant declines in poverty are the ones that have integrated faster into the world economy on the dimensions of trade and investment. It is important to note though that this strand of literature has also had many critics (for example Bardhan (2005), Ravallion (2005), Berg and Kureger (2002), and Cashin et al (2001)), whose consensus is that there is no direct systematic link between trade openness and poverty but that this relationship is indirect and operates through the effect of growth.

Institutional development and democracy

The existing evidence on the impact of democracy on poverty is mixed. A group of authors find that democracies are conducive to poverty alleviation: Sen (1981, 1999), Moon and Dixon (1985), Dasgupta (1993), Boone (1992), Przeworski et al. (2000), Bueno de Mesquita and Root (2000), McGuire (2001), Siegle, Weinstein and Halperin (2004). Most of these papers have argued that democracies improve the conditions of the poor along three lines: democracies empower poor people through elections and hence force governments to attend to their needs; there is free flow of information in democracies which keeps governments informed about the conditions of the poor people and finally, democratic governments provide people with more public goods. On the other hand, Ross (2005) claims that democracy does not have any direct impact on the level of poverty.

Inflation

While it seems intuitive that inflation would hurt the poor proportionally more than the non-poor, there are not many studies that explore the impact on poverty of inflation. Cardoso (1992) and Easterly (2001) are the two most notable papers whose main message resonates the previously stated idea that inflation is bad for poverty.