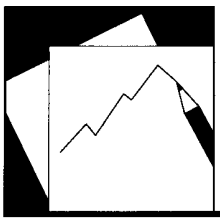
WP/08/62



IMF Working Paper

Financial Development and Poverty Reduction: Can There Be a Benefit Without a Cost?

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INTERNATIONAL MONETARY FUND

 WP/08/62

IMF Working Paper

African Department

Financial Development and Poverty Reduction: Can There Be a Benefit Without a Cost?

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Authorized for distribution by Dhaneshwar Ghura

March 2008

Abstract

This article investigates how financial development helps to reduce poverty directly through the McKinnon conduit effect and indirectly through economic growth. The results obtained with data for a sample of developing countries from 1966 through 2000 suggest that the poor benefit from the ability of the banking system to facilitate transactions and provide savings opportunities but to some extent fail to reap the benefit from greater availability of credit. Moreover, financial development is accompanied by financial instability, which is detrimental to the poor. Nevertheless, the benefits of financial development for the poor outweigh the cost.

JEL Classification Numbers: G0, O15, O16

Keywords: Financial development, Poverty, McKinnon conduit effect

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[1] The authors are grateful to the participants in the sixth conference of the Economic Analysis and Development Network (Marrakech, March 2004) for useful comments. We would also like to thank Erik Oppers, Romain Rancière, Thierry Tressel, Hans Weisfeld, and the participants in the Congress of the Canadian Economic Sciences Society (La Malbaie, May 2005) for helpful comments and discussions. Anne Grant provided useful editorial comments.

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I. INTRODUCTION

Many studies, old and new, consider the relationship between financial development and growth,[2] but the question of whether financial development helps reduce poverty has not been the subject of much empirical work (some exceptions are Dollar and Kraay, 2002; Honohan, 2004; and Beck, Demirgüç-Kunt, and Levine, 2007).

How financial development affects economic growth and how it helps reduce poverty are clearly related issues because growth is a powerful way to reduce poverty (Bruno, Ravallion, and Squire, 1998). However, it is possible that in certain countries the benefit of growth for the poor is undermined or even offset by the increases in inequality that may accompany growth. As Kanbur (2001) emphasized, though there have been many demonstrations that across countries and over time growth in real national per capita income is correlated with reductions in the measure of national income poverty, "the real dispute is about consequences of alternative politics" (pp. 1090–91). This raises interest in assessing the specific impact of financial development on poverty.

The main goal of the paper is to identify and quantify the positive and negative channels through which financial development affects poverty. On the one hand, we argue that financial development helps reduce poverty indirectly by stimulating growth and directly by facilitating transactions and allowing the poor to benefit from financial services (primarily savings products) that increase their income (through interest earned) and enhance their ability to undertake profitable investments and other activities.[3] On the other hand, to the extent that instability arises at various stages of the financial development process, it demonstrably undermines poverty reduction because the poor are generally more vulnerable than the rich to unstable and malfunctioning financial institutions (e.g., payment systems) and indirectly through negative macroeconomic impacts (e.g., volatility of growth, inflation).

This paper therefore aims to (i) explore whether better access to savings or credit opportunities (with a nonnegative real return) is the main direct channel through which financial development works to alleviate poverty; and (ii) assess whether financial instability is detrimental to the poor and thus weakens the beneficial impact of finance on the poor.

Like others, we try to distinguish the direct effect of financial development on poverty reduction from its indirect positive effect through economic growth. However, two features of our analysis set it apart from what has been done so far:

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[2] The pioneer work is that of Gurley and Shaw (1960). More recent contributors are Roubini and Sala-i-Martin, 1992; King and Levine, 1993; Easterly, 1993; Pagano, 1993; Gertler and Rose, 1994; Levine, 1997; Levine, Loayza and Beck, 2000; Khan and Senhadji, 2003; and Christopoulos and Tsionas, 2004).

[3] In fact the direct effect captures the change in income distribution and a residual. Datt and Ravallion (1992) demonstrate that changes in poverty measures can be decomposed into changes in mean income (growth effect) and changes in income distribution plus a residual capturing the interactive effect between the two factors.

1. We are interested in the channels (credit or money) through which poor people benefit from formal financial intermediation. We therefore focus on the "motive of finance" for money demand suggested by Keynes (1937) and rehabilitated by McKinnon (1973) when he presented the "conduit effect." This assumes that even if financial institutions do not provide credit to the poor who must self-finance investment, they are useful because they offer profitable financial opportunities for savings. Consequently, we do not only focus on a credit indicator, as in Dollar and Kraay (2002), Honohan (2004) and Beck, Demirgüç-Kunt, and Levine (2007), but we also examine the impact of an indicator of liquidity.

2. We also recognize that financial development is accompanied by crises that are likely to undermine the potential benefits of financial development, in particular for the poorest. Therefore, in addition to the indicator of financial development in the regression explaining poverty we include an indicator of financial instability. The intent is to reconcile the apparent contradiction between two schools of thought: the first underlines the positive effect of financial development on growth, and the second shows that credit growth is a predictor of banking and currency crises (Loayza and Ranciere, 2006).[4]

The empirical model draws from Dollar and Kraay (2002), who measure aggregate poverty by the average per capita income of the poorest population and show that it depends on real GDP per capita and other variables, which in our case integrate financial development and financial instability indicators. The model is estimated on a large sample of developing countries with panel data over the period 1966–2000 using the system GMM estimator. Two other indicators of poverty are also used: headcount poverty measured by the share of the population earning less than $1 a day, and the poverty gap, which unlike the former takes into account the distance of the poor from the poverty line.

The results suggest that unlike financial instability, financial development is on average good for the poor. However, this result holds only when financial development is measured by the ratio of money to GDP (liquidity ratio), which provides evidence that the conduit effect assumption is relevant.

In what follows, Section II discusses theoretical arguments for a direct positive impact of financial development on the income of the poor beyond its effect through economic growth. It also elaborates on how financial instability could disproportionately hurt the poor. Section III describes the model. Section IV presents the data, the methodology, and the results of the econometric estimations. Section V draws conclusions and offers policy recommendations.

[4] The relationship between financial development and instability may be explained by a number of factors (for a survey, see Andersen and Tarp 2003); it is the main reason why some authors cast theoretical as well as empirical doubt on the beneficial effect of financial development on growth (Ram, 1999; Demetriades and Hussein, 1996). However, mainstream thought supports a positive impact (see notably Levine, Loayza and Beck, 2000; Christopoulos and Tsionas, 2004).

II. FINANCIAL DEVELOPMENT AND THE POOR: THE PREDOMINANT MCKINNON CONDUIT EFFECT

How might financial development directly improve the well-being of the poor?

Borrowing is often necessary to invest in physical capital or human resources and insulate spending against external shocks. As many authors claim, credit constraints chiefly bind the poor (Banerjee and Newman, 1993; Aghion and Bolton, 1997). However, because access of poor households to bank credit may be impeded by the high unit cost of small loans, financial development may be regressive for the poor. This is the prediction of the well-known model of Greenwood and Jovanovic (1990) at an early stage of development. They posit that benefiting from the screening and risk pooling offered by financial intermediation requires a set-up cost that poor households cannot afford. Because they cannot use savings for this outlay, they fall further below in the income distribution. This is why international aid is so heavily directed toward stimulating microcredit institutions, even though their financial equilibrium may be problematic. However, Greenwood and Jovanovic also pointed out that over time it becomes easier for the poorer segments of the population to access credit, which may result in an inverted U-shape curve of income inequality and financial development.

Indeed, as the financial system becomes healthier and more competitive, it may have more capacity and desire to bear the high costs of small credits (Rajan and Zingales, 2003). For instance, in Latin America commercial banks have begun to make pooled loans available to the poor, as microcredit institutions have been doing (Mosley, 1999). Also, the evolution of informal credit, often the only source of borrowing for poor people, is made easier by the growth of a formal financial system that provides informal institutions with opportunities for profitable deposits. Moreover, access to credit enables the poor to smooth their consumption, thus reducing their vulnerability to exogenous shocks and building human capital.

From our point of view, a second argument seems to better support the hypothesis that financial development has a beneficial effect on the poor. Banks may at least offer the opportunity of demand or savings deposits that have a nonnegative real remuneration or a small real positive one for poor households and small firms. Tressel (2003) pointed out that banks have superior ability to mobilize savings and informal lenders enjoy superior information on borrowers.

According to McKinnon (1973), when economic units are confined to self-finance so that there is no useful distinction between savers (households) and investors (firms), indivisibilities in investment are of considerable importance. Here, money and capital become complementary:

> If the real return on holding money increases, so will self-financed investment over a significant range of investment opportunities. The increased desirability of holding cash balances (for the poor) reduces the opportunity cost of saving internally for the eventual purchase of capital goods from outside the firm-household. The financial 'conduit' for capital accumulation is thereby enlarged (McKinnon, 1973, p. 60).

The empirical literature to date has focused, with some success, on the complementary hypothesis of McKinnon, which implies that the demand for real money balances depends positively on real income, the real rate of interest on bank deposits, and the real return on

capital, and that at the same time the investment ratio is positively related to the real return on money balances (Fry, 1978, 1988; de Melo and Tybout, 1986; Edwards, 1988; Ajewole, 1989; Laumas, 1990; Thornton and Poudyal, 1990; Morisset, 1993; Khan and Hasan, 1998; Kar and Pentecost, 2001). Here we take into account the hypothesis that money and capital are complements in developing countries because (i) in the absence of deep financial markets and extensive intermediation, money balances have to be accumulated before indivisible investment can be undertaken, and (ii) liquidity constraints are likely to affect investment by the poor. Therefore, this paper discriminates between the two channels through which financial intermediation may help the poor: deposits and credits.

The conduit effect of real money balances is the main reason why, at the beginning of the seventies, McKinnon advocated freeing the financial systems of developing countries from constraints that impede their development, such as ceilings on interest rates, high reserve requirements, administrative credit allocation, and other government-induced distortions. However, the flip side of the beneficial impact of financial development for the poorest in the population is the detrimental impact that disturbances of the financial system have on the same people.

Why does financial instability hurt the poor relatively more than the rich?

Several reasons support the assumption that the poor are more vulnerable to banking crises than the rich. Indeed, poor people are particularly hurt by disruptions of the payment system and unwarranted bank closures. When deposits are frozen, they are unable to diversify their assets and invest their savings in foreign banks. In countries where some banks are periodically unable to ensure the liquidity of their deposits, the McKinnon conduit effect is probably dampened or even cancelled out by the doubt surrounding the health of the banking system. Moreover, when banks are in difficulty, they begin to ration small loans because these borrowers are less profitable for them and also because the poor have little negotiating power.

Beside the direct effect, an indirect effect may result from the instability of growth and inflation induced by an unstable financial system. Because investment is closely linked to credit availability, financial instability is likely to exacerbate fluctuations in the investment rate, thereby destabilizing growth. Furthermore, financial instability leads to volatility in relative prices because goods prices are affected by credit variation in different ways: the prices of tradable goods are determined by foreign prices and the nominal exchange rate; those of nontradable goods depend on domestic supply and demand and therefore are more directly affected by the level and change in domestic credit. The instabilities of the investment rate and of the real exchange rate both make growth more volatile.

Ramey and Ramey (1995) having shown a negative relationship between average rate of growth and the volatility of annual rates across countries, it is likely that growth volatility induced by financial instability impedes economic growth.[5] Because economic growth is a necessary

[5] The investment rate and relative price (notably real exchange rate) volatility associated with financial disturbances has been shown to be detrimental for economic growth (Guillaumont, Guillaumont Jeanneney, and Brun, 1999).

condition for durably reducing poverty, financial instability thus hurts the poor. Moreover, poor people are more vulnerable to growth volatility in view of the asymmetry between periods of falling and rising aggregate income; falling periods reduce the income of the poor more than rising ones improve it. For instance, de Janvry and Sadoulet (2000), using data from 12 countries in Latin America from 1970 to 1994, have shown that economic growth on average reduced rural and urban poverty but that the negative impact of regressions on poverty was stronger than the positive impact of expansions.

The reasons for the asymmetric effect on the poor are yet to be investigated. It could be the outcome of several factors that differ from one country to another. In general, the less skilled and poorest workers are made redundant at the beginning of an economic downturn. Hence they would have been unemployed for the longest duration when the expansion begins. However they may be the last to get employment, therefore growth fluctuations tend to increase income inequality. Further while prices rarely fall during recessions, they often rise during expansions, most noticeably because expansions are rapid. Also, the poor may depend more than the rich on state-determined income that is not fully indexed to inflation, such as pensions, state subsidies, or direct transfers (Easterly and Fischer, 2001), in which case unanticipated inflation linked to inflation volatility is specifically detrimental to the poor.

Further, though poverty is generally concentrated in rural areas, governments often do not pass through to farmers rises in the international prices of agricultural products—but due to budgetary constraints, falls in international prices are transmitted to producer prices. And because poor people lack access to insurance, a drop in real income may lower their investment in health and education, with adverse consequences for their human capital.

In several African countries it appears that:

> Where there has been recession, mean and redistribution income effects typically have opposite signs, and the redistribution effect substantially mitigates the poverty-increasing impact of lower mean incomes (in Madagascar, Nigeria, and Zimbabwe); better-off groups clearly bear a heavier burden of income losses during periods of economic decline in Africa (Christiaensen, Demery, and Paternostra, 2003, p. 325).

This outcome may be explained by more acute propoor state interventions or international aid allocations where poverty is clearly rising due to economic decline. Finally, it is highly possible that the relationship between poverty and growth instability is not similar between countries. Nevertheless, according to Ravallion (2001), “there is no sign that distributional change helps protect the poor during contractions in average living standards” (p. 1806).

III. THE MODEL

Before we embark on the empirical analysis, it is useful to summarize the channels through which theoretically financial development is likely to affect the well-being of the poor and derive from there the equation to be estimated. First, we assume that financial development has a positive impact on economic growth that is beneficial to the poor. Second, thanks primarily to the McKinnon conduit effect, we assume that financial development has a direct and positive effect on the income of the poor. However, in regions where financial instability goes along

with financial development, financial instability is detrimental to growth and poverty alleviation, which lowers the beneficial impact of financial development.

The basic specification adopted suggests that the average per capita income of the poorest 20 percent of the population is explained by the level of real GDP per capita and the level and instability of financial development. The inflation rate is added as a control variable following Easterly and Fischer (2001) and Dollar and Kraay (2002).

The equation for the model is as follows:

$$Pv_{i,t} = \alpha_0 + \alpha_1 * L\log\left(y_{i,t}\right) + \alpha_2 * Fd_{i,T} + \alpha_3 * Fi_{i,T} + \alpha_4 * Infl_{i,T} + u_i + \varepsilon_{i,t} \quad (1)$$

where Pv is an indicator of poverty, y is GDP per capita, Fd is the level of financial development, Fi represents the level of financial instability, $Infl$ the inflation rate, u an unobserved country-specific effect, ε the error term, i the country, t the year of poverty and income measures, and T the period of measure of the other variables (average over five years—the year of the poverty measure and the four previous years).

Several additional specifications are also considered. The first specification tests whether the beneficial effect of liquidity and credit levels on the poor is conditional on the level of economic development or the access to the banking system (captured by the geographical coverage of bank branches). This specification makes it possible to specify the circumstances where the McKinnon conduit effect is the most relevant.

The second specification includes the initial level of the poverty indicator in the model, which makes it possible to test a convergence effect as in Beck, Demirgüç-Kunt, and Levine (2007).[6] Although this specification consumes data, it aims at assessing whether countries with initial high poverty levels are likely to reduce poverty faster than countries with initial low levels.

The third specification adds to the basic model indicators for economic growth and its volatility, growth asymmetry, and inflation volatility to check whether the detrimental impact of financial instability on the poor results from the fact that they disproportionately bear the cost of economic crises and inflation variability.

Finally, as microeconomic studies have identified some important determinants of poverty, such as primary education, government consumption, trade openness, legal environment, infrastructure, land distribution, and climatic shocks (for a survey, see Christiaensen, Demery,

[6] Our dynamic specification is to some extent different from that of Beck, Demirgüç-Kunt, and Levine (2007), who consider per capita income growth of the poorest 20 percent to be a function of the initial income of the poor, financial development, and the growth rate of real GDP per capita.

and Paternostra, 2003), these variables are also introduced into the model as a test of robustness.[7]

IV. Estimating the Impact of Financial Development on Poverty

This section describes the database and discusses the estimating strategy. After the results are presented, their economic relevance is analyzed. Finally, robustness tests are carried out.

A. The Data

The sample consists of developing countries only, in contrast to that of Dollar and Kraay (2002) and Beck, Demirgüç-Kunt, and Levine (2007), which mixed both developed and developing countries. Several reasons explain why it is more relevant to focus on a sample of developing countries. First, this makes it possible to reduce sample heterogeneity and avoid the statistical techniques necessary to deal with it. Second, the determinants and the nature of poverty may well be different for developed and for developing countries; poverty in the latter group is essentially driven by macroeconomic conditions. Third, because developed countries have diversified and mature financial systems, traditional indicators of banking system development may not fully capture the level of financial development. More importantly, the McKinnon conduit effect plays out in low financially developed economies and environments with credit constraints. Finally, the determinants and consequences of financial instability are not likely to be the same in both groups of countries because developing countries often lack effective banking supervision and good laws that are enforced.

To measure poverty we use first the average per capita income of the poorest 20 percent of the population in 1985 constant dollars (logarithm). The Dollar and Kraay database[8] is relatively rich and contains at least two spaced observations of mean income of the poor for 92 countries (observations within countries are separated by at least five years over the period 1950–1999, the median interval being six years). From this database we select 75 developing countries and 187 observations between 1966 and 1999, though the sample size varies across specifications depending on the availability of data on covariates.

A second poverty indicator is the share of the population earning less than $1 a day based on the 1993 purchasing power parity (PPP) exchange rate. Though this is the most popular measure of poverty, of the 84 developing and transition countries the database covers, 21 have only one observation for the period 1980–2002.[9] We select 65 developing countries and 121 observations for the period 1980–2000.[10] The database also provides information on a third poverty indicator,

[7] Some of these variables may change little over the time; in that case their impact could be captured by the country specific effects.

[8] Sources and definitions of variables are provided in Annex II.

[9] For a description of the data, see Chen and Ravallion (2001).

[10] These data are not without problems (see Deaton, 2001), but we use a method of analysis, System GMM, that is not likely to be too sensitive to errors in the data.

the poverty gap as a percent of the poverty line. Both the poverty rate and poverty gap will be used as alternative indicators of poverty to reinforce the results obtained using the average income of the poorest 20 percent.

To take into account the impact of economic growth on poverty, we use the logarithm of average per capita income measured in the same year as the poverty indicator.[11] Different measures of GDP per capita are used depending on the indicator. For the mean income of the poorest 20 percent, we use GDP per capita in constant 1985 US$ at PPP as indicated by Dollar and Kraay (2002); for the headcount index and the poverty gap, we use GDP per capita in constant 1993 US$ at PPP as provided by the World Bank. This ensures consistency between poverty and income measures.

The variables of interest are financial development and financial instability.[12] Financial development is measured by two indicators commonly used in the literature on the finance-growth link:

1. The ratio to GDP of the liquid assets of the financial system, M3 (currency plus demand and interest-bearing liabilities of banks and non banks); and
2. The ratio to GDP of the value of credits granted by financial intermediaries to the private sector.

These indicators capture different aspects of financial development. Because the first is related to the ability of financial systems to provide transaction services and saving opportunities, it is relevant for testing the McKinnon conduit effect. The second, by excluding credit to the public sector, has the advantage of measuring more accurately the role of financial intermediaries in channeling funds to productive agents and possibly to the poor. Unlike other studies on the impact of financial development on poverty (e.g. Beck, Demirgüç-Kunt, and Levine, 2007; and Honohan, 2004), which focus only on the credit ratio, we also use the liquidity ratio with a view to assessing whether financial intermediaries are actually helpful for the poor in supplying money balances or credits.

It is relatively straightforward to estimate the instability of each indicator of financial development measured as a deviation from the trend. The most common indicator of instability is the standard deviation of the variable growth rate, defined as follows:

[11] Some authors disagree about the use of average income to capture the impact of economic growth on poverty and suggest using the average GDP per capita growth rate. We test both approaches, but favor the first because average income already captures information on past growth episodes over a relatively long period, which is relevant when assessing the impact of long-term growth on poverty reduction. Moreover, average income takes into account the initial level of income, thus allowing us to control for the initial level of poverty.

[12] Data are averaged over five years (the year of the poverty measure and the four previous years), as for all other explanatory variables.

$$V^x = \sqrt{\sum_{t=1}^{n} \frac{1}{n-1}\left(g_t^x - \overline{g^x}\right)^2} \quad (2)$$

where V^x is the indicator of the variable *x* instability and g^x stands for the growth rate of *x*. This indicator has the advantage of being easily computable, but it relies heavily on assumptions (see below). We adopt a more flexible approach, where the instability of a variable *x* is defined as the average absolute value of residuals[13] obtained by regressing the variable (x_t) on its lagged value (x_{t-1}) and a time trend (t). V^x is given as follows:

$$V^x = \frac{1}{n}\sum_{t=1}^{n} |\varepsilon_t| \quad (3)$$

where ε_t represents the residual derived from the OLS estimation of the following model:

$$x_t = a + bx_{t-1} + ct + \varepsilon_t \quad (4)$$

Using the absolute value[14] of residuals as a measure of financial instability has the advantage of not assuming a stochastic or deterministic trend; the standard deviation of the growth rate implicitly assumes that the variable follows a stochastic trend.[15] Moreover, our approach assumes that absolute changes in the ratio M3/GDP (or the credit ratio) measure instability more accurately than relative changes.[16] In other words, we suppose that if, for example, M3/GDP rises from 10 percent to 12 percent and then falls to 8 percent, the effect on poverty will be the same as a rise from 20 to 22 percent, followed by a fall to 18 percent. The hypothesis is the same as in the usual growth regressions where the rate of investment (which is linked to the rate of money or credit to GDP), not its growth rate, is assumed to affect economic growth.

To compute financial instability, we consider each country separately and regress the indicator of financial development on its lagged value and a linear trend for 1966–2000. At each point of

[13] The root-mean-square or the standard deviation can also be used. Both yield results similar to that of the average absolute value of residuals.

[14] It assumes that the variable follows a mix of both trends.

[15] Making the stochastic trend assumption, equation 4 suggests that $a = 0$, $b = 1$, and $c = 0$. As a result $x_t = x_{t-1} + \varepsilon_t$. This implies that x_t follows a random walk process without drift. Assuming that x_t is the logarithm of the variable for which we want to compute an indicator of instability, the standard deviation of ε_t is equivalent to the standard deviation of $x_t - x_{t-1}$, that is, the first log difference or the growth rate of the variable of interest.

[16] The standard deviation of the growth rate assumes that relative changes matter.

poverty data, financial instability is calculated as an average of the absolute value of the residuals over five years (the year of the poverty measurement and the four preceding years).[17]

B. Econometric Methodology

First, we run regressions using OLS. Then, to take into account country-specific effects and address the issues of endogeneity, measurement errors, and omitted variables, we use the system GMM (also known as the dynamic panel generalized method-of-moment) estimator with panel data. The system GMM builds on the first-differenced GMM, where the basic idea is "to take first differences to remove unobserved time-invariant country-specific effects, and then instrument the right-hand-side variables in the first-differenced equations using levels of the series lagged one period or more, under the assumption that the time-varying disturbances in the original levels equations are not serially correlated" (Bond, Hoeffler and Temple, 2001). The system GMM estimator combines the previous set of equations in first differences with suitable lagged levels as instruments with an additional set of equations in levels with suitably lagged first differences as instruments. Blundell and Bond (1998) have evidenced from Monte Carlo simulations that system GMM performs better than first-differenced GMM, which is biased in small samples when the instruments are weak.

To test the validity of the lagged variables as instruments, we use the standard Hansen test of over-identifying restrictions, where the null hypothesis is that the instrumental variables are not correlated with the residual, and the serial correlation test, where the null hypothesis is that the errors exhibit no second-order serial correlation. In our regressions, both tests suggest that we cannot reject the null hypotheses.[18]

C. The Results

The income of the poorest 20 percent of the population

Tables 1 and 2 set out the results for the two financial development indicators M3/GDP and credit/GDP. The first two columns show the OLS estimates, the others the system GMM estimates.

In Table 1 the results suggest that our variables of interest, M3/GDP level and instability, are significantly correlated with the mean income of the poor. The hypothesis of a positive direct effect of financial development on the standard of living of the poor is not rejected. Also,

[17] When estimating equation (4) for the entire period (1966–2000), we recognize that we may not be able to capture structural breaks. However, we expect that the presence of a lagged dependent variable on the right side will partially reduce the risk. The purpose of these estimations is to calculate financial instability rather than explain the level of financial development.

[18] Consistent with system GMM assumptions, the statistics of the first-order serial correlation test also suggest that one cannot accept the null hypothesis of no first-order serial correlation. To save space the results are not reported in the tables.

financial instability seems to significantly reduce the income of the poor.[19] Thus, financial development increases the share of income accruing to the poorest quintile, holding constant average incomes while financial instability reduces it. Comparing column 1 to column 2 and column 3 to column 4 in Table 1, it can be seen that, once controlling for the effect of financial instability on poverty, the coefficient of the liquidity ratio improves in magnitude and significance. This suggests a positive correlation between the instability of financial development and its level;[20] it also suggests that on average financial development (measured by the liquidity ratio) is more beneficial to the poor in countries with stable financial systems.

Other interesting results emerge from the regressions. The interaction term between the liquidity ratio (M3/GDP) and the number of bank branches per km^2 (a proxy of access to the banking system) has a positive and significant coefficient (column 11), suggesting that banking geographical coverage, which itself improves with the level of financial development, in turn reinforces the favorable impact of an increase in the liquidity ratio on the income of the poor. Also, the liquidity ratio seems to have a more powerful effect on poverty alleviation when country income is low, and the negative effect of its instability seems to weaken when the level of development is higher (Column 12 of Table 1). This suggests that the McKinnon conduit effect may be particularly relevant in poor countries.

Note that when McKinnon presented the conduit effect, he considered money balances (currencies and demand deposits) as well as savings and time deposits, and pointed out that the conduit effect is reinforced when poor people have access to saving or time deposits with a positive real interest rate. To test this, we estimate the model using the ratio of saving deposits (M3-M1) to GDP as a financial indicator. The results are similar to the previous ones, though the positive coefficient of (M3-M1)/GDP is slightly higher and the negative coefficient of its instability is smaller.[21] These results also support the McKinnon conduit effect.

In Table 2, the results related to credit/GDP are quite different. Indeed, the credit indicators (level and instability) are not significant except for the OLS estimate, where the coefficient for the private credit ratio is significant at 10 percent (column 1).[22] This suggests that in developing countries, access to credit for the poor remains a challenge and that the main channel of the impact of financial development on the poor is the McKinnon's conduit effect captured by the liquidity ratio. In other words, an increase in the private credit ratio does not necessarily translate into improved well-being for the poor. This result apparently contradicts that of Beck, Demirgüç-Kunt and Levine (2007), who find a significant and positive impact of the private

[19] The standard error of the coefficient for financial instability may be biased because the measure of financial instability is derived from a regression. Bootstrap estimates show, however, that the bias is negligible.

[20] Guillaumont and Kpodar (2006) show a positive relationship between the level of financial development and its instability in a sample of developing countries.

[21] The results not shown in the tables are available upon request.

[22] Because the sample sizes in Tables 1 and 2 are different, we re-estimated the regressions using the same sample; this did not affect the results.

credit ratio on the income growth of the poorest quintile of the population. The reason could lie in the sample composition. Our sample consists of developing countries; theirs comprises both developing and developed economies that have bigger and more diverse financial systems.[23] However, more importantly our results show a positive and significant coefficient for the interaction term between the credit ratio and the number of bank branches per km^2 (column 11, Table 2); this implies that in developing countries banking coverage, by improving delivery of financial services, boosts the benefits the poor can get from more available credit. However, in contrast to M3/GDP, the relationship between credit/GDP and the income of the poor seems not to depend on the level of development (column 12 of Table 2).

In column 5 of Tables 1 and 2, the initial level (lagged value) of the income of the poor is introduced to test the convergence effect, assuming that the growth per capita income of the poor growth more rapidly when its initial level is low. The result for the effect of financial development and financial instability on poverty does not change dramatically. Financial development measured by M3/GDP still has a favorable impact on the income of the poorest, and financial instability has the opposite effect. In addition, the initial level is positively and significantly correlated with the current level of the dependent variable. There is evidence of a convergence effect: the coefficient of convergence (equal to the initial level coefficient minus one) is negative and significant.[24] However, a drawback of this specification is that the sample is significantly smaller, leading us to drop the lagged variable in subsequent regressions that follow. Tables 1 and 2 also show that, as found by Dollar and Kraay (2002), the elasticity of income of the poor with respect to mean income is not significantly different from 1 in almost all estimations, implying that growth proportionately benefits those in the poorest quintile.

With regard to the other covariates, the inflation rate has the right sign (negative) in most regressions of Tables 1 and 2, but its coefficient lacks significance at conventional levels.[25] While the GDP growth rate has a positive impact (at 10% level of confidence) on the income of the poor,[26] without changing significantly the coefficient of financial instability in Table 1, neither growth instability nor inflation instability are significant in both tables.[27] Therefore, we cannot conclude that the detrimental effect of financial instability on the poor occurs through the instability of growth or through the instability of inflation.

The asymmetric effect of periods of falling and rising aggregate income may be a channel for the negative effect of financial instability on the income of the poor. The interaction term

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[23] For instance, for the private credit ratio the sample average of Beck, Demirgüç-Kunt, and Levine (2007) is 40 percent of GDP, compared with 21 percent for our sample.

[24] For example, the coefficient of convergence in column 5 of Table 1 is –0.6 with a t statistic equal to –5.30.

[25] This unexpected result might be due to the correlation between the inflation rate and financial development, namely the liquidity ratio.

[26] GDP growth may pick up the effect of growth instability, since both are thought to be highly correlated.

[27] Inflation and growth instability are computed using the same method that was applied to financial instability.

between the log of GDP per capita and a dummy variable taking 1 when average growth is negative during the five previous years (as in Dollar and Kraay, 2002)[28] appears to be negatively correlated with the mean income of the poor (column 9 of Tables 1 and 2). Moreover, the introduction of this variable reduces the marginal impact and the significance of M3/GDP instability. The same result holds when another indicator of asymmetric effect is used, such as the interaction term between the log of GDP per capita and the number of negative growth episodes over the five previous years (column 10 of Tables 1 and 2).

Headcount poverty index

We estimate the model with a second measure of monetary poverty, the share of the population living on less than US$1 a day (as in Honohan, 2004). Here, the expected signs of the coefficients must be the opposite of those estimated using the income of the poorest 20 percent of the population. The results for M3/GDP and credit/GDP are presented in Tables 3 and 4.

Financial development is negatively associated with the poverty headcount, and financial instability increases the headcount (Table 3). The significance level of the ratio of private credit to GDP improves (columns 1 and 2 of Table 4) for the OLS estimates compared to Table 2, but credit level and instability remain insignificant in the system GMM estimates (Table 4).[29]

Other interesting results appear in Table 3. Growth instability and asymmetry are expected to be positively correlated with poverty incidence, but, surprisingly, the coefficients for these variables are counter-intuitive (column 6 and 8). This may reflect the effectiveness of propoor policies in countries vulnerable to exogenous shocks or experiencing volatile growth. As the average income of the poorest 20 percent of the population is about $2.2 a day (see Annex I), more than the double the poverty line of $1 a day used to estimate the poverty headcount, it may seem that social safety nets intended to reduce the vulnerability of the poor to economic fluctuations are relatively well-targeted to the very poorest. The poor may also rely on informal mechanisms to cope with growth volatility. Nevertheless the poverty incidence rate increases with inflation instability (column 7 of Tables 3 and 4), suggesting that inflation volatility is mostly detrimental to the very poorest.

Poverty gap

The poverty gap (expressed as a percentage of the poverty line) is used as a third indicator of poverty. It provides information on how far poor households are above or below the poverty line. Unlike the headcount index, it is sensitive to a decrease or increase in the income of the poor even when they are below the poverty line. It also estimates the total resources needed to

[28] According to these authors the dummy variable corresponds to episodes which "certainly qualify as economic crises since they correspond to negative average annual growth over a period of at least five years." As this interaction term was statistically indistinguishable from zero in Dollar and Kraay's estimates (contrary to our estimations), we use for robustness purposes another interaction term that is average income multiplied by the number of negative growth years over the five years.

[29] Data limitations prevent us from estimating the dynamic specification.

bring all the poor out of poverty. The results (see Tables 5 and 6) corroborate our previous findings.

Robustness tests

Next, we introduce additional variables such as M3/GDP square, to check whether financial development may be regressive in the early stages of economic and financial development (as predicted by the Greenwood and Jovanovic model, 1990); instability of agricultural value-added as a measure of climatic shocks; inequality of land distribution; government consumption; the civil liberty index, to measure the quality of the legal environment; primary school enrolment as a proxy for human capital accumulation; trade openness; and road density, to capture infrastructure. Tables 8, 9, and 10 report the results for average income of the first quintile, the headcount index, and the poverty gap. Overall in most regressions the variables of interest (financial development and financial instability) keep the right signs and remain significant. However, only a few control variables are significant: more openness to trade (Tables 8, 9, and 10) and higher government consumption (Table 8) seem to worsen poverty,[30] whereas availability of infrastructure[31] (Tables 8 and 10) and human capital accumulation (Tables 9 and 10) seem to alleviate it.

We also test for the potential influence of outliers using the basic specification reported in column 4 of Tables 1, 3 and 5. We remove from the sample all country observations for which the residual is larger than two standard deviations of the dependant variable, but rerunning the regressions without these observations simply confirms our findings.

Despite its shortcomings, the standard deviation of the growth rate of M3/GDP was also used as a measure of financial instability. It appears that financial instability is negatively associated with the log of income of the poorest 20 percent (at the 0.05 level) and positively correlated with the headcount index (at the 0.10 level), but has no effect on the poverty gap. The size and significance of the impact of financial development on the poor do not change dramatically.[32]

Economic relevance

Figure 1 illustrates how financial development may affect poverty both directly and indirectly through economic growth and financial instability. Although the link between financial development and financial instability has not been discussed in this paper, there are theoretical and empirical grounds for suggesting that in developing countries in particular, as the financial system develops, it is more likely to experience some instability either, because of an inadequate legal system and poor macroeconomic policies (Guillaumont Jeanneney and Kpodar

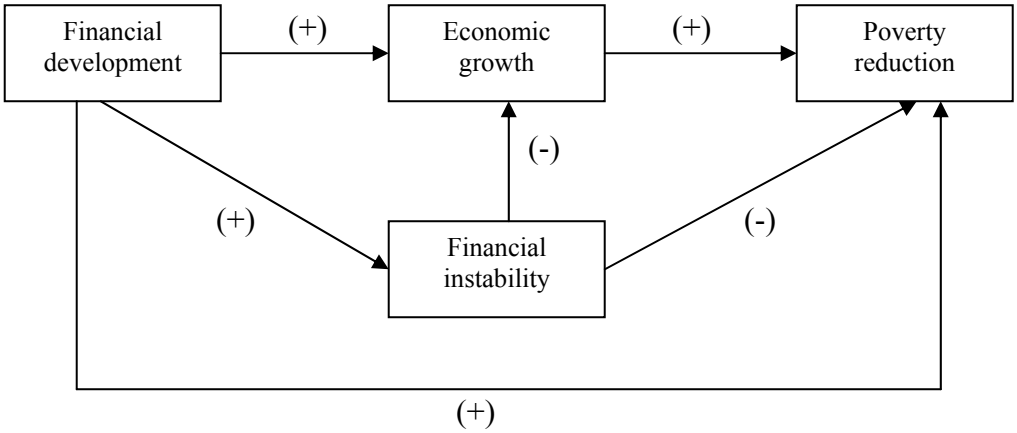
[30] The negative effect of trade openness on the poor need to be interpreted with caution and requires an in-depth intensive analysis. Trade openness may have an indirect positive effect on poverty reduction through economic growth that may offset the negative direct effect.

[31] Because of a lack of time series for road density, an OLS estimate is reported.

[32] The results are available upon request.

(2006), or because of multiple equilibrium states (a switch from noncrisis to crisis equilibrium) on the path to financial development (Loayza and Ranciere, 2006).

Figure 1. Interactions Among Financial Development, Financial Instability, Economic Growth, and Poverty Reduction



To evaluate the total impact of financial development on poverty reduction, we need to estimate the impact of financial development and instability on economic growth. We estimate a standard growth model, where the growth rate of real GDP per capita is regressed on the level and the instability of financial development and a set of control variables. The results (see Table 7) suggest that financial development stimulates economic growth and financial instability reduces it. Moreover, a high level of human capital, a low black market premium, and political stability are beneficial to economic growth.

Table 11 summarizes the coefficients estimated for the links between financial development, financial instability, economic growth, and poverty as presented in Figure 1.[33] It can be shown that the effect on poverty of financial development (measured by M3/GDP) is not only statistically significant but also economically relevant.

[33] The coefficients estimated using the system GMM estimator control for feedback effects.

Table 11. Summary of the Estimated Coefficients for the Channels Between Financial Development and Poverty

Explanatory Variable	Dependent Variable	Coefficient	Source
Impact of :	On :		
Financial development (M3/GDP)	Economic growth	0.250 ***	Column 1 (Table 7)
	Financial instability	4.897 ***	Guillaumont and Kpodar (2006)
	Poverty		
	Income of the poor	0.447 *	Column 4 (Table 1)
	Headcount poverty	-0.326 ***	Column 4 (Table 3)
	Poverty gap	-0.148 **	Column 4 (Table 5)
Financial instability (Instability of M3/GDP)	Economic growth	-1.557 **	Column 1 (Table 7)
	Poverty		
	Income of the poor	-4.627 **	Column 4 (Table 1)
	Headcount poverty	1.590 *	Column 4 (Table 3)
	Poverty gap	1.011 *	Column 4 (Table 5)
Economic growth (GDP per capita growth)	Poverty		
	Income of the poor	1.023 ***	Column 4 (Table 1)
	Headcount poverty	-0.175 ***	Column 4 (Table 3)
	Poverty gap	-0.086 ***	Column 4 (Table 5)

* significant at 10%; ** significant at 5%; *** significant at 1%

An exogenous 10 percentage point increase in M3/GDP (about half the sample standard deviation) would directly produce a 4.5 percent increase in the average income of the poorest 20 percent. In addition, financial development would increase economic growth by 2.5 percent, with an equivalent rise in the average income of the poor. However, the change in financial development level would generate additional financial instability of about 0.49, which translates into a 0.76 percent drop in both economic growth and the average income of the poor. Further, more financial instability will cause the income of the poor to decrease by 2.26 percent. Thus, a 10 percentage point increase in M3/GDP would net out to about a 4 percent increase in the average income of the poor. For a similar increase in M3/GDP, the headcount poverty would have decreased by 2.8 percentage points and the poverty gap would have been narrowed by 1.1 percentage points.

V. CONCLUSION

Three main conclusions can be drawn from our analysis:

1. Financial development is propoor, with the direct effect stronger than the effect through economic growth.

2. However, financial instability hurts the poor and partially offsets the benefit of financial development.
3. The McKinnon conduit effect is most likely the main channel through which the poor benefit from financial development.

Because physical and human capital investments by the poor are subject to liquidity constraints, improvement in financial intermediation is beneficial to the poor because it offers them a higher return on their savings. Later, they may start benefiting for credit being more available. The downside, however, is that bank crises are particularly detrimental to the poor, who have very few opportunities to diversify their assets.

The findings of this paper have straightforward policy implications. As the beneficial impact of financial development on poverty reduction is dampened or perhaps even cancelled out by financial instability, the policy package must take into account the risk of financial instability. Since the literature has found that an excessive money supply that induces inflation, financial and trade openness in economies vulnerable to external shocks, inadequate legal systems, and failure to comply with international accounting standards all undermine financial stability, policies to liberalize the financial sector and foster financial intermediation should be accompanied by sound macroeconomic policies, gradual external openness, and firm banking supervision.

Honohan and Beck (2007) emphasized that the long-term target for financial reform is defined in large part by what has been achieved in advanced economies. But "many of the elements take a long time to put in place. That is …why seeking the shortcuts and ensuring that quick-yielding measures receive sufficient priority are important" (p. 194). The dominance of the McKinnon conduit effect seems to confirm that first-generation reforms to eliminate financial repression by liberalizing interest rates should take priority over second-generation reforms to improve access to affordable finance by improving the institutional lending system. In particular it seems to indicate that at early stages of financial sector development, improving savings mobilization seems to be effective in alleviating poverty, particularly when banks are reluctant to provide credit to the poor. More importantly, saving accumulation will later improve access to credit.

The magnitude of the direct effect of financial development on poverty reduction highlights the relevance of more active financial sector reforms. It is also undoubtedly useful to encourage microfinance lending to the poor, since credit growth does not benefit them directly, especially when bank branches are geographically concentrated. Honohan and Beck (2007) rightly pointed out that the financial system should be "a distributed architecture, with larger institutions such as banks, MFI-network umbrella organizations, or the post office taking the contract and subcontracting parts of it to rural agencies, including MFIs."

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Table 1. Financial Development (M3/GDP), Financial Instability, and the Income of the Poor

Dependent variable: the log of average income of the poorest 20%	OLS		System GMM									
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Log of GDP per capita (y)	0.949	0.947	1.123	1.023	0.682	1.064	1.019	1.023	1.074	1.008	0.886	1.004
	(19.53)***	(19.95)***	(9.94)***	(12.38)***	(5.37)***	(13.53)***	(13.01)***	(12.42)***	(12.64)***	(12.50)***	(9.08)***	(4.99)***
M3/GDP	0.331	0.525	0.069	0.447	0.350	0.380	0.359	0.450	0.350	0.388	0.358	5.994
	(3.05)***	(3.11)***	(0.35)	(1.97)*	(1.86)*	(1.73)*	(1.70)*	(1.98)*	(1.82)*	(1.77)*	(1.73)*	(1.95)*
Instability of M3/GDP		-3.746		-4.627	-4.137	-4.101	-4.028	-4.680	-3.931	-3.388	-3.222	-104.988
		(1.63)*		(2.00)**	(1.85)*	(1.88)*	(1.84)*	(2.01)**	(1.92)*	(1.43)	(1.78)*	(1.91)*
Inflation	-0.123	0.010	-0.248	-0.012	-0.037	0.043	0.030	-0.105	0.087	0.139	0.029	0.093
	(0.52)	(0.04)	(0.83)	(0.05)	(0.20)	(0.23)	(0.15)	(0.30)	(0.45)	(0.65)	(0.12)	(0.41)
Initial log of income of the poorest 20%					0.346							
					(3.26)***							
Growth						0.012						
						(1.71)*						
Instability of growth							-1.503					
							(0.66)					
Instability of inflation								0.216				
								(0.64)				
Asymmetry (Dollar and Kraay)									-0.037			
									(2.35)**			
Log of GDP per capita*Ng										-0.011		
										(2.15)**		
M3/GDP * (Number of bank branches per km2)											0.011	
											(2.04)**	
(M3/GDP)*y												-0.710
												(1.84)*
(Instability of M3/GDP)*y												12.509
												(1.86)*
Constant	-1.064	-1.056	-2.263	-1.581	-1.064	-1.943	-1.497	-1.573	-1.932	-1.437	-0.556	-1.369
	(2.92)***	(2.98)***	(2.81)***	(2.60)**	(1.81)*	(3.30)***	(2.51)**	(2.60)**	(3.07)***	(2.38)**	(0.74)	(0.89)
Observations	146	146	146	146	78	146	146	146	146	146	112	146
R^2	0.78	0.78										
Number of countries	67	67	67	67	35	67	67	67	67	67	42	67
Hansen Test (prob)			0.43	0.97	0.72	0.76	0.99	0.97	0.52	0.98	0.96	0.69
AR(2) (prob)			0.48	0.84	0.18	0.88	0.79	0.51	0.54	0.71	0.71	0.95
Test _b[y]=1 (prob)	0.29	0.27	0.28	0.78		0.42	0.80	0.78	0.39	0.93	0.25	0.99

Notes: Absolute value of robust *t* statistics in brackets; * significant at 10%; ** significant at 5%; *** significant at 1%. AR(2): Arellano and Bond test of second order autocorrelation; Test _b[y] =1: tests the Ho assumption such that the coefficient of the log of GDP per capita is not different from one. Ng= Number of negative growth during five years (the year of poverty measurement and the four preceding years). All explanatory variables are assumed to be predetermined.

Table 2. Financial Development (Credit/GDP), Financial Instability, and the Income of the Poor

Dependent variable: the log of average income of the poorest 20%	OLS		System GMM									
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Log of GDP per capita (y)	0.960	0.977	1.170	1.182	0.729	1.081	1.128	1.182	1.157	1.095	0.971	1.459
	(20.37)***	(19.50)***	(9.94)***	(10.15)***	(4.68)***	(12.64)***	(11.81)***	(10.22)***	(10.16)***	(11.34)***	(7.24)***	(6.77)***
Credit/GDP	0.296	0.169	0.074	-0.162	0.120	-0.102	-0.085	-0.161	-0.138	0.108	-0.327	9.502
	(1.86)*	(0.89)	(0.23)	(0.42)	(0.50)	(0.36)	(0.21)	(0.42)	(0.39)	(0.34)	(1.00)	(1.35)
Instability of Credit/GDP		2.825		3.798	-0.762	4.164	3.585	3.792	5.906	4.343	3.940	-5.510
		(1.08)		(1.11)	(0.28)	(1.31)	(0.99)	(1.11)	(1.96)**	(1.19)	(1.17)	(0.05)
Inflation	-0.090	-0.221	-0.265	-0.305	-0.243	-0.173	-0.279	-0.327	-0.244	-0.045	-0.233	-0.348
	(0.60)	(1.34)	(0.90)	(1.01)	(1.30)	(0.71)	(0.95)	(0.89)	(0.87)	(0.16)	(0.82)	(1.05)
Initial log of income of the poorest 20%					0.402							
					(2.86)***							
Growth						0.009						
						(1.27)						
Instability of growth							-2.014					
							(0.88)					
Instability of inflation								0.053				
								(0.16)				
Asymmetry (Dollar and Kraay)									-0.038			
									(1.82)*			
Log of GDP per capita*Ng										-0.012		
										(2.23)**		
Credit/GDP * (Number of bank branches per km2)											0.024	
											(1.83)*	
(Credit /GDP)*y												-1.193
												(1.33)
(Instability of Credit/GDP)*y												1.000
												(0.08)
Constant	-1.093	-1.216	-2.605	-2.713	-1.729	-2.026	-2.258	-2.711	-2.534	-2.106	-1.097	-4.874
	(3.02)***	(3.14)***	(3.06)***	(3.22)***	(2.09)**	(3.08)***	(3.17)***	(3.24)***	(3.05)***	(2.88)***	(1.09)	(2.98)***
Observations	146	140	146	140	78	140	140	140	140	140	107	140
R^2	0.77	0.78										
Number of countries	67	67	67	65	35	65	65	65	65	65	41	65
Hansen Test (prob)			0.53	0.67	0.89	0.83	0.77	0.67	0.62	0.97	0.70	0.59
AR(2) (prob)			0.49	0.50	0.33	0.59	0.36	0.44	0.27	0.40	0.42	0.56
Test _b[y]=1 (prob)	0.40	0.64	0.15	0.12		0.34	0.18	0.12	0.17	0.32	0.83	0.03

Notes: Absolute value of robust *t* statistics in brackets; * significant at 10%; ** significant at 5%; *** significant at 1%. AR(2): Arellano and Bond test of second order autocorrelation; Test _b[y] =1: tests the Ho assumption such that the coefficient of the log of GDP per capita is not different from one. Ng= Number of negative growth during five years (the year of poverty measurement and the four preceding years). All explanatory variables are assumed to be predetermined.

Table 3. Financial Development (M3/GDP), Financial Instability, and the Incidence of Poverty

Dependent variable: the percentage of population living under the $1 poverty line	OLS		System GMM							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Log of GDP per capita (y)	-0.157	-0.167	-0.151	-0.175	-0.148	-0.192	-0.179	-0.250	-0.172	-0.220
	(7.98)***	(8.17)***	(3.44)***	(4.28)***	(3.24)***	(5.31)***	(4.32)***	(3.17)***	(3.91)***	(3.51)***
M3/GDP	-0.296	-0.412	-0.103	-0.326	-0.391	-0.324	-0.232	-0.341	-0.326	-0.283
	(5.09)***	(6.26)***	(0.71)	(2.61)***	(3.29)***	(2.93)***	(1.92)*	(2.66)***	(2.61)***	(1.93)*
Instability of M3/GDP		2.022		1.590	1.497	2.264	-0.208	3.182	1.536	1.809
		(2.49)**		(1.66)*	(1.38)	(1.98)**	(0.18)	(2.24)**	(1.66)*	(1.69)*
Inflation	0.029	-0.086	0.055	-0.038	-0.038	-0.074	-0.138	-0.046	-0.038	-0.058
	(0.82)	(1.46)	(1.99)**	(0.55)	(0.51)	(0.95)	(0.94)	(0.72)	(0.55)	(0.71)
Growth					-0.000					
					(0.09)					
Instability of growth						-1.695				
						(1.70)*				
Instability of inflation							0.368			
							(2.28)**			
Asymmetry (Dollar and Kraay)								-0.008		
								(1.71)*		
Log of GDP per capita*Ng									0.002	
									(0.24)	
M3/GDP * (Number of bank branches per km2)										-0.004
										(0.82)
Constant	1.567	1.655	1.445	1.686	1.511	1.854	1.713	2.337	1.667	2.054
	(10.11)***	(10.23)***	(4.08)***	(5.55)***	(4.39)***	(6.52)***	(5.63)***	(3.76)***	(5.06)***	(4.28)***
Observations	116	115	116	115	115	115	115	115	115	83
R^2	0.50	0.53								
Number of countries			64	64	64	64	64	64	64	41
Hansen Test (prob)			0.68	0.36	0.47	0.59	0.56	0.66	0.42	0.81
AR(2) (prob)			0.33	0.32	0.33	0.33	0.31	0.26	0.32	0.32

Notes: Absolute value of robust *t* statistics in brackets; * significant at 10%; ** significant at 5%; *** significant at 1%. AR(2): Arellano and Bond test of second order autocorrelation; Ng= Number of negative growth during five years (the year of poverty measurement and the four preceding years). All explanatory variables are assumed to be predetermined.

Table 4. Financial Development (Credit/GDP), Financial Instability, and the Incidence of Poverty

Dependent variable: the percentage of population living under the $1 poverty line	OLS		System GMM							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Log of GDP per capita (y)	-0.175	-0.177	-0.150	-0.159	-0.154	-0.168	-0.166	-0.134	-0.192	-0.159
	(9.28)***	(9.19)***	(3.13)***	(3.68)***	(3.59)***	(3.64)***	(3.04)***	(2.49)**	(3.50)***	(2.57)**
Credit/GDP	-0.226	-0.246	-0.212	-0.184	-0.412	-0.217	-0.272	-0.196	-0.252	-0.198
	(3.05)***	(3.16)***	(1.26)	(1.09)	(2.91)***	(1.65)*	(1.50)	(1.16)	(1.08)	(0.91)
Instability of Credit/GDP		-0.117		-0.116	-1.425	0.323	-0.942	-0.278	-0.168	1.161
		(0.09)		(0.10)	(0.80)	(0.24)	(0.68)	(0.23)	(0.13)	(0.77)
Inflation	0.024	0.024	0.044	0.049	0.042	0.047	-0.177	0.021	0.100	0.024
	(0.68)	(0.67)	(1.37)	(1.37)	(1.14)	(1.51)	(1.20)	(0.58)	(1.56)	(0.64)
Growth					-0.001					
					(0.13)					
Instability of growth						-1.228				
						(1.13)				
Instability of inflation							0.391			
							(2.05)**			
Asymmetry (Dollar and Kraay)								0.019		
								(1.30)		
Log of GDP per capita*Ng									-0.005	
									(1.00)	
Credit/GDP * (Number of bank branches per km2)										-0.012
										(1.00)
Constant	1.652	1.677	1.452	1.521	1.558	1.627	1.606	1.325	1.847	1.531
	(10.81)***	(11.04)***	(3.99)***	(4.62)***	(4.73)***	(4.44)***	(4.03)***	(3.19)***	(3.75)***	(3.21)***
Observations	113	110	113	110	109	109	110	110	110	80
R^2	0.48	0.50								
Number of countries			63	62	62	62	62	62	62	40
Hansen Test (prob)			0.32	0.57	0.44	0.73	0.60	0.84	0.55	0.62
AR(2) (prob)			0.33	0.33	0.33	0.31	0.32	0.33	0.31	0.34

Notes: Absolute value of robust *t* statistics in brackets; * significant at 10%; ** significant at 5%; *** significant at 1%. AR(2): Arellano and Bond test of second order autocorrelation; Ng= Number of negative growth during five years (the year of poverty measurement and the four preceding years). All explanatory variables are assumed to be predetermined.

Table 5. Financial Development (M3/GDP), Financial Instability, and the Poverty Gap

Dependent variable: Poverty gap as a percentage of the poverty line	OLS		System GMM							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Log of GDP per capita (y)	-0.067	-0.073	-0.070	-0.086	-0.072	-0.091	-0.102	-0.081	-0.117	-0.097
	(5.65)***	(5.97)***	(2.55)**	(3.66)***	(2.78)***	(3.87)***	(2.74)***	(2.63)***	(2.69)***	(3.13)***
M3/GDP	-0.130	-0.191	-0.058	-0.148	-0.193	-0.144	-0.004	-0.158	-0.139	-0.100
	(3.59)***	(4.82)***	(0.71)	(2.03)**	(2.60)***	(2.42)**	(0.04)	(2.17)**	(1.97)**	(1.20)
Instability of M3/GDP		0.994		1.011	1.015	1.154	-0.848	1.019	1.588	1.007
		(1.88)*		(1.83)*	(1.61)	(1.83)*	(0.86)	(1.73)*	(2.04)**	(1.60)
Inflation	0.028	-0.029	0.034	-0.025	-0.028	-0.032	-0.076	-0.029	-0.021	-0.033
	(1.58)	(0.70)	(2.12)**	(0.63)	(0.64)	(0.73)	(0.84)	(0.71)	(0.59)	(0.71)
Growth					-0.001					
					(0.34)					
Instability of growth						-0.444				
						(0.78)				
Instability of inflation							0.292			
							(2.60)***			
Asymmetry (Dollar and Kraay)								0.001		
								(0.09)		
Log of GDP per capita*Ng									-0.004	
									(1.19)	
M3/GDP * (Number of bank branches per km2)										-0.006
										(2.12)**
Constant	0.659	0.709	0.652	0.794	0.709	0.838	0.895	0.762	1.063	0.887
	(6.91)***	(7.24)***	(2.94)***	(4.47)***	(3.57)***	(4.51)***	(3.33)***	(3.24)***	(3.04)***	(3.67)***
Observations	114	113	114	113	113	113	113	113	113	81
R^2	0.34	0.38								
Number of countries			63	63	63	63	63	63	63	40
Hansen Test (prob)			0.58	0.36	0.46	0.70	0.68	0.56	0.56	0.62
AR(2) (prob)			0.32	0.31	0.32	0.33	0.30	0.31	0.27	0.32

Notes: Absolute value of robust *t* statistics in brackets; * significant at 10%; ** significant at 5%; *** significant at 1%. AR(2): Arellano and Bond test of second order autocorrelation; Ng= Number of negative growth during five years (the year of poverty measurement and the four preceding years). All explanatory variables are assumed to be predetermined.

Table 6. Financial Development (Credit/GDP), Financial Instability, and the Poverty Gap

Dependent variable: Poverty gap as a percentage of the poverty line	OLS		System GMM							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Log of GDP per capita (y)	-0.076	-0.077	-0.074	-0.077	-0.075	-0.086	-0.080	-0.066	-0.097	-0.079
	(6.42)***	(6.31)***	(2.64)***	(3.05)***	(2.98)***	(3.21)***	(2.26)**	(1.99)**	(2.71)***	(2.00)**
Credit/GDP	-0.105	-0.118	-0.127	-0.116	-0.208	-0.086	-0.180	-0.120	-0.155	-0.025
	(2.29)**	(2.81)***	(1.59)	(1.58)	(2.61)***	(1.66)*	(1.80)*	(1.68)*	(1.13)	(0.22)
Instability of Credit/GDP		0.070		-0.335	-0.763	0.031	-0.901	-0.409	-0.265	0.757
		(0.10)		(0.52)	(0.85)	(0.05)	(0.99)	(0.64)	(0.34)	(0.93)
Inflation	0.024	0.023	0.028	0.032	0.029	0.031	-0.123	0.020	0.065	0.019
	(1.36)	(1.22)	(1.69)*	(1.77)*	(1.59)	(1.81)*	(1.17)	(1.00)	(1.63)	(1.01)
Growth					-0.001					
					(0.17)					
Instability of growth						-0.155				
						(0.30)				
Instability of inflation							0.268			
							(2.03)**			
Asymmetry (Dollar and Kraay)								0.008		
								(0.85)		
Log of GDP per capita*Ng									-0.003	
									(0.98)	
Credit/GDP * (Number of bank branches per km2)										-0.011
										(2.02)**
Constant	0.702	0.717	0.690	0.720	0.738	0.786	0.766	0.632	0.916	0.718
	(7.32)***	(7.35)***	(3.17)***	(3.66)***	(3.74)***	(3.72)***	(2.96)***	(2.41)**	(2.86)***	(2.38)**
Observations	111	108	111	108	107	107	108	108	108	78
R^2	0.34	0.36								
Number of countries			62	61	61	61	61	61	61	39
Hansen Test (prob)			0.35	0.45	0.38	0.44	0.46	0.54	0.64	0.84
AR(2) (prob)			0.32	0.32	0.32	0.31	0.31	0.32	0.31	0.33

Notes: Absolute value of robust *t* statistics in brackets; * significant at 10%; ** significant at 5%; *** significant at 1%. AR(2): Arellano and Bond test of second order autocorrelation; Ng= Number of negative growth during five years (the year of poverty measurement and the four preceding years). All explanatory variables are assumed to be predetermined.

Table 7. Financial Development, Financial Instability, and Economic Growth

Dependent variable: the growth rate of GDP per capita	System GMM
	(1)
Log of initial GDP per capita	0.0002
	(0.01)
M3/GDP	0.250
	(4.49)***
Instability of M3/GDP	-1.557
	(2.01)**
Education	0.183
	(2.85)***
Inflation (a)	0.002
	(0.17)
Government consumption/GDP	-0.004
	(1.23)
Trade openness (Log)	-0.012
	(0.43)
Black market premium (a)	-0.044
	(2.07)**
Civil liberties index	-0.010
	(0.97)
Political instability	-0.058
	(3.31)***
Constant	0.049
	(0.38)
Observations	304
Number of countries	69
Hansen Test (prob)	1.00
AR(2) (prob)	0.40

Notes: Absolute value of robust *t* statistics in brackets; * significant at 10%; ** significant at 5%; *** significant at 1%. AR(2): Arellano and Bond test of second order autocorrelation. All explanatory variables are assumed to be predetermined, except for M3/GDP which is assumed to be endogenous and political instability is assumed to be exogenous. Time dummies included.

Table 8. Financial Development (M3/GDP), Financial Instability, and the Income of the Poor: A Robustness Check

Dependent variable: the log of average income of the poorest 20%	System GMM							OLS	System GMM
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Log of GDP per capita	0.982	0.937	0.988	0.964	1.074	1.028	1.025	0.925	0.874
	(12.07)***	(10.89)***	(11.85)***	(13.32)***	(9.84)***	(12.60)***	(13.25)***	(11.11)***	(14.70)***
M3/GDP	1.147	0.384	0.505	0.515	0.455	0.420	0.569	0.663	0.780
	(2.02)**	(1.93)*	(2.06)**	(2.27)**	(1.91)*	(1.89)*	(2.82)***	(2.32)**	(3.64)***
Instability of M3/GDP	-3.451	-3.641	-4.437	-2.656	-5.401	-4.667	-3.812	-4.333	-2.666
	(1.76)*	(1.77)*	(2.04)**	(1.25)	(2.23)**	(1.91)*	(1.90)*	(1.17)	(1.72)*
Inflation	0.086	0.023	0.200	-0.093	0.095	-0.002	0.069	0.241	-0.204
	(0.34)	(0.11)	(0.90)	(0.43)	(0.38)	(0.01)	(0.36)	(1.31)	(0.88)
$(M3/GDP)^2$	-0.505								
	(1.22)								
Instability of the agricultural value added		-0.072							-0.157
		(1.36)							(1.94)*
Gini land index			-0.004						-0.002
			(1.29)						(0.84)
Government consumption/GDP				-2.602					-0.944
				(2.42)**					(0.98)
Civil liberties index					-0.015				-0.005
					(0.33)				(0.11)
Education (Log)						-0.134			-0.112
						(0.46)			(0.67)
Trade openness							-0.004		-0.006
							(1.67)*		(3.52)***
Road density								0.284	
								(2.70)***	
Constant	-1.487	-0.840	-1.105	-0.849	-1.922	-1.610	-1.458	-1.098	0.218
	(2.52)**	(1.22)	(1.78)*	(1.45)	(2.79)***	(2.52)**	(2.39)**	(1.93)*	(0.48)
Observations	146	144	111	145	138	142	145	64	99
R^2								0.80	
Number of countries	67	66	44	67	67	65	66		42
Hansen Test (prob)	0.98	0.98	0.82	0.91	0.87	0.99	0.84		1.00
AR(2) (prob)	0.92	0.63	0.85	0.48	0.16	0.80	0.87		0.20
Test _b[y]=1 (prob)	0.83	0.46	0.89	0.62	0.50	0.73	0.75	0.37	0.03

Notes: Absolute value of robust *t* statistics in brackets; * significant at 10%; ** significant at 5%; *** significant at 1%. AR(2): Arellano and Bond test of second order autocorrelation; Absolute value of robust *t* statistics in brackets; * significant at 10%; ** significant at 5%; *** significant at 1%. AR(2): Arellano and Bond test of second order autocorrelation; Test _b[y] =1: tests the Ho assumption such that the coefficient of the log of GDP per capita is not different from one. All explanatory variables are assumed to be predetermined except for the Gini land index and the instability of the agricultural value added growth rate which are assumed to be exogenous.

Table 9. Financial Development (M3/GDP), Financial Instability, and the Incidence of Poverty: A Robustness Check

Dependent variable: the percentage of population living under the $1 poverty line	System GMM							OLS	System GMM
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Log of GDP per capita	-0.196	-0.261	-0.164	-0.171	-0.227	-0.155	-0.154	-0.167	-0.185
	(4.58)***	(3.85)***	(2.02)**	(3.70)***	(4.08)***	(2.87)***	(5.08)***	(6.94)***	(2.88)***
M3/GDP	-0.028	-0.302	-0.350	-0.351	-0.326	-0.328	-0.524	-0.351	-0.423
	(0.08)	(2.52)**	(2.10)**	(2.69)***	(2.71)***	(2.68)***	(3.53)***	(5.32)***	(3.36)***
Instability of M3/GDP	2.407	1.896	2.543	1.343	2.123	1.784	1.865	1.452	3.004
	(1.80)*	(2.02)**	(2.01)**	(1.26)	(2.03)**	(1.77)*	(1.71)*	(1.51)	(1.93)*
Inflation	-0.083	-0.035	-0.095	-0.029	-0.075	-0.048	-0.019	-0.052	-0.119
	(0.91)	(0.52)	(1.08)	(0.41)	(0.93)	(0.68)	(0.30)	(0.70)	(1.51)
$(M3/GDP)^2$	-0.258								
	(0.91)								
Instability of the agricultural value added		-0.035							-0.039
		(1.42)							(1.10)
Gini land index			-0.001						0.000
			(0.54)						(0.03)
Government consumption/GDP				0.160					-0.379
				(0.30)					(0.48)
Civil liberties index					0.040				0.025
					(1.21)				(1.40)
Education (Log)						-0.157			-0.236
						(1.26)			(2.86)***
Trade openness							0.003		0.001
							(1.96)*		(0.41)
Road density								-0.045	
								(1.43)	
Constant	1.778	2.380	1.666	1.652	1.967	2.235	1.433	1.669	2.818
	(6.13)***	(4.40)***	(3.43)***	(4.58)***	(5.50)***	(6.08)***	(6.00)***	(8.56)***	(5.72)***
Observations	115	114	86	114	115	114	114	83	85
R^2								0.54	
Number of countries	64	64	44	63	64	64	63		44
Hansen Test (prob)	0.66	0.37	0.65	0.46	0.59	0.84	0.62		0.79
AR(2) (prob)	0.31	0.31	0.32	0.32	0.32	0.34	0.54		0.36

Notes: Absolute value of robust *t* statistics in brackets; * significant at 10%; ** significant at 5%; *** significant at 1%. AR(2): Arellano and Bond test of second order autocorrelation; Absolute value of robust *t* statistics in brackets; * significant at 10%; ** significant at 5%; *** significant at 1%. AR(2): Arellano and Bond test of second order autocorrelation. All explanatory variables are assumed to be predetermined except for the Gini land index and the instability of the agricultural value added growth rate which are assumed to be exogenous.

Table 10. Financial Development (M3/GDP), Financial Instability, and the Poverty Gap: A Robustness Check

Dependent variable: Poverty gap as a percentage of the poverty line	System GMM							OLS	System GMM
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Log of GDP per capita	-0.088	-0.138	-0.099	-0.076	-0.123	-0.063	-0.073	-0.072	-0.082
	(3.52)***	(3.08)***	(1.90)*	(2.83)***	(3.28)***	(2.02)**	(4.28)***	(5.12)***	(2.20)**
M3/GDP	-0.040	-0.134	-0.157	-0.176	-0.151	-0.162	-0.286	-0.158	-0.261
	(0.16)	(1.84)*	(1.65)*	(2.30)**	(2.03)**	(2.46)**	(3.25)***	(3.83)***	(3.01)***
Instability of M3/GDP	1.336	1.223	1.429	0.653	1.358	0.998	1.097	0.811	1.443
	(1.74)*	(2.13)**	(1.95)*	(1.05)	(2.12)**	(1.75)*	(1.69)*	(1.30)	(1.63)*
Inflation	-0.044	-0.025	-0.060	-0.016	-0.051	-0.024	-0.003	-0.024	-0.059
	(0.79)	(0.60)	(1.09)	(0.36)	(1.00)	(0.58)	(0.09)	(0.49)	(1.18)
$(M3/GDP)^2$	-0.104								
	(0.55)								
Instability of the agricultural value added		-0.019							-0.005
		(1.14)							(0.19)
Gini land index			0.000						0.001
			(0.30)						(1.19)
Government consumption/GDP				0.351					-0.003
				(1.16)					(0.01)
Civil liberties index					0.031				0.013
					(1.35)				(1.24)
Education (Log)						-0.091			-0.153
						(1.26)			(3.30)***
Trade openness							0.002		0.001
							(2.47)**		(1.04)
Road density								-0.034	
								(2.45)**	
Constant	0.785	1.215	0.862	0.691	0.983	1.029	0.625	0.710	1.325
	(4.63)***	(3.38)***	(2.76)***	(3.24)***	(4.23)***	(4.80)***	(4.58)***	(6.14)***	(4.11)***
Observations	113	112	85	112	113	112	112	81	84
R^2								0.39	
Number of countries	63	63	44	62	63	63	62		44
Hansen Test (prob)	0.80	0.33	0.51	0.44	0.33	0.76	0.67		0.97
AR(2) (prob)	0.31	0.30	0.32	0.31	0.31	0.33	0.89		0.45

Notes: Absolute value of robust *t* statistics in brackets; * significant at 10%; ** significant at 5%; *** significant at 1%. AR(2): Arellano and Bond test of second order autocorrelation; Absolute value of robust *t* statistics in brackets; * significant at 10%; ** significant at 5%; *** significant at 1%. AR(2): Arellano and Bond test of second order autocorrelation. All explanatory variables are assumed to be predetermined except for the Gini land index and the instability of the agricultural value added growth rate which are assumed to be exogenous.

Annex I. Descriptive Statistics

Variable	Sample of 75 developing countries for which the income of the poorest 20% is available (1966-2000)					Sample of 65 developing countries for which the headcount index is available (1980-2000)				
	Observations	Mean	Standard deviation	Minimum	Maximum	Observations	Mean	Standard deviation	Minimum	Maximum
Mean income of the poorest 20%	187	670	502	42	2882					
GDP per capita (constant 1985 USD at PPP)	187	2461	1871	329	11738					
Headcount index						121	0.258	0.214	0.001	0.823
Poverty gap (as a percent of the poverty line)						119	0.101	0.113	0.000	0.522
GDP per capita (constant 1993 USD at PPP)						120	2881	2043	440	9920
M3/GDP	187	0.365	0.214	0.073	1.419	121	0.355	0.190	0.115	1.294
Instability of M3/GDP	187	0.023	0.018	0.004	0.126	120	0.027	0.027	0.004	0.183
Credit/GDP	166	0.210	0.164	0.012	0.993	116	0.203	0.151	0.014	0.745
Instability of Credit/GDP	153	0.016	0.012	0.004	0.076	113	0.017	0.012	0.000	0.059
Inflation rate	155	0.207	0.258	-0.040	1.727	116	0.398	1.337	0.006	12.642
Instability of the agricultural value added	183	1.249	1.044	0.135	6.110	119	1.280	1.150	0.041	6.823
Instability of growth	187	0.028	0.017	0.005	0.096	120	0.025	0.014	0.003	0.084
Growth	187	4.705	4.752	-12.169	21.152	120	3.922	3.409	-6.516	18.829
Gini index of land distribution	144	66.52	16.59	31.21	93.31	91	66.71	16.98	31.77	93.31
Primary school enrolment rate (Education)	170	0.927	0.231	0.245	1.376	120	0.915	0.251	0.245	1.341
Civil liberties index	162	2.872	1.305	0	6	121	2.864	1.294	0	6
Road density	73	0.240	0.346	0.007	1.581	85	0.269	0.398	0.007	1.660
Trade openness (%)	184	57.67	32.23	8.17	181.82	120	58.22	28.93	9.50	137.91
Number of bank branches per km2	138	9.635	13.383	0.109	71.921	85	7.107	10.007	0.109	47.461
Government consumption/GDP	184	0.130	0.051	0.044	0.318	120	0.131	0.049	0.046	0.295

Annex II. Variables and Sources

Variable	Definition	Source of data
Log of income of the poorest 20%	Log of average incomes in bottom quintile, constant 1985 USD at PPP	Dollar and Kraay (2002)
Log of GDP per capita (1985 PPP)	Log of average per capita income, 1985 USD at PPP	
Headcount index	The percentage of the population living below the $1/day international poverty line	World Bank Global Poverty Index Database http://www.worldbank.org/research/povmonitor
Poverty gap	The average shortfall of the poor with respect to the poverty line, multiplied by the headcount ratio	
Log of GDP per capita (1993 PPP)	Log of GDP per capita based on purchasing power parity (PPP)	International Financial Statistics and World Development Indicators
Growth	Growth of real GDP	
M3/GDP	Liquid liabilities as a percentage of GDP	
Inflation rate	Growth of consumer price index	
Agriculture value added	Agriculture value added as a share of GDP	
GDP per capita growth	Growth of real GDP per capita	
Education	Primary school enrolment rate	
Road density	The ratio of total road network (km) to country's total area (square km)	
Government consumption/GDP	Government expenditures as share of GDP	
Credit/GDP	Private Credit by Deposit Money Banks to GDP	Financial Structure Database 2001 The World Bank
Gini of land distribution	Land distribution inequality (Data are average over 1950 to 1990)	Lundberg and Squire (2003)
Civil liberties index	Civil liberties are measured on a one-to-seven scale, with one representing the highest degree of freedom and seven the lowest. For easing interpretation of this variable, we use in the regressions 7 minus Index of civil liberties	Freedom House Database 1999
Financial openess	Sum of short and long term private debts, publicly or not guaranteed, divided by GDP	Global Development Finance 2002
Political instability	Number of riots, attacks, strikes and coup d'état	CERDI database (2000)
Number of bank branches per km2	Number of bank branches divided by the area of the country	Claessens (2006)
Black market premium	The percentage difference between the black market rate and the official exchange rate	Global Development Network Database (1999)
Trade openness	Sum of real exports and imports as share of GDP	Penn World Table 6.1

Annex III. Correlations: Poverty and Financial Variables

	Average income of the poorest 20%	Poverty incidence	Poverty gap	M3/GDP
M3/GDP	0.37	-0.45	-0.39	..
Private credit/GDP	0.33	-0.38	-0.35	0.78