Finance, Inequality and Poverty:

Cross-Country Evidence

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Abstract: While substantial research finds that financial development boosts overall economic growth, we study whether financial development disproportionately raises the incomes of the poor and alleviates poverty. Using a broad cross-country sample, we distinguish among competing theoretical predictions about the impact of financial development on changes in income distribution and poverty alleviation. We find that financial development reduces income inequality by disproportionately boosting the incomes of the poor. Countries with better-developed financial intermediaries experience faster declines in measures of both poverty and income inequality. These results are robust to controlling for other country characteristics and potential reverse causality.

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I. Introduction

Stunningly high levels of poverty characterize much of the world. In 2001, 2.7 billion people, more than half of the earth's inhabitants, lived on less than $2 a day, and 1.1 billion lived on less than $1 a day.[1] Even these figures mask the extremes plaguing some parts of the world. In South Asia and Sub-Saharan Africa, only one-quarter of the people live on more than $2 per day. Poverty, however, is not stagnant. In Thailand, the percentage of the population living on less than $1 a day in 2000 was one-tenth of the percentage in 1981, while the corresponding poverty rate doubled in Venezuela over the same time period.

Although a large literature finds that financial development produces faster economic growth, it is unclear whether financial development alleviates poverty.[2] If financial development does not intensify income inequality, financial development will help reduce poverty by boosting overall economic growth. If, however, financial development intensifies income inequality, then this income distribution effect could negate – or even reverse – the poverty reducing influence of financial development that operates through overall growth. Thus, financial development may affect poverty through two channels: overall growth and changes in the distribution of income.[3] Nonetheless, researchers have not determined whether financial development benefits the whole population, whether it primarily benefits the rich, or whether financial development disproportionately helps the poor.

[1] These are based on Purchasing Power Parity exchange rates from the World Bank.

[2] While much research indicates that finance causes growth, considerable debate remains. For reviews of this literature, see Levine (1997, 2005). Aghion, Howitt, and Mayer-Foulkes (2005) question whether financial development affects steady-state growth, and instead find that finance influences the rate of convergence.

[3] Changes in poverty can be decomposed into economic growth and changes in income inequality (Bourguignon, 2004). For example, let Y_P equal the per capita income of the lowest quintile, Y equals average income per capita, and L is the Lorenz curve which related the share of income received to the share of the population. Then, $Y_p = Y*L(0.2)/0.2$. Now differentiate with respect to time and compute growth rates, letting g(x) represent the growth rate of variable x. This yields $g(Y_p) = g(Y) + g(L(0.2)$. The growth of per capita income of the poorest quintile equals the growth of average per capita income plus the growth of the Lorenz curve, which captures changes in income distribution.

Theory provides conflicting predictions about the relationship between financial development and changes in poverty and income distribution. Some models imply that financial development enhances growth *and* reduces inequality. Financial market imperfections, such as informational asymmetries, transactions costs, and contract enforcement costs, may be especially binding on poor entrepreneurs who lack collateral, credit histories, and connections. These credit constraints will impede the flow of capital to poor individuals with high-return projects (Galor and Zeira, 1993),[4] thereby reducing the efficiency of capital allocation and intensifying income inequality. From this perspective, financial development reduces poverty by (i) disproportionately relaxing credit constraints on the poor and reducing income inequality and (ii) improving the allocation of capital and accelerating growth.

Other theories, however, question whether financial development reduces poverty. Some research suggests that the poor primarily rely on informal, family connections for capital, so that improvements in the formal financial sector primarily help the rich.[5] Greenwood and Jovanovic (1990) develop a model that predicts a nonlinear relationship between financial development, income inequality, and economic development. At early stages of development, only the rich can afford to access and profit from financial markets so that financial development intensifies income inequality. At higher levels of economic development, financial development helps an increasing proportion of society.[6] Thus, empirical evidence on the impact of finance on the distribution of income and poverty will help distinguish among competing theoretical predictions.

[4] Banerjee and Newman (1993) and Aghion and Bolton (1997) introduce moral-hazard considerations with limited liability as the explicit financial market imperfection and study the impact on income distribution and growth. Benabou (1996), Mookherjee and Ray (2003), and Aghion and Howitt (1998, chapter 1) provide additional theoretical contributions on the linkages between inequality and economic growth.

[5] See discussions surrounding this theme in Haber, et al. (2003) and Bourguignon and Verdier (2000).

[6] Furthermore, some models imply that if financial development reduces income inequality, this could slow aggregate growth and increase poverty. Specifically, if the rich save more than the poor, and financial development reduces income inequality, this could reduce aggregate savings and slow growth with adverse ramifications on poverty (Bourguignon, 2001). Also, as discussed further below, Galor and Moav (2005) develop a model that integrates two

This paper provides the first assessment of the impact of financial development on changes in poverty and income inequality. Thus, our approach complements the large finance and growth literature, which examines the relationship between the level of financial development an average economic growth. Rather than reexamining the finance-growth link, we provide evidence on whether financial development has income distributional effects and whether financial development influences the rate of poverty alleviation.

Methodologically, this paper assesses the relationship between financial development, poverty alleviation, and changes in the distribution of income using broad cross-country comparisons. Since different problems plague income distribution and poverty data, we use both to assess the robustness of the results. First, we examine the impact of financial development on the growth rate of the income of each economy's poorest 20 percent. We assess the effect of finance on income growth of the poor while controlling for average per capita GDP growth. Although income growth of the poor is not a consistent measure of poverty across countries at different levels of economic development, this specification provides information on whether financial development influences the poorest quintile differently from its effect on average growth. By conditioning on average growth, we test whether financial development exerts a disproportionately large impact on the poor. Second, we continue our assessment of the distributional consequences of financial development by examining the growth rate of the Gini coefficient, which measures deviations from perfect income equality. Again, by controlling for average per capita GDP growth, we provide information on how financial development alters the distribution of income beyond its impact on aggregate growth. Third, we directly study poverty alleviation by examining the growth rate of the

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themes in the inequality and growth literature. Under the assumption that savings rates are an increasing function of wealth, inequality positively impacts growth at early stages of economic development when physical capital accumulation is the key source of growth. At later stages of development, credit market imperfections become crucial as human capital accumulation becomes the prime engine of growth. Thus, income equality ameliorates the adverse implications of credit constraints on human capital accumulation with positive ramifications on economic growth.

percentage of the population living under $1 a day (and $2 a day in robustness tests). By controlling for average per capita GDP growth, we test whether financial development exerts a positive, negative, or no influence on poverty beyond the impact of finance on average per capita GDP growth.

We find that financial development alleviates poverty and reduces income inequality. Thus, the data indicate that financial development exerts a disproportionately positive influence on the poor. Since considerable research finds that financial development accelerates aggregate growth, our findings suggest that financial development alleviates poverty both by boosting growth and by reducing income inequality.

More specifically, there are three key findings. First, even when controlling for real per capita GDP growth, financial development boosts the growth rate of the poorest quintile's income. This suggests that financial development reduces income inequality. Second, financial development induces a drop in the Gini coefficient measure of income inequality. Again, the negative relationship between financial development and the growth rate of the Gini coefficient holds when controlling for real per capita GDP growth. This result further emphasizes that financial development reduces income inequality beyond the relationship between finance and aggregate growth. Third, financial development reduces the fraction of the population living on less than $1 a day (or $2 a day). Again, the positive relationship between financial development and poverty alleviation holds even when controlling for average per capita GDP growth. Furthermore, these results hold when using instrumental variables to control for the endogenous determination of financial development and when conditioning on a large number of other country characteristics. In sum, using different datasets, we find that financial development lowers poverty and reduces income inequality by exerting a disproportionately positive impact on the poor.

This paper adds to a large public policy oriented literature on the relationship between inequality and economic growth. While "… the conventional textbook approach is that inequality is good for incentives and therefore good for growth" (Aghion et al, 1999, p. 1615), considerable work actually suggests that income inequality hurts growth.[7] To explain this negative relationship between inequality and growth, many theoretical models assume financial market imperfections impede the efficient allocation of capital (e.g., Aghion and Bolton, 1997; Banerjee and Newman, 1993; Galor and Zeira, 1993). Taking the financial market frictions as given and ignoring incentive effects, these models suggest that public policies that redistribute income from the rich to the poor will alleviate the adverse growth effects of income inequality and therefore boost aggregate growth. Our paper instead highlights an alternative policy approach: Financial sector reforms that reduce market frictions will lower income inequality and boost growth without the potential incentive problems associated with policies that redistribute resources.

Our research also relates to work on how capital market imperfections influence child labor and schooling. Using household data from Peru, Jacoby (1994) finds that lack of access to credit perpetuates poverty because poor households reduce their kids' education. Jacoby and Skoufias (1997) show that households from Indian villages without access to credit markets tend to reduce their children's schooling when they receive transitory shocks more than households with greater access to financial markets. Similarly, Dehejia and Gatti (2003) find that child labor rates are higher in countries with under-developed financial systems, while Beegle, et al. (2003) show that transitory income shocks lead to greater increases in child labor in countries with poorly functioning financial systems. We contribute to this research by examining the aggregate relationship between financial development and both poverty alleviation and income inequality.

[7] See Alesina and Rodrik (1994), Perotti (1993, 1996), Persson and Tabellini (1994), Clarke (1995), and Easterly (2002). Though, also see Banerjee and Duflo (2003), Barro (2000), Forbes (2000), and Lundberg and Squire (2003). For reviews of the literature, see Benabou (1996) and Aghion, Caroli, and Garcia-Penalosa (1999).

Our analyses also contribute to recent examinations of the level of income inequality. Though not the focus of their work, Dollar and Kraay (2002) examine the relationship between finance and income growth of the poorest quintile relative to average per capita GDP growth using dynamic panel procedures with data averaged over five year periods, but they do not study (a) changes in the Gini coefficient or (b) poverty alleviation.[8] Clarke, et al. (2003) also use data averaged over five year periods and panel estimation procedures to study the relationship between financial development and the level of the Gini coefficient, but their research does not examine (a) changes in poverty, (b) income growth of the poor, or (c) changes in income inequality. Besides using a consistent framework to assess the impact of financial development on poverty alleviation, changes in income inequality, and income growth of the poorest quintile, we make methodological contributions. Rather than use data averaged over five year intervals, we examine data averaged over long periods (e.g., 30 years) which has two key advantages. First, the theories we are assessing focus on the long-run relationship between financial development and changes in poverty, so we want to abstract from business cycles and crises that may contaminate higher frequency data. Second, the data are available for only a limited number of countries and years and sometimes with gaps in the time-series. Since small samples can make the dynamic panel estimates unstable and unreliable (Beck and Levine, 2004a), we avoid these biases by examining long-run relationships. Also, rather than examining the level of income inequality (Clarke, et al., 2003), we examine changes in poverty and income inequality. This eliminates biases produced by time-invariant, country-specific measurement error and it connects the analyses to (a) the extensive finance and growth literature and (b) theoretical models, which stress the relationship between financial

[8] Furthermore, to examine financial development, Dollar and Kraay (2002) use the ratio of commercial bank assets to the sum of commercial banks assets plus the assets of the central bank, which has not received much attention as a measure of financial development (Levine, 2005). Using this measure, they do not find a significant effect of financial development on income growth of the poorest quintile.

development and poverty alleviation.

While the results on the impact of finance on poverty alleviation and changes in the distribution of income are robust to different specifications, alternative datasets, and the use of instrumental variables, our analyses face several methodological limitations (Levine and Zervos, 1993). First, we use an aggregate index of financial development that equals credit issued by financial intermediaries to private firms as a share of GDP. This index does not measure the degree to which the population in general or the poor in particular access financial services. Nevertheless, in this initial study, it is crucial to ascertain whether a standard measure of financial development, which past studies find explains economic growth, also helps account for cross-country differences in poverty reduction rates and changes in income inequality. Second, income distribution and poverty are measured with error (Lundberg and Squire, 2003; Dollar and Kraay, 2002). However, unless this measurement error is correlated with financial development in a very particular manner, measurement error will bias the results *against* finding a relationship between financial development and changes in income inequality. Finally, although our results show the importance of financial intermediaries for the poor, they are silent on how to foster poverty-reducing financial development.[9] Future work needs to examine the linkages between particular policies toward the financial sector and poverty alleviation.

The remainder of the paper is organized as follows. Section 2 presents the data and describes the methodology. Section 3 discusses the results and section 4 concludes.

[9] For instance, on bank supervision, see Barth, Caprio, and Levine, 2004, 2005; Demirguc-Kunt, Laeven, and Levine, 2004; and Caprio, Laeven, and Levine 2004).

II. Data, Summary Statistics, and Econometric Methodologies

This section describes the variables, provides summary statistics and correlations, and discusses the econometric methodologies we use to assess the relationship between financial development, poverty alleviation, and changes in income distribution. Table 1 lists the main variables by country.

A. Data: Financial Development

To measure financial development, we would ideally like indicators of the degree to which the financial system ameliorates information and transactions costs and facilitates the mobilization and efficient allocation of capital. Specifically, we would like indicators of how well each financial system researches firms and identifies profitable projects, exerts corporate control, facilitates risk management, mobilizes savings, and eases transactions. Unfortunately, no such measures are available across countries. Consequently, we rely on a commonly used measure of financial development that existing work shows is robustly related to economic growth.

Private Credit equals the value of credit by financial intermediaries to the private sector divided by GDP. This measure excludes credits issued by the central bank and development banks. Furthermore, it excludes credit to the public sector, credit to state-owned enterprises, and cross claims of one group of intermediaries on another. Thus, Private Credit captures the amount of credit channeled from savers, through financial intermediaries, to private firms. Private Credit is a comparatively comprehensive measure of credit issuing intermediaries since it also includes the credits of financial intermediaries that are not considered deposit money banks. After controlling for endogeneity, Levine, Loayza and Beck (2000) and Beck, Levine, and Loayza (2000) show a robust positive relationship between Private Credit and the growth rate of GDP per capita. Data on Private

Credit are from the updated version of the Financial Structure Database (Beck, Demirguc-Kunt and Levine, 2001). There is a wide variation in Private Credit, ranging from less than 5% in Ghana, Sierra Leone, and Uganda to more than 120% in Hong Kong, Japan, and the Netherlands using data over the period 1980 to 2000. As we describe below, we sometimes use data averaged over the period 1960-1999, and sometimes we use data over the period 1980-2000 depending on the other variables and specification.

B. Data: Changes in Income Distribution and Poverty Alleviation

To assess the impact of financial development on the poor, we examine (i) the growth of the income of the poorest quintile in each economy, (ii) the growth of the Gini coefficient, and (iii) the growth of the percentage of the population living on less than $1 (and $2) dollars per day. The remainder of this subsection defines these dependent variables in more depth.

Income Growth of the Poor equals the annual growth rate of the average per capita income of the lowest income quintile, computed over the period 1960-1999 (Dollar and Kraay, 2002). More specifically, we calculate the annual growth rate of the per capita income of the lowest income quintile by taking the difference between the log of the average income per capita of those in the lowest income quintile for the last observation and the log of the average income per capita of those in the lowest income quintile for the first observation, and dividing this log difference by the number of years between the two observations. Income of the poorest quintile is computed in constant 1985 US dollars using PPP exchange rates.

We use Income Growth of the Poor to assess how financial development influences the poorest segment of each economy. Income Growth of the Poor is not a direct measure of income distribution, nor is it a consistent measure of poverty across countries. The poorest quintile in a rich

country could be quite affluent compared to the median person in a poor country. Nevertheless, since we also control for the growth rate of overall GDP per capita, examining Income Growth of the Poor allows us to assess whether financial development exerts a disproportionately large impact on the poorest quintile. Some countries enjoyed rates of Income Growth of the Poor above five percent per annum (Finland, Hong Kong, Japan, Korea, Norway, and Singapore). Others actually suffered rates of Income Growth of the Poor of less than negative two percent per year (Panama, Sierra Leone, and Zambia).

Growth of Gini equals the annual growth rate of each country's Gini coefficient, computed over the period 1960-1999. More specifically, the Gini coefficient is derived from the Lorenz curve, which plots the cumulative percentage of the population on the horizontal axis and the cumulative percentage of income on the vertical axis for each country. A 45-degree diagonal line on this graph depicts a situation where there is perfectly even income distribution, such that, for example, 20 percent of the population receives 20 percent of the income, and 50 percent of the population receives 50 percent of the income. To measure income inequality, the Gini coefficient equals the ratio of the area between the Lorenz curve and the 45-degree line divided by the area below the 45-degree line. Since the Lorenz curve equals the 45-degree line when there is perfect income equality, the Gini coefficient equals zero when perfect equality holds. The Gini coefficient ranges between zero – perfect equality -and one, where larger values imply greater income inequality.[10] We use the first and last observation of the Gini Coefficient from the Dollar and Kraay (2002) database and calculate the annual growth rate by dividing the log difference of the last and the first observations by the number of years between the two observations.

For both Income Growth of the Poor and Growth of Gini, we require a minimum of 20 years

[10] We confirm the conclusions using the standard deviation of the income shares, which is highly correlated with the Gini coefficient.

difference between the first and last observation when computing growth rates. On average, there are 30 years between the first and last observation when computing growth rates, with a maximum of 40 years.[11] This produces identical coverage for the two data series (Income Growth of the Poor and Growth of Gini) and yields a sample of 52 developing and developed countries. Critically, we match other data – e.g. Private Credit and GDP per capita growth and Private Credit – with the sample period covered by Growth of Gini (and Income Growth of the Poor) in regressions where Growth of Gini (or Income Growth of the Poor) is the dependent variable.

It is worthwhile comparing information on Income Growth of the Poor and Growth of Gini. From Table 1, note that in Egypt, Finland, France, and Norway, the Gini coefficient shrank at a rate of more than one percent per annum, while the Dominican Republic, Ecuador, and the United States saw the Gini coefficient grow at almost one percent per annum. Also, observe that Egypt, Finland, France, Japan, and Singapore, and Norway Hong Kong enjoyed rapid rates of Income Growth of the Poor. As stressed by Besley and Burgess (2003), countries may experience very rapid Income Growth of the Poor because of rapid declines in Gini coefficients (Egypt, Finland, France, and Norway) and countries may enjoy rapid Income Growth of the Poor because the economy is enjoying rapid overall growth (Japan, Singapore, and Hong Kong).

Growth of Headcount equals the growth rate in the percentage of the population living below $1 dollar per day (or $2 dollars per day). These data are based on household surveys (Chen and Ravallion, 2001). We use data for 58 developing countries. Using Purchasing Power Parity exchange rates, these definitions of poverty are converted into local currency and we determine the fraction of the population living below each line. Then, we compute the annual log growth rate using the last and first available observations on the fraction of the population living below the $1

[11] We could not compute regression-based growth rates because many countries do not have data for every year and therefore lack sufficient observations.

and $2 per day poverty lines respectively, divided by the number of years between the first and last observation.[12] In the tables, we present the results using the $1 per day definition of poverty, but confirm all of the results using the poverty line cut-off of $2 per day.[13]

There are greater data limitations regarding the Growth of Headcount than for Income Growth of the Poor and Growth of Gini. Data on Headcount are only available for the 1980s and 1990s, and frequently only for the 1990s. Thus, we do not use a 20-year minimum and simply calculate the annualized growth rates of Headcount for the longest available time span.[14] Using shorter time frames could magnify the influence of any outlier observations and make the results more sensitive to business cycle fluctuations or crises. Therefore, we assess the robustness of our results by (i) limiting the sample to countries for which the growth rate in Headcount is calculated over at least five years and (ii) eliminating outliers.

Table 1 indicates that there is wide variation across countries in poverty alleviation rates over the last two decades. The share of population living on less than a dollar per day increased at an annual rate of 39% in Poland between 1992 and 1998. Headcount decreased by an annual rate of 21% in Jamaica between 1988 and 2000.

C. Descriptive Statistics and Correlations

Panel A of Table 2 presents descriptive statistics and Panels B and C present correlations for the 1960-99 and 1980-2000 samples, respectively. Consistent with earlier work, financial development is positively and significantly correlated with GDP per capita growth. Private Credit is

[12] These data are available at http://research.worldbank.org/PovcalNet/jsp/index.jsp.
[13] As a robustness check, we also computed the Poverty Gap, which is a weighted measure of (i) the fraction of the population living on less than one dollar per day and (ii) how far below one dollar per day incomes lie. Thus, Poverty Gap measures both the breadth and depth of poverty. Nonetheless, growth of the Poverty Gap and Growth of Headcount are extremely highly correlated (0.93) and we confirm our findings using the Poverty Gap measure.
[14] Unlike in the income distribution regressions, we include poverty data of transition economies outside the Former Soviet Union after 1990. We do not include the countries of the Former Soviet Union due to data quality and availability.

also positively and significantly correlated with the Income Growth of the Poor, but is not significantly correlated with Growth of Gini. The Table confirms the Dollar and Kraay (2002) result that the Income Growth of the Poor is closely correlated (0.81) with overall GDP per capita growth. Also, there is a significant, negative correlation (-0.49) between the Income Growth of the Poor and Growth of Gini, which can be partly explained by the very high correlation between the income share of the poorest income quintile and the Gini coefficient. There is not a significant correlation between GDP per capita growth and Growth of Headcount. However, Private Credit is significantly and negatively correlated with Growth of Headcount, indicating that countries with more developed financial systems experienced a faster reduction in the number of people living in poverty.[15]

D. Econometric Methodologies: Basic Regression Specifications

This subsection sketches the basic regression specifications used to examine the relationship between financial development and poverty alleviation and income inequality. Here, we simply describe ordinary least squares equations (OLS). The next subsection discusses how we deal with potential simultaneity bias. We use cross-country regressions, calculating growth rates of income, inequality and poverty over the longest available time period and averaging financial intermediary development and other explanatory variables over the corresponding time period.

D.1. Income Growth of the Poor

To evaluate the impact of financial development on income growth of the poorest income quintile, we use data averaged over the period 1960-99 and the following regression specification.

[15] Honohan (2004) documents a negative correlation between financial development and the percentage of people living on less than $1 per day, but he does not (a) examine changes in poverty, income distribution, or income of the poor and (b) his analyses do not control for potential simultaneity bias.

$$(y_{i,p,t} - y_{i,p,t-n})/n = \alpha y_{i,p,t-n} + \beta FD_i + \gamma X_i + \varepsilon_i, \qquad (1)$$

In this regression, $y_{i,p,t}$ is the logarithm of average per capita income of the poorest income quintile in country *i* in year *t*, $y_{i,t}$ is the logarithm of average overall GDP per capita, FD_i is our Private Credit measure of financial development in country i, and X_i is a set of conditioning information for country i.[16] We control for the logarithm of the average years of school attainment in 1960 as an indicator of the initial human capital stock in the economy (**Schooling 1960**), the growth rate of the GDP deflator over the period 1960-99 to control for the macroeconomic environment (**Inflation**) and the sum of exports and imports as share of GDP to capture the degree of international openness (**Trade Openness**). Furthermore, since other national traits associated with the level of economic development maybe associated with both changes in the distribution of income and financial development, we also assess the robustness of the results to controlling for the level of GDP per capita. As noted, the period of aggregation, n, is at least 20 years.

The coefficient β in regression equation (1) captures the relationship between financial development and the growth rate of the average income of the poorest 20 percent of society. This regression set-up does not allow us to assess how much of the effect of Private Credit is due to its positive effect on overall GDP per capita growth and how much is due to distributional effects that influence the poorest income quintile relative to other income groups.

To focus on the possible distributional effects of financial development, we control for real GDP per capita growth in the regression. Specifically, we modify equation (1) by including average growth as a regressor.

$$(y_{i,p,t} - y_{i,p,t-n})/n = \alpha(y_{i,t} - y_{i,t-n})/n + \beta FD_i + \gamma X_i + \lambda y_{i,p,t-n} + \varepsilon_i, \qquad (2)$$

[16] In line with the finance and growth literature (Levine, 2005), we include Private Credit in logs to control for non-linearities in the relationship.

The coefficient α indicates the relationship between the growth rate of average per capita income of the poor and overall per capita GDP growth. If the average income of the poorest quintile grows faster than average per capita GDP growth, α will be greater than one. If the income of the poorest quintile grows more slowly than average, α will be less than one.

The coefficient β indicates whether there is any differential effect of financial development on income growth of the poorest quintile beyond any impact on overall GDP per capita growth. Thus, if financial development only boosts the income growth of the poor by increasing overall economic growth, then β will equal zero. If financial development exerts a particularly positive impact on the rich, then β will be negative. And, if financial development exerts a disproportionately positive impact on the poorest quintile, then β will enter positively.

D.2. Growth of Gini

To further assess the distributional effects of financial development, we examine Growth of Gini:

$$(G_{i,t} - G_{i,t-n})/n = \alpha(y_{i,t} - y_{i,t-n})/n + \beta FD_i + \gamma X_i + \lambda G_{i,t-n} + \varepsilon_i, \qquad (3)$$

where $G_{i,t}$ is the log of the Gini coefficient in country i in period t. As before, the time period *n* is at least 20 years. As in regression (2), we include the GDP per capita growth rate to (a) separate the distributional effect of Private Credit from the aggregate growth effect and (b) control for any effect that GDP per capita growth has on income distribution. If financial development does not affect the distribution of income, then β will equal zero. If financial development reduces income inequality, then β will be negative. And, if financial development exacerbates income inequality, then β will enter positively.

D.3. Growth of Headcount

We also explore the impact of financial development on direct measures of poverty

alleviation. To do this, we regress Growth of Headcount on financial development, while controlling for the overall growth rate of GDP per capita, and each country's initial poverty level.

$$(P_{i,t} - P_{i,t-n}) / n = \alpha (y_{i,t} - y_{i,t-n}) / n + \beta FD_i + \gamma X_i + \lambda P_{i,t-n} + \varepsilon_i \quad (4)$$

In this equation, $P_{i,t}$ is the log of Headcount in country i in year t.

Again, by controlling for GDP per capita growth, we identify the relationship between financial development and poverty alleviation conditional on aggregate economic growth. Thus, this equation also captures the distributional effect of Private Credit on poverty alleviation because we control for the effect of financial development on poverty that runs through overall economic growth. Since the sample periods vary significantly across countries, we match the sample period for GDP per capita growth with the period used to compute Growth of Headcount. We take the average of Private Credit over the period 1980 to 2000 to abstract from business cycle or crisis frequencies.[17]

E. Econometric Methodologies: Instrumental Variables

To control for potential reverse causation and simultaneity bias, we use instrumental variable (IV) regressions. The relationship between financial intermediary development and changes in income distribution and poverty might be driven by reverse causation. For example, reductions in poverty may stimulate demand for financial services. As another example, reductions in income inequality might lead to political pressures to create more efficient financial systems that fund projects based on market criteria, not political connections.

To select instrumental variables for financial development, we focus on exogenous national characteristics that theory and past empirical work suggest influence financial development. We

[17] For the transition economies, we include Private Credit averaged over the period 1991 to 2000.

follow the finance and growth literature and use the legal origin of countries and the absolute value of the latitude of the capital city, normalized between zero and one, as instrumental variables. In particular, an extensive literature holds that British common law countries do a comparatively better job than French civil, German civil, Scandinavian civil, or Socialist law countries at protecting private property rights, fostering private contracting, and hence promoting financial development (See La Porta et al, 1997, 1998; and the review by Beck and Levine, 2004b). Furthermore, an extensive literature holds that natural resource endowments, which are imperfectly proxied by latitude, help explain the development of national institutions (Acemoglu, Johnson, and Robinson, 2001; Engerman and Sokoloff, 1997; and Easterly and Levine, 2003). Previous research demonstrates that both legal origin and latitude explain cross-country differences in financial development (Beck, Demirguc-Kunt and Levine, 2003). We also tried alternative instrument sets, including the religious composition of countries and ethnic fractionalization based on research by Stulz and Williamson (2003) and Easterly and Levine (1997) respectively, and obtained very similar results.

To test the appropriateness of the instruments, we use the Hansen test of the overidentifying restrictions, which assesses whether the instrumental variables are associated with the dependent variable beyond their ability to explain cross-country variation in Private Credit. Under the joint null hypothesis that the excluded instruments (i.e., the instruments not included in the second stage regression) are valid instruments, i.e., uncorrelated with the error term, and that the excluded instruments are correctly excluded from the estimated equation, the Hansen test is distributed χ^2 in the number of overidentifying restrictions. Failure to reject the null hypothesis implies a failure to reject the validity of the instrumental variables. In the tables, we provide the p-values of this test of the overidentifying restrictions and refer to it as “OIR Test”. Furthermore, appropriate instruments

must explain cross-country variation in financial development. In all the regressions reported below, we find the instrumental variables explain cross-country variation in financial development.

III. Empirical Results

A. Changes in Income Distribution

A.1. Income Growth of the Poor

The Table 3 results indicate that (i) financial development increases the growth rate of the incomes of the poorest quintile and (ii) financial development exerts a disproportionately large positive impact on the poor since finance is positively related to growth even when controlling for the growth rate of average per capita GDP. These results are robust to controlling for various country characteristics and to using instrumental variables to mitigate simultaneity bias.

Consider first regression 1, where we conduct a preliminary analysis of the direct relationship between financial development and the growth rate of the incomes of the poor *without* controlling for average growth. This regression is very similar to standard cross-country growth regressions except that here the dependent variable is the per capita growth rate of the income of the poorest quintile. As in standard growth regressions, we condition on the logarithm of the initial level of income, which in this specification is the level of income of the poorest quintile in 1960 (Initial Income of the Poor). The regression indicates that the average income of the poorest quintile grows faster in countries with better-developed financial intermediaries. The log of initial average income of the poorest quintile enters significantly and negatively, suggesting conditional convergence of the poorest income quintile, i.e., the incomes of the poor grow faster in countries where the poor start out poorer. Since we are focusing on the income distributional consequences of financial development and its impact on poverty, we now turn to specifications where we control

for average GDP per capita growth. Nonetheless, we note that (a) the regression 1 results are robust to controlling for Schooling in 1960, Inflation, and Trade Openness and (b) the results hold when using instrument variables to extract the exogenous component of financial development.

Next, by controlling for average GDP per capita growth, we examine whether financial development benefits the poorest income quintile relatively more than the overall population. Regression 2 separates the growth and distributional effects by regressing the growth rate of the average income of the poorest quintile on the overall GDP per capita growth rate, log of initial income of the poor and Private Credit. The coefficient on Private Credit thus captures the effect of financial development on the poorest income quintile beyond its overall growth effect.

There are two key results in regression 2: Financial development is particularly beneficial to the poor and the average income of the poor rises approximately one-for-one with overall economic growth. First, the positive and significant coefficient on Private Credit indicates that financial development disproportionately boosts the growth rate of the incomes of the poor. That is, financial development is positively associated with income growth of the poor beyond finance's effect on overall growth. GDP per capita growth enters positively and significantly in regression 2. Second, consistent with Dollar and Kraay (2002), we cannot reject at the 10% level that the coefficient on GDP per capita growth equals one, so that the average income of the poor increases proportionally with overall GDP per capita growth.

The regressions in columns 3 – 6 confirm that these OLS results are robust to controlling for the level of economic development (GDP per capita), Trade Openness, Inflation, and Schooling. The level of financial development remains positively and significantly associated with Income Growth of the Poor. The control variables do not enter significantly. This does not suggest that Trade Openness, Schooling, and Inflation are unimportant for growth. Rather, this result suggests

that Trade Openness, Schooling, and Inflation do not have income distribution effects when controlling for the level of financial development.

Figure 1 (i) displays the positive relationship between Private Credit and Income Growth of the Poor while controlling for GDP per capita growth and (ii) illustrates the potential importance of controlling for outliers. In particular, Figure 1 presents a partial scatter plot of Income Growth of the Poor against Private Credit and includes the estimated regression line. Using regression 2 of Table, which regresses Income Growth of the Poor against GDP per capita growth, Initial income of the poor, and Private Credit, this figure represents the two-dimensional representation of the regression plane in Income Growth of the Poor – Private Credit space. To obtain this figure, we regress Income Growth of the Poor on GDP per capita growth and Initial Income of the Poor, collect the residuals, and call them e(Income Growth of the Poor | X). Next, we regress Private Credit against GDP per capita growth and Initial Income of the Poor, collect the residuals, and call them e(Private Credit | X). Figure 1 plots e (Income Growth of the Poor | X) against e (Private Credit | X). Figure 1 suggests that outliers may exert an excessively large influence on the relationship between financial development and income growth of the poor. To assess the impact of outliers, therefore, we used the recommendations of Besley, Kuh, and Welsch (1980) for assessing the influence of individual observations. We (i) compute the change in the coefficient on Private Credit when the ith observation is omitted from the regression, (ii) scale the change by the estimated standard error of the coefficient, (iii) take the absolute value, and (iv) call the result $\Delta\beta_i$. Then, we use the Belsley, Kuh, and Welsch recommendation of a critical value of two, and identify those observations where abs ($\Delta\beta_i$) > 2/sqrt (n), where abs(x) yields the absolute value of x, sqrt(x) yields the square root of x, and n represents the number of observations in the regression. When we do this and omit outlier countries (those countries where abs ($\Delta\beta_i$)>2/sqrt (n)), we obtain the same

results.[18] Indeed, omitting these "outliers" increases the t-statistics on Private Credit's estimated coefficient to above six without changing the coefficient estimate appreciably.

When using instrumental variables to control for the potential endogenous determination of financial development, we continue to find that financial development exerts a disproportionately positive impact on the growth rate of incomes of the poor. Regression 7 uses instrumental variables for financial development. Private Credit enters positively and significantly in all of the regressions, suggesting that financial development boosts the incomes of the poor above and beyond its affect on average growth. In terms of assessing the validity of the instruments, the first-stage R-square is about 0.72 and we do not reject the test of the overidentifying restrictions.

In robustness tests, we examined whether the relationship between financial development and income growth of the poor depends on the level of economic development or the level of educational attainment based on insights by Greenwood and Jovanovic (1990) and Galor and Moav (2005). We included (i) the interaction term of financial development and the level of economic development and (ii) the interaction term of financial development and educational attainment. These interaction terms do not enter significantly. Thus, we found no evidence that the relationship between financial development and income growth of the poor varies with the level of GDP per capita or the level of educational attainment.

The distributional effect of Private Credit is not only statistically significant but also economically relevant. First, note that the coefficient on Private Credit in regression 1, which does not control for GDP per capita growth, is 0.031, while the coefficient on Private Credit in the same specification that controls for GDP per capita growth is 0.016 (regression 2). These coefficients suggest that about half of the overall effect of Private Credit on the income growth of the poorest

[18] The influential observations that are omitted are Sierra Leone, Panama, Sri Lanka, and Turkey. Figure 1 indicates that Sierra Leone is a particularly large outlier. The results hold even when we only exclude Sierra Leone.

quintile does not occur through the impact of financial development on average growth. Next, consider the case of Brazil. The instrumental variable results in Table 3 regression 7 indicate that average income of the poor in Brazil would have grown at more than 4% instead of 0% annually over the period 1960-99 if Brazil (Private Credit = 28%) had the same level of financial intermediary development as Korea (74%).[19] This suggests an economically large impact of financial development on income growth of the poor given that Brazil's GDP per capita grew at 2% over the same period.

A.2. Growth of Gini

In Table 4, we use the growth rate of the Gini coefficient measures of income distribution to assess the distributional consequences of financial development. The dependent variable is the annual growth rate in the Gini coefficient over the period 1960 - 99. Since the Gini coefficient is a direct measure of income distribution, we do not use the standard growth equation framework (as in regression 1 of Table 3). Rather, we focus on the income distribution consequences of financial and use specifications that include GDP per capita growth, the initial level of the Gini coefficient in 1960 (Initial Gini), and also control for different country traits. [20] Regressions 1 – 5 present OLS results using alternative control variables. Regression 6 presents two stage least squares results.

The results indicate that financial development reduces income inequality. Private Credit enters negatively and significantly in all of the specifications. When controlling for Initial Gini, GDP per capita growth, Schooling 1960, the macroeconomic and international environments (Inflation and Trade Openness), and when using, or not using, instrumental variables to extract the

[19] To get this, recall that the regressors are in logs and note that the ln(0.740) - ln(0.276) = 0.99. Multiplying this with the coefficient in column 7 (0.043) suggests that income growth of the poorest quintile would have been more than 4% faster. Note this is only an illustrative example. Such conceptual experiments do not explain how to improve financial development and the changes discussed above are not marginal.

[20] We also tested for non-linearities by including the squared term of Private Credit, but it never entered significantly.

exogenous component of Private Credit, there is a negative relationship between financial development and Growth of Gini. In the IV regressions, the OIR is not rejected and the instrumental variables (legal origins and latitude) jointly explain financial development in all the regressions. In terms of the other variables, Initial Gini enters negatively, suggesting that countries with initially highly unequal income profiles (high Initial Gini) tend to see faster reductions in income inequality holding other things constant. Also, the IV regression suggests that GDP per capita growth is associated with increases in income inequality when conditioning on financial development. This may create concerns that financial development intensifies income inequality by boosting growth, while exerting a negative direct effect on income inequality. On net, however, financial development reduces income inequality. We continue to find a negative and significant coefficient on Private Credit when we omit GDP per capita growth from the regression or when we omit Initial Gini. Thus, the negative impact of financial development on income inequality does not depend on conditioning on either GDP per capita growth or Initial Gini.

Figure 2 provides the partial scatter plot of the Growth of Gini against Private Credit and again suggests that possible role of outliers. We use the same methodology to construct Figure 2 as we used to construct Figure 1. While there is clearly substantial variability, the figure illustrates a strong negative relationship between financial development and the growth rate of income inequality. Furthermore, we use the same methodology to remove observations that may exert an exceptionally large impact on the slope of the regression line. Thus, following, Besley, Kuh, and Welsch (1980) we omit those countries where abs ($\Delta\beta_i$)>2/sqrt (n)).[21]

Omitting "outliers" actually strengthens the relationship between financial development and the growth rate of the Gini coefficient. Both the absolute value of the estimated coefficient Private

[21] The influential observations that are omitted are Sierra Leone, Panama, Sri Lanka, the United States, and Finland.

Credit and its t-statistic increase. Thus, outliers do not seem to drive the negative association between finance and changes in income inequality.

In sum, the results in Tables 3 and 4 indicate that financial intermediary development exerts a disproportionately positive impact on the poor and reduces income inequality. Private Credit raises the incomes of the lowest income quintile beyond the overall income growth rate of incomes in the economy. Moreover, Private Credit reduces income inequality, as measured by the Gini coefficient, when controlling for the initial level of income inequality in the economy and average growth. Both results hold when using two-stage least squares to control for simultaneity bias.

B. Poverty Alleviation

Next, we examine the relationship between financial development and measures of poverty alleviation. This has the advantage of directly assessing the focus of our investigation: poverty alleviation. The disadvantage is that the data cover far fewer years. For the Income Growth of the Poor and Growth of Gini analyses, we examined growth rates computed over an average of 30 years, with a minimum of 20 and a maximum of 40 years. Thus, we were testing the impact of finance on long-run growth rates of incomes of the poor and Gini coefficients. Now, we directly examine poverty alleviation, but the growth rates are sometimes computed for less than five years and frequently for less than 10 years. This reduces confidence that these poverty alleviation results capture the relationship between financial development and reductions in poverty over long periods.

To address concerns about limited time-series data on poverty, we do three things. First, we control for GDP per capita growth. Besides isolating the relationship between financial development and poverty alleviation beyond the relationship between finance and aggregate growth, including GDP per capita growth controls for higher frequency economic fluctuations and

therefore provides some comfort that we assessing the long-run relationship between financial development and poverty alleviation. Second, we confirm the Table 5 results when limiting the sample to only those countries where we have a minimum of five years of data. Finally, we control for the logarithm of the initial value of Headcount to identify the long-run relationship between financial development and poverty alleviation and not convergence effects. Furthermore, we control for the level of economic development, trade openness, inflation, population growth, and demographic profile of each country so that we capture the relationship between finance and changes in poverty, not a spurious correlation involving a country specific trait.

The Table 5 regression results suggest that financial development reduces poverty. Private Credit enters negatively and significantly in all of the OLS regressions (regressions 1 - 7). The results hold when controlling for GDP per capita, Trade openness, Schooling, and Inflation. Furthermore, in the poverty regressions, we also control for (1) the ratio of the population below the age of 15 and above the age of 65 to the population between the ages of 15 and 65 (Age dependency ratio) and (2) the average annual growth rate of the total population (Population growth) since these demographic traits may influence changes in poverty. As shown in regressions 6 and 7, including these country characteristics does not alter the results on financial development. Private Credit also enters negatively and significantly in the instrumental variables regression (regression 8). In the IV regression, the specification tests suggest that the instruments are valid. The test of overidentifying restrictions is not rejected and the instruments jointly explain cross-country variation in Private Credit.

Figure 3 is a partial scatter plot of the Growth of Headcount against Private Credit, which both illustrates the strong negative relationship between financial development and changes in poverty and suggests the potential influence of outliers. We use the same methodology to construct

Figure 3 that we describe above in relation to Figures 1 and 2. Figure 3 clearly illustrates that greater financial development is associated with poverty alleviation.

Next, we use the Besley, Kuh, and Welsch (1980) methodology for identifying and removing observations that exert an exceptionally large impact on the slope of the regression line. As described in detail above, we omit those countries where abs ($\Delta\beta_i$)>2/sqrt (n)).[22] Omitting these "outliers" does not change the estimated coefficient on Private Credit or its t-statistic. Thus, outliers are not producing the negative association between finance and changes in poverty.

The effect of Private Credit on poverty alleviation is not only statistically but also economically significant. Compare Chile (Private Credit = 54%) with Peru (Private Credit = 13%). In Chile, the percentage of the population living on less than $1 a day (Headcount) decreased at an annual growth rate of 14% between 1987 and 2000. In Peru, the Headcount increased at an annual growth rate of 19% over the period 1985 to 2000. The OLS results in column 1 indicate that if Peru had had Chile's level of financial intermediary development, Headcount would have increased only at an annual rate of 5% per year, which would have resulted in a share of the population living on less than one dollar of about 2% in 2000 rather than the actual value of 15%.[23] Thus, the economic impact of financial development on the poverty is quite large. The IV results provide an even stronger assessment of the economic impact of well-developed financial intermediaries.

While we have stressed the robustness of the results to various permutations throughout the presentation, we emphasize one sensitivity test in closing. Selecting a poverty line is inherently arbitrary. Thus, we re-did the analyses of poverty alleviation using the $2 a day poverty line. We

[22] The influential observations that are omitted are Uganda, Ghana, Laos, and Poland.

[23] To get this, recall that the regressors are in logs and note that the ln(0.54) - ln(0.13) = 1.42. Multiplying this with the coefficient in column 1 (-0.1), yields 0.14. Thus, instead of growing at a rate of 0.19, Peru's Headcount would have grown at an annual rate of 0.05. Starting from an initial value of Headcount of 1.1 percent and accumulating over 15 years, yields the result in the text.

confirm the Table 5 results: Financial development reduces the fraction of the population living below $2 a day.

IV. Conclusions

An extensive literature shows that financial development is positively associated with the growth rate of per capita GDP. This does not necessarily mean, however, that financial development reduces poverty. If financial development increases average growth only by increasing the incomes of the rich and hence by increasing income inequality, then financial development will not lower poverty rates.

Given the extremely high rates of poverty around the world, this paper focuses on whether financial development reduces poverty. Because of measurement problems, we assess the impact of financial development on poverty alleviation in two ways. First, we assess the relationship between financial development and changes in the distribution of income. Here, we use data on 52 developing and developed economies with data averaged over the period 1960 to 1999. Second, we assess the direct relationship between financial development and poverty alleviation. Here, we use data on 58 developing countries with data over the period 1980 to 2000.

This paper finds that greater financial development induces (i) incomes of the poor to grow faster than average GDP per capita, (ii) income inequality to fall more rapidly, and (iii) poverty rates to decrease at a faster rate. All of these results hold when controlling for the average rate of economic growth, which suggests that financial development alleviates poverty beyond its affect on aggregate growth. Furthermore, these results hold when using instrumental variables to control for endogeneity bias. Thus, we find that financial development reduces poverty by increasing average growth and reducing income inequality. Future research needs to identify which policies induce

poverty-alleviating improvements in the financial system.

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Table 1: Financial Development and Growth of Inequality and Social Indicators

GDP per capita is in constant 1995 US$ and averaged over the period 1960-1999. Private Credit equals claims of financial institutions on the private sector as a share of GDP averaged over the period 1960-1999. Income Growth of the Poor equals the annual growth rate of income per capita of the poorest quintile over the period 1960-1999. Growth of Gini is the annual growth rate of the Gini coefficient over the period 1960-1999. Growth of Headcount is the annual growth rate of the percentage of the population living on $1 a day or less, over the period 1980-2000. Detailed variable definitions and sources are in the appendix.

	GDP per capita	Private Credit	Income Growth of the Poor	Growth of Gini	Growth of Headcount
Australia	19,045	0.535	0.020	0.004	
Burundi	181	0.095			0.031
Burkina Faso	241	0.134			-0.084
Bangladesh	291	0.202	0.015	0.002	0.019
Bulgaria	1,536	0.089			0.296
Bahamas, The	13,057	0.473	0.018	-0.008	
Bolivia	887	0.288	0.010	-0.005	0.109
Brazil	4,217	0.273	0.003	0.007	-0.018
Botswana	2,751	0.116			-0.010
Canada	18,947	0.744	0.020	0.004	
Chile	3,621	0.538	0.011	0.005	-0.143
Cote d'Ivoire	916	0.310			0.092
Cameroon	761	0.190			-0.128
Colombia	2,122	0.284	0.021	0.000	0.002
Costa Rica	3,126	0.160	-0.001	0.001	-0.105
Germany	27,272	0.966	0.018	0.000	
Denmark	32,113	0.413	0.027	0.002	
Dominican Republic	1,590	0.258	-0.002	0.009	
Algeria	1,636	0.311			-0.059
Ecuador	1,746	0.233	0.003	0.011	0.209
Egypt, Arab Rep.	958	0.325	0.042	-0.010	-0.028
Spain	13,514	0.783	0.032	-0.004	
Ethiopia	107	0.162			-0.019
Finland	25,114	0.628	0.057	-0.018	
France	25,210	0.891	0.044	-0.010	
United Kingdom	17,732	0.856	0.014	0.008	
Ghana	352	0.034			-0.003
Gambia	366	0.159			-0.118
Greece	11,057	0.398	0.022	0.003	
Guatemala	1,434	0.160			-0.083
Guyana	757	0.336	-0.001	-0.006	-0.183
Hong Kong, China	18,691	1.483	0.052	0.005	
Honduras	699	0.297	0.013	-0.003	-0.037
Croatia	4,430	0.323			0.045
Hungary	4,622	0.286			0.139
Indonesia	794	0.300	0.044	-0.002	-0.088
India	327	0.251	0.022	-0.004	
Jamaica	1,970	0.266	0.015	-0.007	-0.209
Japan	37,559	1.475	0.055	-0.007	
Kenya	338	0.306			-0.084
Korea, Rep.	8,093	0.861	0.066	0.001	
Lao PDR	345	0.060			0.235
Sri Lanka	646	0.190	0.034	-0.005	-0.033
Lesotho	490	0.151			0.022
Morocco	1,258	0.307			-0.092
Madagascar	265	0.147	-0.017	-0.002	0.010

	GDP per capita	Private Credit	Income Growth of the Poor	Growth of Gini	Growth of Headcount
Mexico	3,298	0.172	0.012	0.002	-0.022
Mali	264	0.131			0.296
Mongolia	430	0.089			0.221
Mauritania	446	0.315			-0.045
Malaysia	3,386	0.894	0.041	0.002	-0.188
Niger	242	0.120	-0.013	0.007	0.124
Nigeria	251	0.139	-0.005	0.003	0.006
Nicaragua	512	0.276			0.006
Netherlands	24,810	1.215	0.035	-0.009	
Norway	30,246	0.814	0.052	-0.012	
Pakistan	436	0.237	0.028	0.000	-0.114
Panama	2,910	0.559	-0.023	0.010	
Peru	2,278	0.135	0.001	-0.006	0.191
Philippines	1,095	0.333	0.016	0.004	-0.026
Poland	2,953	0.155			0.389
Portugal	9,582	0.721	0.039	-0.006	
Paraguay	1,832	0.182			0.123
Romania	1,658	0.079			0.230
Senegal	562	0.276	-0.005	0.002	-0.177
Singapore	18,526	0.974	0.052	0.002	
Sierra Leone	273	0.036	-0.077	0.006	
El Salvador	1,495	0.058	-0.012	0.001	0.034
Slovenia	10,091	0.258			-0.139
Sweden	27,103	1.078	0.033	-0.009	
Thailand	2,009	0.711	0.031	0.004	-0.127
Trinidad and Tobago	4,502	0.436	0.021	0.002	0.141
Tunisia	1,910	0.587	0.036	-0.002	-0.110
Turkey	2,519	0.155	0.029	-0.002	-0.041
Uganda	259	0.025			-0.003
Uruguay	5,512	0.317			-0.056
United States	25,730	0.944	0.011	0.009	
Venezuela	3,533	0.321	0.001	0.003	0.038
Vietnam	253	0.150			0.039
South Africa	4,137	0.521			0.010
Zambia	478	0.062	-0.027	0.004	-0.002

Table 2: Summary Statistics and Correlations

Panel A presents the descriptive statistics and Panels B and C present the correlations.
Income Growth of the Poor equals the annual change in the logarithm of the level of income per capita of the poorest quintile over the period 1960-1999. Growth of Gini is the annual change in the logarithm of the Gini coefficient over the period 1960-99. GDP per capita growth equals the growth rate of real GDP per capita over the periods 1960-99 and 1980–2000 respectively. Private Credit equals claims of financial institutions on the private sector as a share of GDP averaged over the periods 1960-99 and 1980-2000 respectively. Growth of Headcount is the annual growth rate of the percentage of the population living on $1 a day or less, over the period 1980-2000. Panel B presents correlations for the period 1960-99. Panel C presents correlations for the sample 1980 – 2000. Detailed variable definitions and sources are in the appendix.

Panel A:

Variable	Obs	Mean	Std. Dev.	Min	Max
Income growth of poor	52	0.018	0.025	-0.077	0.066
Growth of Gini	52	0.000	0.006	-0.018	0.011
GDP per capita growth 60-99	52	0.020	0.017	-0.021	0.067
GDP per capita growth 80-00	58	0.015	0.022	-0.057	0.063
Private Credit: 60-99	52	0.415	0.302	0.048	1.477
Private Credit: 80-00	58	0.245	0.161	0.025	0.894
Growth of Headcount	58	0.008	0.131	-0.209	0.389

Panel B:

	Income growth of poor	Growth of Gini	GDP per capita growth 60-99
Growth of Gini	-0.491***		
GDP per capita growth 60-99	0.805***	-0.072	
Private Credit: 60-99	0.620***	-0.206	0.646***

***, ** and * represent significance at 1, 5 and 10% level respectively.

Panel C:

	Growth of Headcount	GDP per capita growth 80-00
GDP per capita growth 80-00	-0.125	
Private Credit: 80-00	-0.411***	0.221

***, ** and * represent significance at 1, 5 and 10% level respectively.

Table 3: Finance and Income Growth of the Poor

The dependent variable is Income Growth of the Poor, which equals the annual growth rate in the income per capita of the poorest quintile over the period 1960-1999. The regressors are as follows. Private Credit equals the logarithm of claims of financial institutions on the private sector as a share of GDP averaged over the period 1960-1999. Initial Income of the Poor equals the logarithm of the level of income per capita of the poorest quintile in 1960. GDP per capita growth equals the growth rate of real GDP per capita over the period 1960-1999. Initial GDP per capita is the log of real GDP per capita in 1960. Trade Openness equals the logarithm of the share of exports plus imports relative to GDP averaged over the period 1960-1999. Inflation is the growth rate of the GDP deflator over the period 1960-1999. Schooling 1960 is the logarithm of secondary school attainment from the Barro-Lee dataset in 1960. Specifications (1) - (6) are estimated using OLS with heteroskedasticity-consistent standard errors. Specification (7) is estimated using two-stage least squares with heteroskedasticity consistent standard errors, where instrumental variables are used for Private Credit. The instrumental variables are three dummy variables for the legal origin of the country and the country's latitude. Specifically, Common, French and German equal one for countries with the respective legal origin and zero otherwise. Latitude is the absolute value of the capital city's latitude. Robust standard errors are reported in parentheses. All specifications except (7) report the regression R-squared. Specification (7) reports the first-stage R-squared and the test of the over-identifying restrictions (OIR test), which tests the null hypothesis that the instruments are uncorrelated with the residuals of the second stage regression. Detailed variable definitions and sources are in the appendix.

	1	2	3	4	5	6	7
	Income Growth of the Poor	Income Growth of the Poor	Income Growth of the Poor	Income Growth of the Poor	Income Growth of the Poor	Income Growth of the Poor	Income Growth of the Poor
Private Credit	0.031***	0.016***	0.015***	0.016***	0.017***	0.015**	0.043**
	[0.005]	[0.005]	[0.005]	[0.005]	[0.006]	[0.006]	[0.020]
Initial income of the	-0.009***	-0.005**	-0.008*	-0.005**	-0.004**	-0.003	-0.016*
poor	[0.003]	[0.002]	[0.004]	[0.002]	[0.002]	[0.003]	[0.009]
GDP per capita		0.777***	0.790***	0.780***	0.774***	0.833***	0.135
growth		[0.119]	[0.122]	[0.119]	[0.118]	[0.148]	[0.486]
Initial GDP per capita			0.002				
			[0.003]				
Trade Openness				-0.002			
				[0.003]			
Inflation					0.001		
					[0.002]		
Schooling 1960						-0.001	
						[0.003]	
Constant	0.099***	0.043***	0.039**	0.051**	0.042**	0.03	0.145*
	[0.018]	[0.016]	[0.018]	[0.020]	[0.017]	[0.021]	[0.077]
Estimation Procedure:	OLS	OLS	OLS	OLS	OLS	OLS	IV
R-squared	0.588	0.726	0.729	0.727	0.727	0.723	
R-squared (1^{st} stage)							0.717
OIR Test (p-values)							0.365
Observations	52	52	52	52	52	48	52

***, ** and * represent significance at 1, 5 and 10% level respectively

Table 4: Finance and Changes in Income Distribution

The dependent variable is Growth of Gini, which equals the annual growth rate in the Gini coefficient over the period 1960-1999. The regressors are as follows. Private Credit equals the logarithm of claims of financial institutions on the private sector as a share of GDP averaged over the period 1960-1999. GDP per capita growth equals the growth rate of real GDP per capita over the period 1960-1999. Initial Gini equals the logarithm of the value of the Gini coefficient in 1960. Initial GDP per capita is the log of real GDP per capita in 1960. Trade Openness equals the logarithm of the share of exports plus imports relative to GDP averaged over the period 1960-1999. Inflation is the growth rate of the GDP deflator over the period 1960-1999. Schooling 1960 is the logarithm of secondary school attainment from the Barro-Lee dataset in 1960. Specifications (1) - (5) are estimated using OLS with heteroskedasticity-consistent standard errors. Specification (6) is estimated using two-stage least squares with heteroskedasticity-consistent standard errors, where instrumental variables are used for Private Credit. The instrumental variables are three dummy variables for legal origin of the country and the country's latitude. Specifically, Common, French and German equal one for countries with the respective legal origin and zero otherwise. Latitude is the absolute value of the capital city's latitude. Specifications (1) - (5) report the regression R-squared. Specification (6) reports the first-stage R-squared and the test of the over-identifying restrictions (OIR test), which tests the null hypothesis that the instruments are uncorrelated with the residuals of the second stage regression. Detailed variable definitions and sources are in the appendix.

	1	2	3	4	5	6
	Growth of Gini	Growth of Gini	Growth of Gini	Growth of Gini	Growth of Gini	Growth of Gini
Private Credit	-0.004***	-0.004**	-0.005***	-0.004***	-0.005***	-0.015***
	(0.001)	(0.002)	[0.002]	[0.002]	[0.002]	(0.005)
GDP per capita growth	0.044	0.038	0.041	0.043	0.041	0.314**
	(0.051)	(0.050)	[0.051]	[0.051]	[0.060]	(0.135)
Initial Gini	-0.013***	-0.013***	-0.014***	-0.013***	-0.012***	-0.023***
	(0.003)	(0.004)	[0.004]	[0.004]	[0.003]	(0.007)
Initial GDP per capita		0				
		(0.001)				
Trade Openness			0.001			
			[0.002]			
Inflation				0.000		
				[0.001]		
Schooling 1960					0.001	
					[0.001]	
Constant	0.041***	0.044***	0.040***	0.041***	0.038***	0.063***
	(0.012)	(0.016)	[0.012]	[0.012]	[0.011]	(0.021)
Estimation Procedure:	OLS	OLS	OLS	OLS	OLS	IV
OIR Test						0.744
Observations	52	52	52	52	48	52
R-squared	0.212	0.214	0.220	0.213	0.231	
R-squared (1st stage)						0.607

***, ** and * represent significance at 1, 5 and 10% level respectively

Table 5: Finance and Poverty Alleviation

The dependent variable is Growth of Headcount is the annual growth rate of the percentage of the population living on $1 a day or less, over the period 1980-2000. The regressors are as follows. Private Credit equals the logarithm of claims of financial institutions on the private sector as a share of GDP averaged over the period 1980-2000. Initial Headcount is the logarithm of the Headcount in 1980. GDP per capita growth equals the growth rate of real GDP per capita over the period 1980-2000. Initial GDP per capita is the log of real GDP per capita in 1980. Trade Openness equals the logarithm of the share of exports plus imports relative to GDP averaged over the period 1980-2000. Inflation is the growth rate of the GDP deflator over the period 1980-2000. Schooling 1980 is the logarithm of secondary school attainment from the Barro-Lee dataset in 1980. Age dependency ratio is the ratio of the population below 15 and above 65 to the population between 15 and 65 years of age, averaged over 1980-2000. Population growth is the average annual growth rate of population over the period 1980 -2000. Specifications (1) - (7) are estimated using OLS with heteroskedasticity-consistent standard errors. Specification (8) is estimated using two-stage least squares with heteroskedasticity consistent standard errors, where instrumental variables are used for Private Credit. The instrumental variables are three dummy variables for the legal origin of the country and the country's latitude. Specifically, Common, French and Socialist equal one for countries with the respective legal origin and zero otherwise. Latitude is the absolute value of the capital city's latitude. Robust standard errors are reported in parentheses. Specifications (1) - (7) report the regression R-squared. Specification (8) reports the first-stage R-squared and the test of the over-identifying restrictions (OIR test), which tests the null hypothesis that the instruments are uncorrelated with the residuals of the second stage regression. Detailed variable definitions and sources are in the appendix.

	1	2	3	4	5	6	7	8
	Growth of Headcount	Growth of Headcount	Growth of Headcount	Growth of Headcount	Growth of Headcount	Growth of Headcount	Growth of Headcount	Growth of Headcount
Private Credit	-0.095***	-0.078***	-0.093***	-0.092***	-0.085***	-0.093***	-0.096***	-0.163***
	(0.020)	[0.019]	[0.020]	[0.021]	[0.016]	[0.021]	[0.021]	(0.034)
GDP per capita growth	-0.934	-0.976	-0.821	-0.949	-1.128	-0.71	-0.823	-0.778
	(0.625)	[0.619]	[0.691]	[0.631]	[0.799]	[0.639]	[0.697]	(0.678)
Initial Headcount	-0.035***	-0.048***	-0.035***	-0.034***	-0.051***	-0.046***	-0.039**	-0.041***
	(0.011)	[0.012]	[0.011]	[0.012]	[0.013]	[0.015]	[0.015]	(0.012)
Initial GDP per capita		-0.038**						
		[0.018]						
Trade Openness			-0.017					
			[0.032]					
Inflation				0.005				
				[0.011]				
Schooling 1980					-0.01			
					[0.039]			
Age dependency ratio						0.131		
						[0.113]		
Population growth							0.012	
							[0.023]	
Constant	-0.059	0.257*	0.012	-0.071	0.008	-0.002	-0.077	-0.159***
	(0.040)	[0.146]	[0.136]	[0.053]	[0.081]	[0.066]	[0.054]	(0.058)
Estimation Procedure:	OLS	OLS	OLS	OLS	OLS	OLS	OLS	IV
OIR Test								0.514
Observations	58	58	58	58	47	58	58	58
R-squared	0.387	0.427	0.39	0.389	0.517	0.401	0.39	
R-squared (1^{st} stage)			0.399	0.358	0.303	0.401	0.388	0.329

***, ** and * represent significance at 1, 5 and 10% level respectively.

Figure 1: Partial Scatter Plot of Income Growth of the Poor against Private Credit

Using regression 2 of Table 3, which regresses Income Growth of the Poor against GDP per capita Growth, log of Initial Income of the Poor and Private Credit, this figure represents the two-dimensional representation of the regression plane in Income Growth of the Poor – Private Credit space. To obtain this figure, we regress Income Growth of the Poor on GDP per capita Growth and log of Initial Income of the Poor, collect the residuals, and call them e(Income Growth of the Poor | X). Next, we regress Private Credit against GDP per capita Growth and log of Initial Income of the Poor, collect the residuals, and call them e(Private Credit | X). Then, we plot e(Income Growth of the Poor | X) against e(Private Credit | X).

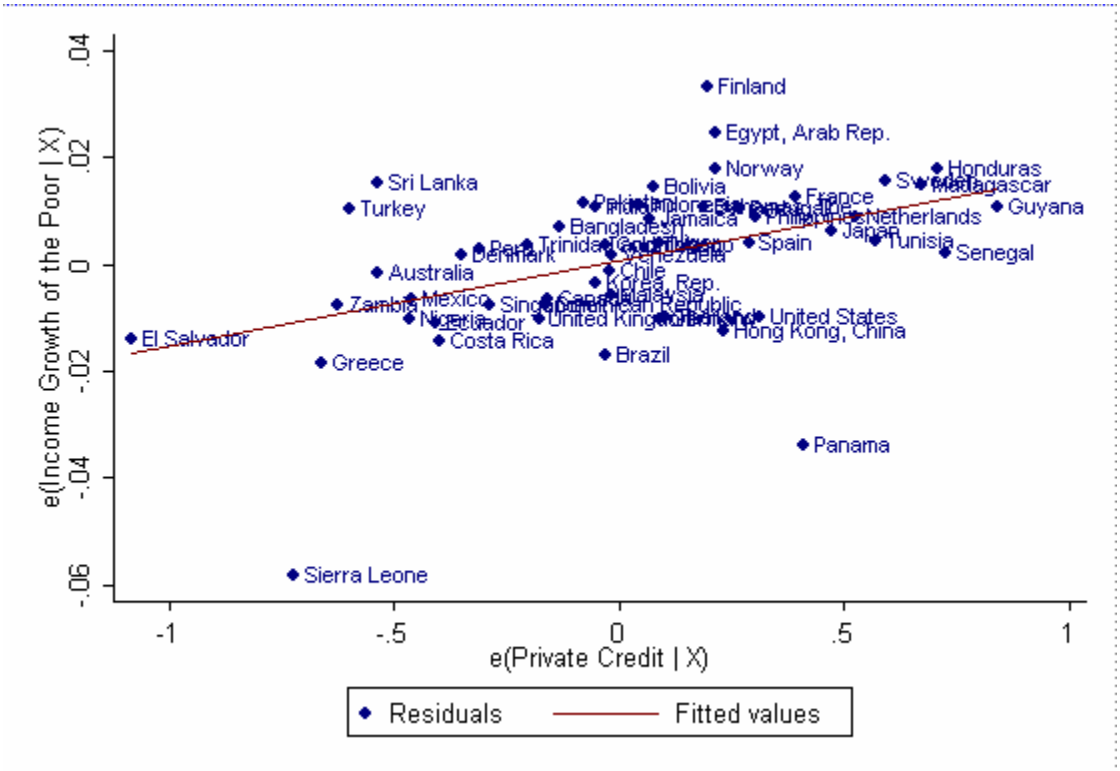


Figure 2: Partial Scatter Plot of Growth of Gini against Private Credit

Using regression 1 of Table 4, which regresses Growth of Gini against log of initial Gini, GDP per capita Growth and Private Credit, this figure represents the two-dimensional representation of the regression plane in Growth of Gini – Private Credit space. To obtain this figure, we regress Growth of Gini on log of initial Gini and GDP per capita Growth, collect the residuals, and call them (Growth of Gini | X). Next, we regress Private Credit against log of initial Gini and GDP per capita Growth, collect the residuals, and call them e(Private Credit | X). Then, we plot e(Growth of Gini | X) against e(Private Credit | X).

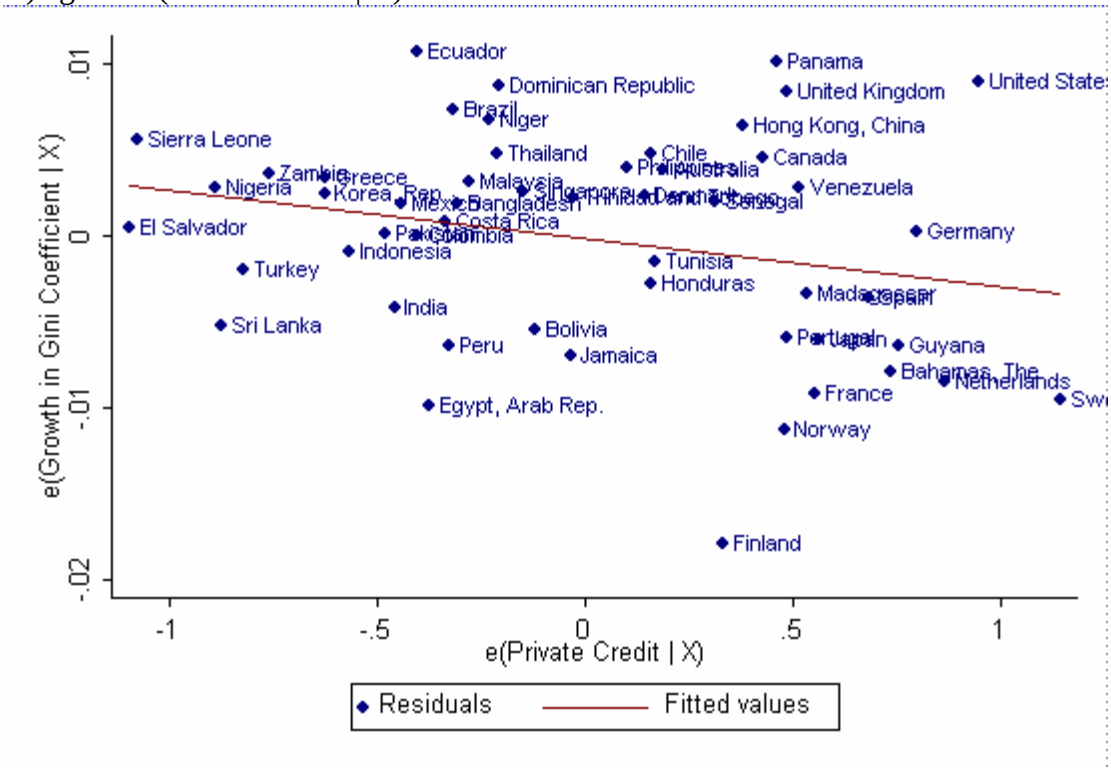
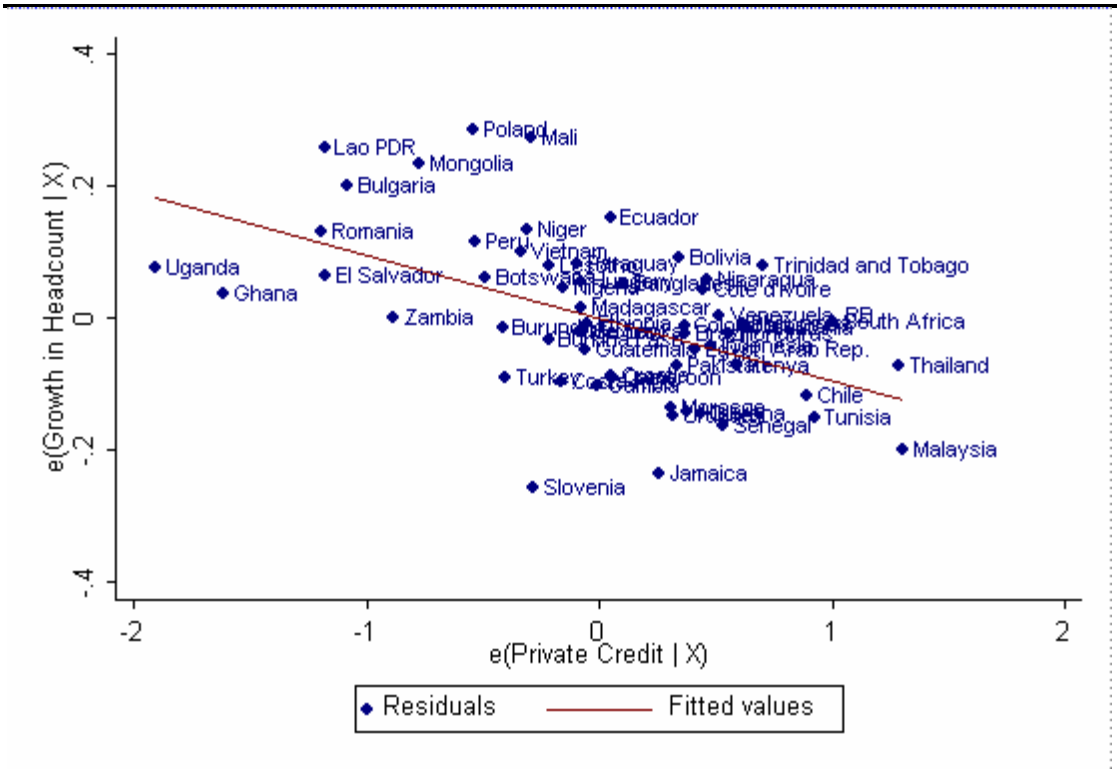


Figure 3: Partial Scatter Plot of Growth of Headcount against Private Credit

Using regression 1 of Table 5, which regresses Growth of Headcount against log of initial Headcount, GDP per capita Growth and Private Credit, this figure represents the two-dimensional representation of the regression plane in Growth of Headcount – Private Credit space. To obtain this figure, we regress Growth of Headcount on log of initial Headcount and GDP per capita Growth, collect the residuals, and call them (Growth of Headcount | X). Next, we regress Private Credit against log of initial Headcount and GDP per capita Growth, collect the residuals, and call them e(Private Credit | X). Then, we plot e(Growth of Headcount | X) against e(Private Credit | X).



Appendix: Variable Definitions

Variable	Variable Definition	Source
Income Growth of the Poor	GDP per capita growth of the lowest income quintile group	World Development Indicators (WDI), Dollar and Kraay (2002)
Growth of Gini	The Gini coefficient is the ratio of the area between the Lorenz Curve, which plots share of population against income share received, to the area below the diagonal. It lies between 0 and 1, where 0 is perfect equality and 1 is perfect inequality. The growth rate is calculated as the log difference between the last and the first available observations, divided by the number of years.	Dollar and Kraay (2002)
Growth of Headcount	Headcount is the percentage of the population living on $1 a day or less. The growth rate is calculated as the log difference between the last and the first available observations, divided by the number of years.	Povcal Net, World Bank
GDP per capita	GDP per capita in constant 1995 US$	WDI
GDP per capita Growth	GDP per capita growth, annual %	WDI, Dollar and Kraay (2002)
Private Credit	The claims on private sector by deposit money banks and other financial institutions as a share of GDP	IFS, own calculations
Schooling in 1960/1980	The logarithm of the average years of school attainment in 1960 or 1980	Barro-Lee dataset; Barro and Lee (1993)
Inflation	The growth rate of the GDP deflator	WDI
Trade Openness	The logarithm of the share of imports plus exports in GDP	WDI
Age dependency ratio	Ratio of population below 15 and above 65 to population between 15 and 65	WDI
Population growth	Average annual growth rate of total population	WDI
Latitude	The absolute value of the latitude of the country, scaled to take values between 0 and 1	La Porta, Lopez-de-Silanes, Shleifer, and Vishny (henceforth LLSV, 1999)
Common	A dummy variable that takes on a value of one if the origin of the country's legal system is British and zero otherwise.	LLSV (1999)
French	A dummy variable that takes on a value of one if the origin of the country's legal system is French and zero otherwise.	LLSV (1999)
German	A dummy variable that takes on a value of one if the origin of the country's legal system is German and zero otherwise.	LLSV (1999)
Socialist	A dummy variable that takes on a value of one if the country is a transition economy and zero otherwise.	LLSV (1999)