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FINANCIAL DEVELOPMENT AND POVERTY REDUCTION IN DEVELOPING COUNTRIES

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IN DEVELOPING COUNTRIES

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Abstract

Empirical investigation of the link between financial development and economic growth has established that finance exerts a significant and positive influence on growth. This paper extends this line of analysis by examining the contribution that financial development makes to poverty reduction in low-income countries. The results reported support the contention that financial sector development policy can contribute to achieving the goal of poverty reduction in developing countries.

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1   Introduction

Throughout his professional career, Max Fry had an abiding concern with the impact of financial sector policies on economic growth in developing countries. The publication of *Money, Interest and Banking in Economic Development* (Johns Hopkins University Press, 1988), marked the twenty-first anniversary of his first assignment in a developing country, Turkey, which was the beginning of a continuing interest in financial aspects of economic development. His research on the adverse effects of the 'repressive' financial policies adopted in many developing countries served to strengthen his conviction that 'it has become increasingly important to assess the potential role of improved financial intermediation in the process of economic development' (:419).

There has been a longstanding interest among development economists and practitioners in the contribution that finance makes to development. The issue of causality between financial development and economic growth – does finance contribute positively to growth? – has been at the centre of this debate. Almost a century ago, Schumpeter (1911) argued that financial intermediation through the banking system played a pivotal role in economic development by affecting the allocation of savings, thereby improving productivity, technical change and the rate of economic growth. Lewis (1955), one of the early pioneers of development economics, suggested a two-way relationship between financial development and economic growth, where financial markets develop as a consequence of economic growth, and in turn act as a stimulus to real growth. Subsequent analysis has built on these earlier ideas by developing a fuller understanding of the various functions performed by the financial system – mobilising savings, allocating capital funds, monitoring the use of funds, managing risk – in supporting the process of economic growth (Levine, 1997). Noting these multiple and complex functions of finance, Stiglitz (1998) likens the financial system to the

'brain' of the economy, performing the task of allocating resources across space and time in an environment of uncertainty.

These arguments in support of a causal link between finance and economic growth have provided the justification for policy initiatives aimed at strengthening the contribution of financial development to economic development, particularly in lower-income countries. The work of McKinnon (1973) and Shaw (1973) gave the theoretical foundations for the widespread adoption of financial liberalisation and reform measures in developing countries in the 1980s. The deregulation of interest rates was intended to mobilise an increased volume of financial saving and allocate capital to more productive uses, both of which would enhance the volume and productivity of physical capital and thereby contribute to economic growth. More recently, broader, sector-wide programmes of financial market deregulation formed an important part of the structural adjustment programmes of the Bretton Woods institutions, which were intended to put developing countries onto a more stable and higher, long-term growth path (World Bank 1989, Cull 1997).

There are competing views on the effectiveness of financial liberalisation in improving economic performance in developing countries (Williamson and Maher 1998). There is a consensus, however, that the results of financial sector reform have been disappointing, falling well short of expectations. In many cases, a failure to recognise the underdeveloped and imperfect characteristics of financial markets led to premature deregulation, with serious adverse consequences for the stability of the financial system as a whole (Brownbridge and Kirkpatrick, 2000). Typically, economic growth has fallen dramatically in the aftermath of financial sector collapse, severely affecting the most vulnerable and poorest people, and resulting in an increase in poverty levels in the crisis-hit countries (World Bank, 2001a).

4

The refocusing of the goals of development strategy from an exclusive concern with economic growth to growth with poverty reduction, has increased interest in the contribution that financial development can make to poverty reduction in developing countries. It is widely recognised that improving the access of the poor to financial services, particularly to credit and insurance-against-risk services, strengthens the productive assets of the poor and thereby enhances their productivity and potential for sustainable livelihoods (World Bank 2001a). Market failure is a fundamental cause of poverty, and financial market failures, particularly asymmetric information and high, fixed costs of small scale lending limit the access of the poor to formal finance (Stiglitz 1998). Expanding the supply of financial services which can be accessed by the poor can contribute directly to poverty reduction.

The 'failure' of financial liberalisation, combined with the current prioritisation of poverty reduction as the goal of development, have encouraged a renewed interest in the contribution of finance to development. In particular, it has led to an intensified effort on the part of researchers and policy analysts to reach a better understanding of the relationship between financial sector development, economic growth and poverty reduction in developing countries, and to provide robust, empirical evidence on which to build financial sector policies which will contribute to poverty reduction in the developing world.

This paper examines the link between financial development and poverty reduction. Using panel data for a sample of 42 countries, it tests empirically for a causal relationship between financial development, economic growth and poverty reduction. The rest of the paper is organised as follows. Section 2 reviews the relationship between financial development and growth and summarises the empirical evidence on the causal linkages. Section 3 considers

the direct and indirect linkages between financial development, economic growth and poverty reduction. Sections 4 and 5 report on the empirical analysis and results, which show that financial development has a significant impact on poverty reduction in developing countries. Section 6 concludes the paper.

2 Financial Development and Economic Growth

Empirical research on the link between financial development and economic growth can be traced back to the pioneering work of Goldsmith (1969), who stressed the connection between a country's financial superstructure and its real economic infrastructure. Using cross country data, Goldsmith was able to show a strong positive trend in the ratio of financial institutions' assets to gross domestic product for a sample of developed and developing countries. More recent cross sectional analysis, using larger country samples and alternative measures of financial sector development have confirmed the cross-country association between financial development and the level of per capita income, although there is evidence of a wide variation in the level of financial development between countries at comparable income levels, a difference which has persisted over time (World Bank, 2001b).

Cross-country regression analysis has also been used extensively to examine the long-run relationship between financial development and economic growth (Arestis and Demetriades 1997; Luintel and Khan, 1999; King and Levine, 1993a,b). The findings of King and Levine (1993a) are representative of this body of literature: 'higher levels of financial development are significantly and robustly correlated with faster current and future rates of economic growth, physical capital accumulation and economic efficiency improvements (:717-18) and 'finance does not only follow growth: finance seems importantly to lead economic growth' (:730).

The problems associated with cross-country analysis are well known, particularly in its use for causal inference (Graff, 2001). Recent advances in econometric techniques allow for the pooling of cross-country and time series data and by the correcting for simultaneity bias, allow the issue of causality to be addressed. Luintel and Khan (1999) for example, examine the long-run causality between financial development and economic growth in a multivariate time series framework using data from 10 sample countries. Their results show bi-directional causality between financial development and economic growth in the sample countries analysed. The study by Levine et al (2000) uses both traditional cross-sectional procedures and dynamic panel techniques to show that the exogenous components of financial intermediary development are positively linked to economic growth.

Beck et al (2000) assess the impact of financial intermediary development on the sources of economic growth, including private savings, capital accumulation and productivity. Using data for 63 countries averaged over the period 1960-1995 they find that financial intermediation exerts a significant, positive influence on total factor productivity growth, which feeds through to overall GDP growth. However, long-term links between financial development and both physical capital growth and private savings rates are tenuous.

In this paper we develop further the approach used by Beck et al (2000), by embedding the investigation of the relationship between financial development and poverty reduction within a growth accounting-production function framework. Most recent empirical investigations have extended Solow's (1956) original approach (Mankiw et al, 1992; Knight et al, 1993; Islam, 1995; Pugno, 1996). Nonneman and Vanhoudt (1996) have generalised this approach to include various categories of investment and empirically applied this generalised framework to an

7

evaluation of the effects of different investment categories and technological know-how on economic growth. There are practical problems, however, in using a Solow-type empirical model. In particular, in a Solow type growth accounting regression, if there is a correlation between saving/investment and a measure for financial development, then the precision of parameter estimates will be reduced as the degree of correlation increases.

Here we adopt a variant of the model developed by King and Levin (1993a) to measure directly any contribution that financial development is likely to make to economic growth. As in King and Levine (1993a) we assume that economic growth is directly related to financial development as well as other explanatory variables; that is:

$$g = ?_0 + ?_1 F + ?_i W_i \qquad\qquad i=1….m \qquad\qquad\qquad (1)$$

where F is a proxy for financial development and W_i, i=1 to m, stand for other explanatory variables, both quantitative and qualitative, that have an impact on growth. Adding an intercept and a stochastic error term to equation (1) gives us a generic econometric model which can then be used to measure the magnitude of various growth determinants. Proxies for economic stability, trade regime and initial conditions for income and human capital, are example of variables that are contained in W. There are also likely to be differences between countries reflecting their level of development, in which case appropriate dummies can be used to test this hypothesis. A further factor that is likely to impact on the quality of growth is the structure and nature of financial system. Within developing countries for example, financial systems that have a rural network of branches are likely to have a different impact to those which predominantly cater for the needs of the formal sector of the economy. Information on the

8

nature or structural characteristics of the financial system could also be incorporated in equation (1) in order to measure the impact of differences in financial structure on economic growth.

3   Financial Development and Poverty Reduction

It is generally believed that financial development will contribute to poverty reduction in developing countries. A fundamental cause of poverty is market failure, and financial market imperfections often prevent the poor from borrowing against future earnings to invest. By addressing the causes of financial market failure, particularly asymmetric information and high, fixed costs of small scale lending, it is possible to improve the opportunities for the poor to access formal finance (Stiglitz, 1998). Improving the access of the poor to financial services, particularly to credit and insurance-against-risk services, strengthens the productive assets of the poor, enhances their productivity, and increases the potential for achieving sustainable livelihoods (World Bank, 2001a: 75).

Financial development can also have an indirect impact on the living standards of the poor through its support of economic growth (World Bank, 2001b: 6). The relationship between growth and poverty has been the focus of considerable attention in recent years (Squire, 1999; World Bank, 2001a; Ravallion, 2001). Any given growth scenario can generate different poverty outcomes – 'for a given rate of growth, the extent of poverty reduction depends on how the distribution of income changes with changes in growth and on initial inequalities in income, assets and access to opportunities to allow the poor to share in growth' (World Bank 2001a: 52). Equi-proportional growth leaves income distribution intact whereas by improving the position of some on the lower scale of the distribution it reduces poverty. Pro-poor growth however, will by definition improve the status of the poor and affects income distribution. There may however be other cases in which growth will benefit the non-poor of the society, while at the same time

improving the measure of distribution. It is obvious therefore, that aggregate growth may have different relationships with poverty (Goudie and Ladd, 1999; McKay, 2002).

The recent contribution by Dollar and Kraay (2000), following that by Deninger and Squire (1996), has generated considerable interest regarding the empirical evidence on the interaction between growth and poverty. Dollar and Kraay argue that growth has been beneficial for the poor. Using the most up to date data available on the income of the lowest quintiles, they show empirically that the poor have benefited from growth at least as much as the other quintiles. The generic model that they put forward is of the following form:

$$y^p_{ct} = f(y_{ct}, x_{ct}) \qquad\qquad (2)$$

where y^p denotes per capita income in the poorest quintile of the population, y stands for the average per capita income in the entire population and x is a vector of all other determinants of mean income of the poor; c and t stand for the country and time period respectively. Vector x includes proxies for the macroeconomic policies, openness and globalisation. The strength of relationship between y^p, the average income of the poor and y, the average income of the population, gives an indication of the impact of growth on poverty. The rationale is that if average income of the poor changes, the poverty head count will also change.

Dollar and Kraay's empirical results suggest that "good" macroeconomic policies, openness and globalisation have a positive, direct impact on the income of the poor. Amongst other variables that are likely to impact poverty, Hanmer and Naschold (2000) include a proxy for income distribution to directly test any possible impact that inequality may have on poverty. It is also likely that the rate of change in poverty will be affected by the initial absolute level of poverty,

in so far as the higher the initial level, the greater is the potential for a higher rate of poverty reduction in the next period. Cross-country evidence shows that when initial inequality is low, growth reduces poverty nearly twice as much as when inequality is high (World Bank, 2001a: 54-5).

The interaction between financial development and poverty can be examined by first considering the contribution that financial development makes to the growth performance of the economy. This in turn has implications for changes in the poverty level within the economy. The relationships can be formulated for the purpose of a testable model, as follows:

$$g = ?_? + ?_?X^{'} + ?_?Z^{'} + ?_{??} \quad ? \qquad ? \qquad\qquad ???_? \quad ? \qquad ? \qquad ? \qquad ????$$

$$P = ?_{??}? \, ?_?X^{''} + ?_??^{''} + ?_2 \tag{4}$$

Where g and P stand for the rate of growth of GNP and poverty headcount respectively, $X^{'}$, $X^{''}$ are vectors of explanatory variables, and $Z^{'}$ and $Z^{''}$ vectors of fixed and mainly qualitative variables that influence g and P respectively. ? and ? in each equation stand for the vectors of parameters, ? for the intercept and ? stands for the error term in each equation. Amongst other variables, $X^{'}$ includes a proxy for financial development and $X^{''}$, g rate of growth of GNP. If, as is the case with the "trickledown effect", there is no simultaneity, by substituting for g from (3) into (4), we get a reduced form equation of the following form:

$$P = ?_? ? \, ?X + ?? + ?? \tag{5}$$

Where X and Z are vectors which includes all the variables that affect g and P. Data permitting, one could run regressions as specified by (5) and get parameter estimates with respect to all the variables included.

Most of the variables that are included in the growth accounting exercise are candidates for inclusion in poverty model. The interaction of these variables with growth however, may differ from those with poverty, in which case the reduced form suggested by equation (5) may at most give an estimate of the net effects of various common variables. If there is any simultaneity present however, a reduced form equation is inappropriate and a different estimation procedure is required for the model. For these reasons we prefer not to use a reduced form equation as in (5). Instead we use an explicit log-linear formulation of equation (2) as follows:

$$In(y_{ct}^{p}) \; ? \; ?_{1}Iny_{ct} \; ? \; ?_{i}\sum_{i?1}^{m} x_{ict} \qquad\qquad i=1.....m \qquad\qquad (6)$$

First difference of equation (6) give us a relationship between growth of income of the poor and growth of average income in country c; that is:

$$g^{p}_{ct} = ?_{1} g_{ct} + \; ?_{i} \; ? \; ? \; x_{ict} \qquad\qquad (7)$$

As before, adding an intercept and a stochastic error term to either equation (6) or (7) gives us an econometric model of poverty determinants, parameter estimates of which give the magnitude of the elasticity of poverty reduction with respect to growth and other determinants of poverty. x_{ict} incorporates most of the relevant variables mentioned above. As a poverty reduction model, we use variants of equations (6) and (7) in our empirical analysis in this study.

12

We include a separate variable for financial development to capture the direct, non-growth effects from finance to poverty. Hence, financial development potentially has two poverty impacts, first indirectly through its impact on the rate of mean income growth, and second, directly through improved supply of, and access to, financial services to the poor.

4   Data Sources and Analysis

Data on macro variables are taken from the World Bank CD-ROM World Development Indicators 2000. The Penn World tables from the NBER web site on Purchasing Power Parity income figures complement the World Bank data set. Data on various indicators of financial development are extracted from the IMF's IFS CD-ROM.

We are however pressed for a reliable and up to date series on poverty and inequality for most countries, and particularly for developing countries. The data set most researchers have used in recent empirical research is based on Deninger and Squire (1996) and Lundberg and Squire (1998), which give both income and headcount data for the poor, as well as Gini coefficients. Dollar and Kraay (2000) have extended the series both with respect to countries and time period and it is their data for income for the bottom quintile that we use. There is also an extensive Theil inequality index series prepared by the University of Texas Inequality Project (Galbraith and Lu 2000). In some regressions we experiment with the use of this index as an alternative to the Gini coefficient.

We set up various data sets based on availability of data and their use in different models. For both the growth accounting and growth-poverty analyses we use a pooled-panel data approach with both a time series and cross section dimension. This is now judged to be the

13

best-practice procedure to account for the diversity of experience within and between countries (Hsiao 1986, Baltagi 1995). All of the data sets generated were unbalanced panels. For each of the corresponding panels we also generated five-yearly averages. For each of the models specified we ran regressions on both level and average data sets to check for any differences in the regression results that may be due to the excessive noise in the level data.

For the growth accounting exercise data on most variables were available for a large number of countries, including those from developing and developed countries, except for a proxy for human capital. The largest data set that we were able to construct included 304 observations covering 42 countries, including 26 developing and 16 developed countries. Available information on income of the poor however was a limiting factor as a result of which we ended up with an smaller data set for testing the full model, capturing the interaction between financial development, growth and poverty reduction. This data set included 147 observations covering 26 countries including 18 developing countries as well as 8 developed countries.

Before proceeding with the formal test of the models we attempted to carry out some preliminary investigation of the data in terms of stationarity and causation. Formal tests for these require a long length of lags for variables of interest. None of the data sets we were able to construct had sufficient lags; for most of the developing countries in our data set we only had one or two lags. For this reason we did not carry out formal tests for these problems. Graphical inspection of the residuals and diagnostic tests however did not suggest any serious problem as far as non-stationarity is concerned. Given that we are using the first difference models and that most economic series are $I(1)$, we are sufficiently confident that the first difference series are $I(0)$ and that we are not capturing a spurious relationship using the first

difference models. As far as causality is concerned, we are relying on empirical findings published on causation between financial development and growth. As far as causation between growth and poverty is concerned we do not find any evidence that it runs from poverty to growth, which would be contrary to our a priori expectation of a causal link from growth to poverty reduction.

A further issue that we were concerned with in our empirical analysis is that of spatial correlation. Given the limitations in the data set we are using it is not possible to carry out a formal test on this. Again graphical inspection of residuals combined with diagnostic tests do not seem to suggest that this is a problem. We nevertheless warn that the results reported are at most suggestive and further detailed analysis using a more comprehensive data set may produce different results.

As far as regression techniques are concerned, we have applied simple OLS, Panel and Two-Stage Least Square (2SLS) to both sets of data. As we are unable to establish simultaneity and as the results of the 2SLS do not differ substantially from those of OLS and Panel, we only report results of regressions based on the latter here.

5   Results

Tables (1) and (2) provide regression results for the growth and poverty regressions as specified by equations (1) and (7) respectively. Because of limitations of data availability on a proxy for poverty, we ended up using different data sets for growth and poverty regressions. Furthermore, due to the limited availability of time series data on variables of interest we were not able to apply a more rigorous technique of data analysis as used, amongst others by Dollar and Kraay (2000) and Beck et al (2000). We were also confronted by serious

15

limitations in terms of having sufficient length of lags as well as instruments to be able to apply IV technique for the panels of data we constructed. The technique we have used for analysis in this paper is that of OLS combined with country dummies if necessary, to account for heterogeneity in our data set. We are confident, however, that results reported are sufficiently robust, and various diagnostic tests do not suggest any serious statistical shortcomings.

Growth and Financial Development

We have applied a variety of proxies for financial development. Bank Deposit Money Assets over GDP (BDMA) as well as Net Foreign Assets (NFA) over GDP perform well and the results reported are based on these two indicators. BDMA is also a preferred indicator in Beck et al (2000) as well as King and Levine (1993a). The rational for the use of NFA is based on the fact that in developing countries in particular, the flow of foreign resources is mainly directed to those economies with more developed markets, including financial . It could also be used as a proxy to capture the flow of FDI which the literature argues has a strong growth enhancing effect. Our analysis indicates that NFA is likely to capture this second effect.

Variables entered into our base regression (Reg. 1) follow the discussion in the literature on possible sources of growth. In addition to entering BDMA to capture financial development, we also include as regressors a proxy for education, trade regime, inflation, trade share, initial income, general public expenditure and a proxy to capture economic structure (share of manufacturing value added in GDP). Lag of the dependent variable is also used in order to correct for the problem of serial correlation. All have the expected sign but BDMA is insignificant. As regression result in (Reg. 2) suggests, there seems to be a difference

between developing countries in terms of their growth experience; the significance level for BDMA improves but it is still insignificant at the usual significance levels.

In Reg. 3 we add an interactive term to test the hypothesis that financial development is likely to have an impact on developing countries only; the literature on this issue seems to indicate that those that have already benefited from financial development (eg advanced countries) are likely to be affected by financial structure rather than further increases in financial development. As far as the first hypothesis is concerned however, the parameter estimate for the interactive term is positive and highly significant, suggesting that it is developing countries that benefit most from financial development; on its own the parameter estimate for BDMA is negative and highly insignificant suggesting that once a threshold is achieved further expansion in financial development is not likely to have a growth enhancing role. We also enter a proxy for government expenditure in Reg. 4; the parameter estimate is highly significant and negative, suggesting, as has previous research in this area, that general government expenditure is likely to be harmful to the growth potential of an economy. Reg. 4 reports the regression results after removing BDMA from Reg, 3. In Reg. 5 we test any possible additional role that foreign finance (NFA) may have on economic growth. Financial indicator II captures this influence and as seen, the results suggest that NFA has a positive and significant role to play regarding economic growth. Although this role may seem small given the relative size of NFA, its marginal contribution to growth is relatively larger than that of BDMA. The results reported indicate that the two financial variables have a separate positive impact on growth.

Table 1:   **Relationship Between Financial Development Indicators and Growth**

Dependent variable is GNP growth[*]

Independent Variables	Reg. 1	Reg. 2	Reg. 3	Reg. 4	Reg. 5
Constant	-0.06	-8.15	-8.25	-8.41	-10.74
	(0.01)	(0.96)	(0.99)	(1.01)	(1.29)
Lag of Dependent Variable	0.39	0.37	0.35	0.35	0.32
	(7.92)	(7.58)	(7.06)	(7.06)	(6.40)
Financial Indicator I [(a)]	0.12	0.17	-0.06		
	(0.83)	(1.22)	(0.34)		
Financial Indicator II [(b)]					0.03
					(1.99)
Education [(c)]	2.69	3.67	3.77	3.80	4.28
	(1.65)	(2.23)	(2.30)	(2.32)	(2.60)
Trade Regime [(d)]	-1.02	-2.08	-1.93	-1.84	-1.96
	(2.25)	(3.60)	(3.45)	(3.81)	(4.06)
Change in Inflation [(e)]	-0.02	-0.02	-0.02	-0.02	-0.02
	(2.67)	(2.72)	(2.92)	(2.93)	(2.80)
Change in Trade Share [(f)]	19.58	21.68	22.00	21.82	20.90
	(4.16)	(4.61)	(4.68)	(4.68)	(4.48)
Initial Income [(g)]	-1.25	-0.89	-0.61	-0.62	-0.59
	(4.46)	(2.94)	(1.88)	(1.95)	(1.85)
Change in Manufacturing Share [(h)]	0.31	0.33	0.37	0.37	0.32
	(2.21)	(2.38)	(2.70)	(2.70)	(2.30)
Public Spending [(I)]			-1.13	-1.17	-1.28
			(2.49)	(2.65)	(2.90)
Developing Countries Dummy [(j)]		1.79			
		(2.89)			
Interactive Term [(k)]			0.42	0.39	0.41
			(2.88)	(3.26)	(3.46)
Number of Observations	300	300	300	300	300
Adjusted R^2	0.39	0.41	0.42	0.42	0.43

Notes:
* Figures in brackets are t- ratios.
    (a) Logarithm of Bank Deposit Money Assets over GDP.
    (b) Net Foreign Assets over GDP.
    (c) Logarithm of percentage of primary school enrolment (gross).
    (d) A dummy variable which is one if the economy is considered closed in terms of trade
        regime or zero if it is open. This is based on criterion used in Sachs and Warner
        (1995).
    (e) Change in the rate of inflation between two consecutive periods.
    (f) Change in the share of trade (exports plus imports) in GDP between two consecutive
        periods.

(g) Log of initial real income per capita.
(h) Change in manufacturing value added over GDP between two consecutive periods.
(i) Logarithm of public expenditure on education used as a proxy for general government expenditure.
(j) A dummy variable which is set 1 if the country is a developing country, zero otherwise.
(k) An interactive term between developing country dummy and financial indicator I, constructed as (Developing Countries Dummy * Financial Indicator I).

Poverty and Growth

Our base regression for the study of the link between poverty, and growth and financial development is specified by equation (7). Given the data limitations on a proxy for poverty, it reduces to half the number of observations used for analysing the links between poverty and growth/ financial development. There does not appear to be any simultaneity between growth and poverty; causation seems to run from growth to poverty reduction (improving the growth of income of the poor). Although we were not able to test for this directly, the inequality/poverty indicator we use does not have any significant role in our growth regression. Results reported in table 2 are based on OLS combined with country/regional dummies if necessary to account for heterogeneity in our data set. Given that the base regression is the first difference of equation (6), it is likely to have addressed most of the issues regarding autocorrelation as well as stationarity.

Variables included in the regressions follow those suggested by other researchers in this area and conform to those in Dollar and Kraay (2000) and Hanmer and Naschold (2000). Parameter estimates for growth confirms broadly those reported by Dollar and Kraay (2000) that growth is at least as good for the poor as it is for others. We also find a strong and negative influence from distribution to income of the poor. A change in inflation also seems to be significantly and negatively related to the growth of income of the poor. Change in

government general expenditure is marginally positively related to the growth of income of the poor. There is no evidence that there is any difference between developing and developed countries as indicated by the level of significance of the developing countries dummy.

Linking Financial Development and Poverty

We have not been able to directly test the link between financial development and income of the poor. The approximate method of capturing the role that financial development plays in poverty reduction, based on our discussion here, is as follows:

$$dg^p / dfd \ ? \ ?g^p / ?g * ?g / ?fd \ ? \ ? g^p / ?fd \qquad (8)$$

This derivative is based on equations (1) and (7), where fd above stands for the proxy for financial development. The relationship shown by equation (8) captures the overall impact of financial development on the growth of income of the poor. The first term on the right hand side of equation (8) captures the indirect (trickle-down) impact of financial development on growth of income of the poor and the second term, its direct impact. From equation (7), $?g^p / ?g \ ? \ ?_1$ is the rate of change of growth of income of the poor with respect to change in average growth of income of population. Based on equation (1), $?g / ?fd \ ? \ ?_1$ captures change in average growth of income with respect to a unit change in financial development. Therefor the overall impact is equal to:

$$dg^p / dfd = ?_1 * ?_1 + ? \qquad (9)$$

where $? = ?g^p / ?fd$ captures the direct poverty reduction effect of financial development. All the measures for financial development are each correlated with the growth of GDP. Therefore it was not possible to include any of them separately in our poverty regressions as a test of whether there is any additional direct link between financial development and poverty

that is separate from its indirect trickle-down influence which is captured through the growth effect; therefore ???????

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Estimates of coefficient of growth in poverty regression given in table (2) gives us an average value for $?_1$ which is unity. The coefficient of the interactive term in table (1) gives us a measure of $?_1$ for developing countries, which averages 0.4.   Therefore our results suggest that a unit change in financial development improves the growth prospects of income of the poor in developing countries by almost 0.4 per cent. Our results also seem to suggest that there is a threshold effect for financial development; beyond a certain level, financial development does not appear to have much impact on growth prospects of an economy, as evidenced by the statistically insignificant parameter estimate in our regressions. This confirms research in this area that indicates that it is the structure of finance that matters in advanced economies.

Table 2:   Poverty Reduction Regression

Dependent variable is growth of income of the poor [*]

Independent Variables	Reg. 1	Reg. 2	Reg. 3	Reg. 4	Reg. 5
Constant	-1.66	-1.97	-10.84	-8.44	
	(1.57)	(1.74)	(1.48)	(1.36)	
Growth of GDP	0.99	1.09	1.18	1.16	
	(5.90)	(5.41)	(5.20)	(5.80)	
Change in Gini [a]	-4.34	-4.22	-4.26	-4.20	
	(6.91)	(7.46)	(7.50)	(7.57)	
Change in Inflation [b]	-0.08	-0.09	-0.10	-0.09	
	(2.24)	(2.46)	(2.54)	(2.72)	
Change in Public Expenditure [c]		1.74	1.73	1.67	
		(1.57)	(1.60)	(1.61)	
Initial Income [d]			1.01	0.75	
			(1.24)	(1.05)	
Developing Countries Dummy [e]				-2.12	
				(0.66)	
Number of Observations	147	147	147	147	
Adjusted R^2	0.55	0.56	0.56	0.56	

Notes:
   (a) Change in Gini Coefficient between two consecutive periods.
   (b) Change in the rate of inflation between two consecutive periods.

21

(c) Change in general government expenditure between two consecutive periods.
(d) Logarithm of initial real income per capita.
(e) A dummy variable set to one for developing countries, zero otherwise.

6   Conclusion

The purpose of this paper has been to examine the linkages between financial development, economic growth and poverty reduction. More precisely, the paper has sought to generate empirical evidence to help answer the policy question of whether financial sector development can contribute to the goal of poverty reduction in developing countries. There are limitations in the data available for empirical investigation of these issues, and the cross-country results that are produced are likely to disguise significant differences between countries in how the poor benefit from financial development and growth (Ravillion, 2001). Nevertheless, the results reported in this paper are consistent in showing that financial development does contribute to poverty reduction, and therefore provide a firm basis on which to undertake more focused, micro empirical investigation of how specific financial sector policies and programmes can be deployed as effective instruments for achieving poverty reduction in low-income countries.

Appendix: List of Countries

Countries used in growth accounting regression included: Argentina, Austria, Australia, Bangladesh, Bolivia, Brazil, Canada, Chile, China, Colombia, Costa Rica, Algeria, Ecuador, Egypt, Spain, Finland, France, Great Britain, Greece, Guatemala, Hungary, Indonesia, India, Italy, Jamaica, Jordan, Japan, Korea, Sri Lanka, Mexico, Malaysia, Netherlands, Norway, New Zealand, Portugal, Sweden, Turkey, Uruguay, united States, Venezuela, South Africa and Zimbabwe.

List of countries used in poverty regression included: Australia, Bulgaria, Brazil, Canada, China, Spain, Finland, Great Britain, Indonesia, India, Italy, Jamaica, Japan, Sri Lanka, Malaysia, Netherlands, Norway, New Zealand, Philippine, Poland, Portugal, Singapore, Sweden, Thailand, United States, and Venezuela.

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