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HOW HAS FINANCIAL DEEPENING AFFECTED POVERTY REDUCTION IN INDIA? EMPIRICAL ANALYSIS USING STATE-LEVEL PANEL DATA

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Abstract

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JEL classification: G00, O11
Keywords: Financial Deepening; GMM; India; Poverty Reduction

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Abstract

This paper examines empirically whether financial deepening has contributed to poverty reduction in India. Using unbalanced panel data for 28 Indian states and union territories between 1973 and 2004, we estimate models in which the poverty ratio is explained by financial deepening, controlling for international openness, inflation rate, and economic growth. From the dynamic generalised method of moments (GMM) estimation, we find that financial deepening and economic growth alleviate poverty, while international openness and the inflation rate have the opposite effect. These results are robust to changes in the poverty ratios in rural areas, urban areas, and the whole economy.

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Financial development is considered to be an integral factor in the economic growth of a country. So far, many studies have noted that a well-functioning financial system that mobilises savings, allocates resources, and facilitates risk management contributes to economic growth by supporting capital accumulation, improving investment efficiency, and promoting technological innovation (Kirkpatrick, 2000, p. 366). It has also been argued that economic growth creates the demand for financial services, which in turn leads to financial development. Indeed, empirical studies employing a causality method suggest that there may be a bi-directional causal relationship between financial development and economic growth (e.g. Demetriades and Hussein, 1996; Luintel and Khan, 1999; Apergis *et al.*, 2007).

However, these close relations between finance and growth do not necessarily mean that financial development contributes to poverty reduction (Beck *et al.*, 2007, p. 46). Typically, governments in developing countries are faced with the task of realising economic growth that includes equitable income distribution and poverty reduction. In other words, economic growth can be categorised as either growth with rising income inequality and poverty, or growth with falling income inequality and poverty. The differences between these two categories can alter the impacts of growth on the poor. If financial development increases average growth only by increasing the incomes of the rich and hence worsening income inequality, then financial development will not help the poor (*ibid*, p. 46). Therefore, based on the close relations between finance and growth, there is a growing body of empirical studies that analyses the effects of financial deepening on income distribution on the one hand and poverty conditions on the other.

Studies on financial deepening and income distribution include Li *et al.* (1998), Milanovic (2005), Clarke *et al.* (2006), Beck *et al.* (2007), Kai and Hamori (2009), and Ang (2010), and generally observe that financial deepening helps reduce income inequality. Most studies on financial deepening and poverty (e.g. Honohan, 2004; Jalilian and Kirkpatrick, 2005; Beck *et al.*, 2007; Jeanneney and Kpodar, 2008; Quartey, 2008; Odhiambo, 2009, 2010) point out that financial deepening affects poverty reduction directly and also has an indirect impact through its effect on economic growth. In short, prior research tends to suggest that financial deepening contributes to both inequality reduction and poverty alleviation. However, these findings are mostly based on data for a

large sample of countries; in this paper, we examine whether the findings from previous studies can be applied to a specific country, India.

We chose to examine poverty issues in India because this country is estimated to have the world's largest number of poor people. Over the last few decades, the poverty ratio in India has steadily decreased. In fact, according to national estimates, the percentage of the population below the poverty line (poverty headcount ratio) has fallen from 54.9% in fiscal year 1973 to 27.5% in fiscal year 2004. During the same period, however, the number of people below the poverty line has fallen only slightly, from 321 million to 317 million, partly due to rapid growth of the national population. Recently, under the slogan of 'Inclusive Growth', the Indian government has attempted to realise poverty reduction with economic growth accompanied by equitable distribution of the benefits of growth to all people, including those in the poor and weaker sections of society. Meanwhile, Chen and Ravallion (2008) point out that, in India, around 456 million people still live below the new international poverty line of $1.25 a day, using 2005 purchasing power parity (PPP) prices. This corresponds to one third of the world's poor, and exceeds the number of poor in sub-Saharan Africa as a whole. Therefore, although India has enjoyed rapid economic growth for a decade, poverty reduction remains one of its biggest challenges.

In order to empirically analyse the poverty issue in India, we focus our attention particularly on the effect of financial deepening on poverty reduction. This is because Ang (2010) recently examined the impact of financial deepening on income distribution and found that financial development helps reduce income inequality in India.[1] In our empirical analysis, we consider models in which the poverty headcount ratios in the whole economy, urban areas, and rural areas are explained by financial deepening and control variables including economic growth, international openness, and the inflation rate. We then estimate the models by using unbalanced panel data for 28 states and union territories covering seven time periods between fiscal 1973 and fiscal 2004.

[1] Ang (2010) states that, in India, the effect of financial deepening on income inequality appears to be different from that of financial liberalisation. He empirically analyses how income inequality responds to financial sector reforms by using various measures of financial liberalisation and finds that, unlike financial deepening, financial liberalisation seems to have a harmful effect on income distribution.

Empirical results mainly indicate the following findings. First, the coefficients of financial deepening are estimated to have a significant negative value, suggesting that an increase in financial development helps to alleviate poverty in India. Second, economic growth also displays a significant negative effect on poverty alleviation. Third, the coefficients of international openness are estimated to have a significant positive value, suggesting that greater international openness has the effect of increasing poverty. Fourth, like international openness, a rising inflation rate has an adverse effect on poverty alleviation. These findings are robust to changes in the dependent variable, namely, the poverty ratio in rural areas, urban areas, or the whole economy.

The paper is organised as follows. The next section briefly reviews relevant literature and discusses the contributions of this study. Section 2 explains the definitions, sources, and properties of the data, and Section 3 presents the models. In Section 4, we show the empirical results, and the final section summarises the main findings of this study and suggests policy implications.

1. Literature Review

Recently, there has been an increasing number of empirical analyses on the effects of financial deepening on poverty reduction, including several studies such as those by Honohan (2004), Jalilian and Kirkpatrick (2005), Beck *et al.* (2007), and Jeanneney and Kpodar (2008), that use a large sample of countries.[2] For example, Honohan (2004) attempts to explore the association between financial depth, as measured by private credit, and the poverty ratio by using cross-country data available for more than 70 developing countries. He finds that financial depth is negatively associated with the poverty ratio, even after controlling for the mean income, the income share of the top 10%, and the inflation rate.

Jalilian and Kirkpatrick (2005) also examine whether financial sector development can contribute to the goal of poverty reduction in many developed and developing countries, including

[2] Jalilian and Kirkpatrick (2002) and Beck *et al.* (2004) also analyse the impact of financial development on poverty reduction for a large sample of countries. They draw similar conclusions to Jalilian and Kirkpatrick (2005) and Beck *et al.* (2007), respectively.

India. In analysing this relationship, they incorporate three distinct research strands: the linking of financial development with economic growth, the linking of economic growth to poverty, and the linking of financial development and inequality. By estimating each link separately, they find that the ratio of private credit to gross domestic product (GDP) (a proxy for financial development) improves growth prospects, especially in poorer developing countries; that the income of the poor changes as much as average income; and that financial development has an inverted U-shaped relationship with income inequality. Based on this evidence, Jalilian and Kirkpatrick (2005, p. 652) conclude that financial development helps to reduce poverty; their results indicate that a unit of change in financial development improves the income growth prospects of the poor by almost 0.3%.

Also, Beck *et al.* (2007) investigate the impact of financial development on the poor by estimating the relationships between finance and changes in both income distribution and poverty levels, because financial development may affect the poor through both aggregate growth and changes in income distribution. Specifically, using the ratio of private credit to GDP as a proxy for financial development, they regress the growth of the Gini coefficient, the growth of the income share of the lowest quintile, and the growth of the poverty ratio, controlling for the relevant variables and using the panel data from 72 countries from 1960 to 2005 (68 countries from 1980 to 2005 in the case of the growth of the poverty ratio as a dependent variable). As a result, they find that an increase in financial development lowers income inequality, increases the income of the relatively poor disproportionately, and is strongly associated with poverty alleviation.

Moreover, Jeanneney and Kpodar (2008) assess how financial development helps reduce poverty directly and also indirectly through economic growth. Using the panel data for 75 developing countries from 1966 through 1999, they use the generalised method of moments (GMM) system to estimate models in which the average per capita income of the poorest 20% of the population is explained by real GDP per capita, the level and instability of financial development, and a set of control variables. Financial development is measured by either M3/GDP or private credit/GDP, whereas financial instability is defined as the average absolute value of residuals obtained by regressing the indicator of financial development on its lagged value and a linear trend. Their results

indicate that financial development measured by M3/GDP has a significant positive relationship with the mean income of the poor, that the direct effect of financial development on poverty reduction is greater than the indirect effect that it causes by increasing economic growth, and that financial instability accompanied by financial development significantly reduces the income of the poor and partially offsets the benefit of financial development.

As is the case with the studies referred to above, prior empirical studies with a large sample of countries generally suggest that financial deepening and economic growth are effective in alleviating poverty. There have also been studies on the relation between finance and poverty within particular countries. For example, Quartey (2008), Odhiambo (2009), and Odhiambo (2010) each focus on a country in sub-Saharan Africa and mainly examine the causal relationship between financial deepening and poverty reduction within each country by applying the Granger causality test and the cointegration test.

Quartey (2008) explores the interrelationship between financial development, savings mobilisation, and poverty reduction in Ghana from 1970 to 2001. By conducting a pairwise causality test, he finds that financial development, measured as the ratio of private credit to GDP, Granger-causes poverty reduction, measured in terms of per capita consumption, although it does not Granger-cause savings mobilisation. Odhiambo (2009) examines the dynamic relationships among financial development, economic growth, and poverty reduction in South Africa from 1960 to 2006, employing a trivariate causality test based on an error correction model. The empirical results of the Granger-causality test indicate that M2/GDP (a proxy for financial development) and economic growth cause an increase in per capita consumption (a proxy for poverty reduction), and that economic growth causes financial development. Moreover, Odhiambo (2010) empirically analyses the causal relationship between financial development and poverty alleviation in Zambia from 1969 to 2006. She examines the effect of three proxies for financial development—M2/GDP, private credit/GDP, and domestic money bank assets—on per capita consumption, a proxy for poverty levels. Using a bivariate causality test based on an error correction model, she finds that financial development seems to cause poverty reduction when private credit and domestic money bank assets

are used, while the reverse causality is found when M2/GDP is used. Table 1 summarises the above-mentioned literature on the finance-poverty nexus.

In comparison, this paper differs from the reviewed literature in the following ways. First, we examine the impact of financial deepening on poverty alleviation in India by utilising state-wise panel data. As far as we are aware, this is the first attempt to analyse the finance-poverty nexus in India using a state-level framework. Second, in estimating the models, we apply the dynamic GMM estimator to the panel data. This allows us to examine the dynamic movement of dependent variables and to deal with the endogeneity problem. Third, in contrast to prior studies that use private credit and/or monetary aggregates as a proxy variable for financial development, this paper utilises the amount of credit and deposits of the scheduled commercial banks to measure financial depth in India.[3] This reflects the relatively important role of commercial banks in the Indian financial system. Fourth, in our empirical analysis of finance and poverty, we consider economic growth, international openness, and inflation rate as the control variables. To measure the degree of international openness, we use two indicators: the openness to trade and foreign investment. Finally, in this paper, we present the empirical results for the whole economy as well as for rural and urban areas, and show the impacts of individual explanatory variables on the poverty ratio in each area.

2. Data

To assess the impact of financial development on poverty, this paper uses the unbalanced panel data of 28 states and union territories in India over the period from fiscal 1973 to fiscal 2004, covering seven

[3] In India, commercial banks can be broadly classified into two categories: scheduled and non-scheduled banks. Scheduled banks are the banks which are included in the Second Schedule of the Reserve Bank of India Act. This inclusion entitles the banks to avail of certain services from the central bank such as accommodations in the form of refinancing and loans and advances and the granting of authorised dealer's licences to handle foreign exchange business (RBI, 1995, p. 108). Correspondingly, scheduled banks are required to maintain a minimum amount of capital and obey the central bank directives regarding cash reserves (Sen and Vaidya, 1997, p. 37). In contrast, non-scheduled banks are excluded from the Second Schedule of the Reserve Bank of India Act. In fact, almost all of the commercial banks in India are classified as scheduled banks.

time periods (1973, 1977, 1983, 1987, 1993, 1999 and 2004).[4] The explained variable is the poverty ratio, while the explanatory variables are the measure of financial deepening and other conditioning information variables (see Table 2 and Data Appendix for more precise definitions).

The poverty headcount ratio (POV) is measured by the state-wise poverty ratio, namely, the percentage of people below the poverty line set by India's government.[5] We consider the *POV* in the whole country and in urban and rural areas separately. The data is obtained from the Reserve Bank of India (RBI) (2009) and the websites of the Planning Commission and Indiastat.com.

Financial deepening is measured by two variables. One is the logarithm of the credit amount of a region's scheduled commercial banks as a share of the output in the same region ($FD1$). The other is the logarithm of the deposit amount of a region's scheduled commercial banks as a share of the output in the same region ($FD2$). Each measure is related to the scheduled commercial banks since these banks have played a dominant role in the Indian financial system; they have typically accounted for around 70% of the total assets of financial intermediaries in India, at least during the last couple of decades.

Financial deepening is thought to promote efficient credit allocation, risk reduction through diversified investment in financial intermediaries, and lowering of the transaction costs of these intermediaries through information generation. As a result, it is generally believed that financial deepening will promote economic growth and thereby reduce income inequality. Furthermore, it is possible to deduce that financial deepening contributes to poverty reduction by eliminating credit constraints on the poor and increasing their productive assets and productivity (World Bank, 2001; Jalilian and Kirkpatrick, 2002). As surveyed in the previous section, empirical analyses, albeit limited, actually support the evidence that financial deepening is conducive to poverty reduction.

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[4] All benchmark years are fiscal years except for 1983, which is the calendar year.

[5] In India, the poverty line is based on a minimum consumption expenditure anchored in a nutritional norm of 2400 calories per person per day in rural areas and 2100 calories per person per day in urban areas (RBI, 2009, p. 494). These poverty lines are then applied to the household consumption expenditure distribution of the National Sample Survey Organization (NSSO) to estimate the proportion and number of poor at the state level (*ibid*, p. 494). Although the 61st round of the Consumer Expenditure Survey conducted in fiscal 2004 by the NSSO permits comparable estimates of inequality and poverty with the 50th (fiscal 1993) and earlier rounds, it is not strictly comparable to the 55th round (fiscal 1999) because the design of the National Sample Survey changed in the 55th round (Datt and Ravallion, 2002, pp. 93–94; Himanshu, 2007, p. 497).

In terms of the conditioning information, we control for two sets of factors: the macroeconomic environment and the regional environment. For the macroeconomic environment, we take into consideration the measure of international openness and the inflation rate. For the regional environment, we take account of the output growth rate of each region.

International openness. There have been many theoretical and empirical studies conducted to analyse the impact of international openness on the poor in developing countries, but a general consensus on this topic has not yet been formed. For example, according to the standard general equilibrium trade model, global economic integration should help the poor in developing countries since these countries have a comparative advantage in producing goods that use unskilled labour (Harrison and McMillan, 2007, p. 123). Also, empirical studies such as Dollar and Kraay (2004) observe that international openness measured in terms of trade integration has the effect of alleviating poverty in a large sample of countries. On the other hand, a question is also raised from the theoretical and empirical perspectives as to whether international openness or globalisation actually contributes to poverty reduction in developing countries (e.g. Wade, 2004; Milanovic, 2005; Topalova, 2005; Davis and Mishra, 2007). Therefore, a more detailed analysis of this topic, including country-level analyses, is required.

In this paper, we use two variables to capture the degree of international openness and its impact on the poverty ratio. One is the sum of a country's exports and imports as a share of GDP ($OPEN1$). The other is the net inflow of foreign direct investment into India as a share of its GDP ($OPEN2$). Since the net inflow of foreign direct investment can be negative, we do not use the logarithmic value for the measure of international openness.

Inflation rate. To capture the macroeconomic environment, we also control for India's inflation rate (INF). The inflation rate is calculated as the growth rate of the wholesale price index, which is obtained from RBI (2009). High and unpredictable inflation is thought to have a disproportionally negative impact on the poor because the poor have relatively limited access to financial instruments

that hedge against inflation and are also likely to have a larger share of cash in their small portfolios (Easterly and Fischer, 2001, p. 160; Holden and Prokopenko, 2001, p. 30). Indeed, prior empirical studies such as Romer and Romer (1998) and Easterly and Fischer (2001) generally support this position for a large sample of countries. Therefore, even in the Indian context, we expect inflation to be detrimental to the poor.

Output growth. A large number of studies have pointed out that financial development helps reduce poverty indirectly through its effect on economic growth. This suggests that economic growth is an effective instrument for poverty reduction. Meanwhile, economic growth may not be a sufficient condition for poverty alleviation (Holden and Prokopenko, 2001, p. 7). Theoretically, it is possible that in certain countries the benefit of economic growth for the poor is undermined or even offset if growth is accompanied by an increase in income inequality (Jeanneney and Kpodar, 2008, p. 3). However, recent empirical evidence does not support the argument that, in general, economic growth affects income distribution. For example, by using data from a sample of 92 countries over four decades, Dollar and Kraay (2002) empirically find that incomes of the poor on average rise in proportion to average incomes, suggesting that economic growth typically benefits the poor as much as everyone else. Moreover, for 49 developed and developing countries during the period from 1947 to 1994, Li *et al.* (1998) observe that income inequality measured by the Gini coefficient is relatively stable over time within countries, though it varies significantly across countries. Therefore, based on these research results, economic growth is expected to help alleviate poverty.

To control for economic growth in a regional environment, we use the output growth (y) of a region. The regional output growth is calculated as the growth rate of the per capita output in each state and union territory.[6]

[6] Alternatively, we also tried using the level of per capita income instead of the growth rate in our empirical analysis. However, we found that the model specification is rejected in most cases when we use the level of per capita income.

3. Models

This paper uses four models, specified as follows.

Model 1:

$$POV_{it} = \lambda POV_{i,t-1} + \beta_{i0} + \beta_{i1} FD1_{it} + \beta_{i2} OPEN1_t + \beta_{i3} INF_t + \beta_{i4} y_{it} + u_{it}, \quad (1)$$

Model 2:

$$POV_{it} = \lambda POV_{i,t-1} + \beta_{i0} + \beta_{i1} FD1_{it} + \beta_{i2} OPEN2_t + \beta_{i3} INF_t + \beta_{i4} y_{it} + u_{it}, \quad (2)$$

Model 3:

$$POV_{it} = \lambda POV_{i,t-1} + \beta_{i0} + \beta_{i1} FD2_{it} + \beta_{i2} OPEN1_t + \beta_{i3} INF_t + \beta_{i4} y_{it} + u_{it}, \quad (3)$$

Model 4:

$$POV_{it} = \lambda POV_{i,t-1} + \beta_{i0} + \beta_{i1} FD2_{it} + \beta_{i2} OPEN2_t + \beta_{i3} INF_t + \beta_{i4} y_{it} + u_{it}, \quad (4)$$

where POV_{it} is the poverty ratio for region i at time t, $FD1_{it}$ is the logarithm of credit amount as a share of the output for region i at time t, $FD2_{it}$ is the logarithm of deposit amount as a share of the output for region i at time t, $OPEN1_t$ is the sum of exports and imports as a share of the country's GDP at time t, $OPEN2_t$ is the net inflow of foreign direct investment into the country as a share of GDP at time t, INF_t is the country's inflation rate at time t, y_{it} is the growth rate of output for a region i at time t, u_{it} is the error term, $i(=1,2,\cdots,N)$ is the number of cross-sections, and $t(=1,2,\cdots,T)$ is the number of time series.

These models are used to examine the effects of financial deepening on the poverty ratio. Models 1 and 2 employ the ratio of credit to GDP as the measure of financial deepening, whereas Models 3 and 4 use the ratio of deposits to GDP as the measure of financial deepening. Models 1 and 3 utilise the trade to GDP ratio as the measure of international openness, whereas Models 2 and 4 use the foreign direct investment to GDP ratio as the measure of globalisation. These models are applied

to check whether the empirical results are robust with respect to the choice of the measures of financial deepening and international openness. We expect that financial development will ease the credit constraints on the poor, thus decreasing the poverty ratio. Our analysis uses the inflation rate and the regional growth rate as additional control variables.

4. Empirical Results

4.1 *Results for the Whole Country*

Table 3 reports the empirical results for Models 1, 2, 3, and 4 when we use the poverty ratio for the whole country. Since explanatory variables include the lagged value of the explained variable, we cannot apply the ordinary regression techniques. Instead, we estimate each model using the dynamic panel GMM estimators developed by Arellano and Bond (1991). Thus, we can also deal with the endogeneity problem.[7]

As is clear from Table 3, the coefficients of the credit to regional output ratio ($FD1$) are estimated to be negative (–9.166 for Model 1 and –9.081 for Model 2) and are statistically significant at the 1% level. The empirical results indicate that the coefficients of the deposits to regional output ratio ($FD2$) are estimated to be negative (–11.356 for Model 3 and –11.359 for Model 4) and are statistically significant at the 1% level. Our results reveal that the poverty ratio decreases as the financial system deepens.

With regard to other control variables, we examine the effects of two macro variables on the poverty ratio: the measure of openness and the inflation rate. With respect to the influence of the measure of openness on the poverty ratio, the table reveals that the coefficients of the trade to GDP ratio ($OPEN1$) are estimated to be positive (0.002 for Model 1 and 0.003 for Model 3) and are statistically significant at the 1% level. The empirical results also indicate that the coefficients of the net inflow of foreign direct investment to GDP ratio ($OPEN2$) are estimated to be positive (0.039 for

[7] For each model, the poverty ratio is used as the dynamic instrumental variable, and the measures of openness, inflation rate, and regional growth rates are used as the standard instrumental variables.

Model 2 and 0.055 for Model 4) and are statistically significant at the 5% level. Our results show that the poverty ratio increases as the degree of openness increases.

Next, we examine the effects of inflation on the poverty ratio. The coefficients of inflation (*INF*) are estimated to be positive (0.327 for Model 1, 0.394 for Model 2, 0.440 for Model 3, and 0.535 for Model 4) and are statistically significant at the 1% level for all cases. Thus, an increase in inflation rate increases, and therefore worsens, the poverty ratio.

Furthermore, we analyse the effects of regional variable on the poverty ratio. This paper uses the regional growth rate as the regional variable. As the table shows, the coefficients of regional growth rate of output (*y*) are estimated to be negative (–0.997 for Model 1, –0.968 for Model 2, –1.581 for Model 3, and –1.543 for Model 4) and are statistically significant at the 1% level. Our results indicate that an increase in regional growth rate decreases, and therefore improves, the poverty ratio.

Finally, Table 3 reports the J statistic and its associated p-value for each model. The J statistic is used as a test of over-identifying moment conditions. As is clear from the table, the over-identifying restriction cannot be rejected at the 5% significance level and thus the model specification is empirically supported.

4.2 *Results for the Urban Areas*

Table 4 reports the empirical results when we use the poverty ratio for the urban areas. As is clear from this table, the coefficients of the credit to regional output ratio ($FD1$) are estimated to be negative (–6.194 for Model 1 and –6.693 for Model 2) and are statistically significant at the 1% level. The empirical results indicate that the coefficients of the deposits to regional output ratio ($FD2$) are estimated to be negative (–6.081 for Model 3 and –6.441 for Model 4) and are statistically significant at the 1% level. Our results reveal that the poverty ratio decreases as the financial system deepens in the urban areas.

Next, we examine the influence of the measure of openness on the poverty ratio. The table reveals that the coefficients of the trade to GDP ratio ($OPEN1$) are estimated to be positive (0.004 for

Model 1 and 0.005 for Model 3) and are statistically significant at the 1% level. The empirical results also indicate that the coefficients of the net inflow of foreign direct investment to GDP ratio (*OPEN2*) are estimated to be positive (0.096 for Model 2 and 0.114 for Model 4) and are statistically significant at the 1% level. Our results show that the poverty ratio increases as the degree of openness increases in the urban areas.

Third, we analyse the effects of inflation on the poverty ratio. The coefficients of inflation (*INF*) are estimated to be positive (0.109 for Model 1, 0.235 for Model 2, 0.135 for Model 3, and 0.284 for Model 4) and are statistically significant at the 5% level for Models 1 and 3 and at the 1% level for Models 2 and 4. Thus, an increase in inflation rate worsens the poverty ratio in the urban areas.

Furthermore, we analyse the effects of regional growth rate on the poverty ratio. As the table shows, the coefficients of regional growth rate of output (*y*) are estimated to be negative (–1.413 for Model 1, –1.349 for Model 2, –1.775 for Model 3, and –1.764 for Model 4) and are statistically significant at the 1% level. Our results indicate that an increase in regional growth rate improves the poverty ratio in the urban areas.

Finally, as is clear from the table, the over-identifying restriction cannot be rejected at the 5% significance level and thus the model specification is empirically supported. The results in Table 4 are consistent with those shown in Table 3.

4.3 *Results for the Rural Areas*

Table 5 reports the empirical results when we use the poverty ratio for the rural areas. First, we analyse the effects of financial deepening (*FD*1 or *FD*2) on the poverty ratio. As is clear from this table, the coefficients of financial deepening are estimated to be negative (–8.674 for Model 1, –8.517 for Model 2, –9.890 for Model 3, and –9.979 for Model 4) and are statistically significant at the 1% level for all cases. Our results reveal that the poverty ratio decreases as the financial system deepens in the rural areas.

Next, we examine the influence of the measure of openness (*OPEN*1 or *OPEN*2) on the

poverty ratio. The empirical results indicate that the coefficients of the measure of openness are estimated to be positive (0.003 for Model 1, 0.047 for Model 2, 0.003 for Model 3, and 0.060 for Model 4) and are statistically significant at the 1% level for Models 1 and 3 and at the 5% level for Models 2 and 4. Our results show that the poverty ratio increases as the degree of openness increases in the rural areas.

Third, we analyse the effects of inflation (*INF*) on the poverty ratio. The coefficients of inflation are estimated to be positive (0.299 for Model 1, 0.395 for Model 2, 0.397 for Model 3, and 0.510 for Model 4) and are statistically significant at the 1% level for all cases. Thus, an increase in inflation rate worsens the poverty ratio in the rural areas.

Furthermore, we analyse the effects of regional growth rate (*y*) on the poverty ratio. As the table shows, the coefficients of regional growth rate of output are estimated to be negative (–1.180 for Model 1, –1.118 for Model 2, –1.647 for Model 3, and –1.601 for Model 4) and are statistically significant at the 1% level for all cases. Our results indicate that an increase in regional growth rate improves the poverty ratio in the rural areas.

Finally, as is clear from the table, the over-identifying restriction cannot be rejected at the 5% significance level, and thus the model specification is empirically supported. The results given in Table 5 are consistent with those shown in Tables 3 and 4.

4.4 *Summary*

Table 6 summarises the empirical results of this study. Financial deepening and economic growth improve the poverty ratio, whereas international openness and inflation worsen the poverty ratio. Our results for financial deepening, inflation, and economic growth are typically consistent with those of prior research.

5. Concluding Remarks

A number of studies hitherto conducted to examine the finance-growth nexus have suggested that the

development of financial intermediaries contributes to economic growth (e.g. King and Levine, 1993*a*, 1993*b*; Rajan and Zingales, 1998; Levine *et al.*, 2000). Moreover, given the close relation between finance and growth, a growing body of empirical studies has analysed the effect of financial deepening on poverty reduction for a variety of countries and regions. The principal objective of this paper is to investigate this issue empirically for the country with the largest poor population, India. In our empirical analysis, we consider models in which the poverty ratio is explained by financial deepening, controlling for international openness, inflation rate, and economic growth. We then estimate the models by using unbalanced panel data for 28 Indian states and union territories covering seven time periods (1973, 1977, 1983, 1987, 1993, 1999 and 2004). From the dynamic GMM estimation, we obtain the following main findings.

First, financial deepening has a statistically significant positive effect on the poverty ratio in the whole economy and, separately, in urban areas and rural areas. Since we measured financial deepening by the credit amount or deposit amount of the scheduled commercial banks, this indicates that the development of the banking sector has been beneficial for the poor in India. Our results are generally in line with those of existing studies including Honohan (2004), Jalilian and Kirkpatrick (2005), Beck *et al*. (2007), and Jeanneney and Kpodar (2008), albeit with different samples and different econometric techniques.

Second, like financial deepening, the coefficient of economic growth is estimated to have a significant negative value in the whole economy as well as in urban areas and rural areas. This implies that economic growth is effective in increasing not only the country's average income but also the income of the poor within the country. Since the early 1990s, a clear trend of rising inequality has emerged in India, replacing what had previously been a flat trend in urban areas and a declining trend in rural areas (Datt and Ravallion, 2009, p. 18). Our results indicate that, in spite of the recent increase in inequality, economic growth actually helps to alleviate poverty. Using decomposition analysis, Bhanumurthy and Mitra (2004) observe that the growth/mean effect, rather than the inequality effect and the population shift effect, accounts for much of the decline in poverty in most of their sample states over the time periods from 1983 to fiscal 1993 and from fiscal 1993 to fiscal 1999. Besides, by

regressing the poverty measure on either per capita consumption or income, Datt and Ravallion (2009) also find that from 1958 to 2006 economic growth tended to reduce poverty in India. Accordingly, our result seems to be consistent with these results from previous studies.

Third, international openness has a statistically significant negative effect on the poverty ratio in the whole economy and in urban and rural areas taken separately. This result holds in cases where international openness was measured by either *OPEN*1 or *OPEN*2. Among the literature, the impact of economic globalisation on poverty is still an important source of debate. For example, Dollar and Kraay (2004) show that changes in trade volume have a strong positive relationship with changes in growth rate for roughly 100 countries. Taking into account the evidence from Dollar and Kraay (2002), they state that the increase in growth rates that accompanies expanded trade generally translates into proportional increases in the income of the poor. Meanwhile, Milanovic (2005) estimates the pooled cross-country regressions that relate trade and financial openness to relative income shares across 138 decile shares in three time periods and finds that at very low national income levels it is the rich who benefit from trade openness, but, as income levels rise, the incomes of the poor and the middle class rise proportionately more than the incomes of the rich (Milanovic, 2005, p. 40). Partly consistent with the latter study, our result indicates that international openness may hurt the poor in both rural and urban areas, implying that the current phase of economic globalisation supported by Anglo-Saxon capitalism is not the method for solving poverty at the present time in India.[8]

Finally, the coefficient of the inflation rate is estimated to have a significant positive value in the whole economy and in both urban and rural areas; this suggests that inflation has an adverse effect on poverty in India. This result is in line with most comparable results in the literature. For example, Romer and Romer (1998) examine the relationship between the long-run performance of monetary policy and the average income of the poor by using cross-country regression and find that low inflation as well as stable growth in aggregate demand is associated with improved well-being of the

[8] Further research may be necessary to analyse the existence of a nonlinear relationship between economic globalisation and poverty in India, as stressed by Agenor (2002).

poor for a large sample of countries.[9] In the Indian debate, Datt and Ravallion (1998) attempt to explain the deviations from the trend rates of progress in reducing rural poverty by using pooled state-level data for the period from 1957 to 1991, and point out that the rural poor are adversely affected in the short run by rising inflation. Moreover, Datt and Ravallion (2002) and Pradhan (2008) also draw a similar conclusion to Datt and Ravallion (1998).[10]

In sum, we conclude from the above results that further financial deepening as well as rapid economic growth will become an important priority for India as it attempts to reduce poverty. Since the start of economic reforms in the early 1990s, India has promoted financial deepening to a large extent. In fact, the credit and deposit amounts of the scheduled commercial banks, given as shares of real GDP, have increased, respectively, from 6.6% and 10.4% in the 1980s to 16.9% and 30.8% in the 1990s, and to 83.1% and 114.8% in 2008. However, when these banks are categorised into regions such as metropolitan, urban, semi-urban and rural, it is found that metropolitan areas have shown the highest rates of growth and that regional differences between metropolitan and other areas have expanded over time, especially since the 1990s.

Recently, the Indian government has attempted to realise faster and more inclusive growth so that all people, including the poor and the weaker sections of society, equitably receive the benefits of growth. Following this, in April 2005, the RBI, which is India's central bank, formally announced that 'financial inclusion' would be one of its policy objectives, and it has since undertaken various initiatives to ensure access to and usage of formal financial services for all people, especially hitherto excluded people, at an affordable cost.[11] These measures are expected to promote financial deepening

[9] Besides, Easterly and Fischer (2001) use pooled cross-country samples and find that direct measures of the well-being of the poor such as the change in their share of national income, the percent decline in poverty, and the percent change in the real minimum wage are negatively correlated with the inflation rate.

[10] Datt and Ravallion (2002) analyse empirically how the poverty ratio is affected by the relevant variables, using unbalanced panel data for 15 Indian states from 1960 to 1994. They find that a higher inflation rate increases the incidence of poverty, while higher farm yield, state government spending, and nonagricultural output per person reduce the poverty ratio. Moreover, in an attempt to examine the determinants of rural poverty in India from fiscal 1987 to fiscal 1999, Pradhan (2008) observes that the consumer price index (CPI) for agricultural labourers has a positive causal effect, suggesting that an increase in food prices leads to an increase in rural poverty.

[11] For example, the RBI advised the commercial banks to make available a basic 'no-frills' banking account that has a low or nil minimum balance requirement and charges, introduce a General Credit Card facility in rural and semi-urban areas, and simplify the know-your-customer procedure for those accounts with small balances and lower credit limits (Leeladhar, 2008, pp. 1508–1509; RBI, 2008, p. 306, p. 308).

by expanding the reach of banking facilities to wider sections of the population and, given our empirical results, to contribute to poverty reduction.

In addition, the empirical results in this paper indicate that, to make progress on poverty reduction, Indian authorities should also consider the negative impacts that higher inflation and more international openness have on the poor. Although the RBI defines the pursuit of price stability and economic growth as its ultimate objectives, it is not easy for India to control inflation. This is partly because the inflation rate is subject to both demand and supply shocks under rapid economic growth (Singh, 2006, p. 2961). In spite of the difficulties, however, there is still an urgent need for the central bank to tackle inflationary pressure from the perspective of poverty alleviation. Moreover, regarding international openness, it is inevitable that India will become further integrated into the global economy through trade and capital liberalisation and economic growth. Accordingly, the government will be increasingly required to expand support for those people adversely affected by globalisation.

Data Appendix

1. The 28 states and union territories covered in this paper are as follows:

Andhra Pradesh, Arunachal Pradesh, Assam, Bihar, Goa, Gujarat, Haryana, Himachal Pradesh, Jammu & Kashmir, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Manipur, Meghalaya, Mizoram, Nagaland, Orissa, Punjab, Rajasthan, Sikkim, Tamil Nadu, Tripura, West Bengal, Andaman & Nicobar Islands, Chandigarh, Delhi, and Pondicherry

2. The explanation and source of each data set used in this paper are as follows:

Poverty Ratios: Rural, Urban and Combined (%)
Source:
(1) RBI (2009), except for the data mentioned below
(2) The website of the Government of India's Planning Commission (http://www.planningcommission.nic.in/) for the combined poverty ratios of fiscal 1977 and fiscal 1987
(3) The website of Indiastat.com (http://www.indiastat.com/default.aspx) for the rural and urban poverty ratios of fiscal 1977 and fiscal 1987

Per Capita Net State Domestic Product: Per Capita Net State Domestic Product at factor cost (at constant prices; base year: fiscal 1999)
Source:
(1) The website of the Central Statistical Organization (http://mospi.nic.in/cso_test1.htm)
(2) The website of Indiastat.com

Net State Domestic Product: Net State Domestic Product at factor cost (at constant prices; base year: fiscal 1999)
Source:
(1) The website of the Central Statistical Organization
(2) The website of Indiastat.com

Population: Population is calculated as the ratio of the net state domestic product to the per capita net state domestic product.

Deposit Amount: The state-wise deposits of scheduled commercial banks
Source:
Various issues of *Banking Statistics* and *Basic Statistical Returns of Scheduled Commercial Banks in India*

Credit Amount: The state-wise credit of scheduled commercial banks
Source:
Various issues of *Banking Statistics* and *Basic Statistical Returns of Scheduled Commercial Banks in India*

Trade Volume: The sum of nominal exports and nominal imports
Source:
RBI (2009)

Foreign Direct Investment Net Inflow: The sum of equity capital, reinvestment of earnings, other long-term capital, and short-term capital, as shown in the balance of payments, converted into Indian currency using the exchange rates described below
Source:
World Bank (2008)

Exchange Rates: Bilateral exchange rates between the U.S. and India
Source:
RBI (2009)

Nominal GDP: GDP at factor cost (base year: fiscal 1999)
Source:
RBI (2009)

Wholesale Price Index (WPI): The annual average of all commodities (base year: fiscal 1993 = 100)
Source:
RBI (2009)

Inflation: The log difference of the WPI

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Table 1 *Summary of Literature on the Finance-Poverty Nexus*

Study	1) Period 2) Region/Country	Financial Deepening Measure	Poverty Measure	Main Findings
Honohan (2004)	1) - 2) 70 to 76 countries	Private credit/GDP	Poverty headcount ratio	Financial depth is negatively associated with headcount poverty, even after taking account of mean income and inequality.
Jalilian and Kirkpatrick (2005)	1) 1960–1995 2) 42 countries	Private credit/GDP	Growth of income of the poor	Financial sector growth contributes to poverty reduction through the growth enhancing effect, up to a threshold level of economic development.
Beck *et al.* (2007)	1) 1980–2005 2) 68 countries	Private credit/GDP	Growth of poverty headcount ratio	Financial development is associated with poverty alleviation.
Jeanneney and Kpodar (2008)	1) 1966–1999 2) 75 countries	Private credit/GDP or M3/GDP	Average per capita income of the poor (or poverty headcount ratio/ poverty gap)	Financial development measured by M3/GDP has a significant positive relationship with the mean income of the poor.
Quartey (2008)	1) 1970–2001 2) Ghana	Private credit/GDP or M2/GDP	Per capita consumption	Financial sector development is measured by private credit/GDP Granger-causes poverty reduction.
Odhiambo (2009)	1) 1960–2006 2) South Africa	M2/GDP	Per capita consumption	Both financial development and economic growth Granger-cause poverty reduction, while economic growth Granger-causes financial development.
Odhiambo (2010)	1) 1969–2006 2) Zambia	Private credit/GDP, M2/GDP, or domestic money bank assets	Per capita consumption	Financial development causes poverty reduction when private credit/GDP or domestic money bank assets are used, while the reverse causality is detected when M2/GDP is used.

Table 2 *Explanation of Each Variable*

Variables	Explanation
Explained Variable	Poverty headcount ratio of each region (POV)
Explanatory Variable	Financial deepening (1) logarithm of credit amount in a state as a share of the regional output in the same region ($FD1$) (2) logarithm of deposit amount in a state as a share of the regional output in the same region ($FD2$)
Control Variables	
Macroeconomic Variables	International openness (1) the sum of exports and imports as a share of GDP in a country ($OPEN1$) (2) net inflow of foreign direct investment as a share of GDP in a country ($OPEN2$) Inflation rate of a country (INF)
Regional Variables	Output growth of a region (y)

Table 3 *Financial Deepening and Poverty: Whole Country*

	Model 1	Model 2	Model 3	Model 4
POV (-1)	–0.223	–0.258	–0.438	–0.488
	(0.001)***	(0.000)***	(0.000)***	(0.000)***
*FD*1	–9.166	–9.081		
	(0.000)***	(0.000)***		
*FD*2			–11.356	–11.359
			(0.000)***	(0.000)***
*OPEN*1	0.002		0.003	
	(0.000)***		(0.000)***	
*OPEN*2		0.039		0.055
		(0.014)**		(0.033)**
INF	0.327	0.394	0.440	0.535
	(0.000)***	(0.000)***	(0.000)***	(0.000)***
y	–0.997	–0.968	–1.581	–1.543
	(0.000)***	(0.000)***	(0.000)***	(0.000)***
J statistic	21.286	21.485	20.837	20.812
	(0.067)	(0.064)	(0.076)	(0.077)
Number of Observations	124	124	124	124

Note: Numbers in parentheses are p-values.
***, **, and * represent significance at the 1, 5, and 10% level, respectively.
The dependent variable is the poverty ratio (*POV*). *FD*1 is equal to the logarithm of the credit amount in a state as a share of the output in the same region. *FD*2 is equal to the logarithm of the deposit amount in a state as a share of the output in the same region. *OPEN*1 is the share of exports plus imports relative to GDP. *OPEN*2 is the share of foreign direct investment relative to GDP. *INF* is equal to the growth rate of the wholesale price index. *y* is the growth rate of the per capita output in each state.

Table 4 *Financial Deepening and Poverty: Urban Areas*

	Model 1	Model 2	Model 3	Model 4
POV (-1)	0.100	0.103	0.205	0.240
	(0.024)**	(0.037)**	(0.001)***	(0.001)***
*FD*1	–6.194	–6.693		
	(0.000)***	(0.000)***		
*FD*2			–6.081	–6.441
			(0.000)***	(0.000)***
*OPEN*1	0.004		0.005	
	(0.000)***		(0.000)***	
*OPEN*2		0.096		0.114
		(0.000)***		(0.000)***
INF	0.109	0.235	0.135	0.284
	(0.028)**	(0.000)***	(0.027)**	(0.000)***
y	–1.413	–1.349	–1.775	–1.764
	(0.000)***	(0.000)***	(0.000)***	(0.000)***
J statistic	16.151	13.978	18.158	16.140
	(0.241)	(0.375)	(0.152)	(0.242)
Number of Observations	124	124	124	124

Note: See Note to Table 3.

Table 5 *Financial Deepening and Poverty: Rural Areas*

	Model 1	Model 2	Model 3	Model 4
POV (-1)	–0.044	–0.099	–0.176	–0.249
	(0.470)	(0.086)*	(0.067)*	(0.001)***
*FD*1	–8.674	–8.517		
	(0.000)***	(0.000)***		
*FD*2			–9.890	–9.979
			(0.000)***	(0.000)***
*OPEN*1	0.003		0.003	
	(0.000)***		(0.002)***	
*OPEN*2		0.047		0.060
		(0.012)**		(0.013)**
INF	0.299	0.395	0.397	0.510
	(0.000)***	(0.000)***	(0.000)***	(0.000)***
y	–1.180	–1.118	–1.647	–1.601
	(0.000)***	(0.000)***	(0.000)***	(0.000)***
J statistic	20.523	19.720	18.965	18.078
	(0.083)	(0.102)	(0.124)	(0.155)
Number of Observations	124	124	124	124

Note: See Note to Table 3.

Table 6 *Summary of Empirical Results*

Explanatory and Control Variable	Effect on Poverty Ratio
Financial Deepening	Decreases (improves)
International Openness	Increases (worsens)
Inflation	Increases (worsens)
Economic Growth	Decreases (improves)