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Growth-Poverty Linkages: Does Sectoral Composition Matter for Pakistan?

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Abstract: This study seeks to investigate the growth in agricultural, industrial and services sector of Pakistan in terms of their relative impacts on poverty reduction within the country. Further, it identifies the dynamic effects of growth on poverty as a way to capture the usual 'trickle down' effects. Secondary data ranging from 1981-2010 are used in the analysis and the results are obtained through regression analysis. The findings reveal that poverty is mostly affected by the growth rate in industrial sector. Moreover, our findings suggest the presence of both 'static' as well as 'dynamic effects' of growth on poverty reduction. It is suggested in this paper that the government should make all out efforts to pursue the growth of the industrial sector at this transitional stage of the economy so that the slide towards poverty could be halted.

Key words: Poverty · Growth · Agriculture · Industry · Service · Past growth · Pakistan

INTRODUCTION

It is true that the traditional theories in the field of 'development economics' have been either grossly changed or completely replaced during the last six decades [1]. However, 'economic growth' of a country is still considered as one of the necessary conditions to uplift the masses from below the line of poverty. The economic history of the various countries also seems to suggest that even the poorest of the poor takes the benefit from the accelerated economic growth rate [2]. It is, therefore, widely accepted that overall economic growth reduces overall poverty.

There is sufficient research work on the growth-poverty linkages for example [3-7]. However, most of this empirical literature generally neglects the sector specific assessment of growth and its contribution towards poverty reduction. Moreover, the available literature deals mainly with the 'static effects' of growth on poverty while its 'dynamic effects' are generally ignored. In this research study, we combine all these perspectives which are thus far limited in the growth poverty literature with special reference to Pakistan. In particular, this study seeks to identify the relationship between sectoral compositions of growth and poverty reduction in Pakistan. In addition to this, we attempt to investigate the static as well as dynamic effects of growth on poverty.

Moreover our research study is useful in the sense that it tries to investigate the widely held belief that growth in agriculture sector is more poverty reducing than growth in industrial or services sector of Pakistan [8]. This perception is generally based on the fact that majority of our population lives in rural areas, attached directly or indirectly to agriculture sector. The effort in this research work is, therefore, to empirically test this assertion as to whether agriculture sector is more

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poverty reducing as opposed to the other two sectors (industrial and services sectors) in Pakistan. This is important to analyze as the economy of Pakistan has gone through the structural transformation with services sector taking the lead.

The available literature provides evidence that sectoral composition of growth affects the pattern of poverty in various countries. For example, in cross country estimations it is found that growth rates in different sectors of the economy plays important role in the poverty alleviation [9-12]. In case of India it is found that growth in agriculture and services sector has higher impact on poverty alleviation than manufacturing sector [13]. A multiplier decomposition technique applied to South Africa show that increase in the output of any sector decreases overall poverty [14]. With regard to the dynamic effects of growth, it is estimated that the impact of prior economic growth is significant on poverty alleviation [7].

A careful review of the literature on this issue reveals that most of the earlier work emphasized a generally positive impact of growth on poverty.However, the usual trickle down effects may not always be working especially in case of developing countries like Pakistan. Our study attempts to test this skepticism by analyzing the impacts of lagged values of growth on poverty. Since most of the domestic studies ascertain only poverty-growth relationship, our study contributed to this literature by analyzing the pattern of growth (sectoral composition) as well.

The plan of the paper is that section 2 discusses the methodology, while section 3 presents the results and discussion. This section is followed by a brief conclusion of the study.

MATERIALS AND METHODS

Annual time series data from 1981-2010 were collected from two sources; State Bank of Pakistan and Economic Survey of Pakistan. To estimate the coefficient of multiple linear regression model, Ordinary Least Square Method (OLS) was used. As per econometric theory, a time series has to be stationary in order to obtain consistent estimates. For this purpose, stationarity of the data was checked by using Augmented Dickey Fuller test [15-16].

The Model: Along with taking the overall growth, we disaggregate this into three sectors; agricultural sector, industrial sector and the service sector growth. The final form of the model used in this study is given below:

$$P = \beta_0 + \beta_1 GDP + \beta_2 AG + \beta_3 IND + \beta_4 SER + \beta_5 LGDP + \beta_6 EEXP + \varepsilon_i \quad (1)$$

where,

P = Head Count Index of Poverty
GDP = Growth rate of Gross Domestic Product.
AG = Growth Rate of Agricultural Sector.
IND = Growth Rate of Industrial Sector.
SER = Growth Rate of Services Sector.
LGDP = Lag Value of GDP Growth Rate.
EEXP = Expenditure on Education

ε_i is an error term which is assumed to be independently and normally distributed with zero mean and constant variance. β,s are the coefficients of the respective independent variables.

Data Stationarity: Non stationary data must be made stationary before analysis. In order to check the unit root hypothesis, Dickey-Fuller test is one of the most appropriate methods. To show the conditions for stationarity following first order autoregressive model was considered.

$$X_t = \square X_{t-1} + \mu_t \quad (1)$$

where t=1……..T

The number of lags in the Dickey Fuller (ADF) equation were chosen in order to ensure that serial correlation is absent. The DF test estimated the following equation by OLS:

$$\Delta Y_t = \alpha + \beta_{3t} + (\square - 1)\, Y_{t-1} + \mu_t \quad (2)$$

This equation indicates that series Y_t has both stochastic and deterministic trend, this can be used as Dickey Fuller equation for testing the hypothesis for unit root i.e. Ho: ($\square$ -1) = 0. The test statistic for the unit root hypothesis is t-statistics and the critical values. If the t calculated $\square$ is less than the critical value, then Y_t is non-stationary. Conversely, if the null hypothesis is rejected, Y_t is stationary.

The DF test is based on the assumption that μ_t is white noise and error term is not, there is auto correlation in the residual of OLS regression in eq. (2). We used two approaches which are meant to overcome this problem. First we generalized the testing equation of (2) on second

we adjusted the DF statistic. ADF made μ_t white noise, lagged value for the dependent variable were included on the right side of the DF equation. It became as follows

$$\Delta Y_t = \alpha_3 + \beta_{3t} + (\square_3 - 1)\, Y_{t-1} + \Sigma\, \theta_t \Delta Y_{t-1}\, \mu_t. \quad (3)$$

ADF test is based on the assumption that there is only one unit root in the hypothesis, however in some variables there were more than one unit root. For this first we tested the series Y_t in the level, the null hypothesis was not rejected, then we tested the first difference of the series Y_t for the presence of unit root and so on.

RESULTS AND DISCUSSION

The results of ADF test are given below and the level of significance was taken as 5%.

Table 1 show that only two variables which are highlighted by a star are stationary at the level form. In ADF test the values of ADF test statistic is compared with the 5% level of significance. If the ADF test statistic has greater value than 5% level of significance then that variable is called stationary. Here two variables AG and IND are stationary at the level form in both trended and non-trended whereas education expenditure is stationary when it is non trended

Table 2 show the results of ADF unit root test at the first difference form. Only two variables were stationary at their level forms. However, after differencing them at first, not all but five variables become stationary at first difference. All five variables are stationary with trend and intercept and without trend but with intercept because the value of ADF test statistic of GDP, AG, IND, SER, LGDP is greater than the critical value at 5% level of significance. After applying the unit root test at level form and at first difference form it was found that all variables were not stationary at level and first difference form. So the unit root test was applied at the second difference.

Table 3 shows the results at second difference. Here two variables which were not stationary at level and at first difference form also become stationary. All the ADF test statistic values are greater than the critical values at 5% level of significance. And the variables are stationary both with intercept and with intercept and trend. Further all the probabilities are approximately zero.

The estimated coefficient of growth rate in GDP is negative and has a significant impact on poverty reduction. This result affirms the theories in the economic literature that overall growth reduces overall poverty in the country. These results are in line with the findings of [10-11, 17-20].

Table 1: ADF Unit Root Test Results at Level Form.

Variables	ADF Test Statistic Without Intercept	ADF Test Statistic Trend and Intercept	Conclusion
P	-2.4473	-2.5148	1(1)
GDP	-2.8606	-2.81	1(1)
AG	-4.80313*	-4.7935*	1(0)
IND	-3.1890*	-3.2382*	1(0)
SER	-2.33	-2.4460	1(1)
LGDP	-2.8064	-2.7395	1(1)
EEXP	-3.4318*	-2.9608	1(0)
Critical Value	-2.9718	-3.5806	

P = Poverty, GDP = Growth rate of GDP, AG = Growth rate of Agriculture Sector, IND = Growth rate of Industrial Sector, SER = Growth rate of Services Sector, LGDP = Lag Value of GDP Growth Rate and EEXP = Expenditure on Education.

Table 2: ADF Unit Root Test Results at First Difference

Variables	ADF Test Statistic Without Intercept	ADF Test Statistic Trend and Intercept	Conclusion
P	-2.1343	-2.5068	1(1)
GDP	-5.6300*	-5.5290*	1(0)
AG	-6.3854*	-6.2531*	1(0)
IND	-5.8681*	-5.7593*	1(0)
SER	-5.6188*	-5.5440*	1(0)
LGDP	-5.4908*	-5.4043*	1(0)
EEXP	-2.7847	-3.0536	1(1)
Critical Value	-2.9762	-3.5875	

Table 3: ADF Unit Root Test Results at Second Difference

Variables	ADF Test Statistic Without Intercept	ADF Test Statistic Trend and Intercept	Conclusion
P	-4.3071*	-4.3332*	1(0)
GDP	-7.4736*	-7.3917*	1(0)
AG	-7.4974*	-7.3593*	1(0)
IND	-8.8175*	-8.5626*	1(0)
SER	-8.8177*	-7.9858*	1(0)
LGDP	-7.0442*	-6.9231*	1(0)
EEXP	-5.1418*	-5.0383*	1(0)
Critical Value	-2.9810	-3.5950	

Table 4: Results of OLS model

Independent variables	Coefficients	t-value
Constant	3.2359	1.733680*
GDP	-1.12446	-1.947576*
AG	-0.098706	-0.417194
IND	-0.487286	-2.164191**
SER	0.990668	1.957880*
LGDP	-1.063625	-3.034789***
EEXP	-0.87334	-4.176113***

Dependent Variable: (Poverty) R^2= 0.83, * 1% level of significance, ** 5% level of significance and *** 10% level of significance

The coefficient of growth rate in agriculture sector also shows negative impact, however this is statistically insignificant. Since this sector has strong forward linkages with the industrial sector, the potential poverty reducing impacts of agriculture sector cannot take place unless the vibrant growth in value addition takes place at the industrial level. The impact of growth in agriculture sector is minimized by number of factors which are explained by different researchers. Hussain and Ishfaq [21] discussed that increased food prices and over population are the factors which counter the effect of agricultural growth on poverty.

The result of our study shows that industrial growth is significantly negatively related with poverty. This could be because of the fact that this sector has the absorbing capacity of the unskilled labor workforce of the country. In addition to this, the steady growth rate in this sector as compared to the other sectors may also be another factor which makes it more poverty reducing. In a cross country analysis, Hasan and Quibria [22] also find that reduction in poverty is associated with the industrial growth in South Asia.

Regarding services sector growth, we found that it actually increases the poverty. There may be several reasons behind the simultaneous increase of growth rate and poverty in this sector. Since it mainly employs those individuals who are already above poverty line therefore growth in this sector of the economy worsen the income distribution in the country. Although this sector has the major share in GDP, the unskilled poor get less benefit from it because of lack of absorption of such a work force. The same case is presented by [23] who asserts that although the services sector in India contributes more in GDP share but it has no much employment absorption because it employs mostly the skilled labor. Further, Dutt and Lee [24] inform that whether the effect of services sector on poverty as negative or positive, depends on how the growth rate of this sector is measured.

The dynamic impact of growth on poverty is estimated by the lag values of GDP. The growth rate of previous year has negative and significant impact on the poverty of the present year. This result indicates that the 'trickle down effects of growth' does take place and this theory is still valid in case of Pakistan. The results are consistent with [7] which suggested that past growth has impact on the poverty reduction in the present.

CONCLUSIONS

The present study attempted to investigate the growth poverty nexus, the dynamic impact of growth on poverty and how sectoral growth rate affect poverty in Pakistan. The regression results indicated that the growth rate in industrial sectors matters for poverty reduction as compared to the agricultural and industrial sectors. Since Pakistan's economy has made a structural transition from agriculture to industry, the agricultural sector can be made more effective with respect to poverty reduction only when the vigorous industrial growth takes place. Thus the forward linkages of the agricultural sector are more important if it is to sustain as a viable sector of the economy. Moreover, pursuing a service sector led growth at a stage when the economy has not yet made a natural transition to this step is counterproductive.

REFERENCES

1. Todaro, M.P. and S.C. Smith, 2011. Contemporary Models of Development and Underdevelopment. Economic Development. Chapter 4. 11/E. Prentice Hall.
2. Rodrik, D., 2008. One Economics, Many Recipes: Globalization, Institutions and Economic Growth. World Trade Review, 7(3): 473-510.
3. Datt, G. and M. Ravallion, 2002. Is India's Economic Growth Leaving the Poor Behind? J. Economic Perspec., 16(3): 89-108.
4. Adams, R.H.J., 2004. Economic Growth, Inequality and Poverty: Estimating the Growth Elasticity of Poverty. World Develop., 32(12): 1989-2014.
5. Klasen, S., 2007. Economic Growth and Poverty Reduction: Measurement Issues using Income and Non-Income Indicators. World Develop., 36(3): 420-445.
6. Donaldson, J.A., 2008. Growth is Good for Whom, When, How? Economic Growth and Poverty Reduction in Exceptional Cases. World Develop., 36(11): 2127-2143.
7. Chambers, D., Y. Wu and H. Yao, 2008. The impact of Past Growth on Poverty in Chinese Provinces. J. Asian Econ., 19(14): 348-357.
8. Bhutto, A.W. and A.A. Bazmi, 2007. Sustainable Agriculture and Eradication of Rural Poverty in Pakistan. Natural Resource Forum, 31(4): 253-262.

9. Loayza, N.V. and C. Raddatz, 2006. The Composition of Growth matters for Poverty Alleviation. World Bank Policy Research Papers 4077, Washington DC.
10. Fosu, A.K., 2008. Inequality and the Impact of Growth on Poverty: Comparative Evidence for Sub-Saharan Africa. World Inst. Develop. Econ. Res., 45(5): 726-45.
11. Anwar, T., 2010. Role of Growth and Inequality in Explaining Changes in Poverty in Pakistan. Pakistan Development Review, 49(1): 1-17.
12. Arndt, C., A. Garcia., F. Tarp and J. Thurlow, 2010. Poverty Reduction and Economic Structure: Comparative Path Analysis for Mozambique and Vietnam. World Inst. Develop. Econ. Res., Working Paper, 2010/122.
13. Ravallion, M. and G. Datt, 1996. How Important to India's Poor is the Sectoral Composition of Economic Growth? The World Bank Economic Review, 10(1): 1-25.
14. Khan, H.A., 1999. Sectoral Growth and Poverty Alleviation: A Multiplier Decomposition Technique Applied to South Africa. World Develop., 27(3): 521-530.
15. Dickey, D.A. and W.A. Fuller, 1979. Distribution of Estimators for Autoregressive Time Series with a Unit Root. J. Amer. Statistical Assoc., 74(36): 427-431.
16. Dickey, D.A. and W.A. Fuller, 1981. Likelihood Ratio Statistics for Autoregressive Time Series with a Unit Root. Econometrica, 49(4): 1057-1072.
17. Balisacan, A.M. and N. Fuwa, 2004. Going Beyond Cross Country Averages: Growth, Inequality and Poverty Reduction in the Philippines. World Develop., 32(11): 1891-1907.
18. Dollar, D. and A. Kraay, 2002. Growth is good for the Poor. J. Economic Growth. Develop. Res. Group. World Bank. Policy Research Working Paper, pp: 2587.
19. Janvry, A.D. and E. Sadoult, 2000. Growth, Poverty and Inequality in Latin America: A Casual Analysis, 1970-94. Review of Income and Wealth, 46(3): 267-87.
20. Loayza, N.V. and C. Raddatz, 2010. The Composition of Growth Matters for Poverty Alleviation. Journal of Develop. Econ., 93(1): 137-51.
21. Hussain, S.M.T. and M. Ishfaq, 1997. Dynamics of Agricultural Productivity and Poverty in Pakistan. Working Paper, pp: 97-14.
22. Hasan, R. and M.G. Quibria, 2004. Industry Matters for Poverty: A Critique of Agricultural Fundamentalism. KYKLOS Int. Rev. Soc. Sci., 57(2): 253-264.
23. Wu, Y., 2007. Services Sector Growth in China and India: A Comparison. China: An Int. J., 5(1): 137-154.
24. Dutt, K.A. and K.Y. Lee, 1993. The Services Sector and Economic Growth: Some Cross Section Evidence. Int. Rev. Appl. Econ., 7(3): 311-29.