



Co-integration between Resource Allocation to Education and Development

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ABSTRACT

In the present paper we have tried to estimate the long run relationship between resource allocation for primary education and gross state domestic product. We have used secondary time series data from 1990-91 to 2011-12. Plan, non plan and total allocation for primary education, and gross state domestic product have been considered for analysis. It has been found from the study that plan, non-plan and total allocation to primary education do not have long run relationship with gross state domestic product of Karnataka, which is against to the existing theories of returns to investment in education. Therefore, resource allocation made by government of Karnataka (GOK) is not according to the needs of primary education and more-over, resource allocation in primary education by GOK has not been leading to economic development of the state. Hence, there is a need to re-orientation of resource allocation to primary education.

KEYWORDS

Resource Allocation, Education, Development, and Co-integration.

Introduction:

In the present paper an attempt has been made to analyze the long run relationship between resource allocation to education and economic development. The modern democratic governments have been given at most importance for the development of education (Sharma, 2007). Government intervention in the form of resource allocation has been played a crucial role in the development of education (Michal & Stephen, 2011). Meantime, resource allocation for education has been treated as consumption as well as investment (Jha, 1991). Investment always expects returns (Premakumara, 2006). Therefore, economists have been tried to estimate the returns to investment in education by establishing the relationship between resource allocation for education and growth of gross domestic product (Psacharopoulos, 1994), (Dilme, 2009), (Annals, 1998), (Neugart, Michel, Tuinstra, & Jan, 2002) & (Trostel & Philip, 2007). In the present paper we have tried to estimate the long run relationship between resource allocation for primary education and gross state domestic product.

Methodology:

In the present paper we have used secondary time series data from 1990-91 to 2011-12. As proxy to investment in education, we have used plan allocation (PAPE), non plan allocation (NPAPE) and total allocation for primary education (TAPE). Per capita incomes (PCI), gross state domestic product (GSDP), have been considered as proxy to economic development. Since the time series data have been used in the analysis, the necessary checks were taken to the test of the stationarity of data. The unit root, Philip-Peron (PP) tests have been conducted to find the stationarity of data. The Johansen co-integration techniques are used to estimate the long-run relationship.

Unit Root Tests for Stationarity of Data:

The unit root test (PP) tests have been conducted to find the stationarity of data for the level data. The tests were conducted with three types of models;

1. without intercept and trend ($\delta y_t = y_{t-1} + e_t$)
2. with intercept ($\delta y_t = \alpha + y_{t-1} + e_t$)
3. with intercept and trend ($\delta y_t = \alpha + y_{t-1} + T + e_t$)

Table 1: PP tests for Stationarity with Level and First Difference Data

De-scriptions	With Level Data						
	None		Intercept		Intercept with Trend		
Sl. No.	Variables	t-statistic	Prob.	t-statistic	Prob.	t-statistic	Prob.
1	TAPE	6.445	1.000	4.877	1.000	1.273	0.999
2	PAPE	4.376	0.999	2.678	0.999	-3.487	0.066
3	NPAPE	5.843	1.000	4.347	1.000	1.233	0.999
4	GSDP	4.975	1.000	0.858	0.992	-0.940	0.931
De-scriptions	With First Difference Data						
	None		Intercept		Intercept with Trend		
Sl. No.	Variables	t-statistic	Prob.	t-statistic	Prob.	t-statistic	Prob.
5	TAPE	0.462	0.803	-5.827***	0.000	-	-
6	PAPE	-5.146***	0.004	-	-	-	-
7	NPAPE	1.062	0.916	-5.267***	0.000	-	-
8	GSDP	-1.757	0.075	-3.649	0.014**	-	-

Source: Economic Surveys of Karnataka, and Budgets of Various Years.

Data for TAPE is I ~ (1), Integrated of the order ONE

Data for PAPE is I ~ (1), Integrated of the order ONE

Data for NPAPE is I ~ (1), Integrated of the order ONE

Data for GSDP is I ~ (1), Integrated of the order ONE.

Table 2: Co-integration between TAPE and GSDP

Hypothesized No. of CE(s)	Eigen-value	Trace Statistic	0.05 Critical Value	Prob.**
None	0.474803	19.03104	20.26184	0.0731
At most 1	0.264768	6.151395	9.164546	0.1793
1 Co-integrating Equation(s):		Log likelihood	-427.9318	
Normalized co-integrating coefficients (standard error in parentheses)				

TAPE	GSDP	C
1.000000	-6.772821 (0.75147)	96827.17(49169.0)
Adjustment coefficients (standard error in parentheses)		
D(TAPE)	-0.479905 (0.12357)	
D(GSDP)	-0.027730 (0.01264)	

Source: Economic Surveys of Karnataka, and Budgets of Various Years.

Note: Not Significant at one percent level.

It has been found from the co-integration test that total allocation for primary education and GSDP do not have long-run relationship even at ten percent level. Therefore, there has not been significant long-run stable relationship between total allocation for primary education and GSDP in Karnataka. However, since the adjusted coefficients of TAPE and GSDP are -0.479905 and -0.027730 respectively, if TAPE increased by one unit GSDP shall be increased by 0.058 times (-0.027730/-0.479905= 0.058), but, this is also not reliable in the long-run, since there is no significant long-run stable relationship between total allocation for primary education and GSDP in Karnataka. Therefore, the total allocation made by government of Karnataka (GOK) is not according to the needs of primary education and more-over, total allocation in primary education by GOK has not been leading to economic development of the state. Hence, there is a need to re-orientation of total allocation to primary education.

Table 3: Co-integration between PAPE and GSDP

Hypothesized No. of CE(s)	Eigen-value	Trace Statistic	0.05 Critical Value	Prob.**
None	0.410209	16.49406	20.26184	0.1526
At most 1	0.256744	5.934301	9.164546	0.1958
1 Co-integrating Equation(s):		Log likelihood	-400.2161	
Normalized co-integrating coefficients (standard error in parentheses)				
PAPE	GSDP	C		
1.000000	-1.230544 (0.08983)	22751.40 (5980.54)		
Adjustment coefficients (standard error in parentheses)				
D(PAPE)	-1.097273 (0.36573)			
D(GSDP)	-0.162487(0.11788)			

Source: Economic Surveys of Karnataka, and Budgets of Various Years.

Note: Not Significant at five percent level.

It has been found from the co-integration test that plan allocation for primary education and GSDP do not have long-run relationship even at ten percent level. Therefore, there has not been significant long-run stable relationship between plan allocation for primary education and GSDP in Karnataka. However, since the adjusted coefficients of PAPE and GSDP are -1.097273 and -0.162487 respectively, if PAPE increased by one unit GSDP shall be increased by 0.148 times -0.162487 / -1.097273 = 0.148), but, this is also not reliable in the long-run, since there is no significant long-run stable relationship between plan allocation for primary education and GSDP in

Karnataka. Therefore, the plan allocation made by government of Karnataka (GOK) is not according to the needs of primary education and more-over, plan allocation in primary education by GOK has not been leading to economic development of the state. Hence, there is a need to re-orientation of plan allocation to primary education.

Table 4: Co-integration between NPAP and GSDP

Hypothesized No. of CE(s)	Eigen-value	Trace Statistic	0.05 Critical Value	Prob.**
None	0.461800	19.45871	20.26184	0.0642
At most 1	0.297711	7.068201	9.164546	0.1229
1 Co-integrating Equation(s):		Log likelihood	-426.2605	
Normalized co-integrating coefficients (standard error in parentheses)				
NPAP	GSDP	C		
1.000000	-5.343197 (0.65530)	69376.21 (42348.5)		
Adjustment coefficients (standard error in parentheses)				
D(NPAP)	-0.439350 (0.11538)			
D(GSDP)	-0.032993 (0.01502)			

Source: Economic Surveys of Karnataka, and Budgets of Various Years.

Note: Not Significant at five percent level.

It has been found from the co-integration test that non-plan allocation for primary education and GSDP do not have long-run relationship even at ten percent level. Therefore, there has not been significant long-run stable relationship between non-plan allocation for primary education and GSDP in Karnataka. However, since the adjusted coefficients of NPAP and GSDP are -0.439350 and -0.032993 respectively, if NPAP increased by one unit GSDP shall be increased by 0.075 times -0.032993/-0.439350 = 0.075), but, this is also not reliable in the long-run, since there is no significant long-run stable relationship between non-plan allocation for primary education and GSDP in Karnataka. Therefore, the non-plan allocation made by government of Karnataka (GOK) is not according to the needs of primary education and more-over, non-plan allocation in primary education by GOK has not been leading to economic development of the state. Hence, there is a need to re-orientation of non-plan allocation to primary education.

Conclusion:

The present paper estimated the long run relationship between resource allocation to primary education and economic development. It has been found from the study that plan, non-plan and total allocation to primary education do not have long run relationship with gross state domestic product of Karnataka, which is against to the existing theories of returns to investment in education. Therefore, resource allocation made by government of Karnataka (GOK) is not according to the needs of primary education and more-over, resource allocation in primary education by GOK has not been leading to economic development of the state. Hence, there is a need to re-orientation of resource allocation to primary education.

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