

PUBLIC EXPENDITURE ON EDUCATION AND HEALTH, AND HUMAN CAPITAL FORMATION IN SRI LANKA 1990-2012

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Introduction

Sri Lanka has a long tradition of public expenditure on education and health (Jayasuriya 1996). As ‘social welfare spending’, its role in generating relatively high living standards (Osmani 1993), and in undermining their sustainability – by impacting negatively on saving, investment and growth (Bhalla and Glewwe 1986, Kelegama 2006, Osmani 1993) have been hotly debated. In present times, such expenditures are seen as potentially contributing to the formation of human capital and thence, economic growth – especially in the context of a globalized ‘knowledge economy’ (World Bank 2009).

Though recognized as a distinct factor of production (Becker 1964, Shultz 1961, Romer 1986, Lucas 1988), there is no universally accepted measure of the stock of human capital. Expenditures on education and health are often taken as proxies for human capital in explaining economic growth (e.g. Vimalendraraja (2005)¹²). This is not satisfactory if, in fact education and health expenditures impact on growth by raising the stock of human capital. The productivity of such expenditures should then be evaluated with respect to the human capital produced.

The primary objective of this paper is to test the relationship between public expenditures on education and health and the formation of human capital in Sri Lanka – measured in terms of a human capital index³. Secondary objectives are to test for the existence of a short run relationship and long run equilibrium.

¹Who, though using it in the sense of ‘social welfare expenditure’, finds it related positively to economic growth.

²Vijesandran and Vinayagathan (2014) provide an exception by constructing separate proxy variables for education and health, treating *both* as *separate* human capital variables.

³ Which differs from that of Vijesandran and Vinayagathan (2014)

Methodology

A human capital index was first constructed as follows. Education-specific employment rates were obtained for four education categories and each rate was weighted by the average years of schooling corresponding to that category⁴. This ‘weighted employment rate’ was then multiplied by the estimated labor force⁵ to yield an ‘educationally weighted work-force’ as (annual values of) the index. The index closely follows that of Bergin and Kearney (2004), but differs from the latter by using average years of schooling instead of a subjective weight.

The index was fitted to a regression model with real public expenditure on education, real public expenditure⁶ on health and real GDP as explanatory variables. Secondary data was obtained from annual reports of the Central Bank of Sri Lanka, Labor Force survey reports, the Household Income and Expenditure survey and the report on the Census of Population and Housing. Nominal variables were deflated using the Consumer Price Index. The time period was 1990 to 2012 as regular labor force survey data was not available prior to 1990.

The vector error correction model was defined as

$$\ln \Delta y_t = \alpha_0 + \Pi \ln y_{t-1} + \sum_{i=1}^2 \Theta_i \ln \Delta y_{t-1} + U_t$$

y_t

= (*Human capital index, Public expenditure on education, Public expenditure on Health, and GDP*)

y_{t-1} is a lagged value of y_t

$\Pi = \alpha \beta'$

α = *coefficient of speed of adjustment*

β' = *coefficient of co – integrating vectors*

$U_t \sim N(0, 1)$

⁴ Thus for employment rates a_i, b_i, c_i and d_i corresponding to average years of schooling 2.5, 8, 10.5 and 15, the weighted employment rate would be $[(a_i \times 2.5) + (b_i \times 8) + (c_i \times 10.5) + (d_i \times 15)]$

⁵ The labor force in turn was obtained by $(LFP_i) \times WAP_i$ where LFP represents the (estimated) labor force participation rate and WAP the ‘Working Age Population’, with the subscript i denoting a specific period.

⁶ Public expenditure on both education and health includes capital and recurrent expenditure.

Results and discussion

As per the Augmented Dickey-Fuller (ADF) and Phillips Peron (PP) tests, all variables except Human Capital were non-stationary⁷ at their levels. Real education and health expenditure were stationary at their first differences and Real GDP was stationary at its second difference. All variables were integrated in order two (I(2)).

The optimal lag length was selected as one, based on the Likelihood Ratio (LR), Hannan-Quinn information criterion (HQ), Final Prediction Error (FPE), and Akaike Information Criterion (AIC) tests⁸. Johansen's co-integrating rank test suggested one co-integrating equation at $\alpha = 0.1$. The null was rejected at most 1 rank. So there was one co-integrating equation.

The Error Correction Model was utilized to examine the presence and nature of a long run relationship (also yielding results for short run relationship, and long run equilibrium). The long run relationship from the co-integrating vector was as follows⁹.

$$HC(-1) = 3.29 + 0.34 REDU(-1) - 0.02 RGDP(-1) - 0.35 RHEL(-1)$$

[5.42200]	[-4.51482]	[-3.03821]
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HC refers to the Human Capital Index, REDU is Real Public Expenditure on Education, RGDP represents Real Public Expenditure on Health, and RGDP is Real GDP.

In the long run human capital is positively related to education expenditure, while health expenditure and GDP show negative relationships (in contrast to Vijesandiran and Vinayagathan (2014) who obtained opposite coefficient signs for education and health). The impact of GDP is very small, while health and education exhibit approximately equal effects on human capital. The unexpected negative coefficient for health expenditure is possibly due to a combination of the following factors: Non-inclusion of a health dimension in the human capital index, the relatively short time period, and confounding factors – especially the

⁷ Null hypothesis defined as 'variable has a unit root'

⁸Schwarz information criterion (SC) indicated a zero lag

⁹ With all three explanatory variables significant at the 5% level

effects of the internal armed conflict in the country, with some of health spending being directed towards the war effort.

The short run relationship is given by

$$HC = 0.60 - 0.22 HC(-1) - 0.24REDU(-1) + 0.001RGDP(-1) + 0.29RHEL(-1)$$

[-0.73963] [-2.26033] [0.32083] [2.14012]

Education and health are both significant, and here health spending has the ‘correct’ sign, but not education. Also, human capital moves towards its long run equilibrium path by 85% by each year, but long run equilibrium does not exist for education, health and GDP.

Conclusion

This study attempted to relate public spending on education and health to the formation of human capital in Sri Lanka during 1990-2012.

In the long run, the stock of human capital was positively related to public expenditure on education, but negatively to (real) GDP and public health expenditure. The result for health expenditure may have been derived by the specific formula used to construct the human capital index, which included weights for schooling, but none for health¹⁰. Other possible reasons are; specific sub-periods experiencing a decline in the proportion of GDP devoted to health spending¹¹, and health expenditures being directed towards the war effort than contributing to the formation of human capital. The result for GDP is more difficult to interpret as one would expect a positive relationship. One possibility is that the dominant patterns of growth during 1990-2012 would have been such as to favor the absorption of labor of relatively low skills¹². The impacts of health and education on human capital are reversed in the short run.

Study results indicate that spending on education contributes significantly to human capital formation over the long run. Recent calls for higher spending on education thus seem justified in terms of its impact

¹⁰ There are no comparable health indicators for the working population

¹¹ On the other hand, the proportion of GDP spent on education has been declining since 2005, yet education shows a positive relationship with human capital.

¹² Since 2005, growth has been led by public services and the non-traded sector.

on human capital. To carry this argument to the point of determining specific amounts of expenditure requires an assessment of the private and social rates of return to investment in education. Also, the other, counter-intuitive results merit further study, for instance by constructing alternative human capital indices.

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