IMPACT OF THE GRADE FIVE SCHOLARSHIP EXAMINATION ACHIEVEMENTS ON THE PERFORMANCE OF SECONDARY SCHOOL EDUCATION IN SRI LANKA

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Abstract

This study examines whether the Grade Five Scholarship Examination (G5) of Sri Lanka has a spillover positive effect on the secondary school education of students with the help of the educational production function. Using longitudinal data collected at two different times from a stratified random sample of 380 students from the Southern Province of Sri Lanka, it was found that the G5 examination performance carries forward a significantly positive influence on the secondary level of education. More precisely, the findings suggest that one more additional test score (out of 200) obtained in the G5 examination will be reflected as a rise in the O/L performance index value by 0.112 at a 1% significance level. It implies that ten additional marks in the G5 examination will be transmitted to the secondary level academic performance as a shift of one grade above for one subject in G.C.E. O/L results, i.e., a B-pass could be elevated to an A-pass. These results imply that the academic inputs fed into primary education will yield in secondary education. Accordingly, this research recommends the existence of the G5 scholarship examination, of which the motivational factors embodied would improve the secondary school-level academic achievements of the child, although G5 has already lost its original goals.

JEL: *I21, I22, I24, I28*

Keywords*: Educational production function, G.C.E. O/L Examinations, Grade five Scholarship, Primary education, Secondary education*

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INTRODUCTION

The Grade Five Scholarship Examination (G5) is a highly competitive examination conducted by the Department of Examinations of Sri Lanka for students in the final year of primary school education. (Usually ages 9–10). The G5 scholarship examination was introduced in 1948 to meet two objectives: admitting talented students to popular schools and providing bursaries to brilliant but economically disadvantaged students. In the early decades, the system was well-functioning. Many rural unprivileged students had the opportunity to enter well-established popular schools in the capital city on a merit basis. The bursary was adequate to sustain their needs. However, the examination seems to have deviated from its prime objectives in recent years. Thus, the Ministry of Education issued a new circular in April 2019, making the Grade Five Scholarship Examination non-compulsory.

"The Grade Five Scholarship Examination has been held annually as a selection test to award scholarship grants for talented students in low-income families within the prescribed income limits and to select students for Grade Six in schools. However, at present, this examination has deviated from its prime objectives, creating unnecessary stiff competition, and it has also been observed that in most schools, all students are being pressured to upgrade Grade Five Scholarship Examination results irrespective of the diversity or cognitive development of the students. Accordingly, after this, all students who are eligible for Grade Five Scholarship Grants, except those within the prescribed income limits, are not required to sit for the examination. It is further emphasised that students should not be pressurised in any manner regarding the examination" (Ministry of Education of Sri Lanka, 2019)

Table 1: Grade Five Scholarship Examinations Performance of Candidates 2016 – 2021

Year		2016	2017	2018	2019	2020	2021
Number Sat			350,462	350,191	332,168	326,264	335,158
Obtained marks 70 or above (35 or above for each paper	No.	260,130	243,236	276,978	259,445	283,305	258,481
	%	75.67	69.40	79.09	78.11	86.83	77.12
Obtained marks 100 or above (50 or above for each paper)	No.				190,151	215,696	161,202
	%				57.25	66.11	48.10
Equal or above the cut-off (qualified to receive bursaries and apply for schools)	No.	32,646	33,163	36,144	47,667	47,193	47,536
	%	9.50	9.46	10.32	14.35	14.46	14.18
Means of marks		107.86	106.43	117.98	114.38	125.65	109.31
Standard deviation of marks		35.17	38.23	37.58	36.85	36.42	34.75

Source: Department of Examination, 2022

Nevertheless, even after enforcing the circular, no significant change can be seen in the competition among students and the parent's pressure on the children to record a super grade in G5. As shown by the statistics in Table 1, the competition has further aggravated after making it non-compulsory.

One of the eight Millennium Development Goals is that all children in developing countries should complete primary education. Much progress has been made toward this goal, but completing primary school does not ensure students attain basic literacy and numeracy skills. Indeed, there is ample evidence that many children in developing countries are not learning these essential skills (Aturupane et. al, 2013).

The successful candidates' admissions to the popular schools are also not guaranteed merely on a merit basis but depend on the parents' affordability to the incremental cost when sending their children to the cities from the suburbs. The bursary by no means is adequate to look after even their basic needs. Compared to the cost of living in the country, monthly bursary instalment[1] of LKR 750 (Approximately 2 USD) is hardly enough to pay 1/10 of the student's monthly boarding fees. Thus, the only logical ground to continue the G5 examination is the big impulse that motivates the child for the rest of his/her academic career. This research is intended to examine the spillover effect of G5 examination achievements on the performance of secondary education. The finding will be helpful for the policymakers to decide whether the G5 examination should be continued, which has been a critical policy debate under educational reforms in the country.

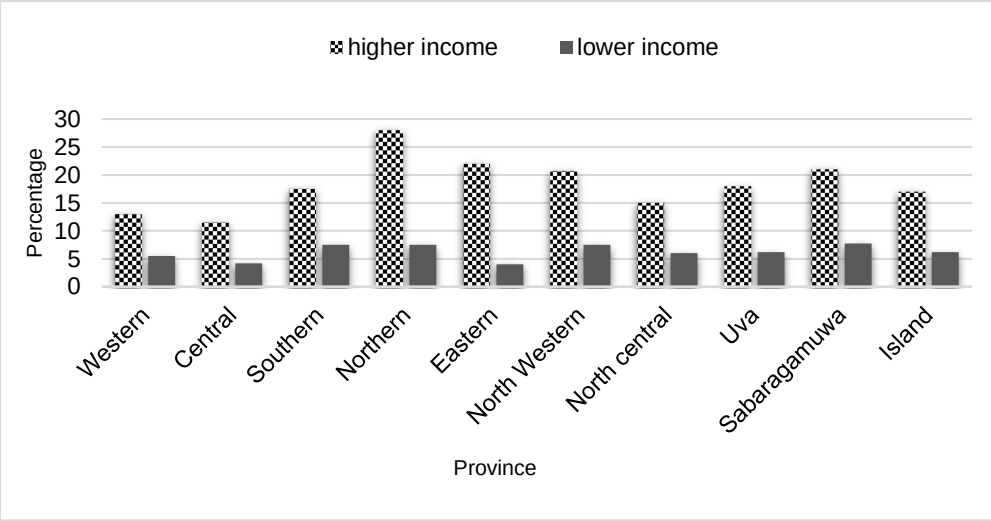
Research Problem

The G5 pass rate of high-income families is higher than that of low-income families. (See Figure 1) According to the Department of Examinations statistics, only about 10% of the children who sit for the examination qualify for bursaries or entry into prestigious schools. (Ministry of Education of Sri Lanka, 2018). For example, it was only 9.5% in 2016 and 9.46% in 2017 (Department of Examinations, 2022). Therefore, the Grade Five Scholarship Examination seems to have lost its primary objectives for which it was introduced. Abayasekara (2019) claims that the enabling environment and the structuring of the exam do not ensure that its main target group talented and poor students have a fair chance of exploiting the opportunities presented, thereby rendering its goals unachievable. It has been debated a lot in the present context, and the government is in a dilemma as to whether this competitive exam should be continued. The only logical ground left is the argument that the success of the G5 exam achievements will act as an influencing and motivational factor for the better performance of the students in

[1] The amount was LKR 500 per month until it was increased to LKR 750 in 2018.

secondary school education, which is similar to the way of functioning of the Big Push theory in economic development[2].

Figure 1: Percentage Distribution of Number of Candidates above Cut-off by Province and Income Level Grade Five Scholarship Examination 2017



Source; Department of Examination, Sri Lanka

The research problem of this study is whether past exam performance affects future educational performance. To quantify the results, this study works on the workable hypothesis that the performance of the Grade Five Scholarship Examination will significantly and positively impact the performance in secondary school education measured by G.C.E. O/L results.

Objectives

This research examines whether successful students in the Grade Five Scholarship Examination perform better in their secondary school education, controlled for the other possible factors in the educational production function influencing secondary-level education. To put it differently, it is expected to see whether the weaker student in G5 performs still weaker in their secondary level education, given the other factors being equal.

LITERATURE REVIEW

The estimation of education production functions has provided direct evidence about the effectiveness of various educational policies, most specifically, the differences in student outcomes by the influences of families, peers, commonly purchased school inputs, class

[2] The Big Push theory suggests that economic development occurs when there is a concerted effort to invest in infrastructure and technological progress.

size, teacher experience, and teacher education (Hanushek, 2020). Irfana & Kanesarajah (2014), in a study about Kalmunai Educational Division in Eastern Sri Lanka, examined the psychological, physical, mental, social and spiritual problems among the students sitting for the G5 scholarship examination. The researcher identified that most grade-five students are affected psychologically in many ways, including Phobia, Anxiety, Grief, Tension, Stress, and Personality disorders.

Using a multi-stage cluster sample of 301 students who recorded the highest results in 2018 from the Kurunegala district, Dinika et al. (2019) investigated the factors affecting the academic performance in grade-five scholarship examination in Kurunegala District. The data was collected from students and their parents using a structured questionnaire. The response variable was the academic performance of the grade-five students formed to a binary variable as pass or fail. As per the binary logistic regression analysis results, the researchers concluded that the mother's occupation, type of school and father's education level were the salient factors affecting the child's academic performance in the grade-five scholarship examination. The study further revealed that tuition provided by the government school alone was sufficient for passing this examination as the private tuition factor became insignificant.

Using data from 500 students from eight primary schools in the Gampaha district, Ranawaka and Rajapakse (2020) tested a model of academic performance as measured by past results of Grade four and Grade five school tests. The Logistic Regression and Multiple Linear Regression models have been applied to predict students' performances at the examination. The model depicts the likelihood of a student passing or failing the grade five scholarship examination and predicts the range of results students will obtain.

Abayasekara (2019), evaluating the effectiveness and relevance of Sri Lanka's G5 Scholarship Examination, concluded that structuring the exam fails to ensure that its main target group (talented and poor students) has a fair chance of exploiting the opportunities. Among the significant issues identified about the system, the researcher highlighted an insufficient number of good secondary schools across the country to provide opportunities to well-performing students, limited beneficiaries of financial bursaries, an inadequate number of schools offering good quality primary education, lack of qualified and experienced primary teachers and supervisors in primary schools, poor validity of the exam in identifying and measuring intelligence. The researcher used national-level data of the G5 scholarship examination 2008 in OLS and binary logistic regressions where the dependent variable was individual schools' pass/failure rate but not that of the individual student. However, we observe the inclusion of some technically unacceptable variables in a correctional regression. For example, GDP per capita, poverty level, population density, and the unemployment rate included in the regressions create two problems. (1) How does each of these variables have reference to the dependent variable, which is individual school? (2) In a cross-sectional dataset, those four variables are not varying

but constant numbers. Hence, the regression results are spurious and worthless interpreting.

So far, there is no study done in Sri Lanka concerning G5 examination using longitudinal data, where the same sample is tracked twice at two different points in time. In this study, we evaluate the very same student sample at their G5 examination and at the GCE O/L examination (the national benchmark for lower secondary education) six years from the first investigation to ascertain the progress of their academic performances. Then, we isolate the influence descending from the G5 examination to their post-academic performance measured by GCE O/L examination results, controlling the other factors causing the effects.

METHODOLOGY

This paper uses the concept of educational production function to evaluate the impact of primary educational inputs on secondary educational outputs. An education production function is an application of the economic concept of a production function to the field of education. It relates various inputs affecting a student's learning (schools, families, peers, neighbourhoods, etc.) to measured outputs, including subsequent labour market success, college attendance, graduation rates, and, most frequently, standardised test scores. (Bowles, 1970).

$$A = f(X_i \dots X_m,\ X_n \dots X_u, X_w \dots X_z) \quad \text{..... (1)}$$

where,

$A =$ measure of school output

$X_i \dots X_m$ = variables measuring the school environment (Amount and quality of teaching services, physical facilities, length and time students exposed to these inputs)

$X_n \dots X_u$ = variables representing environmental influences on learning outside the school (parents' educational attainments)

$X_w \dots X_z$ = variables representing the student's ability and the initial level of learning attained by the student before entry into schooling in question.

This idea became very popular among researchers after the controversial Coleman report[3] of 1966. The Coleman report identified that school inputs have a very marginal influence

[3]The Equality of Educational Opportunity Study (EEOS), also known as the "Coleman Study," was commissioned by the United States Department of Health, Education, and Welfare in 1966 to assess the availability of equal educational opportunities to children of different race, colour, religion, and national origin.

on student achievement. According to this report, family background and peer group effect are the most important factors. There were many studies on the association between school inputs and student performance after the Coleman report (Ranasinghe, 1999).

This study used a stratified random sample of 380 students who sat for the 2018 G.C.E. O/L examination from Galle, Matara and Hambantota districts of Sri Lanka and collected the longitudinal data, evaluating the same sample at two different times about the variables given in the equation 2 below including their Grade Five Scholarship examination marks reported seven years back in 2011.

The national level G5 cutoff mark varied from the Min = 150/200 (Badulla Balika M.V.) to the Max = 185/200 (Colombo Royal College) in 2011. The Ministry of Education declared these cutoff marks, comparing the placements available in each school against the students' test scores. The cutoff marks of the selected sample vary from the Min = 157/200 (Weeraketiya) to the Max = 174/200 (Galle).

Except for administrative purposes, there is no rationale for demarcating the students from 0-157 as failed while 158-200 are regarded as passed. Hence, instead of a passed/failed binary variable, this study uses the students' raw marks as a continuous variable, reflecting the varying degrees of their performances.

As shown in Figure 2, the sample comprises nearly 72% of G.C.E O/L passed students (passed six subjects with a minimum of three credits/ eligible to continue Advanced Level education), of which almost 55% had passed the G5 scholarship examination (above cutoff). The remaining 28% of the sample belongs to the G.C.E O/L failed category, among which 86% was reported below the G5 cutoff. Accordingly, the sample comprises four student categories as follows.

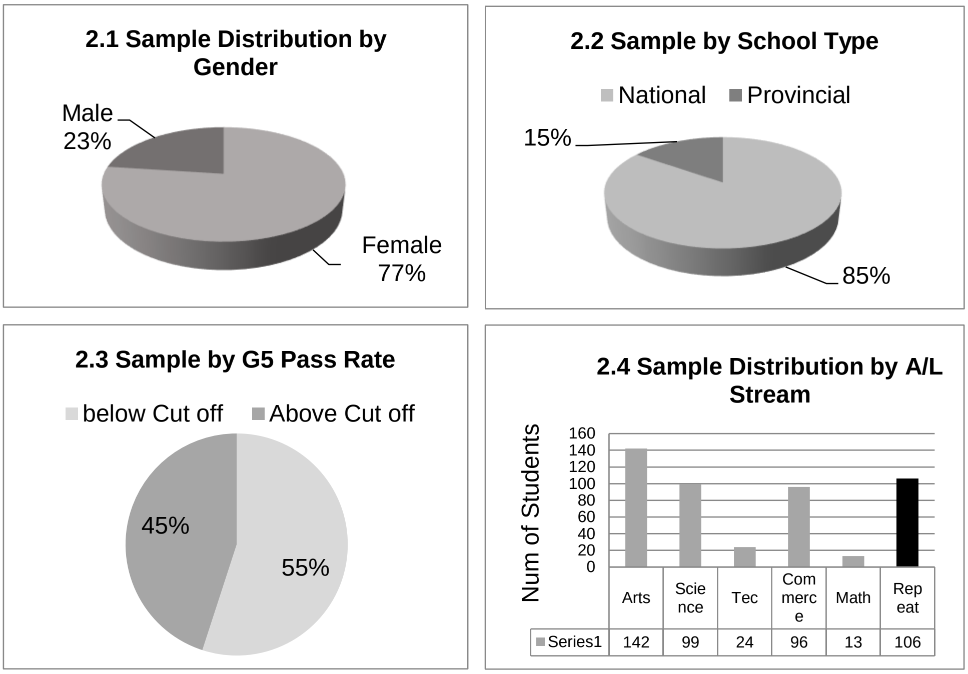
- G.C.E O/L passed and G5 above cutoff : (151) 39.6%
- G.C.E O/L passed and G5 below cutoff : (123) 32.4%
- G.C.E O/L failed and G5 above cutoff : (76) 03.9%
- G.C.E O/L failed and G5 below cutoff : (30) 24.1%

The secondary data sources include the annual School Census of Government Schools published by the Ministry of Education for 2018, and the datasets on the 2011 G5 scholarship examination results of the Department of Examination, Sri Lanka. Each student's secondary school performance was measured by his/her G.C.E. O/L results[4] converted to an index.

[4] G.C.E O/L Grading in Sri Lanka, index varying from 0-36, which is the sum of A = 4, B = 3, C = 2, S = 1, W = 0

Grade	Scale	Grade Description	Grade	Scale	Grade Description
A	75.00 - 100.00	Distinction	S	40.00 - 54.99	Ordinary Pass
B	65.00 - 74.99	Very Good Pass	W	0.00 - 39.99	Failure
C	55.00 - 64.99	Credit Pass			

Figure 2: Characteristics of the Sample



Source: Author's calculations

In line with the predefined educational production function in equation 1, the following multiple regression modal was defined, incorporating the possible variables that influence O/L performance.

$$OL_i = C + \sum_{ji=1}^{15} \beta_{ji} X_{ji} + e_i \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad (2)$$

where,

OL	Results	Index varying from 0 to36, which is the sum of A = 4, B = 3, C = 2, S = 1, W = 0
C	C	Intercept
X_1	SEX	1 If male, 0 Otherwise
X_2	TUITION	Private tuition supported number of subjects
X_3	FJOB	1 if father's job is related to the field of education, 0 otherwise
X_4	MJOB	1 if mother's job is related to the field of education, 0 otherwise
X_5	FED	Father's education, 1-12 Numbers assigned by UGC-SLQF (SLQL / NVQL)[5]

[5] Level of education as per the UGC- SLQF (SLQL / NVQL)

X_6	MED	Mother's education 1-12 Numbers assigned by UGC-SLQF (SLQL / NVQL)
X_7	INCOME	Family income/month
X_8	FSIZE	Family size defined as the number of dependents excluding child
X_9	SPORT	Average number of hours spent for sports per week
X_{10}	PARTS	Average number of hours spent for performing arts per week
X_{11}	GROUP	1 if has a study group, 0 otherwise
X_{12}	CSIZE	Class size, number of students in OL Class
X_{13}	MEDIUM	1 if English, 0 Otherwise
X_{14}	NATIONAL	1 if National school, 0 Otherwise
X_{15}	G5	Grade 5 scholarship exam marks

While all the fifteen variables might take any positive or negative value, we explicitly test the null hypothesis $H_0: \beta_{15} = 0$, against the alternative $H_1: \beta_{15} > 0$.

RESULTS AND DISCUSSION

The correlation matrix was used as a preliminary test. Pairwise correlation between all the variables was tested and reported (see Table 2). No strong correlation was detected among independent variables except for a 0.55 positive correlation between MED and MJOB. To check multi-collinearity, the Variance Inflation Factor (VIF) for each independent variable was computed. The VIF values were found to be less than 10, showing that there was no evidence of multi-collinearity.

Table 2: Pairwise Correlation Matrix

	CSIZE	FED	FJOB	FSIZE	PARTS	OACT	INCOM	MED	MEDIU	MJOB	NATION	OL	ISPORT	SEX	OSPOR	TUTION
CSIZE	1.00															
FED	0.01	1.00														
FJOB	(0.01)	0.39	1.00													
FSIZE	0.04	0.01	0.00	1.00												
PARTS	0.06	0.12	0.08	(0.06)	1.00											
OACT	0.06	(0.04)	0.06	(0.09)	(0.06)	1.00										
INCOME	(0.04)	0.21	0.21	(0.04)	0.09	0.10	1.00									
MED	(0.02)	0.71	0.30	(0.09)	0.10	0.04	0.27	1.00								
MEDIUM	(0.18)	0.24	0.12	0.05	0.19	0.00	0.13	0.23	1.00							
MJOB	(0.03)	0.41	0.25	(0.10)	0.18	0.08	0.33	0.55	0.17	1.00						
NATIONAL	(0.05)	0.01	(0.06)	0.02	0.31	(0.03)	0.03	0.00	0.06	0.05	1.00					
OL	0.06	0.20	0.05	(0.07)	0.49	(0.05)	0.14	0.27	0.22	0.25	0.20	1.00				
ISPORT	0.07	0.07	0.06	(0.11)	0.04	0.01	0.14	0.17	0.07	0.11	0.11	0.14	1.00			
SEX	(0.19)	(0.02)	(0.08)	(0.06)	(0.25)	0.27	0.01	0.01	(0.05)	(0.04)	(0.22)	(0.24)	(0.02)	1.00		
OSPORT	0.02	(0.08)	(0.04)	(0.06)	(0.17)	0.15	0.07	(0.04)	(0.09)	(0.05)	(0.08)	(0.13)	0.11	0.20	1.00	
TUTION	0.03	(0.00)	0.05	(0.08)	0.22	(0.12)	0.14	0.06	0.17	0.07	0.04	0.23	0.10	(0.25)	(0.10)	1.00
	CSIZE	FED	FJOB	FSIZE	PARTS	OACT	INCOM	MED	MEDIU	MJOB	NATION	OL	ISPORT	SEX	OSPOR	TUTION

Source: Author's calculations

Table 3 contains the estimated marginal effects of each explanatory variable on the variation in the dependent variable. The regression results reveal that the mother's occupation, father's education level, family income, family size, class size, involvement in performance arts, being a member of a peer study group, and school type will have no

significant influence on the secondary level educational achievement measured by O/L results.

However, the mother's education level and private tuition significantly positively impacted secondary-level educational achievements. Mother is regarded to have been more closely involved with students' homework than father in primary education. In the Sri Lankan context, the dependence and over-reliance on private tuition increases gradually when the students step up from Grade 6 to O/L. Therefore, private tuition shows a significantly positive influence on their O/L performance. Moreover, it was found that English medium students are performing better than the students of their mother tongue, and girls are performing better than boys in exams, given all else being equal.

Table 3: Estimated Results of Multiple Regressions for Equation 2

Dependent Variable: OL

Method: Least Squares

Included observations: 380

Variable	Coefficient	t-Statistic	rob.
C	6.940	2.491	0.013**
SEX	-1.673	-2.104	0.036**
TUITION	2.444	1.669	0.096*
FJOB	-1.558	-1.726	0.085*
MJOB	0.916	0.870	0.385
FED	0.034	0.099	0.921
MED	0.991	2.863	0.004***
INCOME	0.000	0.468	0.640
FSIZE	-0.171	-0.617	0.538
SPORT	-1.424	-5.570	0.000***
PARTS	1.201	1.512	0.131
GROUP	-0.003	-0.060	0.952
CSIZE	0.013	0.326	0.745
MEDIUM	2.693	1.920	0.056*
NATIONAL	0.582	0.637	0.525
G5	0.112	8.167	0.000***
R-squared	0.643		
Adjusted R-squared	0.515		
S.E. of regression	5.715		
F-statistic	12.098		
Prob(F-statistic)	0.000		

Source: Author's calculations

On the contrary, the results show the student's sports involvement significantly negatively influences secondary education. In this study, a student was considered involved in sports only if he/she had gone beyond the school's house meet level. The realised negative results may be due to loss of class hours, less attention by teachers, less time available for homework and discontinuity of the lessons when involved in sports. Nevertheless, it was puzzling for the researchers as to why a father's job in the field of education has a significant negative impact on the child's education. Interviews with such fathers revealed that most of them are private tuition providers, school teachers doing private tuition or school principals who hardly get any time to attend his/her own child's academic work as a parent. Most of them have been contentiously excused or absent from parents' meetings after the child got through Grade 6.

More prominently, our interested variable, the G5 Scholarship exam performances measured by the student's total G5 exam test scores, have a statistically significant positive impact on the secondary level educational achievement measured by O/L results. More precisely, controlled for all the other factors, at a 1% significance level, suggests that one more additional test score (out of 200) obtained in the G5 examination will be reflected as a raise in the O/L performance index value by 0.112, meaning that ten additional marks in G5 examination will be reflected as a shift of one grade above for one subject in O/L results, i.e. for example a B-pass could be elevated to an A-pass.

However, the numbers alone do not tell anything about the transition mechanism from G5 to G.C.E. O/L. The researcher's direct observations and discussions with the school teachers, principals and parents revealed that the G5 influence does not necessarily pass through to secondary-level education in terms of test scores. The higher test scores only imply the higher level of intelligence and strong commitment of those who passed G5. The influence mainly transmits through the enormous motivation the students receive after succeeding in such a competitive examination. Moreover, the parents' enhanced confidence in their children's future performance, which in turn facilitates the student to continue secondary education at any cost, tremendously causes better student performance in the G.C.E. O/L Examination. Parents often redistribute their education expenses, facilities and attention in such a way that the G5-qualified children get the most part while G5-failed children are marginally treated. So do the teachers intentionally or unintentionally.

Nevertheless, this study is not free from limitations. The students' ethnicity, physical and mental health status, and facilities available for them at home were excluded from the set of independent variables. More importantly, although the teacher qualifications may be more or less similar in government schools, the physical resources and the quality of the teaching-learning process could differ. The only variable used to capture such disparities in this study is the NATIONAL dummy, which denotes whether the school is a national school or a provincial one. However, for the reason that some national schools are located in rural areas, and some provincial schools are located in cities, this variable poorly

approximates the difference in available physical facilities. It could be the reason this variable became insignificant when estimated. Furthermore, the transition of the students to privileged schools from underprivileged schools after G5 was not taken into consideration. The omission of such variables due to lack of data is a limitation of this study.

CONCLUSIONS

This study was done on the null hypothesis that the G5 examination results of primary college students will not influence students' achievements in secondary education. The null hypothesis is rejected at a 1% significant level, favouring the alternative that the Grade Five scholarship examination has a significant positive impact on the child's secondary education. From the statistical point of view, this researcher recommends continuing the G5 scholarship examination to improve secondary school-level academic achievements, although G5 has now lost its original goals. This is in contrast to the Education Ministry's Circular No.08/2019 to the intention of the government to abolish the Grade Five Scholarship examination in the future and to the ongoing debate in the political arena favouring abolition of G5. Nevertheless, it should be noted that the estimated positive impact is not merely coming from the exam itself. It is the combined effect of student's intelligence, inborn talents and all subsequent handwork by the students, family and the school. Educational policymakers and parents must be well aware of the psychologically negative effects of the excess pressure mounting on children to motivate them to get through the G5 and the socio-economic impacts taking place within the family due to uneven allocation of household resources favouring the G5 child at a cost to the other dependents in the family. Also, if G5 continues, the government must address the disparities among the primary schools in physical facilities and human resources and the unequal access to educational possibilities in the urban vs. rural suburbs. There are 3,884 schools in Sri Lanka having only 1-5 grades and 1,001 schools catering above grade 6. It will be mandatory to introduce a workable solution to bridge these two segments of government schools if the G5 scholarship examination is to be abolished.

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