AN APPROACH TOWARDS THE MEASUREMENT OF HUMAN CAPITAL IN BARBADOS

by

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Introduction

Since the beginning of the decade of the 1960s, it has increasingly been recognised that the concept of accumulation needs not be limited to technology and physical capital but is also applicable to the cluster of factors, including health, education, on-the-job training and general skills of the labour force, which is collectively referred to as human capital.

The pioneering work of Solow (1957) and Denison (1962) suggested that in process of accounting for economic growth in the US economy, the traditional factors of physical capital and labour explained only a fraction of the observed changes in output, leaving a substantial residual. These studies, and the others that followed them, imputed a large part of the unexplained residual to increases in the level of education of the labour force, without necessarily setting out the framework by which such contribution could be measured.

The process of integrating knowledge acquisition into the theories of economic growth owes its genesis to the so-called modern growth theories, led by endogenous growth models of which Romer (1986), is the main champion. These theories recognise that the accumulation of knowledge is not only endogenously determined but knowledge itself may have an increasing marginal product.

While it is recognised that both human capital and physical capital, along with technological progress provide the main impetus for economic growth, the determinants of human capital accumulation have attracted less attention in the literature than physical capital mainly because of the extreme difficulties of measuring the latter.

Early attempts to measure the educational component of human capital made use of literacy rates and school enrolment ratios. While the latter may be considered an improvement on the former, both are rather unsatisfactory. Literacy rates capture only a basic level of overall education but ignore the fact that some people are much better educated then others. Similarly, school enrolment ratios measure future human capital rather than the present.

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The wage or income-based approach to human capital measurement avoids some of the pitfalls that come from equating levels of education directly with human capital. It is based on the idea that the amount of human capital a person possesses should be reflected in pay. The underlying assumption is that wage rates and therefore labour incomes are determined endogenously by the marginal productivity of the worker. The latter, in turn, is determined by all the exogenous characteristics (such as education, experience, health and cognitive skills) which define human capital. This approach also has its drawbacks but in general, it represents a measure of improvement over the first two.

Barro and Lee (1993) and more recently, Mulligan and Sala-i-Martin (1995) provide recent examples of studies that have adopted this approach to measure human capital. Our study is largely based on this approach.

Data Sources and Methodology

There are two parts to the wage-based approach to the measurement of human capital. First, one needs to have an idea about the proportions in the adult population who have completed different levels of education. Then, the wages

and/or salaries at the specified levels need to be estimated. In the case of Barbados, three educational levels for the population aged 14 years and over were identified: those with educational level up to the primary school (L_1), those with secondary/technical/vocational level (L_2) and those with a tertiary level of education (L_3). To be classified in the latter category, a person must be a university graduate, at the minimum.

From the 'Schedule of Emoluments' which is published with the national estimates, three classes of salary structures were identified. These are;

i. The higher executive scale (S-scale)
ii the model scale (Z-scale) and
iii the lower model scale

The median salaries were estimated for these three salary classes for the period 1961/62 to 1993/93. A basic assumption was that the median wages or salaries of those adults with educational level up to primary level correspond to the lower model scale. Similarly the median salaries of the Z-scale and S-scale were

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assumed to correspond to the secondary/technical and tertiary levels, respectively. That cut off point between the model and the lower model scale was the clerical officer.

There is no information available that divides the adult population by the highest level of education, except for the census years of 1960, 1970, 1980 and 1990. However, the Ministry of Labour provides a series on employed labour force by the three levels already identified in its Labour Market Information publication. Unfortunately, the series runs only from 1983 to 1992. For this period, the proportions in the three categories were used to derive the series on adult population by the highest level of education. The data for adult population was taken from the ASD of Central Bank of Barbados and Best (1993). The census reports for 1960, 1970 and 1980 provided information on the number of adults in the three educational levels and the rest of the information between these periods were estimated on trend, supplemented by the estimates by Best (1993) of the actual number of university graduates in 1963/64, 1973/74 and 1983/84.

Two different series of human capital were derived. The first is a weighted average of the salaries received by the three classes of adult by the highest level of education. The other is simply the sum of the yearly incomes of the three categories of adult group by education.

The main drawback of this approach is the implied assumption of perfect functioning of the labour market. In actual fact various distortions such as trade unions and social legislation (e.g. minimum wage laws) do influence wages a great deal so that the assumption of workers being paid according to the value of their marginal product may need to be qualified and interpreted with care.

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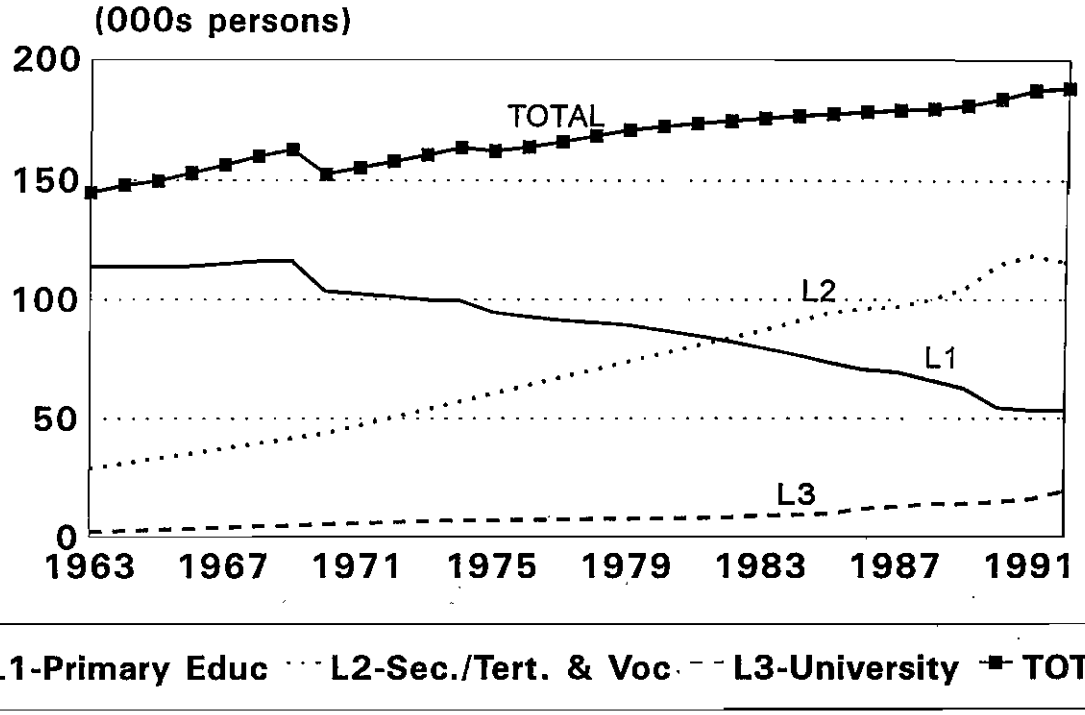
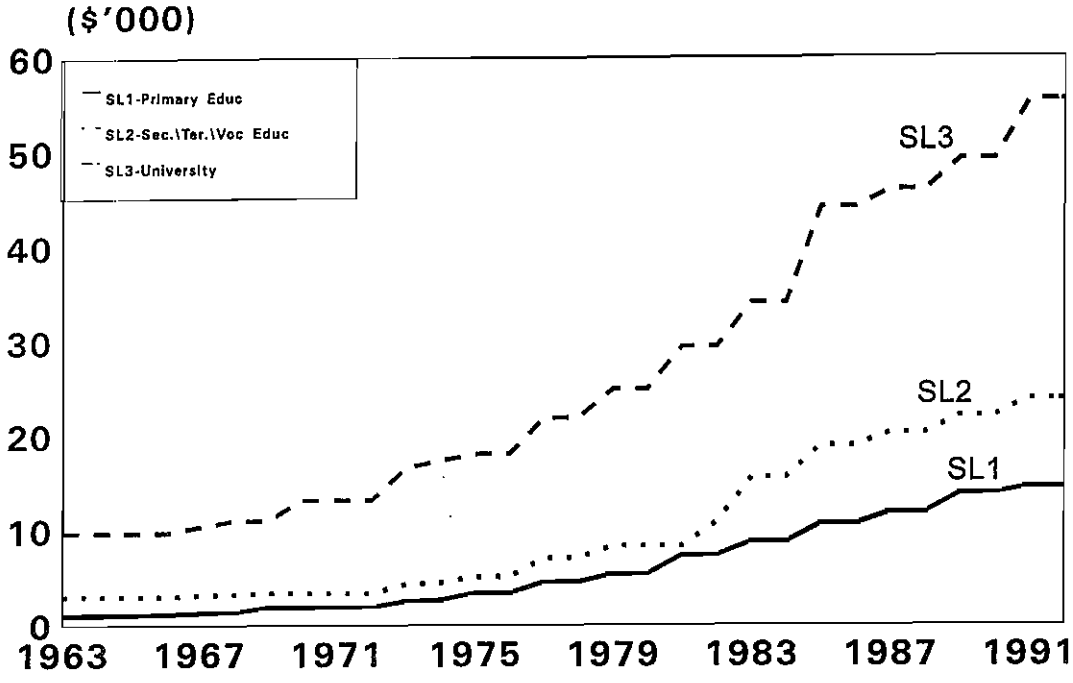
ADULT POPULATION BY HIGHEST LEVEL OF EDUCATION

	LEVEL OF EDUCATION				PROPORTION OF TOTAL			MEDIAN SALARIES ($)		
	L1	L2	L3	TOTAL	WL1	WL2	WL3	SL1	SL2	SL3
1960										
1961										
1962										
1963	113,620	29,093	2,187	144,900	0.784	0.201	0.015	1,128	3,119	9,800
1964	114,190	31,176	2,634	148,000	0.772	0.211	0.018	1,128	3,119	9,800
1965	113,461	33,258	3,081	149,800	0.757	0.222	0.021	1,128	3,119	9,800
1966	114,131	35,341	3,528	153,000	0.746	0.231	0.023	1,255	3,119	9,800
1967	115,002	37,423	3,975	156,400	0.735	0.239	0.025	1,380	3,236	10,430
1968	115,972	39,506	4,422	159,900	0.725	0.247	0.028	1,422	3,340	11,060
1969	116,142	41,589	4,869	162,600	0.714	0.256	0.030	1,980	3,465	11,060
1970	103,514	43,670	5,316	152,500	0.679	0.286	0.035	1,980	3,465	13,200
1971	102,404	47,033	5,763	155,200	0.660	0.303	0.037	1,980	3,465	13,200
1972	101,197	50,393	6,210	157,800	0.641	0.319	0.039	1,980	3,465	13,200
1973	100,081	53,759	6,660	160,500	0.624	0.335	0.041	2,610	4,385	16,560
1974	99,557	57,122	6,821	163,500	0.609	0.349	0.042	2,727	4,564	17,305
1975	94,633	60,485	6,982	162,100	0.584	0.373	0.043	3,492	5,171	18,000
1976	92,809	63,848	7,143	163,800	0.567	0.390	0.044	3,492	5,171	18,000
1977	91,485	67,211	7,304	166,000	0.551	0.405	0.044	4,596	7,086	21,828
1978	90,461	70,574	7,465	168,500	0.537	0.419	0.044	4,596	7,086	21,828
1979	89,437	73,937	7,626	171,000	0.523	0.432	0.045	5,436	8,365	24,910
1980	87,309	77,304	7,787	172,400	0.506	0.448	0.045	5,436	8,365	24,910
1981	85,075	80,577	7,948	173,600	0.490	0.464	0.046	7,362	8,365	29,396
1982	82,741	83,850	8,109	174,700	0.474	0.480	0.046	7,362	10,840	29,396
1983	79,859	87,123	8,274	175,256	0.456	0.497	0.047	8,766	15,480	34,040
1984	76,951	90,828	9,121	176,900	0.435	0.513	0.052	8,766	15,480	34,040
1985	73,568	94,485	9,647	177,700	0.414	0.532	0.054	10,608	18,828	44,156
1986	70,631	96,087	11,882	178,600	0.395	0.538	0.067	10,608	18,828	44,156
1987	69,492	97,001	12,807	179,300	0.388	0.541	0.071	11,736	20,166	45,952
1988	66,024	100,024	13,852	179,900	0.367	0.556	0.077	11,736	20,166	45,952
1989	62,581	104,495	14,024	181,100	0.346	0.577	0.077	13,728	21,966	49,228
1990	54,501	114,632	14,867	184,000	0.296	0.623	0.081	13,728	21,966	49,228
1991	53,329	118,376	15,895	187,600	0.284	0.631	0.085	14,379	23,781	55,443
1992	53,314	115,678	19,408	188,400	0.283	0.614	0.103	14,379	23,781	55,443

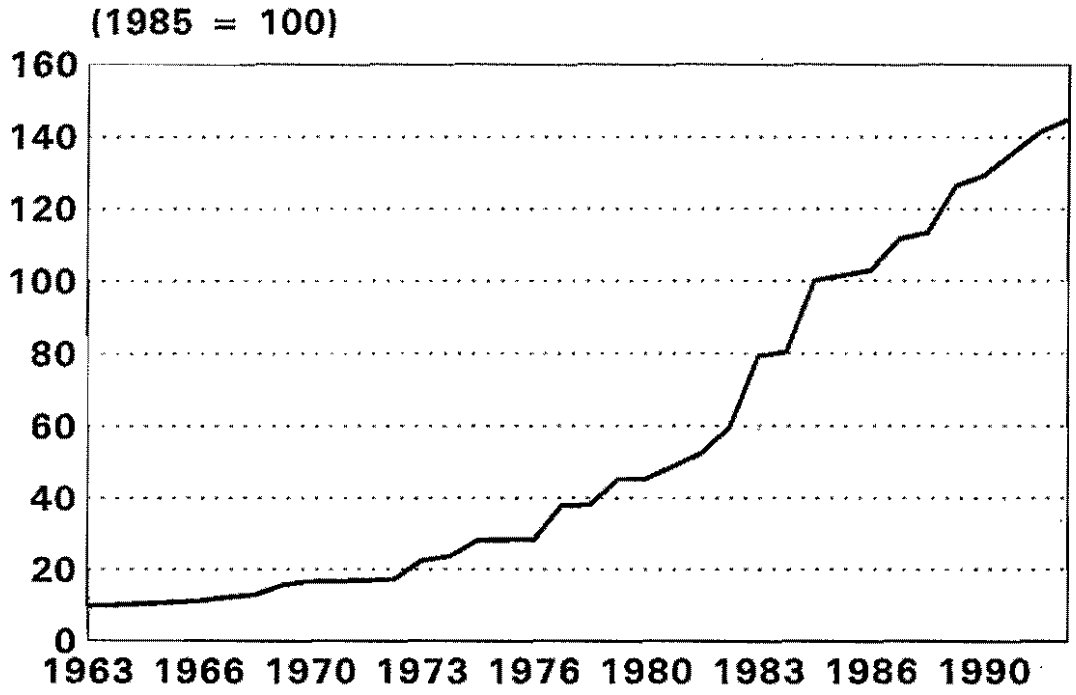
Adult Population
By Highest Level Of Education
(1963 - 1992)



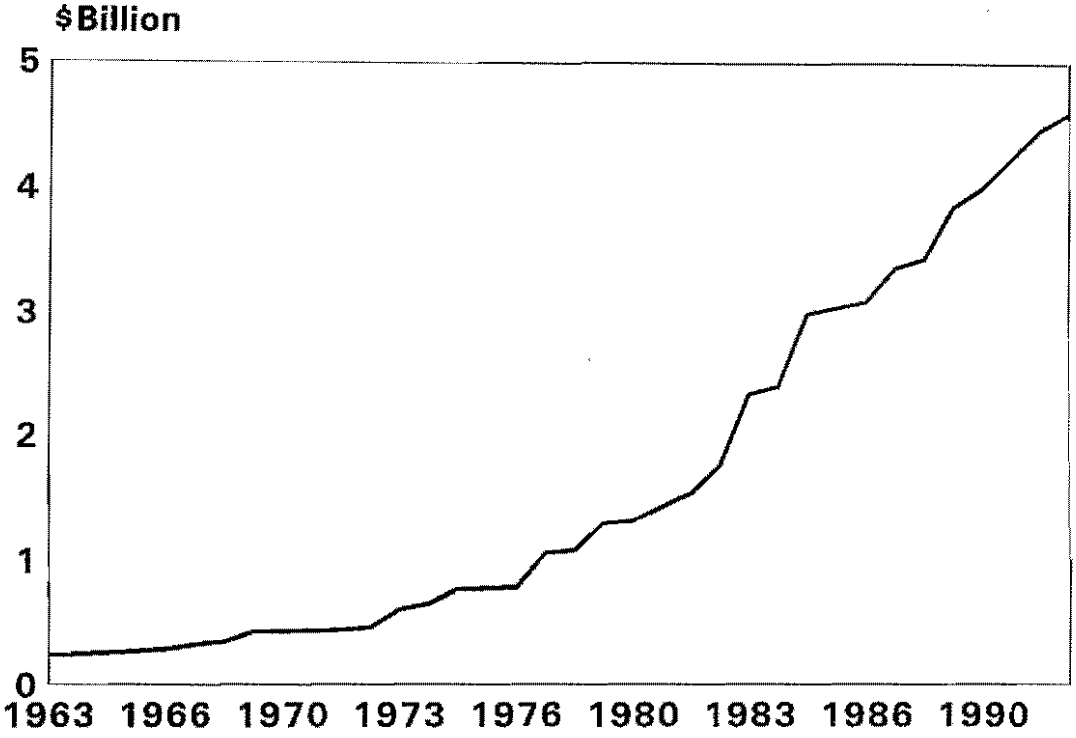
Median Salaries
Of The Adult Population
Barbados (1963 - 1992)



Weighted Index of Estimated Human Capital
Barbados (1963 - 1992)



Estimated Human Capital
Barbados (1963 - 1992)



Index Of Estimated Human Capital Barbados (1963 - 1992)