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CARIBBEAN POLICY RESEARCH INSTITUTE

B171
FEBRUARY 2017

ESTIMATING THE COST OF TERTIARY EDUCATION IN JAMAICA

J-TEC
Jamaica Tertiary Education Commission

ESTIMATING THE COST OF TERTIARY EDUCATION IN JAMAICA

On behalf of:

The Jamaica Tertiary Education Commission (J-TEC) and The Ministry of Education (MOE)

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Research Support: Simon Johnson and Caribbean Policy Research Institute

February 9, 2017

ABBREVIATIONS

ARP	Average number of rooms per person
CaPRI	Caribbean Policy and Research Institute
EMC	Edna Manley College of the Visual and Performing Arts
J-TEC	Jamaica Tertiary Education Commission
OCSL	Opportunity Cost of Student Living
MOE	Ministry of Education
STATIN	Statistical Institute of Jamaica
UTECH	University of Technology
UWI	University of the West Indies, Mona

Programme Fact Sheet

Project Title	Determining the Economic Cost to pursue an undergraduate degree at UWI, UTECH and Edna Manley College of Performing Arts
Sector	Education
Sub-Sector	Tertiary Education, Undergraduate
Duration	4 Months
Starting Date	July 14, 2016
Intended Beneficiaries	Ministry of Education Jamaica Tertiary Education Commission (J-TEC)
Research Goal	To contribute to policy formulation and implementation that will enhance access to the quality of tertiary education.
Research Objective	To determine the economic costs associated with pursuing an undergraduate degree at Jamaican public Universities
Components	Investigation of institutional costs affiliated with undergraduate degree programmes Survey to determine education-related student expenses Collation and Analysis of data from research sources
Key Stakeholders	Undergraduate Students University Administrators Ministry of Education J-TEC

CONTENTS

INTRODUCTION

Ascertaining the true cost of providing an undergraduate degree in Jamaica is critical for students, tertiary institutions, and government policy-makers. For prospective and current university students, understanding the real cost of a degree may force them to make more cost-effective choices, thus, reducing the cost barrier to education and increasing the likelihood of finishing their degree programme. For policy-makers, this information is important in order to make decisions that ultimately enhance access to and choice of attaining a tertiary education. Lastly, tertiary institutions, and by extension the government, would be interested in decreasing this barrier (the real cost) to tertiary education which in turn would increase access, enrolment, and contribute more significantly to economic development.

Education is arguably the most important factor in attaining economic development. No country can achieve sustainable development without a substantial investment in human capital[1]. There are both public and private benefits to increasing the amount of people in a citizenry who have attained high levels of education. The public benefits include an expansion in the knowledge base of an economy, which drives productivity and technological innovation. It can be said that a smarter economy is a more productive economy. Individuals who attain a higher level of education benefit from better employment prospects (both locally and abroad), higher salaries, a greater ability to save and invest, and a better opportunity at social mobility[2].

This study aims to determine the extent of the cost barrier to accessing and attaining a tertiary education in Jamaica by looking at three institutions: the University of the West Indies Mona campus (UWI), the University of Technology (UTech) and the Edna Manley College of the Visual and Performing Arts (EMC). These institutions were chosen because they cumulatively account for 11.3 percentage points of the 28.9 percent tertiary cohort (persons aged 20-24) who are enrolled in tertiary institutions[3], and absorb a high per-student subsidy from the government annually. Tertiary enrolment in Jamaica decreased by 3.9 percent between 2010 and 2014. Such a reduction in the access to tertiary education strengthens the argument for policy-makers to identify the potential costs to education as well as formulate policies aimed at broadening financial alternatives and improving access to and choice of tertiary education.

Although this study pulls from the methodology of the Delta Cost Project White Paper[4], we have restructured the measurement for the costs of a degree to adapt to Jamaica's educational system. The three main types of cost are identified as Catalogue Cost, Transcript Cost, and Social Cost. The first two costs are determined using data collected from institutions and their students. These costs are deemed accounting costs[5]. The third cost, the social cost, takes into consideration the previous accounting costs but adjusts for production foregone.

The first section outlines the methodology used to collect the data needed for the study, data descriptions, and the main assumptions made in the paper. The second section provides a description of each cost used, a discussion of these costs, the results of our analysis and inferences about what the data revealed. The third section highlights the current mechanisms through which students can finance their tertiary education. Finally, the fourth section concludes by offering recommendations for reducing the barrier to education faced by students.

[1] Ozturk (2001)
[2] Bloom, Canning, Chan (2006)
[3] The Economic and Social Survey of Jamaica (2014)
[4] Johnson (2009)
[5] The accounting cost is a total explicit monetary value

METHODOLOGY

Students were surveyed to provide data on the costs associated with their undergraduate degree, along with demographic and socio-economic information. The survey instrument utilized was a questionnaire[6]. In the absence of a population sample, the research team set a target sample size of 50 respondents per institution. The target population is all students enrolled in the study programmes chosen at each institution[7]. According to the Central Limit Theorem[8], generally in a simple case of estimating a population mean, if the sample size is at least 30, then it is fair to assume that the sample mean is approximately normally distributed. Thus, any sample size greater than 30 would be considered to be approximately representative of the population.

The total sample ultimately comprised 232 respondents but was subsequently reduced to 213 due to the omission of outliers. Of this 213 respondents, a total of 100 were from the University of the West Indies, 73 were from the University of Technology and 40 from Edna Manley College. 102 respondents were between the ages of 17 and 20; 104 were between 21 and 24; 5 persons were aged 25 through 28 while only 2 persons within the sample were older than 28 years old. The sample consisted of 202 full time students and 11 part-time students of which, 56 were at level 1; 57 were at level 2; 72 were at level 3 , and 27 respondents were in their fourth year of study.

The sample accounted for a range of degree programmes. The most represented major was Visual Arts with 37 respondents followed by Management or Business Studies, and Hotel and Tourism Management or Tourism Management, which accounted for 28 respondents each. The majority of Hotel and Tourism students were from UTech. Twenty-one persons indicated their major to be Banking or Banking and Finance. Computing and Drama accounted for 31 and 11 respondents respectively. Only 27 respondents were Engineering students, while 18 were Actuarial and 12 Industrial Technology students.

Data required to calculate the direct and indirect institutional costs were extracted from the most recent financial statements of the institutions. For the University of the West Indies, the research team used the financial statements for the year ending July 31st 2016. For the University of the Technology, the costs were extracted from their financial statements for 2014/15, thus are not consistent with the survey data collected in 2016. To correct the problem, the values in the financial statements were inflated by average prices increases between the two time periods using data from the Consumer Price Index. The financial statements examined for Edna Manley College were for the period 2015/16, and so did not present a problem.

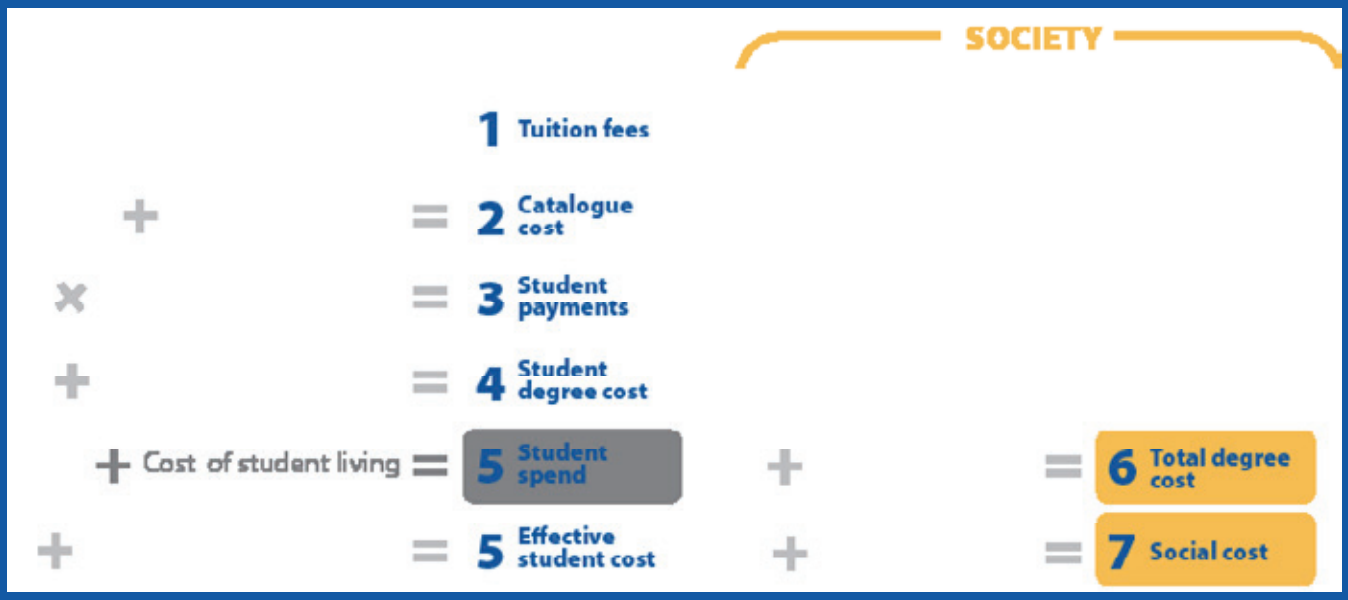
For the purpose of this study, a school year is taken to be an 8 month, 32 week or 2-semester period. As a result, monthly, weekly and semester expenses are multiplied by their respective frequencies to attain the annual expenses. All expenses in this report are presented in Jamaican dollars unles s otherwise stated[9].

[6] See Appendix1
[7] See Appendix 2
[8] See Hill, Griffiths, Lim (2011)
[9] The two sources represent money of different real values due price inflation between the two time periods.

RESULTS AND ANALYSIS

The objective is to estimate the cost of an undergraduate degree from the perspective of the students, the institution at which they are enrolled, and the society as a whole. The figure below outlines the model used to estimate the cost of an undergraduate degree and the subsequent paragraphs will provide further clarification on these cost and their implications.

Figure 1: Schematic of Costs to Students and Society



**All the instituion's recurrent costs. per student, not covered by the student payments to institution.*

In Figure 1, the cost of tertiary education to students is represented in blue , and the cost to the society represented in green. In the blue section of figure 1, we have outlined the categories used to arrive at the total cost to students. First, the student faces tuition fees and miscellaneous costs, which is the cost described in the catalogues of universities. The catalogue cost is then multiplied by the average time that it takes to complete a degree (completion time multiple) which is the direct student payment to tertiary institution. The cost for books and supplies, living, and the foregone income the student would have received if they were working is then added. This then gives you the total cost that the student pays which is the effective student cost. The effective student cost is then added to the institution subsidy paid by government, which gives you the total cost of the degree. The green section represents the cost borne by the society. The society bears three costs, — effective student cost, the monies paid through the government subsidy to tertiary institutions (institution subsidy) and the production losses because the student is not working. The entire student cost and the society cost are added together to provide an estimate of the full cost of tertiary education. All these costs are discussed and examined further in the following paragraphs.

Catalogue Cost

The Catalogue Cost represents the minimum cost of attaining an undergraduate degree as outlined within the institution's catalogue and is calculated by summing each year's tuition and miscellaneous fees over the institutional required time to complete a degree programme:

3 years for UWI, 4 years for UTech, and 4 years for EMC (4 years)[1]. This may be viewed as the cost advertised in the tertiary institutions catalogue.

Catalogue Cost = Cost of attaining a degree for the 3 or 4 years

Table 1: Catalogue Costs per degree programme at each institution

	Degree	Yrs.	Catalogue Cost (Programme)
UWI	Visual Arts	3	1,053,666
	Actuarial Science	3	878,109
	Computing	3	878,842
	Management Studies	3	878,975
	Tourism Management	3	936,900
	Banking and Finance	3	877,880
	Electronic Engineering	3	3,888,420
UTech	Actuarial Science	4	1,611,200
	Computing	4	1,456,400
	Management Studies	4	1,275,000
	Hotel & Tourism Mngnt	4	1,949,600
	Industrial Technology	4	1,129,700
	Electronic Engineering	4	1,601,800
EMC	Visual Arts	4	1,151,055
	Drama	4	1,089,042
Avgs.	UWI*		917,529
	UTech		1,403,950
	EMC		1,120,049

**The average 3-year versus 4 –year programme. The average catalogue cost of an Electronic Engineering degree is excluded since it is an outlier. The 3 years*

1 The Catalogue cost assumes that all students enter their degree programmes in the first year and don't transfer in or out of their chosen programme of study.

Figure 2: Catalogue Costs for a Degree (average)

Figure 2, based on the data in Table 1, shows that the tuition plus miscellaneous fees to attend UTech are higher than they are for UWI for corresponding degree programmes. This arises for two reasons. First, UTech programmes, which generally do not require CAPE for matriculation, need four years at normal course loads to complete whereas UWI programmes, which do require CAPE, are to be completed in three. Thus, UTech catalogue costs are inflated by the requirement to be in school for an extra year. In addition, UTech tuition on an annual basis is higher than that of UWI for corresponding requirement to be in school for an extra year. In addition, UTech tuition on an annual basis is higher than that of UWI for corresponding programmes, by an average of 9 percent. This average masks great variation, though, with Actuarial Science at UTech costing some 38 percent more annually than UWI, while at the other end, Hotel and Tourism Management cost 8 percent more. (Comparisons with Edna Manley College are not fruitful since they don't have programmes that correspond to those at the other two institutions.)

Miscellaneous fees at UTech are at least twice as much as UWI and EMC. This divergence may be an indication that UTech is passing off a larger proportion of its operating expenses to its students. What we call "miscellaneous fees" are sometimes tuition fees under a different name. To that extent, the miscellaneous fees divergence is not significant outside of the larger context of total fees charged.

TRANSCRIPT COSTS

Transcript Costs attempt to capture how actual student behaviour affects how much tuition and fees students end up paying. It takes into consideration that a large number of students do not complete their degree programme within the institutionally recommended completion time. Transcript Costs will depart from the Catalogue Cost by adjusting for the actual time taken to complete a degree programme and variations between minors and majors in degree programme rather than using the institutionally required completion time.

Student Payments (Adjusted Catalogue Cost)

To adjust the Catalogue Cost to reflect actual student behaviour, we introduced a 'completion time multiple'[1]. The completion time multiple is as an estimate of the average time taken to complete a particular degree programme. For degrees done at UWI, it was calculated from transcript data on the graduating cohort of 2016. Where there were multiple variations between minors and majors in a degree programme, an average of all completion times were used. The completion time multiples for EMC and UTech were imputed from those of UWI, as the researchers were unable to get the required data from those institutions. As such, actual completion time multiples may be higher or lower than reported. This variation in multiples would be attributable to, but not limited to, variations in exam structure and modalities, and the level of education and preparation of incoming students to the different institutions.

Student Payment=Catalog Cost*completion time multiple

Table 2: The Adjusted Catalogue Cost

	Degree	yrs	Catalogue Cost (Programme)	Completion Time Multiple	Student Payments
UWI	Visual Arts	3	1,053,666	3.00	1,053,666
	Actuarial Science	3	878,109	3.41	998,117
	Computing	3	878,642	3.59	1,051,442
	Management Studies	3	879,976	3.58	1,050,104
	Tourism Management	3	936,900	3.41	1,064,943
	Banking and Finance	3	877,880	3.33	974,447
	Electronic Engineering	3	3,888,420	4.05	5,249,367
UTech	Actuarial Science	4	1,611,200	4.41	1,776,348
	Computing	4	1,456,400	4.59	1,671,219
	Management Studies	4	1,275,000	4.33	1,380,188
	Hotel & Tourism Mgmt.	4	1,349,600	4.41	1,487,934
	Industrial Technology	4	1,129,700	4.10	1,157,943
	Electronic Engineering	4	1,601,800	5.05	2,022,273
EMC	Visual Arts	4	1,151,056	4.15	1,194,221
	Drama	4	1,089,042	4.15	1,129,881
Avgs.*	UWI		917,529	3.48	1,032,120*
	UTech		1,403,950	4.48	1,582,651*
	EMC		1,120,049	4.15	1,162,051*

** The averages for Student Payments are computed by taking the average for each institution's programmes in the Student Payments column (except for Electronic Engineering which for UWI is full-cost recovery programme and thus treated as an outlier), and not by applying the Completion Time Multiple to the averages from the Catalogue Cost column.*

[1]See Appendix 3 for the estimated completion time multiple used for each degree programme

Table 2 indicates that students pay an average of 12 percent more to complete their degree programmes than the amount featured in the tertiary institution catalogues and therefore more than they would have budgeted to pay. This will naturally lead to a miscalculation on the part of the students , and for a few who are barely able to finance their education, could be the difference between being able to complete and dropping out.

Student Degree Cost

Attaining a degree results in a student incurring expenditure beyond that outlined within an institution's catalogue of costs. Consequently, the research team sought to include these additional costs, which are directly related to the student completing the degree. Hence, books & supplies, tutoring fees and other degree related costs that are not covered in the catalogue costs were added to the student payments or adjusted catalogue cost.

Student Degree Cost = Adjusted Catalog Cost+books & supplies + tutoring fees + other degree related activities

Table 3: Student Degree cost

	Degree	Yrs.	Catalogue Cost (Programme	Student Payments	Books, Supplies, Tutoring & Activities	Student Degree Cost
UTech	Visual Arts	3	1,053,666	1,053,666	53,325	1,106,991
	Actuarial Science	3	878,109	998,117	44,330	1,042,447
	Computing	3	878,642	1,051,442	30,994	1,082,436
	Management Studies	3	879,976	1,050,104	31,822	1,081,927
	Tourism Management	3	936,900	1,064,943	67,313	1,132,256
	Banking and Finance	3	877,880	974,447	63,714	1,038,161
	Electronic Engineering	3	3,888,420	5,249,367	65,205	5,314,572
	Actuarial Science	4	1,611,200	1,776,348	129,360	1,905,708
	Computing	4	1,456,400	1,671,219	193,486	1,864,705
	Management Studies	4	1,275,000	1,380,188	12,557	1,392,745
	Hotel & Tourism Mngnt	4	1,349,600	1,487,934	22,663	1,510,597
	Industrial Technology	4	1,129,700	1,157,943	119,788	1,277,731
	Electronic Engineering	4	1,601,800	2,022,273	40,109	2,062,375
EMC	Visual Arts	4	1,151,056	1,194,221	202,948	1,397,168
	Drama	4	1,089,042	1,129,881	117,179	1,247,060
Avgs.	UWI		917,529	1,032,120	48,583	1,080,703
	UTech		1,403,950	1,582,651	86,326	1,668,977
	EMC		1,120,049	1,162,051	160,063	1,322,114

Table 3 indicates that accounting for the cost of books, supplies and tutoring associated with pursuing a degree adds another 5 to 6 percent to the cost of the degree for UWI and UTech, and as much as 14 percent for EMC students. This wide disparity is accounted for by the nature of the programmes offered at EMC and the nature of the supplies and equipment required for those pursuits. The nature of the programmes does not, however, account for the equally wide disparity between UWI and UTech. For books, supplies, and extra activities, students at UTech pay on average 50 percent more on corresponding programmes than those at UWI. This curious outcome begs for an explanation.

Student Spending

Student Spending cost incorporates, in addition to the student degree cost, what we refer to as the 'cost of student living'. This cost of living captures transportation, groceries/lunch, accommodation, utilities, clothes, toiletries, entertainment and internet expenses. Total student spending is meant to be representative of the total expenses that students incur while attaining a degree by capturing a number of costs. These include : the costs paid directly to the university (adjusted catalogue costs), those which are not necessarily charged by or paid to the institution but which are necessary to complete a programme (student degree cost) and

those costs which a student incurs in living day to day during the life of the degree programme (cost of student living).

The survey revealed living costs of between $1.4 and $1.9 million, depending on the institution. This large amount, however, exaggerates the cost of tertiary education since it includes expenditures that students would have incurred whether or not they were in school. So this component of student costs needs to be refined further, to which we now turn.

Student Effective Cost

The cost of living of students may not be completely representative of the actual cost of pursuing a degree because some of the expenditures while being a student would have been incurred even if they were not pursuing a degree. For example, a student that chooses to work rather than pursue an undergraduate degree still incurs transportation costs by travelling to and from work. Another example is breakfast, a meal usually eaten at home, which would have been equally necessary if the student were living at home with their family rather than being away from home at the university.

The Student Effective Cost thus seeks to adjust the student spending cost above by excluding expenditure that would have been incurred in any case and keeping any living cost that would have been incurred by virtue of being a student. Hence forth, we will be referring to this additional measure as the opportunity cost of student living (OCSL).

This cost is meant to represent the total amount that the student actually incurs in pursuing an undergraduate degree by accounting for expenses that they could have avoided had they not been in school for the duration of the programme.

Student Effective Cost=Total Student Spending+the oppurtunity cost of student living (OCSL [1])

Table 4: Student Effective Cost

	Degree	Catalogue Cost (Programme)	Student Degree Cost	Student Spending	Opp. Cost of Student Living	Student Effective Cost
UWI	Visual Arts	1,053,666	1,106,991	2,551,153	482,126	1,589,117
	Actuarial Science	878,109	1,042,447	2,486,609	482,126	1,524,573
	Computing	878,642	1,082,436	2,526,597	482,126	1,564,562
	Management Studies	879,976	1,081,927	2,526,088	482,126	1,564,053
	Tourism Management	936,900	1,132,256	2,576,418	482,126	1,614,383
	Banking and Finance	877,880	1,038,161	2,482,323	482,126	1,520,287
	Electronic Engineering	3,888,420	5,314,572	6,758,734	482,126	5,796,698
UTech	Actuarial Science	1,611,200	1,905,708	3,764,859	620,670	2,526,378
	Computing	1,456,400	1,864,705	3,723,856	620,670	2,485,375
	Management Studies	1,275,000	1,392,745	3,251,895	620,670	2,013,415
	Hotel & Tourism Mgmt.	1,349,600	1,510,597	3,369,747	620,670	2,131,267
	Industrial Technology	1,129,700	1,277,731	3,136,881	620,670	1,898,401
	Electronic Engineering	1,601,800	2,062,375	3,921,526	620,670	2,683,046
EMC	Visual Arts	1,151,056	1,397,168	2,866,040	457,313	1,854,482
	Drama	1,089,042	1,247,060	2,715,932	457,313	1,704,374
Avgs.	UWI	917,529	1,080,703	2,524,865	482,126	1,562,829
	UTech	1,403,950	1,668,977	3,528,127	620,670	2,289,647
	EMC	1,120,049	1,322,114	2,790,986	457,313	1,779,428

With the above adjustment for the opportunity cost of living, Table 4 reveals that those expenses are on average 46 percent on top of the catalogue cost. While the figure is much lower than that attributed to cost of living from the crude adding up of spending attempted prior, half again is still a significant figure. It seems likely that many prospective students might underestimate the magnitude of this cost.

[1]OCSL= Accommodation/Hall Fee + Internet Expense +Utility expenses incurred solely because of enrollment in school + Transportation cost (However, in calculating the opportunity cost of transportation, we adjusted the cost to account for only the proportion of students that would not have incurred transportation costs that is, those students who would have been unemployed hence would have had not need to incur a transportation cost. Therefore, Opportunity cost of transportation = Total transportation expense*youth unemployment rate of 27.4 percent)

SOCIAL COST

So far we have included only the costs of delivering the education that are recovered by the institution through tuition and miscellaneous fees. We also have to consider those costs that aren't recovered from students and are borne by the institution and ultimately, the wider society.

Institutional Costs

Direct institutional expenditure[1], to provide for the educational service delivered to tertiary students, includes administrative expenses, cleaning and sanitation, computer and software licenses, general office supplies, laboratory and medical supplies, printing and stationary, repairs and maintenance, equipment and space rental, security, teaching and research, staff costs, training and development, and utilities. The sum of those expenditures and number of students enrolled, by institution, yielded direct expenditure on tertiary education per studen[2]t. The resultant amount is the cost of education that each student should be paying, on average, in order to cover the costs of the service being offered to him/her. However, the institutions recover a portion of this cost from students through tuition and miscellaneous fees. Thus, the total education cost (institution cost per student) minus the student degree cost gives us the amount that students are currently not paying for themselves and thereby represents the amount of subsidy being provided by the institution. With the consideration that this amount is financed by other means, largely through the government's subvention to each institution, the cost is borne by the wider society.

Total Degree Cost=Student Degree Cost+Institution Subsidy

Table 5: Total Degree Cost

	Degree	Catalogue Cost (Programme)	Student Spending	Student Effective Cost	Institution Subsidy	Total Degree Cost
UWI	Visual Arts	1,053,666	2,551,153	1,589,117	1,495,094	2,548,760
	Actuarial Science	878,109	2,486,609	1,524,573	1,898,973	2,897,091
	Computing	878,642	2,526,597	1,564,562	1,998,574	3,050,016
	Management Studies	879,976	2,526,088	1,564,053	1,991,416	3,041,520
	Tourism Management	936,900	2,576,418	1,614,383	1,832,148	2,897,091
	Banking and Finance	877,880	2,482,323	1,520,287	1,854,676	2,829,124
	Electronic Engineering	3,888,420	6,758,734	5,796,698	-1,808,541	3,440,826
UTech	Actuarial Science	1,611,200	3,764,859	2,526,378	237,041	2,013,389
	Computing	1,456,400	3,723,856	2,485,375	424,349	2,095,568
	Management Studies	1,275,000	3,251,895	2,013,415	596,677	1,976,865
	Hotel & Tourism Mgmt.	1,349,600	3,369,747	2,131,267	525,455	2,013,389
	Industrial Technology	1,129,700	3,136,881	1,898,401	713,915	1,871,858
	Electronic Engineering	1,601,800	3,921,526	2,683,046	289,309	2,305,581
EMC	Visual Arts	1,151,056	2,866,040	1,854,482	2,637,854	3,832,075
	Drama	1,089,042	2,715,932	1,704,374	2,702,193	3,832,075
Avgs.	UWI	917,529	2,524,865	1,690,112	1,845,147	3,407,976
	UTech	1,403,950	3,528,127	2,462,747	499,487	2,789,134
	EMC	1,120,049	2,790,986	1,862,491	2,670,024	4,449,451

[1]All direct institutional expenses were recovered from the financial statements of each institution.
[2]This is the total direct expenditure of the university divided by total enrollment

Table 5 indicates that the institutional subsidies by government vary across institutions. An EMC student receives five times more than the amount of subsidy that a UTech student receives while a UWI student receives four times more than the amount of subsidy that a UTech student receives on average. The basis for this is that the cost of educating a student at EMC and UWI is considerably higher, by a multiple, than at UTech. This can arise for both good and bad reasons. Some of the difference reflects the higher costs that UWI incurs because it is a research institution, with its attendant faculty and research costs; some might not be accounted for in that way and may reflect modes of managing overheads, while EMC's is attributed to its low enrolment rates and the nature of its programmes.

Social Cost

We have established the total costs currently incurred in order to provide education at the tertiary level. But the society pays a higher price for students to be educated. We collectively sacrifice the loss of productive capacity and its potential output by having able-bodied persons out of the workforce and in school. Since these persons still need to consume, the productive loss is a loss for the entire society.

The commonplace proxy for the value of a potential worker's lost productivity is the imputed value of their salary. What a worker would have earned is the value of his/her contribution to the foregone product. Recognising this, we may estimate the value of the production foregone by calculating the value of the salaries that would have been earned. While there would have been no guarantee that all of the students would have been employed, equally, there is not reason to believe that they would have had a higher unemployment rate than the national average for their age cohort.

For this purpose, we used the average wage of "wage earners in large establishments by industry"[3] data from STATIN. The degree programmes under study were then categorised based on the industry[4], after which the associated average was applied per degree. The final step was to account for the probability that students would have actually been employed if not in school. The national youth employment rate of 72.6 percent was used as an estimate of this probability. Thus, the total income that a student would have earned had they been gainfully employed would be this imputed wage multiplied by the probability of being employed.

Social Cost= Student Effective Cost+Income Foregone

Table 6: Total Social Cost

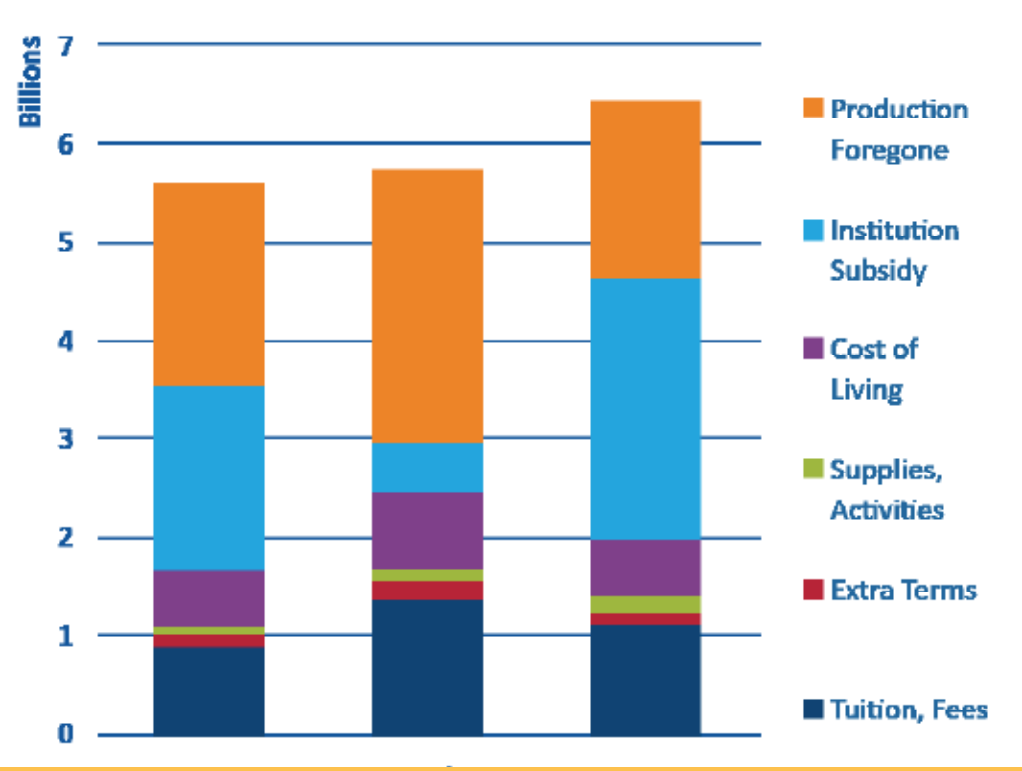
	Degree	Catalogue Cost	Student Payments	Student Effective Cost	Total Degree Cost	Foregone Income	Social Cost
UWI	Visual Arts	1,053,666	1,053,666	1,589,117	2,548,760	1,311,234	3,859,994
	Actuarial Science	878,109	998,117	1,524,573	2,897,091	1,851,947	4,749,037
	Computing	878,642	1,051,442	1,564,562	3,050,016	3,861,716	6,911,732
	Management Studies	879,976	1,050,104	1,564,053	3,041,520	1,944,272	4,985,793
	Tourism Management	936,900	1,064,943	1,614,383	2,897,091	1,494,732	4,391,823
	Banking and Finance	877,880	974,447	1,520,287	2,829,124	1,808,499	4,637,623
UTech	Electronic Engineering	3,888,420	5,249,367	5,796,698	3,440,826	4,356,532	7,797,358
	Actuarial Science	1,611,200	1,776,348	2,526,378	2,013,389	2,395,040	4,408,428
	Computing	1,456,400	1,671,219	2,485,375	2,095,568	4,997,403	7,032,971
	Management Studies	1,275,000	1,380,188	2,013,415	1,976,865	2,351,592	4,328,457
	Hotel & Tourism Mgmt	1,349,600	1,487,934	2,131,267	2,013,389	1,933,070	3,946,459
	Industrial Technology	1,129,700	1,157,943	1,898,401	1,871,858	2,236,055	4,107,913
	Electronic Engineering	1,601,800	2,022,273	2,683,046	2,305,581	5,492,219	7,737,800
EMC	Visual Arts	1,151,056	1,194,221	1,854,482	3,832,075	1,813,874	5,645,949
	Drama	1,089,042	1,129,881	1,704,374	3,832,075	1,813,874	5,645,949
Avgs.	UWI	917,529	1,032,120	1,562,829	3,407,976	2,045,400	5,453,376
	UTech	1,403,950	1,582,651	2,289,647	2,789,134	3,214,230	6,003,364
	EMC	1,120,049	1,162,051	1,779,428	4,449,451	1,813,874	6,263,325

***Average # of rooms per person (ARP) is the average # of bedrooms per student. This was calculated by dividing the number of bedrooms per household of each respondent by the number of individuals that permanently live in their household. The research team worked under the following assumptions: where ARP<1 – relatively lower income household, ARP=1 –middle income household and where ARP>1 –relatively higher income household.*

[3]The most recent data available was for 2012 so we inflated the respective salaries from that data set to 2016 using the Consumer Price Index.
[4]The assumption made here was that students who chose to do a degree in a particular field, had they chosen to work instead, would have been more than likely to seek employment in that field.

The cost to the society of educating a student at the tertiary level is considerably greater than the catalogue cost, as revealed in Table 6 and Figure 3. The social cost of a degree equates to approximately six times the catalogue cost for UWI, more than four times for UTech, and more than five times for Edna Manley College. The society is making a heavy investment in each tertiary student. The data we have shows that the students bear most of that cost — between 58 percent (Edna Manley) and 92 percent (UTech).

Figure 3: Components of the Total Cost of Tertiary Education



Of the portion that the student bears, tuition and fees account for around a quarter (27 percent, on average), more than half (52 percent) is foregone income, and most of the rest is the (opportunity) cost of living outside of home. The corresponding proportions for each of the institutions is close to the average.

One implication of this data is that the student loan facility, as presently structured, is inadequate to cover most of the real cost of a tertiary education since so much of it is not paid to the schools. A further off-shoot is that the high dropout rates at these institutions could be the result of socio-economics and not academics. A student needing to meet the daily cost associated with getting a degree might struggle to allocate sufficient time to their school work, which in turn manifests as poor grades. Thus, students who are forced to withdraw from school due to poor academic performance may have actually been affected by economic factors.

FINANCING OPTIONS

Tertiary education funding in Jamaica is usually a combined effort between the government, students, and a number of other contributors who offer scholarships and other forms of monetary and non-monetary assistance. Chief among these are private sector organisations, private donors, and international aid. Nonetheless, a vast portion of students still find tertiary education unaffordable. This section of the report will seek to highlight the various methods of tertiary education financing in Jamaica.

Government Financing

The government funds the vast majority of the tuition costs for a number of courses of study. Particularly, financing is provided through direct subsidies, which are paid over to the institutions each year or through loans, scholarships and social welfare programmes. These provisions are aimed at offsetting the cost of attaining a tertiary education.

The Students' Loan Bureau (SLB)

The Students' Loan Bureau is Jamaica's premier student loan financing organization, providing funding for students who have been accepted into a recognized tertiary institution. The SLB is able to lend because of its revolving loan scheme. Students borrow today and agree to repay at the end of their course of study to ensure that succeeding generations of students benefit from the fund. The SLB estimates that they fund approximately 30 percent of enrolled students in tertiary institutions or over 14,600 students, as of 2014.

Programme of Advancement through Health and Education (PATH)

The Programme of Advancement through Health and Education (PATH) is a conditional cash transfer (CCT) programme funded by the Government of Jamaica and the World Bank with the aim of delivering benefits by way of cash and bursary grants to the most needy and vulnerable in the society. In 2009, PATH began to offer a post-secondary bursary that allows beneficiaries to secure a one-time payment of $50,000 to pursue a degree programme. However, in order to qualify for the PATH programme, applicants must satisfy its specific eligibility criteria– prove that they are a member of a low income or poor family residing in Jamaica. This is accomplished through the application of a Proxy Means Test. During this test, the applicant is asked to provide personal data pertaining to their family including levels of education attained, consumption patterns and expenditures, and access to basic social amenities. The complication that arises with this assessment is that genuinely poor and needy students may not pass the Proxy Means Test and as such will not qualify for funding. Additionally, for those students who do qualify, the programme only offers a one-off payment and as such it only offsets a minor part of the cost of education for a single year.

Jamaica Values and Attitude Programme (JAMVAT)

The JAMVAT programme assists tertiary students who qualify for admission to an approved institution but are unable to cover their tuition cost. Access to this programme provides the opportunity for students to participate in the development of the nation's social capital through their contribution of 200 hours of public service. In return, the government undertakes 30 percent of the student's tuition cost, not exceeding $350, 000 per annum.

STUDENT FINANCING OPTIONS

Financial Institutions

All major financial institutions offer loans, which can be used to finance tertiary studies. However, only few of these institutions have loans dedicated to education. The main problems with this method of financing is that the interest rates can be as high as 15 percent. Additionally, unlike the Students' Loan Bureau, because financial loans are not geared specifically to education, repayments begin while the student is still pursuing his/her degree.

Student Cultural Exchange Programme

Student cultural exchange programmes are becoming an increasingly popular medium for financing tertiary education. These programmes allow students to spend the summer holidays being employed, mainly within the service industries of the United States and Canada. Since these programmes are offered during the holidays, students are able to earn an income that offsets their educational expenses while enrolled. However, a major drawback of these programmes is that they attract a large initial expense, as students must pay an exorbitant fee to secure a spot within the programme and incur other costs such as airfare and living expenses prior to beginning their employment tenure in the foreign country.

Employment Options

Students are becoming increasingly involved in both part time and full time employment while pursuing their studies. One example is the call centre on the UWI campus established by Sutherland Global Group. Sutherland Global employs a number of students and allows them to undertake their degree while earning to pay for school and living expenses. Nonetheless, there is still a need for more 'on campus' employment facilities that allow students to undertake work while in school.

Conclusion & Recommendations

Overall, the full cost of tertiary education is expensive for students and the society. In examining the cost considerations, students will have to ensure that they are choosing the programme they enrol in and the university they attend wisely. For government, the distribution of the subsidies will have to be revisited to ensure that all Jamaican students across the university network equitably benefit from government subsidies. Another option is to subsidise tertiary education programmes in relation to the benefit to society. Meaning, degree programmes could be assessed based on whether they respond to labour market needs, foster innovation, or serve communities' aspirations before approval. The drawback of this approach is that there could be shortages or an over-supply of some skills. Also, the government could seek to expand grants in aid offered by PATH and the Student Loan Bureau to cover not only text books, but also living expenses.

Universities should review the Catalogue Cost of the degree that is listed in their handbooks because it does not take into consideration all the costs that students pay directly to the university in order to complete the degree. As such, universities should further create income-generating schemes to supplement the government subsidies and address the need for a student support system. Lowering the cost associated with purchasing textbooks is one way to help students burdened by rising tuition. Universities could explore reducing the cost of school supplies by seeking free, open-source textbooks to eliminate a substantial and growing part of the increasing cost of tertiary education: the often-prohibitive expense of class materials. In addition, universities could improve the affordability of higher education by examining what it costs the industry to educate a student. More than a third of the cost of education at most colleges is attributable to the cost of instruction: how the school delivers instruction. Courses could be redesigned in a way that considers the materials that the student uses so as to include assignments that requires less resources. Not all of these options will be right for every institution or for every academic department. However, if institutions and the government are serious about improving outcomes and reducing costs, they must be willing to innovate.

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GLOSSARY

Catalogue Cost - This represents the minimum cost of attaining an undergraduate degree and is calculated by summing each year's tuition and miscellaneous fees over the institutional required time to complete a degree programme; UWI (4 years), UTECH (3 years) and EMC (4 years).

Completion Time Multiple - The completion time multiple is an estimate of the average time taken to complete a particular degree program, all other things remaining constant. The completion time multiples for degrees done at UWI were calculated from actual transcript data on the graduating cohort of 2016. Where there were multiple variations between minors and majors in a degree programme, an average of all completion times was used. The multiples for UTECH and EMC degrees were approximated based on UWI's multiples.

Foregone Income - This represents the income that could have been earned had students not chosen to enrol in an undergraduate degree programme and instead chosen to pursue gainful employment.

Institution Subsidy - This represents the portion of the total cost of a degree that students don't pay to the institution through tuition and/or miscellaneous fees. The cost is the proportion of the institutions total direct expenditure that is borne solely by society.

Opportunity Cost of Student Living - This seeks to represent all those expenses that a student would not have incurred if he had not enrolled in a degree program. Here, we assumed that a student who is currently paying for accommodation and utilities would not have had these expenses had they chosen not to attend college.

Social Costs - This represents the total cost to society and includes both the private cost incurred by a student to pursue their education but also the cost that is incurred by society through productivity lost (income foregone) and institution payments made on behalf of each student (institution subsidy)

Student Effective Cost - This measure of student costs seeks to adjust the student spending cost to only reflect those costs that are directly related to pursuing a chosen degree programme. It is meant to represent the total expense that a student actually incurs in pursuing an undergraduate degree by accounting for expenses that they could have avoided had they not been in school for 3 or 4 years.

Student Degree Cost - This cost represents the total institution required fees (tuition and miscellaneous) along with all other costs that are directly linked to pursuing a chosen degree programme such as the cost of books, supplies and any other mandatory degree related activity or fee not included in the institutions catalogue of degree costs which is presented to students.

Student Payments - This cost approximate can also be described as the 'adjusted catalogue cost'. It adjusts the catalogue cost by using the completion time multiple to estimate how long students actually take to complete a degree programme. It gives a more accurate estimation of the costs that students incur.

Transcript Costs - Transcript costs are those that make an attempt at looking at how actual student behaviour affects the cost of the degree attributable to students. These costs adjust the catalogue cost to reflect students that have failed to finish the degree programme within the stipulated time. Student payments, student degree cost, student spending and the student effective cost are all transcript costs.

Total Degree Cost - This represents the total cost to the institution of providing an undergraduate degree. It was estimated by finding how much of the total direct expenditure of an institution is attributable to each student.

APPENDICES

Appendix 1: Questionnaire

Thank you for agreeing to take part in this important survey on behalf of the Jamaica Tertiary Education Commission (J-TEC). Our objective is to assess the cost of tertiary education which will ultimately help in the restructuring of Jamaica's tertiary education system and provide policy advice to the Minister of Education. This survey should take less than 4 minutes to complete. Be assured that all answers you provide will be kept in the strictest confidentiality. Please note that we will not be collecting your name for this survey, thus your identity will remain anonymous.

1. From the list below, chose the programme for which you are registered at the University of the West Indies, Mona.

Faculties	Name of Programme	Choice
Liberal Arts/Education	Bachelor of Arts In Visual Arts	☐
	Bachelor of Education in Mathematics	☐
Natural Sciences/ Engineering	Bachelor of Science in Actuarial Science	☐
	Bachelor of Science In Electronics Engineering	☐
	Bachelor of Science In Computer Science	☐
Social Sciences	Bachelor of Science in Management Studies	☐
	Bachelor of Science InTourism Management	☐
	Bachelor of Science in Banking and Finance	☐

2. How old are you? _____

3. Are you a Full Time or Part Time student?

Full Time: ☐ Part Time: ☐

4. What is the level of the majority of courses that you are taking for this semester?

Level: ☐ 1 ☐ 2 ☐ 3

5. Please choose from the list below the expenses that you incur in pursuing your degree.

Name of the Cost	Frequecy	Costs
Accomodation	Monthy	$
Utility Bills	Monthly	$
Internet	Monthly	$
Books and Supplies	Semester	$
Degree related Outings (e.g. other course field studies)	Semester	$
Tutoring Fees	Semester	$
Transportation	Weekly	$
Toiletries	Monthly	$
Clothing	Semester	$
Groceries	Monthly	$
Entertainment	Monthly	$
Other: Lunch etc.		

6. Are you a residing or commuting student?

Residing: ☐ Commuting: ☐

7. If residing, what is your annual hall fee?

$ _____

Name of other hall related expenses	Cost

8. How many rooms are in your household (your permanent residence)? _____

9. Are you the primary income earner in your household? _____

10. How many individuals permanently live in your household? _____

11. How many income earning individuals permanently live in your household? _____

THANKS FOR YOUR COOPERATION!

Appendix 2: Degree Programmes in the Study

Selected Undergraduate Degrees		
Faculties	Name of Programme	Institution
Liberal Arts/ Education	Bachelor of Arts in Drama Education	Edna Manley
	Bachelor of Fine Arts in Visual Arts	Edna Manley
	Bachelor of Arts in Visual Arts	UWI*
	Bachelor of Education in Industrial Technology**	U-Tech
Natural Sciences/ Engineering	Bachelor of Science in Actuarial Science	UWI
	Bachelor of Science in Electronics Engineering	UWI
	Bachelor of Science in Computer Science	UWI
	Bachelor of Science in Actuarial Science	U-Tech
	Bachelor of Science in Electrical Engineering	U-Tech
	Bachelor of Science in Computing	U-Tech
Social Sciences	Bachelor of Science in Management Studies	UWI
	Bachelor of Science in Tourism Management	UWI
	Bachelor of Science in Banking and Finance	UWI
	Bachelor of Science in Hotel and Tourism Mngmnt	U-Tech
	Bachelor of Business Studies***	U-Tech

Notes:

*The Bachelors of Education in Mathematics for UWI was excluded from the study due to an insufficient representative sample.

**The Bachelor of Education in General Technologywas replaced with the next most populous degree within that area (Bachelor of Education in Industrial Technology. This was done because a General technology major is currently not being offered at UTECH.

***The respondents for the Bachelor of Science in Business Studies and the Bachelor of Science in Banking & Finance were combined to form a general Bsc in Business/Management Studies. This was done because the Bsc in Banking & Finance is one in the same as a Bsc in Business Studies.

Appendix 3: Completion Time Multiples

Institution	Degree	Completion rate
Edna Manley College		
	Visual Arts	4.15
	Drama	4.15
UTECH		
	Industrial Technology	4.1
	Actuarial Science	4.41
	Electronic Engineering	5.05
	Computing	4.59
	Hotel & Tourism Management	4.41
	Business Administration	4.33
UWI		
	Visual Arts	3
	Actuarial Science	9.41
	Electronic Engineering	4.05
	Computer Science	9.59
	Management Studies	9.58
	Tourism Management	9.41
	Banking & Finance	9.39

Notes:

*Actual completion rates were received from the UWI for the most recent graduate cohort.

*The completion rates for UTECH were modelled from degrees of the same field done at UWI. Thus, the period greater than the institutional standard completion time for UWI was duplicated and added to the standard completion time of degrees in the same field at UTECH. These completion rates are best estimates and as such may or may not be higher and/or lower than those that are currently being reflected.

*In the absence of transcript data for EMC, the completion rate for both degrees were estimated. The completion rate for Visual Arts at UWI could not be used in this case as the entire graduating cohort completed their programme in the standard 3-years and as such this would not be a true representative of the completion rate at EMC.

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ESTIMATING THE COST OF TERTIARY EDUCATION IN JAMAICA

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