

Avoiding Vertical Inefficiencies in funding Tertiary Level Education (TLE) in Resource Abundant States

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Abstract

This paper reviews the Government Assistance for Tuition Expenses (GATE) programme in a small petroleum exporting economy. The GATE Programme was launched in 2004 to facilitate the expansion of Trinidad and Tobago's knowledge base through the provision of financial assistance to citizens for studies undertaken within specified institutions. The programme came out of the Dollar for Dollar programme which commenced in 2001 and allowed for the provision of 50% of funding for tuition expenses. Initially the GATE programme made a further provision for students to apply for up to 100% of tuition expenses based on the results of a means testing questionnaire. The programme, however, was modified in 2006 to allow access to funding for Tertiary Level Education (TLE) to all citizens of Trinidad and Tobago, removing the need to qualify for same according to students' financial capabilities. Between fiscal year 2004/2005 and 2010/2011, expenditure on GATE increased from TT\$102 million to TT\$625 million. Persons who have taken advantage of the GATE programme are required to serve a period of national service, however, currently no systems have been established to ensure the fulfilment of the required service period after the study period has been completed. The universal issuance of the GATE programme however has led to concerns about vertical inefficiency and wasting of the economic rents from the petroleum sector.

This paper reviews the economics of subsidising tertiary level education in small economies, investigates the extent of vertical inefficiency associated with the GATE programme and analyses the sustainability of the GATE Programme.

Introduction

This paper conducts an analysis of the use of rents from the extraction and sale of petroleum to fund the Government Assistance for Tuition Expenses (GATE) Programme. The paper revisits the economics of subsidising tertiary level education in small economies, investigates the extent of vertical inefficiency associated with the GATE programme and analyses the sustainability of the GATE Programme.

The paper has been divided into six sections. Section one reviews the global trends associated with publicly subsidised tertiary level education; section two describes the GATE Programme to date; section three conducts an economic analysis of the efficiency of the GATE Programme; section four outlines the methodology and results of the study done on the GATE Programme within the University of the West Indies St Augustine Campus; section five outlines the issues associated with the programme and section six investigates the programme's sustainability.

Literature Review

Both developed and developing countries have found themselves in a vertically inefficient place with regards to subsidising TLE as government bodies have taken too much of the share of tertiary funding. This has led to a movement toward increasing the share of the private sector since the 1990s (LaRocque 2003). The trend in the 1990s was “*remarkably consistent worldwide*” (Johnstone et al, 1998) as countries with varying socio-economic and socio-political systems all faced the “*financial distress*” associated with higher education. Between 1985 and 1989, the World Bank dedicated 17% of its “*worldwide education-sector spending*” to higher education, however, from 1995 to 1999 this percentage decreased to 7% (Bloom, Canning and Chang 2006, iii). Overall, between 2008 and 2012, several European countries saw substantial cuts in the public finance budget directed toward TLE (EUA 2012)¹. These cuts to higher education funding have amounted to more than 10% in countries such as Ireland, the Netherlands and Iceland. This has led countries to seek a balance between “*keeping student charges reasonable and finding sufficient funding for their higher education systems*” (OECD 2012). As such, certain OECD countries which provide large public subsidies on higher education have raised their tuition fees for non-European Union students, continuing the growing trend of higher tuition rates for international students.

In a March 29, 2012 article in The Guardian written by Lisa Evans entitled “*Higher education funding: which institutions will be affected?*” spending cuts of £1,296 million were highlighted for the 2011/2012 academic year in England. This is in line with a thrust of the Higher Education Funding Council for England (HEFCE) to “*shift from the Hefce grant to tuition fee loans*”. It should be noted that the “*Government's changes to the finance arrangements for higher education*” (Higher Education Funding Council for England Circular Letter 2012) occurred predominantly post global financial crisis. The reason for the replacement of grant funding with student tuition fee loans was pegged mainly to the resultant reduction in departmental spending (Twelfth Report of Session 2010-12, Vol. 1 2011, 207). This change would reduce departmental expenditure by about 74%. “*In accountancy terms*” there would be a reduction in departmental spending, but in “*economic terms*” spending was simply “*replaced by borrowing*”. This system

¹ Countries which have experienced cuts in public funding to higher education between 2008 and 2012 include the Baltic countries, Czech Republic, Hungary, Croatia, Greece, Italy, Spain, Portugal, The Netherlands, Ireland and Iceland (EUA's Public Funding Observatory 2012, 7).

increased the amount paid for higher education by the student and was estimated to increase private student spending on a three year degree by approximately £4,500 (Twelfth Report of Session 2010-12, Vol. 1 2011, 207). In addition, it was estimated that approximately one quarter of English universities would experience a reduction in the number of student places funded by the government in autumn of 2012 (Evans 2012). In Scotland, estimated reductions of £10.6 million in the budget for teaching in tertiary institutions are to be implemented for the 2013-2014 academic year according to an October 2, 2012 article in the Daily Record entitled "*Scottish budget cuts will reduce student places at college*". The effect of these cuts on the students includes access to "*employability skills but not the substantive qualification that companies may look for*" meaning also that students may not be able to access the programmes they desire due to "*insufficient college places*".

The USA has also experienced changes in their funding schemes for higher education. Dougherty (2004) speaks of the changes in the amount of public funding offered to universities for the two decades prior to the writing of the paper. He highlights the significant decrease in the share of public funding to the universities while emphasising the movement toward funding institutions based on performance. In turn, TLIs have sought to increase tuitions, cut costs by outsourcing services and seek private funding. In 2011 there was a sharp increase in tuition fees for public universities and colleges as well as cuts in funding which were expected to continue this year according to an article in the University World News written January 8th, 2012 entitled "*US: Funding cuts, tuition hikes likely to define 2012*". Funding cuts to state universities and colleges took place in about 40 states with higher education budgets being cut by 50% in certain states. In an attempt to "*bridge the gap*", universities have increased their tuition fees by an average of 8.3% from those charged in 2011 (University World News). The US Government has sought to keep the Pell Grant federal loan programme active for low-income undergraduate students, however, federal loans for graduate students were cut to finance the support of the Pell Grant fund. An ultimate result from the funding cuts and tuition increases could be that "*college may soon be accessible to only the wealthy and privileged*" according to the article. Private universities have also experienced tuition increases of approximately 4.6% for 2011-2012.

The case of Canada is unique in the fact that there are two tiers of government; federal and provincial (Madgett and Blanger, 2008). Also different Canadian provinces have different rules with regards to funding and tuition fees for higher education. However, the use of a system focused primarily on loans, as opposed to government grants, still exists. Reductions in transfer payments to provinces directed toward health and higher education began in the late 1980s under the Mulroney government, eventually leading to a reduction in direct public funding to higher education from 80% to 60% "*within a few years*" (ibid). As a consequence, tertiary level institutions increased tuition fees. Between 2008/09 and 2012/13 average undergraduate tuition fees for fulltime students in Canada increased from CAN\$4,747 to CAN\$5,581 (Statistics Canada, 2012). Students are therefore charged for tuition but have access to Government loans which they must generally start repaying six months after the completion of their degree.

Looking to the Eastern Hemisphere in the aftermath of the global financial crisis, it can be seen that funding of TLI in China was affected as the rate of growth of funding decreased in 2008 (UNESCO 2012). China has "*the largest higher education system in the world*" (Wang 2009) with over 3,000 TLIs in 2006 enrolling 25.4 million students. During the late 1980s and early 1990s China introduced its "*dual track*" enrolment policy whereby students not meeting the

minimum grades in the national college entrance examinations would pay their tuition. However, this system was adjusted in 1997 so that all students were made to pay tuition fees. Over time the proportion of public funding to public TLIs has been decreasing while the proportion of funding coming from tuition fees has been increasing. Though it is still the major source of funding for public institutions, public expenditure as a percentage of total expenditure has decreased from 91.81% in 1993 to 42.77% in 2005 while the proportion from tuition and fees increased from 6.81% in 1993 to 31.05% in 2005 (Wang 2009).

In Hong Kong, “*a more intensive public-private connection in higher education*” (UNESCO 2012, 37) is being encouraged. Hong Kong’s University Grants Committee recognised that “*within public sector funding, it is vital to target funding and to ensure that it is put to best use*” (University Grants Committee 2004, 6). Charging tuition fees has “*a long tradition*” in Hong Kong and these have increased from HK\$8,700 in 1990 to HK\$42,100 (US\$ 7,400) toward the end of the 1990s (ibid, 2). This latter amount represented 18% of unit costs according to the University Grants Committee. In addition, in 2003 the Hong Kong government implemented the “*Matching Grants Scheme*” with the major aim of sharing the funding burden with TLIs. This scheme promised that the government would match dollar-for-dollar private donations secured by the universities (Wang 2009).

In Malaysia, though there is the benefit of lower tuition fees in comparison to other countries, living expenses are higher. Financial aid for higher education comes primarily from a system of loans, however, this mechanism does not work equally well across the board as it is not targeted well enough (World Bank). The National Higher Education Fund Act 1997 gives student loans which allow students to access TLE. The loans range from full loans for low income families to partial loans for middle and high income earning families (World Bank). The Malaysian government, however, reduced funding to the tertiary education sector, including all public universities, in 2010 (UNESCO 2012).

In New Zealand, after a 100% nominal increase in TLE funding between 1997/1998 and 2008/2009, by late 2009 the Ministry of Education had realised the economy’s inability to provide funding to meet increasing demand for TLI and therefore sought to embrace a redirection of funding away from “*low quality qualifications*” to “*high-quality qualifications*” (ibid, 97). The year 2010 also saw the reduction of funding to tertiary education in the Philippines (ibid, 117).

It is estimated that, for the poorest households in Thailand, 60% of their total income comprises private spending on higher education while the wealthiest spend less than 1% on the same (World Bank, 110). These figures do not include loans. In order to increase access to TLE, Thailand has a system of “*government loans [which] have to be repaid over 15 years at a 1 percent interest rate*” and can be administered by TLIs (World Bank, 110). In addition, Thailand has instituted a grant and scholarship system to facilitate access to TLE for the poor. However, Thailand also experienced a reduction in tertiary education funding post global financial crisis (UNESCO, 128).

Turning also to higher education funding in the Caribbean, public spending on education as a percentage of GDP in 2010 in Jamaica was 6.1%, Guyana 3.7%, St Lucia 4.4%, Dominica 3.6% and St Vincent and the Grenadines 4.9% (World Bank 2012). Taking a brief look at funding for higher education in other Caribbean states, it can be seen that St Lucia dedicates 25% of its

recurrent budget on education with less than 1% of this being allocated to higher education in 1998 (The Ministry of Education, Human Resource Development, and Labour, St Lucia 2012). In Jamaica, public expenditure per student in tertiary level education as a percentage of GDP per capita in 2010 was 50.2% (World Bank 2012). In a paper written by Horace Williams entitled “*Some Key Forces Impacting on Higher Education– The Caribbean Perspective*” rates of funding for tertiary education in the Caribbean were given as seen below:

“Barbados and Jamaica have relatively high levels of spending on tertiary education (respectively 30 percent and 23 percent of the total education budget), compared to lower levels in Cuba (17.7 percent), St. Lucia (12 percent) and the Dominican Republic (9 percent of the total education budget).”(Williams, 7).

Table 1: Summary Table of Countries’ Use of Tuition Fees

Country	Use of Tuition Fees	Reasons for Use of Tuition Fees
UK	Yes	Need to reduce departmental expenditure at the HEFCE. Switch from grant funding to student tuition fee loans.
USA	Yes	Reduction in the share of public funding to the universities.
Canada	Yes	Reductions in transfer payments to provinces directed toward health and higher education
China	Yes	The “dual track” system was adjusted in 1997 so that all students were made to pay tuition fees. Over time the proportion of public funding to public TLIs has been decreasing.
Hong Kong	Yes	In 2003 the Hong Kong government implemented the “ <i>Matching Grants Scheme</i> ” with the major aim of sharing the funding burden with TLIs.
Malaysia	Yes	Financial aid for higher education comes primarily from a system of loans, however, Malaysia reduced funding to the tertiary education sector, including all

		public universities, in 2010.
New Zealand	Yes	Recognition of the economy's inability to provide funding to meet increasing demand for TLI.
Thailand	Yes	Thailand has a system of "government loans [which] have to be repaid over 15 years at a 1 percent interest rate", however, Thailand also experienced a reduction in tertiary education funding post global financial crisis.

From this it can be seen that the effect of a financial crisis eventually leads to the reduction in funding for tertiary level education in countries of both the Western and Eastern hemispheres.

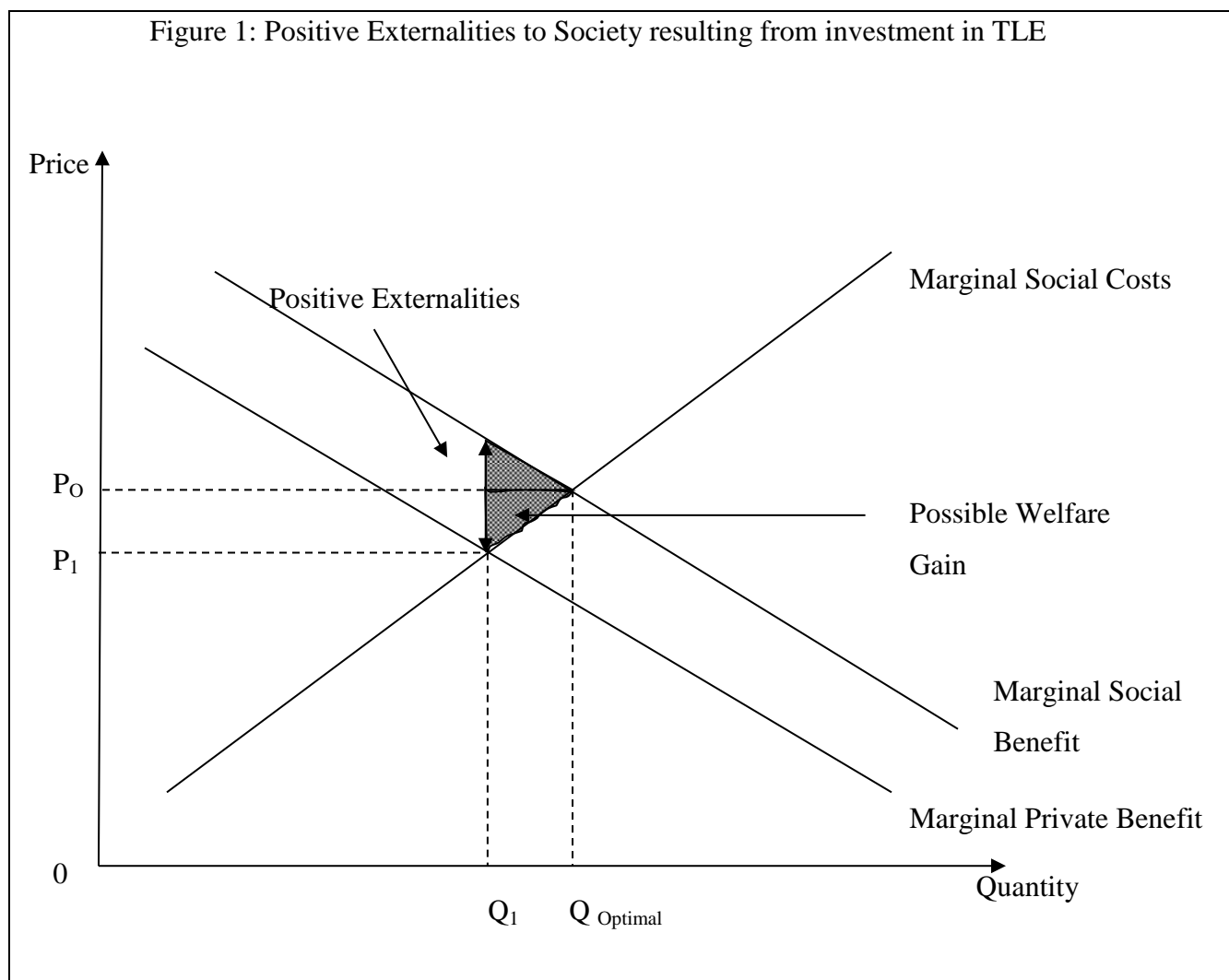
Even more so, now the question of the economic efficiency of a public subsidy for TLE is brought to bear. Within poverty alleviation programmes, policy makers have come to the conclusion that "*the "best" solution is one which identifies who is poor and then targets benefits towards that group*" (Besley and Kanbur 1990, 2). This constitutes the horizontally efficient means of poverty alleviation. However, the costs associated with the identification of the poor often leads to the counterargument for universal poverty alleviation programmes, which do not take into consideration income (ibid). In the case of the subsidising of TLE, if the option of state education were to be removed from the equation, it would be possible for only those of the wealthier class to afford TLE. In this case, the poorer class would be disadvantaged as they would be unable to afford TLE and therefore unable to benefit from the advantages associated with the attainment of the same. The option for the introduction of a "general" public subsidy on TLE may therefore be introduced to improve equality of access to TLE. The availability of this subsidy to both "*credit-constrained*" and "*non-credit constrained*" individuals, would allow the former to use it efficiently but to the latter, it would be "*no more than a transfer*" (Bloom and Sevilla 2004, 142). Hence, a universal or general subsidy will go beyond the horizontal efficiency embedded in the targeted provision of resources for the poorer class.

Research by Salmi and Hauptman (2006) has revealed a compounding issue to the inefficiency associated with the subsidising of TLE; increasing demand for the same. In essence, the demand for post-secondary level education is increasing "*far faster than the ability or willingness of governments to provide public resources*" (Salmi and Hauptman 2006, 1) to meet this demand. This increase in demand has been accredited to; the faster growth in future economic value attributed to a tertiary level degree as opposed to that of a secondary level graduate, the changing of cultural norms toward the attainment of TLE to improve one's social standing and the attempt of governments to steer university curricula toward areas with human resource gaps (ibid). Governments and TLIs, therefore, have sought to increase the cost sharing between the private and public sectors for TLE. Of the methods introduced by these bodies, three stand out as the

most popular according to Salmi and Hauptman. These are; increasing tuition fees, commercialising research and use of facilities within the TLI and increasing bond issuance or other financing measures which facilitate “*public/private partnerships*” with regards to funding TLE.

If the route of subsidising TLE is taken, for the true benefit of the subsidising initiative to be realised, three major conditions must be met according to Bloom and Sevilla (2004). Firstly, there must be a positive net return to the public on the investment made into the society. This refers to a level of positive externalities, represented in Figure 1 below, which produces net social benefits which are greater than that of net private benefits. If the size of the net benefit is related to the level of investment, this condition would create a gap between the “*optimal*” level of investment from the private sector as opposed to the public sector. Private demand alone would allow for a demand level of Q_1 , however, this is below optimal demand. If the public were to demand TLE through the subsidising of TLE, increased demand would be facilitated raising demand to Q_{Optimal} as seen in Figure 1. The presence of positive externalities resulting from this subsidising would allow the social benefit to outweigh the private benefit. If condition one were to hold, the public sector should be more inclined to invest in TLE. In the case of Trinidad and Tobago, however, the GATE Programme removes the responsibility entirely from the private sector of paying for the private benefit gained from TLE, i.e. up to P_1 .

Figure 1: Positive Externalities to Society resulting from investment in TLE



This leads us to the second condition; persons must have “*insufficient ability or incentive*” (Bloom and Sevilla 2004, 135) to satisfy the socially optimal level of investment in TLE on a private level. In addition, demand for TLE must be price elastic for condition two to hold. This would assume responsiveness of private demand to the cost of TLE as inelastic demand for the same would negate the value of a subsidy. As will be expanded upon further in the section entitled “Economic Analysis of the Efficiency of the GATE Programme” below, Trinidad and Tobago does not satisfy this condition. This is evidenced by the “high income” category taking the greatest advantage of the subsidy. Thirdly, the investment must generate levels of net social benefits which outweigh that of alternative uses of public funds. This factor stands in the face of valid uses of public finance including healthcare, transportation, primary education and agriculture which place TLE “*far from the highest priority for public funding in both industrial and developing countries*” (Salmi and Hauptman 2006, 1). Hence, other public investments may satisfy conditions one and two with “*much larger net social benefits*” (Bloom and Sevilla 2004, 141) than those associated with funding TLE. Bloom and Sevilla state that it is most likely that the first condition will be satisfied, however, this is not as true for the latter two. In this case, Bloom and Sevilla conclude that “*there is no clear-cut efficiency reason for a general subsidy for higher education in developing countries*” (ibid).

The Government Assistance for Tuition Expenses Programme (GATE)

Launched in 2004, this programme, which is run by the Ministry of Science, Technology and Tertiary Education (MSTTE), was created to facilitate the expansion of Trinidad and Tobago's knowledge base through the provision of financial assistance to citizens to the tune of 100% undergraduate tuition and 50% postgraduate tuition for studies undertaken within specified institutions. The programme came out of the Dollar for Dollar programme which commenced in 2001 and allowed for the provision of 50% of funding for tuition expenses. Initially the GATE programme extended the Dollar for Dollar programme funding with the addition of a provision for students to apply for up to 100% of tuition expenses based on the results of a means testing questionnaire, however, this system was stopped as of January 1st 2006 (Ministry of Education). This 2006 modified version of the GATE programme was funded by the economic windfall attributed to the rise in oil and gas revenues within Trinidad and Tobago (Hosein and Franklin 2010) and no longer required proof of the need for assistance. This version of GATE has been referred to as the "oil windfall" GATE (Hosein and Franklin 2010). In 2010 a further amendment was made to the programme so that it included funding for students in "*Technical Vocational Education and Training (TVET) programmes at Level 2*" (Report of the Standing Committee on the GATE Programme 2011, 10).

Prior to 2004 the tertiary participation rate within Trinidad and Tobago stood at 8% while the same for developed countries such as the USA stood at 42%. Hence, one of the major goals created for the GATE programme was the attainment of a tertiary participation rate of 60% by 2015 and, according to an article in the Trinidad Express Newspapers dated January 10th 2012, entitled "*Expanding the GATE on Tertiary Education: Is it Justified?*" the tertiary participation rate had increased to 40% by 2008. The GATE Programme has been made available to citizens wishing to pursue tertiary level education via on campus and Distance Learning programmes within local and regional public Tertiary Level Institutions (TLIs) and certain local private TLIs. For postgraduate programmes within approved private TLIs, the 50% coverage of tuition is to a maximum of TT \$20,000 to \$30,000 for on campus courses and TT\$5,000 for Distance Learning programmes. Persons who have taken advantage of the GATE programme are required to serve a period of national service which is connected to the value of funds provided according to the following scheme:

Table 2: Scheme of National Service Requirements Associated with the GATE Programme

Value of Tuition Expense Paid (TT\$)	Length of Service Required
\$50,000	1 Year
\$50,000 - \$100,000	2 Years
\$100,000 - \$150,000	3 Years
\$150,000 - \$200,000	4 Years
Over \$200,000	5 Years

Source: Report of the Standing Committee on the GATE Programme (November 14, 2011)

This period of national service can be fulfilled within the private or public sector within the Republic of Trinidad and Tobago. A provision has also been made for part-time students to incrementally apply their work during study at the TLI as a part of their national service. However, currently no systems have been established to ensure the fulfilment of the required service period after the study period has been completed (ibid, 23).

Between fiscal year 2004/2005 and 2010/2011, expenditure on GATE increased from TT\$102 million to TT\$625 million. On average, this funding is divided between public and private tertiary institutions at a rate of 56% and 44% respectively. It should be noted that the introduction of the GATE Programme “*brought with it a mushrooming of private tertiary level institutions*” according to a January 18, 2012 article in the Trinidad Express Newspaper entitled “*Expanding the GATE on Tertiary Education: Is It Justified?*”. Average student enrolment in the programme was calculated to be approximately 50,000 students per year from 2007 to 2010, however, enrolment for 2011 fell to 45,040. Prior to the more stabilised enrolment rate of 2007 to 2010, there was a peak inflow of 57,328 students in the fiscal year 2006/2007; a drastic increase from the 27,214 enrolled in 2004/2005.

Table 3: Total Expenditure through GATE on Private and Public Institutions; Number of Beneficiaries of GATE Funding

Fiscal Year	Total Expenditure \$TT (Millions)		Number of Students Receiving GATE Funding
	Private Institutions	Public Institutions	
2004/2005	30	72	27,214
2005/2006	70	110	38,669
2006/2007	244	229	57,328
2007/2008	232	270	53,437
2008/2009	240	335	52,822
2009/2010	236	349	53,711
2010/2011	281	344	45,040

Source: Report of the Standing Committee on the GATE Programme (November 14, 2011)

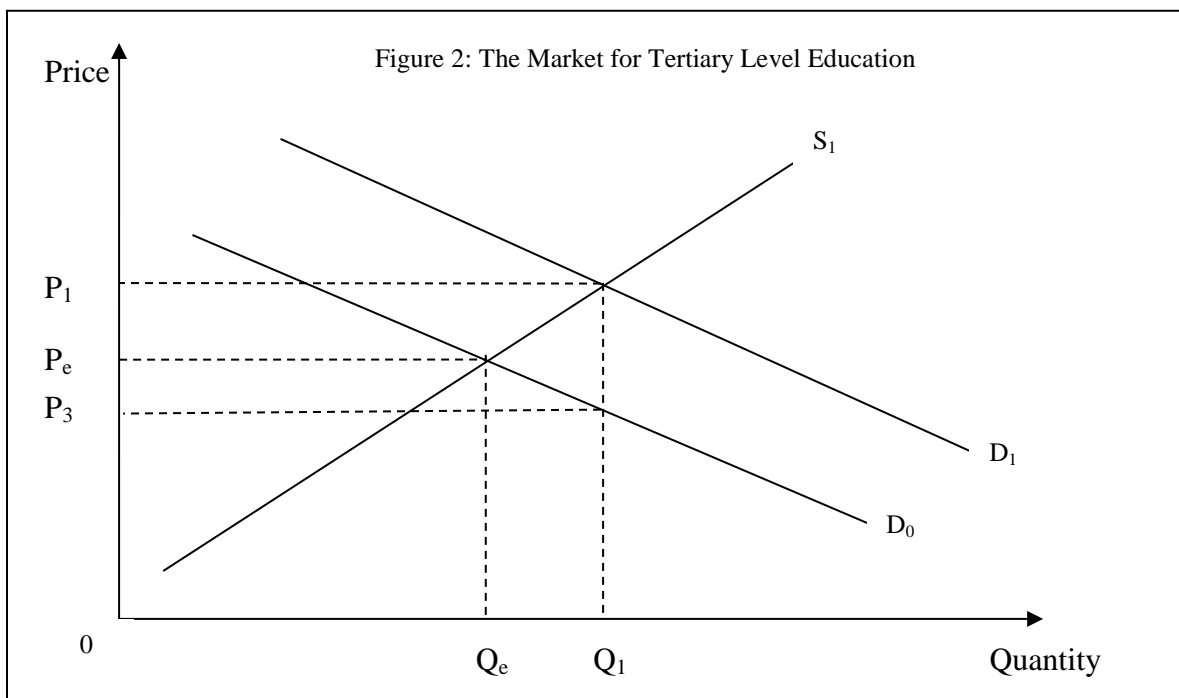
What may have occurred is that there was a rapid inflow of private capital into tertiary education level facilities in order to easily benefit from the GATE programme which, once a student enrolls, would allow the TLI to receive the revenue inflow.

Economic Analysis of the Efficiency of the GATE Programme

Within the discipline of Economics, classification is made between public and merit goods. Economic theory states that a public good, such as national defence, street lighting or a public park, is deemed to be one that, once produced, can be consumed by another consumer at no additional cost. This characteristic has also been extended to include the free, non-exclusive consumption of the good once it has been produced (Holcombe 1997). Since these characteristics dissuade the private sector from producing these goods, government bodies generally take over production of these goods while “*forcing people to contribute to [their] production*” (Holcombe 1997, 1) through taxation. Conversely, merit goods are those goods, produced by the private sector, which are considered to be of such benefit to the general public that they should be produced by the public sector (King 1979). These goods are produced based on need or merit and include housing for the poor, education and healthcare. Both the public and

private sector therefore are willing to produce merit goods, with the private sector attaching a higher cost to the same goods. Hence, production of merit goods solely by the private sector leads to inefficiency and inequality of distribution as only the very rich would be able to afford consumption of these goods and services while the poor would be excluded.

From this analysis, it can be seen that TLE cannot be considered a “*purely public good*” as it does not satisfy all the conditions of the same (Johnstone, 1998). Not only is its supply limited, but the cost and criteria for entry into TLE excludes persons from its consumption (ibid). Also, as will be seen below, the true value of TLE is not completely understood by the consumer and the total benefit to society cannot be calculated. This is yet another characteristic of a merit good which is clearly shown when analysing TLE.



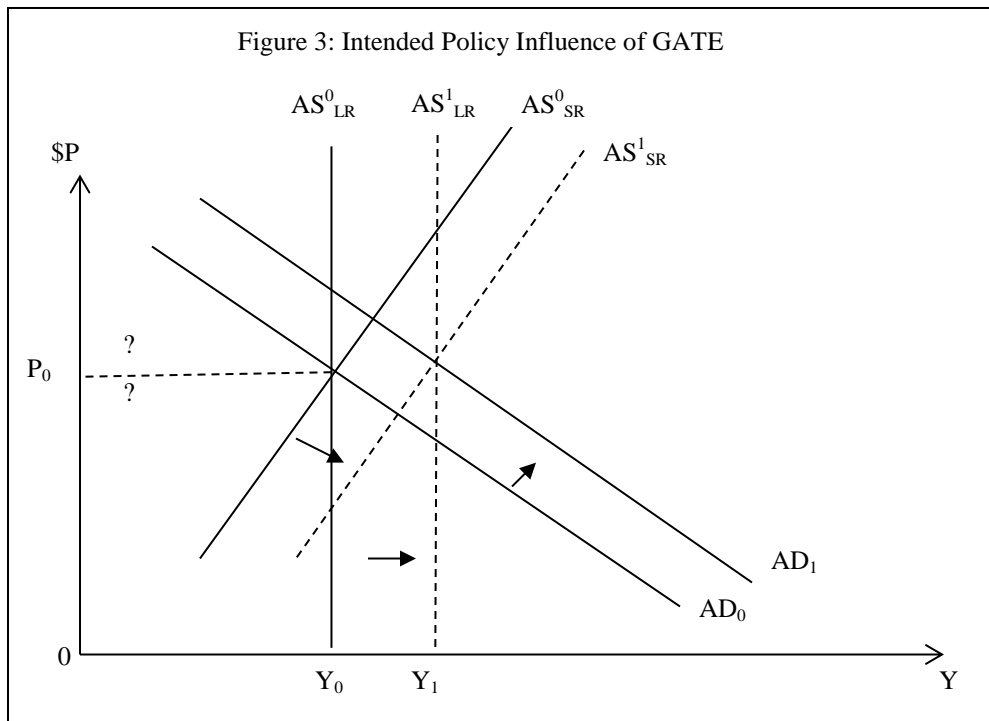
Source: Hosein and Franklin (2010)

In the example of the provision of the merit good Tertiary Level Education given above, private demand for TLE is depicted by D_0 . These individuals, having realised the future earning capacity associated with higher education, would be willing to pay for the merit good. If we assume that S_1 represents the supply curve of profit maximising tertiary institutions, the resultant market clearing equilibrium price would be P_e where Q_e would represent the amount being consumed. Q_e would, however, fall below the “*socially efficient amount of education required*” (Hosein and Franklin 2010) as this level would represent unequal distribution of the good and market failure. Part of this market failure would be information failure. The benefit to society, through positive externalities, is greater than the private benefit of consumers of TLE, however, consumers are unable to calculate this benefit. This information failure is a key characteristic of a merit good.

This implies that the consumer is unable to charge the society for the benefit provided by their higher education.

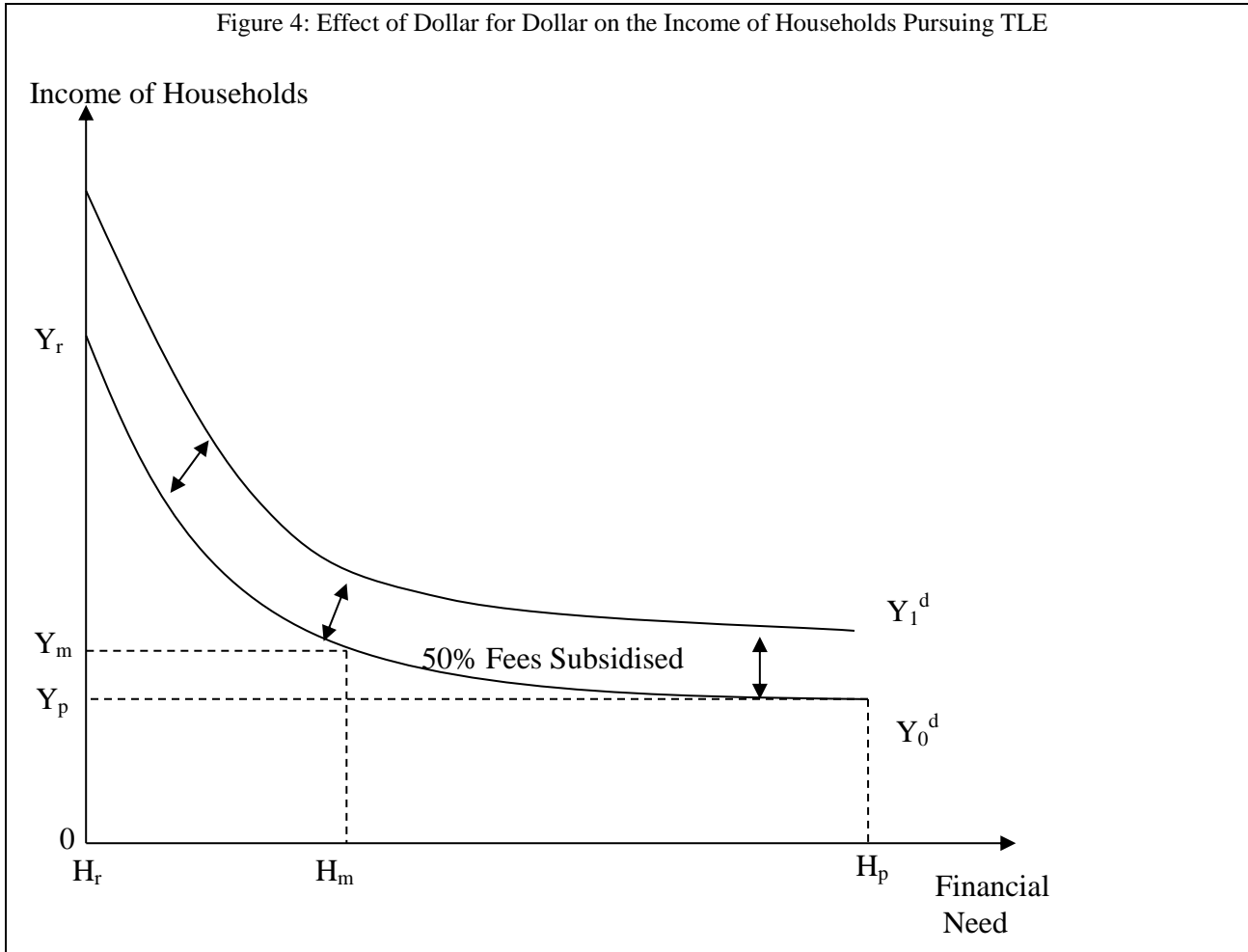
As with goods of this nature, the social benefits outweigh the individual benefits. Hence, society's combined demand curve, according to private and social benefit, for education is represented by D_1 placing the efficient education consumption level at Q_1 . This analysis therefore results in students paying P_3 , institutions receiving P_1 and the difference $(P_1 - P_3)$ being covered by the government as the charge for the benefit gained by society from the education of students. At the level D_1 the socially efficient level of TLE is achieved, while the benefit to society and the consumer is taken into consideration through the sharing of the cost of the good. This analysis, therefore does not endorse free tertiary level education. Since TLE is not a public good, it should not be treated as such through the 100% coverage of tuition by a government body.

Hosein and Franklin's review of the "oil windfall" GATE programme using Figure 3 below, illustrates the impact in the long run of the current initiative. This programme represents a large increase in government expenditure which creates a "lump sum income subsidy" which subsidises the consumption of TLE. With this government expenditure, there is a rightward shift from AD_0 to AD_1 of the macroeconomic aggregate demand curve for TLE. This increased consumption of TLE allows for rightward shifts in both the long run and short run aggregate supply curves. Eventually, this policy intervention should bring about a shift in the real level of macroeconomic activity from Y_0 to Y_1 , however, the effect on price is ambiguous. This analysis shows that oil windfall GATE is well intentioned but vertically inefficient, as will be explained below.

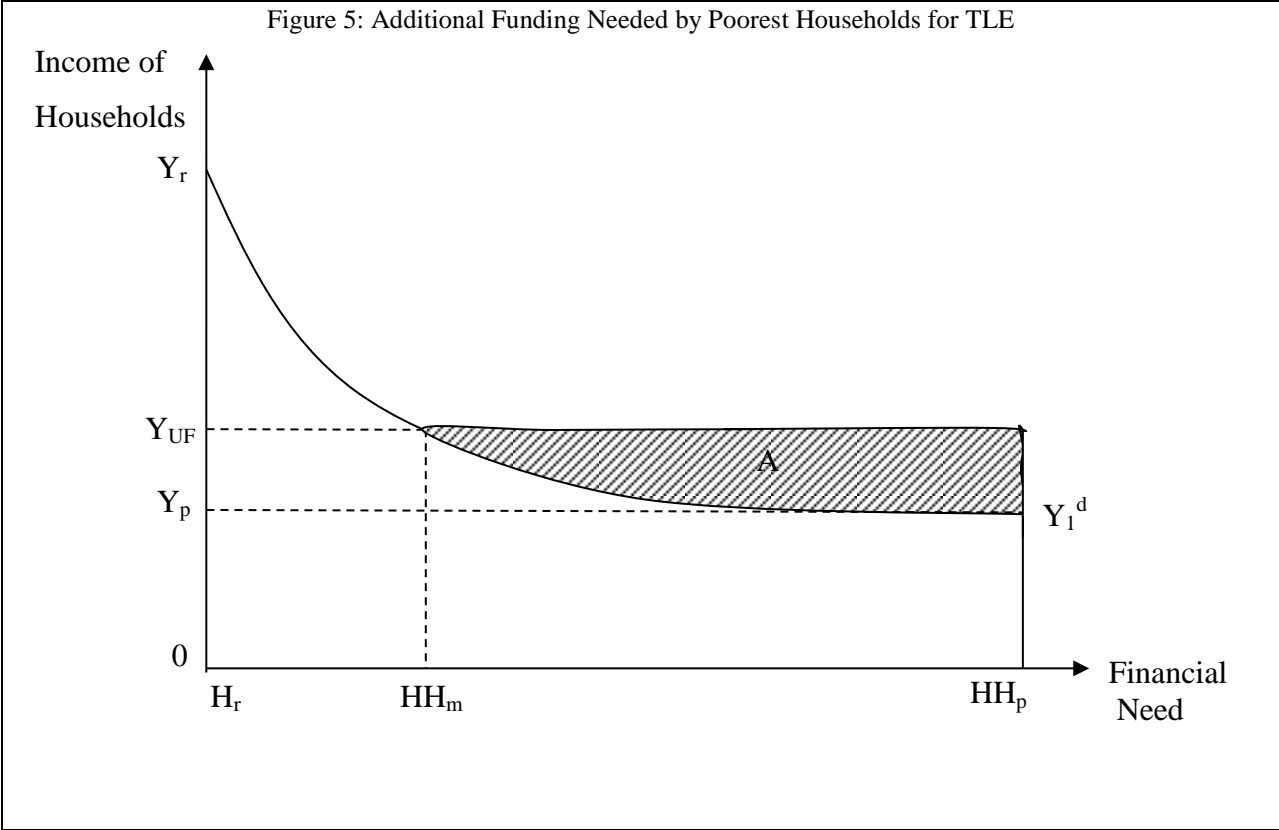


Source: Franklin & Hosein (2010)

For illustrative purposes Figure 4 below speaks to the effect of the Dollar for Dollar regime on the income of households desiring to pursue TLE. In this first permutation, all households' income increased by 50% and the distribution of income remained the same in terms of its slope although its intercept changed (compare Y_0^d with Y_1^d).

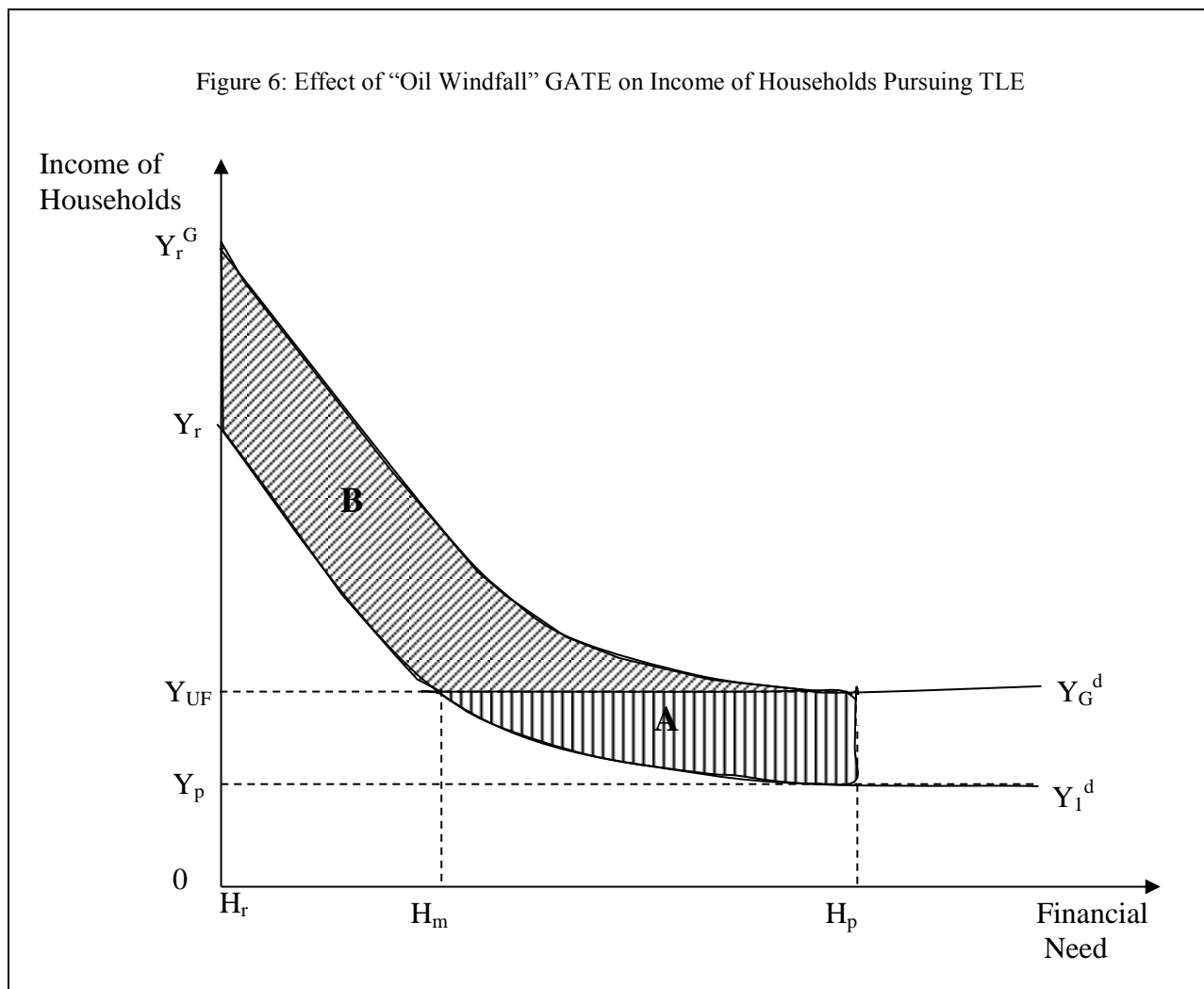


Using Figure 5 below with the Dollar for Dollar funding scheme, let Y_{UF} be the level of university fees. Clearly, the poorest household, HH_p , would require the most assistance and the marginal household (HH_m) would need zero assistance as things stand. In this second permutation, the shaded area A is minimum funding to get all the students whose income fall short of the amount necessary to pay fees.



The 2006 modified GATE programme removed the means testing aspect of the same and introduced 100% tuition funding for TLE for all households. The effect of this can be seen in the third permutation in Figure 6 below.

Figure 6: Effect of “Oil Windfall” GATE on Income of Households Pursuing TLE



If Figure 6, the income of the poorest households with students meeting the standard to enter TLE is Y_p while that of the richest household is Y_r . If university fees are $\$Y_{UF}$ per month then A, as said before, represents the minimum level of resources required to subsidise TLE for the poorest households in the interval H_m to H_p . This area therefore represents a vertical and horizontal efficiency position. The universal nature of “oil windfall” GATE, however, commands the extra block of resources (B) which could be otherwise employed. The area $A + B$ results in vertical inefficiency in the use of funds as households which are well able to afford TLE are subsidised within the universal funding scheme. Therefore, B represents vertical inefficiency where $\frac{B}{A+B}$ would equate the amount of money wasted. “The area [B] is a manifestation of the resource curse problem at work” (Hosein and Franklin 2008).

By way of a simple illustration. Assume we have 5 students with income levels \$1, \$2, ...\$5. If university fees are \$6 then by giving all five students \$6 we expend \$30 whereas with an appropriate means test we only expend \$15. Both \$15 in the case of a means test and \$30 in the

case of universal funding provides horizontal coverage. The \$15 outlay is vertically efficient whilst the \$30 outlay is very vertically inefficient.

In the case of Trinidad and Tobago, evidence of vertical inefficiency is seen in the types of households accessing the GATE programme. From Table 4 below, it can be seen that household heads earning \$9,000 or more access GATE funding at a higher percentage than those earning an income of less than \$9,000. Of particular interest is the income group \$17,000 - \$18,999, of which 7.9% access GATE Funding. From table 4 it can be seen that 31.3% of households, i.e. those earning between \$9,000 and \$18,999, access GATE in the highest percentage while the majority of households, i.e. 60.6%, which earn less than \$9,000 per month access GATE in the smallest percentage. Of the 0.9% of households accessing GATE, 0.03% represents households earning less than \$9,000 per month while 0.2% represents households earning \$9,000 to \$18,999.

Table 5 shows university fees on average per faculty. The largest faculty is the faculty of Social Sciences with a total intake of 3719 students representing 29.5% of the 2011/2012 undergraduate student body. At \$12,000 fees per annum, it means that an average monthly saving of \$1000, other things constant and assuming no prior savings, can be released to pay for student fees. Households in the income group \$9000² and above save at least \$1000 per month and so can afford to pay fees, other things constant.

Very clearly then, households accessing GATE in the greatest density come from those income groups that can afford to pay or are in the range H_m to H_r in Figure 6 above.

Table 4 Comparison of Household Expenditure and Access to GATE by Income Group of Head and Household Income Group

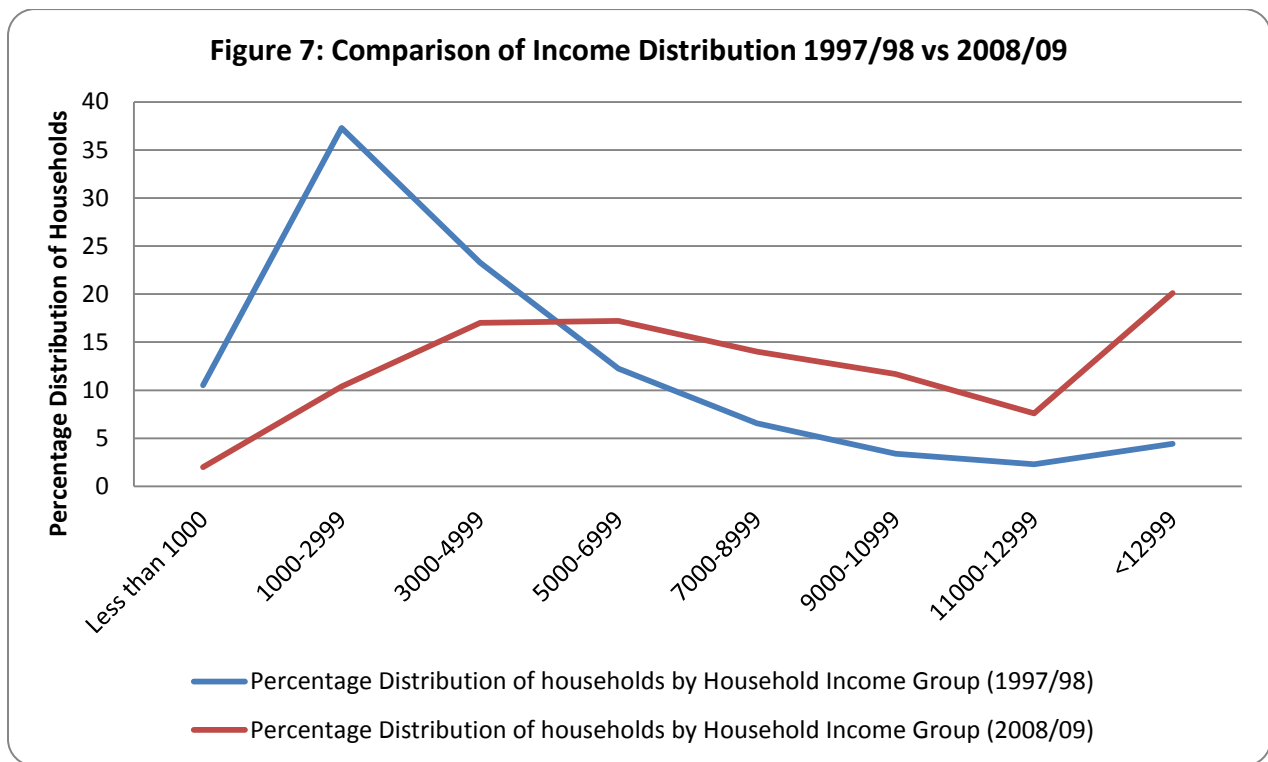
Income Group (TT\$)	Average Size of Household by Income Group of Head	% Accessing GATE Funding by Income Group of Head	Percentage Distribution of households by Household Income Group	Average Monthly Savings per household by Household Income Group	Per capita Monthly Household Income by Income Group	Average Consumption Expenditure per household by Household Income Group	Percentage of Income Spent on Education by H/hold Income Group
All Income Groups	3.4	0.9	100.0	\$1033.60	\$2744.20	\$7223.40	1.1
Less than 1,000	3.8	0.5	2.0	\$114.10	\$124.50	\$3713.40	1.3
1,000-2,999	3.1	0.2	10.4	\$298.50	\$929.80	\$2947.10	0.3
3,000-4,999	3.3	0.3	17.0	\$292.90	\$1466.90	\$4075.10	0.5
5,000-6,999	3.4	1	17.2	\$503.40	\$1943.40	\$5315.40	0.6
7,000-8,999	3.5	1.8	14.0	\$767.50	\$2299.60	\$6609.50	0.8
9,000-10,999	3.4	4.6	11.7	\$981.20	\$2696.50	\$8099.20	0.8
11,000-12,999	3.3	2.9	7.6	\$1389.50	\$3048.90	\$8989.40	1.1
13,000-14,999	3.3	5.5	5.2	\$1706.70	\$3447.20	\$10126.00	1.1

² The average monthly savings for the income group \$9,000 - \$10,999 has been rounded up from \$981.20 to \$1,000.

15,000-16,999	3.3	1.5	3.9	\$1894.40	\$3857.40	\$11209.80	1.3
17,000-18,999	3.3	7.9	2.9	\$2110.60	\$4525.40	\$12805.50	1.7
19,000-20,999	4.1	0	2.1	\$2256.80	\$4754.70	\$13616.60	1.5
21,000-22,999	4.1	0	1.5	\$3418.00	\$4917.20	\$14947.20	1.1
23,000-24,999	2.9	0	0.9	\$3293.80	\$5390.40	\$14867.50	1.8
25,000 and Over	3.2	5	3.6	\$5079.90	\$7910.60	\$19335.50	3.1

Source: Trinidad and Tobago Household Budget Survey 2008/2009

Below, a comparison of income distribution within Trinidad and Tobago between 1997/98 and 2008/09 is given. Review of Figure 7 below shows the change in the distribution of income to reflect a more even distribution especially through the reduction in the percentage of households in the less than \$1,000 to \$3,000 income bracket. Though the income distribution has become more even, the increase in the percentage of persons earning more than \$12,999 in 2008/09 should be noted.



Source: CSO Household Budget Surveys (1997/98 and 2008/09)

Table 4.3 below entitled “Percentage Distribution of Household Members by Type of Government Social Programmes Accessed by Household Members, Income Area and Urban/Rural Classification” of the 2008/2009 Trinidad and Tobago Household Budget Survey highlights that 2.2% of all households accessed GATE funding in 2008/09. The analysis continued to include access to GATE funding according to “Income Area” which reveals that

1.4% accessing GATE funding were from low income households, 1.9% from middle income and 3.6% from high income households.

Table 4.3
Percentage Distribution of Household Members by Type of Government Social Programmes Accessed by Household Members, Income Area and Urban/Rural Classification

Type of Government Social Programmes Accessed by Household Members	All Households	Income Area			Urban/Rural Classification	
		Low	Middle	High	Urban	Rural
Type of Government Social Programmes Accessed by Household Members		(2)	(3)	(4)	(5)	(6)
GATE	2.2	1.4	1.9	3.6	2.7	1.4

Source: Excerpt from CSO Household Budget Survey 2008/09

Table 5 Estimated Tuition Fees at the University of the West Indies per Academic Year According to Faculty

Faculty	Estimated tuition fees for the academic year (TT\$)
Food and Agriculture	12600
Science and Technology	12600
Humanities and Education	12000
Social Sciences	12000
Engineering	18000
Law	13500

Source: Undergraduate Financial Information University of the West Indies St Augustine Campus (2012)

Methodology

The empirical work in this paper involved the use of both primary and secondary data.

Secondary Data

Secondary data was gathered from publications including the Report of the Standing Committee on the GATE Programme (2011) and the Household Budget Survey of Trinidad and Tobago, web pages such as that of various Ministries of Education and world organisations such as the

OECD and World Bank, published reports and newspaper articles. The data was gathered from internet sources as well as hard and soft copies of published reports.

Primary Data

Primary data was gathered via a sample survey of students at the St Augustine Campus of the University of the West Indies. The population sizes of the faculties on the Campus were retrieved from the University of the West Indies' Students Statistics publication for 2011/2012.

The survey objectives were separated into general objectives and specific objectives.

General Objectives:

The survey had the overall objective of assessing the sustainability of the GATE programme through measuring the impact it had on the pool of students from varying income categories within the University of the West Indies St Augustine Campus.

Specific Objectives:

The specific objectives of this survey were very strongly linked with those of the survey done in 2003³. These were the:

1. Establishment of the income profiles of Level I/II and Level III undergraduate students in the Faculties of Food and Agriculture, Humanities and Education, Engineering, Science and Technology and Social Sciences, including Law.
2. Comparison of Level I/II and Level III students with respect to demography and socioeconomic profiles with particular focus on the comparison of students within the lower income category.
3. Measurement of the perception of the GATE programme by students within the St Augustine Campus.

Methodology

A quantitative methodology was used for this study whereby one questionnaire was designed for distribution to all the faculties of the St Augustine campus of the University of the West Indies. Questionnaires were administered "face-to-face" to undergraduate students in each faculty in September and October 2012. Due to the lead time to obtain the sampling frame, a quota sampling design was applied resulting in an undergraduate sample size of 957 for the St Augustine Campus. The sample sizes for the faculties were calculated using the Sample Size Calculator provided on the Creative Research Systems website. They were calculated using a 99% confidence level with a margin of error of 10. The population sizes were retrieved from the University of the West Indies' Students Statistics publication for 2011/2012. The undergraduate faculty quotas were as follows:

³ The 2003 study of the Dollar for Dollar programme had the general aim of measuring the impact of the programme with respect to increasing the proportion of students at the UWI from families with lower incomes in Trinidad and Tobago. The study provided for a sample of 865 UWI students and was divided into faculty quotas of 176 Engineering, 219 Science and Agriculture, 288 Humanities and Education and 282 Social Sciences. Overall, it catered to 585 Level I/II students and 280 Level III students. The achieved sample was made up of 813 students with 574 at the Level I/II tier and 239 at the Level III tier.

Table 6: Sample Sizes for each Faculty of the St Augustine Campus of the University of the West Indies

Faculty	UWI faculty population size (Enrolment 2011/2012)	Sample Size	Percentage Sample by Faculty (Enrolment 2011/2012)
Food and Agriculture	559	128	22.90
Humanities and Education	1821	260	14.28
Engineering	1384	149	10.77
Science and Technology	3030	158	5.21
Social Sciences and Law	3987	262	6.57
Total	10781	957	8.88

The questionnaire used was designed to be comparable with the questionnaire used for the study of the Dollar for Dollar programme conducted in 2003; the published paper of which was entitled *Dollar for Dollar and Tertiary Level Education in Trinidad and Tobago* (Tewarie, Franklin and Hosein 2005). It sought to gather both demographic and socio-economic data from the students including their age, sex, location of family residence, employment status and income. Socio-economic data was also gathered on their parents/ guardians, as well as, data on means used for the financing of additional fees, data on their appreciation of the GATE Programme and data on their perceived response if the programme were to be discontinued in the coming academic year. Five new questions were added to the GATE questionnaire. These relate to the following:

1. *Number of years enrolled in UWI*
2. *Family Structure*
3. *The extension of the GATE Programme to all students accepted for technical/vocational education*
4. *Opinions with respect to the requirement of the GATE Programme that beneficiaries serve the Government for a defined number of years or repay the funding provided.*
5. *Students' immediate plans after graduation*

Altogether, the questionnaires consisted of nineteen closed and open ended questions.

The Achieved Sample – UWI Students

The achieved sample was 897 students subdivided into 557 Level I/II Students and 338 students in Level III registered in the Faculties of Food and Agriculture, Humanities and Education, Engineering, Science and Technology and Social Sciences, including Law. Two students within the sample neglected to state their degree level. Eighty-eight percent (88%) of students in Level III were Full Time students while ninety-four percent (94%) of Level I/II students surveyed were Full Time.

GATE Survey Results

Student Results – UWI Students

The achieved sub samples by faculty were: 121 Faculty of Food and Agriculture, 215 Faculty of Humanities and Education, 144 Faculty of Engineering, 157 Faculty of Science and Technology and 260 Faculty of Social Sciences including Law. As a percentage of the total number of students enrolled into the various faculties in 2011/2012, the above sub-samples represented 21.65% of Food and Agriculture, 11.8% of Humanities and Education, 10.4% of Engineering, 5.18% of Science and Technology, and 6.52% of Social Sciences including Law. A further breakdown of the composition of the sample is given in Table 7 below and can be compared to the breakdown of faculty quotas for the 2003 study in Table 7.1.

TABLE 7: PROFILE OF THE SAMPLE BY FACULTY AND LEVEL 2012								
Faculty	Level III	%	Level I & II	%	No Response	%	All Levels	%
Food & Agriculture	40	11.8	81	16.6	0	0.0	121	13.5
Humanities & Education	98	29	117	23.9	0	0.0	215	24
Engineering	25	7.4	119	24.3	0	0.0	144	16.1
Science & Technology	67	19.8	90	18.4	0	0.0	157	17.5
Social Sciences & Law	108	32	82	16.8	2	100.0	260	29
Total	338	100	489	100	2.00	100.0	897	100.0

TABLE 7.1 – PROFILE OF THE SAMPLE BY FACULTY AND LEVEL 2003							
Faculty	Level III	%	Level I & II	%	All Levels	%	
Humanities & Education	40	16.8	116	20.2	156	19.2	
Social Sciences	69	28.6	159	27.7	228	28.0	
Science & Agriculture	65	27.3	162	28.2	227	28.0	
Engineering	65	27.3	137	23.9	202	24.9	
	239	100.0	574	100.0	813	100.0	

Source: Tewarie, Franklin and Hosein (2003)

Profile by Gender

The ratio of males to females within the sample was approximately 36:64. As can be seen in Table 8 and 8.1 below, the gender ratio was relatively consistent amongst the levels and between the two time periods. The comparison of the male/female frequencies at all levels for 2003 and 2012 revealed a Chi-Square statistic of 2.045 at 1 degree of freedom and a P-Value of 0.153. This shows that there is not a significant difference between the results of 2003 and 2012.

TABLE 8: GENDER PROFILE OF THE SAMPLE 2012						
	Level III	%	Level I & II	%	All Levels	%
Male	119	35.2	205	36.8	324	36.2
Female	217	64.2	350	62.8	567	63.4
No Response	2	0.6	2	0.4	4	0.5
Total	338	100.0	557	100.0	895*	100.0

*Neither level nor sex stated by two(2) respondents

TABLE 8.1: GENDER PROFILE OF THE SAMPLE 2003						
	Level III	%	Level I & II	%	All Levels	%
Male	98	41.0%	225	39.2%	323	39.7%
Female	141	59.0%	349	60.8%	490	60.3%
Total	239	100.0%	574	100.0%	813	100.0%

Source: Tewarie, Franklin and Hosein (2003)

When compared to the study of the Dollar for Dollar programme done by Tewarie, Franklin and Hosein in 2003, there has been a 4% change in the male to female ratio from 40:60. This shows a continuation of the trend of the percentage of males being lower than that of females being registered.

Profile by Age

At all levels, the predominant age remained as people 25 years and under, with this age group representing 85.3% of the total sample as seen in Table 9. Further sub-division shows that 77.58% of the Level III sub-sample was in this age group whereas 90.13% of the Level I/II sub-sample was in this age group. These percentages can be compared with that of the 2003 study in Table 9.1 whereby the relative percentages were 89.5% for the Level III sub-sample and 92.4% for the Level I/II sub-sample. Similar to the 2003 study, it can be observed that there is a near

equal likelihood of Level III students falling into the age categories 21 & under and 22-25 while those of Level I/II are most likely to fall in the 21 & under category.

Age	Level III		Level I & II		All Levels	
		%		%		%
21 & under	149	44	429	77.0	578	64.5
22 – 25	114	33.6	73	13.1	187	20.9
26 – 29	19	5.6	23	4.1	42	4.7
30 – 34	16	4.7	16	2.9	32	3.6
35 – 39	16	4.7	2	0.4	18	2.0
40 – 44	10	3	6	1.1	16	1.8
45 – 49	12	3.5	8	1.4	20	2.2
50 - 54	3	0.9	0	0	3	0.3
Total	339	100	557	100	896	100.0

Age	Level III	Level I & II
21 & under	45.4%	77.6%
22 – 25	44.1%	14.8%
26 – 29	5.7%	3.0%
30 – 34	3.1%	0.9%
35 – 39	0.9%	1.8%
40 – 44	0.4%	0.7%
45 – 49	0.4%	1.2%
Total	100.0%	100.0%

Source: Tewarie, Franklin and Hosein (2003)

Employment Status Prior to Registration at UWI

With the exception of 13 persons who did not respond to the question “*Employment Status prior to registration at UWI*”, 34.5% of Level III students sampled were employed prior to their enrolment in UWI as compared to the 28.9% for Level I/II students as can be seen in Table 10 below. This can be compared with the 2003 study, where 32% of Level III students and 29% of Level I/II students were employed prior to registering at UWI. Analysis of the frequencies relating to employment status from 2003 and 2012 revealed a Chi-Square test statistic of 6.153 at 1 degree of freedom. This related to a p-value of 0.013 which shows that there is a significant difference between the levels of employment prior to registration at the UWI when 2003 is compared to 2012.

TABLE 10: EMPLOYMENT STATUS PRIOR TO REGISTRATION AT UWI 2012						
Employment Status	Level III		Level I & II		All Levels	
		%		%		%
Employed Full Time	87	26.1	106	19.3	193	21.8
Employed Part Time	28	8.4	53	9.6	81	9.2
Unemployed	219	65.6	391	71.1	610	69
Total	334	100	550	100	884	100

Current Employment Status

From the Level I/II sample of students responding to the question “Current Employment Status”, 9.26% are employed full time, 7.04% are employed part time. This compares to the 20.73% of Level III students employed full time and 9.45% of the same employed part time. The current monthly income of students in Level III averaged \$1,324. The standard deviation for Level III was \$2,646. For students in Level I the mean was \$492 with a standard deviation of \$1,514.30. Students in Level II earned an average of \$915 and standard deviation of \$2,309.

Geographical Spread

From Table 11 below it can be seen that, with the exception of North East Trinidad, there is not a large difference between Level III and Level I/II in terms of geographical spread in 2012. In the 2003 study, shown in Table 11.1, the results were also similar. Though there appears to be an increase, from the 2003 study, in the proportion of persons living in each area in 2012, calculation of the Chi-Square test statistic between the frequencies from 2003 and 2012 revealed a statistic of 6.25 at 5 degrees of freedom with a p-value of 0.28. This shows that there is no significant difference between the results of 2003 and 2012.

TABLE 11 GEOGRAPHICAL SPREAD 2012						
Family Residence	Level III		Level I & II		All Levels	
		%		%		%
North Central Trinidad	21	6.2	33	5.9	54	6.0
North West Trinidad	44	13.1	87	15.6	131	14.6
North East Trinidad	113	33.5	143	25.6	256	28.6
Central Trinidad	79	23.4	138	24.7	217	24.2
South Trinidad	78	23.2	145	25.9	223	24.9
Tobago	2	0.6	13	2.3	15	1.7
Total	337	100	559	100	896	100

TABLE 11.1: GEOGRAPHICAL SPREAD 2003		
Family Residence	Level III	Level I & II
North Central Trinidad	5.1%	8.1%
North West Trinidad	5.5%	4.9%
North East Trinidad	28.0%	31.6%
Central Trinidad	22.9%	22.0%
South Trinidad	36.9%	31.9%
Tobago	1.7%	1.4%
	100.0%	100.0%

Source: *Tewarie, Franklin and Hosein (2003)*

Family Status

Type of Residence

As can be seen in Table 12, eighty-two percent (82%) of the Level I/II sample had an “owner occupied property” as their family’s residence as compared to seventy-eight percent (78%) for Level III. When compared with the results of the 2003 study, these percentages were 79% for Level I/II and 84% for Level III. Those living in “rented property” or within “rent free accommodation” were far outweighed with the respective percentages for Level I/II being 13% and 5% and for Level III, 15% and 7% in 2012.

Family Residence	Level III		Level I & II		All Levels	
		%		%		%
Owner Occupied Property	264	78.3	457	82.2	720	80.7
Rented Property	50	14.8	70	12.6	120	13.4
Rent Free Accommodation	23	6.8	29	5.2	52	5.8
Total	337	100	556	100	892	100

Occupation of Parents/ Guardians

Similar to the 2003 study, the modal category of occupation of parents/ guardians across all levels is the Professionals category. It is interesting to note that the highest percentages of parents across all levels were in the categories “Senior Officials & Managers” and “Professionals”. This also reflects the data supplied by the HBS (2008). This is important as these categories represent high income earners. Specifically, forty-six percent (46%) of Level III parents/guardians are Professionals, Senior Officials & Managers or sub professionals, whereas 51% of Level I/II parents/guardians are Professionals, Senior Officials & Managers or sub professionals. Fourteen percent (14%) of parents/guardians of Level III students are retired as compared with 8% of those of Level I/II (See Table 13). Also, 11% of parents of Level III and 12% of Level I/II students are housewives. As compared to the 2003 study shown in Table 13.1 more UWI students came from households where parents have better paying jobs.

Occupation	Level III		Level I & II	
		%		%
Senior Officials & Managers	58	14.1	124	18.6
Professionals	85	20.7	153	22.9
Sub Professionals	45	11	55	9.8
Clerks	34	8.3	39	5.8
Service & Shop Sales Workers	20	4.9	28	4.2
Agric, Forestry & Fishery Workers	11	2.7	29	4.3
Craft & Related Workers	8	2	18	2.7
Plant & Machine Operators	13	3.2	34	5.1
Elementary Occupation	7	1.7	22	3.3
Senior Police & Defence Force	19	4.6	18	2.7

Housewives	40	8.7	75	9.7
Students	4	1	4	0.6
Unemployed	9	2.2	14	2.1
Retired	56	13.6	53	7.9
Other	4	1	2	0.3
Total	411	100	668	100

TABLE 13.1 – OCCUPATION PROFILE OF PARENTS/GUARDIANS 2003		
Occupation	Level III	Level I & II
Senior Officials & Managers	5.8%	11.8%
Professionals	24.0%	22.5%
Sub Professionals	16.0%	12.1%
Clerks	4.9%	7.1%
Service & Shop Sales Workers	3.4%	5.5%
Agric, Forestry & Fishery Workers	1.2%	1.0%
Craft & Related Workers	3.4%	4.5%
Plant & Machine Operators	3.4%	2.5%
Elementary Occupation	6.3%	4.4%
Senior Police & Defence Force	1.7%	0.7%
Housewives	13.8%	14.2%
Students	0.0%	0.1%
Unemployed	1.9%	6.7%
Retired	14.1%	7.0%
	100.0%	100.0%

Source: Tewarie, Franklin and Hosein (2003)

This is a significant table and indeed tells a strong story. Let it not be forgotten that the per capita GDP of Trinidad and Tobago at current prices in 2011 was US\$17,231 and in 2001 when the Dollar for Dollar programme was started it was US\$6,804.

Living Status of Students

Students living off of the university campus made up 95% of the Level I/II sub-sample and 98% of the Level III sub-sample, an increase from the results of the 2003 study which showed 92% and 80% respectively for students living off campus. 70% of Level I/II students lived at home with their parents/ guardians while 74% of students in Level III did the same. Of those renting accommodation off of the university's campus, the percentages for Level I/II and Level III respectively were 20% and 17%. These figures represent sharp decreases of 33% and 38% respectively in the percentage of students occupying rented accommodation when compared to the 2003 study. These sharp decreases are consistent with the growth in the student numbers since 2003.

The rent paid by Level I students had an average of \$1,241.10 with a standard deviation of \$552.40. For Level II the average was \$1,209.40 with a standard deviation of \$628.40. Level III's average was \$1,242.40 with a standard deviation of \$738. These figures show the

significant increase in the rent paid on accommodation when compared with figures from the 2003 study which are quoted below:

“The rents paid by the off campus Level III students average \$625 per month and possess a standard deviation of \$250 per month; the comparative mean rent and standard deviation for off campus Level I/II students are \$700 and \$400 per month respectively.” B. Tewarie, M. Franklin and R. Hosein (2005)

Disposable income of households of students

As with the 2003 study, students were asked to categorise their income levels according to the following categories:

“Category I – don’t have enough money to live

Category II – just enough money to live but I do so by making many sacrifices

Category III – have sufficient money to live without having to make many sacrifices

Category IV – have enough so that I do not have to go without anything of importance.”

There has been, between the two time periods shown in Tables 14 and 14.1, some improvement in the disposable income of students.

TABLE 14: DISPOSABLE INCOME OF HOUSEHOLD OF STUDENTS 2012				
Category	Level III	%	Level I & II	%
I	14	3.6	27	5.1
II	183	54.5	258	47.9
III	97	30.2	181	33.6
IV	36	11.8	72	13.3
Total	330	100	538	100

**No response from 25 respondents, multiple answers from 4 respondents*

TABLE 14.1 – DISPOSABLE INCOME OF HOUSEHOLD OF STUDENTS 2003				
Category	Level III	%	Level I & II	%
I	23	9.9%	38	6.8%
II	129	55.4%	313	56.3%
III	69	29.6%	140	25.2%
IV	12	5.2%	65	11.7%
	233	100.0%	556	100.0%

Source: Tewarie, Franklin and Hosein (2003)

The categorisation of the majority students in categories II and III suggests that the GATE programme continues to facilitate the increase in disposable income of students in the University of the West Indies.

This is also a significant table and continues to tell us a strong story. Let it not be forgotten that the per capita GDP of Trinidad and Tobago at current prices in 2011 was US\$17,231 and in 2001 when the DfD programme was started it was US\$6,804.

Issues Associated with the GATE Programme

By 2008, several “abuses” of the GATE Programme were identified leading to the introduction of a “GATE Clearance Policy” (Report of the Standing Committee on the GATE Programme 2011, 12) to reduce the problems created by students who:

1. Withdrew from programmes without good cause
2. Pursued more than one programme simultaneously
3. Started and ended programmes repeatedly
4. Switched programmes without giving sufficient notice or getting approval
5. Repeated the same programmes.

However, this policy was only applicable to private TLI as it was assumed that public TLI would act “*in the interest of the state and to closely monitor student performance and commitment to academic programmes*” (ibid, 23).

Also among the issues identified within the GATE Programme is the inability of students to maintain a suitable Grade Point Average (GPA) to facilitate their continued funding. Hence, in January 2012 a “student performance policy” was introduced in public TLIs which stipulated that students falling below the minimum GPA requirements, ranging from 1.0 to 2.0, of the respective TLI would be made to pay their tuition. The withholding of the GATE funding would remain until the GPA returns to the minimum level or above.

Between 2008 and 2011, 6,388 applications for GATE funding were denied with the major reasons for the denial being:

1. Lack of proof of completion of previously pursued programmes; 60% of applications denied
2. Failure to maintain or attain the required GPA; 11.5% of applications denied
3. “*Failure to complete the lower level of the current programme*”(ibid, 19); 8.8% of applications denied.

According to a September 9, 2012 article in *The Trinidad Guardian Newspaper* “*Close to 1,100 students at the College of Science, Technology and Applied Arts of T&T (Costaatt), 2,000 students at the University of the West Indies (UWI), St Augustine campus and 900 students at the University of T&T (UTT)*” faced the removal of GATE funding for 2012/2013 due to failure to maintain the required GPA standards of the institutions at the end of 2011/2012.

In addition to student related inefficiencies associated with GATE, private TLIs also demonstrate inefficiencies arising out of lack of accreditation for GATE funded programmes, abuse of funds due to “*non-conformity with the [GATE] Agreement*” (Report of the Standing Committee on the GATE Programme 2011, 29) and inaccurate record-keeping. The MSTTE is therefore responsible for conducting biennial reviews of its Agreement with private TLIs. This review seeks to maintain standards set for private TLIs including registration with the Accreditation Council of Trinidad and Tobago (ACTT) or the National Training Agency (NTA), attainment of approval for GATE funded programmes and changes in tuition fees. The Government of Trinidad and Tobago, having greater control over tuition fees with the introduction of GATE, must review and approve changes in tuition fees before they are put into effect. Prior to 2011, advice on the suitability of these tuition changes was sought twice, “[*h*]owever, the process of

objectively assessing tuition fees at private institutions has been confined to a level of reasonableness of tuition fees as opposed to a more comprehensive analysis of the economic cost of tuition for each programme and institution” (Report of the Standing Committee on the GATE Programme 2011, 21). Laws have also been put in place which require private TLIs to support requests for increased tuition fees. The strict monitoring of these private TLIs arose out of the rapid increase in the number of the same after the introduction of GATE specifically in 2006/2007.

The MSTTE has also sought to align funding for programmes within TLIs to national developmental goals. As such, 2011 ushered in new regulations for the approval of funding for programmes including their alignment to “*economic and development priorities of the Government*” (ibid, 24). This statement was supported in the 2011/2012 budget which highlighted the need to match the GATE programme to human resource gaps within Trinidad and Tobago’s economy and ensured the sustainability of development. With regards to Tobago, specific emphasis was placed on programmes geared toward the development of niche market tourism. This emphasis of the Government has led to the commissioning of the Centre for Workforce Research and Development at UWI to identify the human resource gaps which need to be filled. This initiative will provide support for the expansion of the GATE programme to include relevant TVET programmes.

Sustainability of the GATE Programme

Table 15: Key Macroeconomic Indicators for Trinidad and Tobago, 1990-2011.

Year	Real GDP TT\$mnn real GDP (%) (2000= 100) (a)	Growth rate of real GDP (%)	Unemployment rate (%)	Inflation rate (%)	Crude oil production (000 barrels per day)	Price per barrel of crude oil (US\$) West Texas Intermediate	Petroleum industries Contribution to GDP TT\$mnn (b)	Natural Gas Prices	Reserve to production ratio
1990	35725.9	1.5	20.2	11.1	152.2	23	12107.9	1.7	9.5
1991	36687.1	2.7	18.5	3.8	144.1	19.3	12249.5	1.64	9.4
1992	36081.6	-1.6	19.6	6.5	135.7	19	11708.1	1.49	9.5
1993	35554.8	-1.45	19.8	10.8	122.2	16.8	10923.1	1.77	10.9
1994	36824.1	3.6	18.4	8.8	128.8	15.9	11877.3	2.12	10.4
1995	38282.4	4	17.2	5.3	131.8	17.2	11911.1	1.92	11.6
1996	39748.6	3.8	16.3	3.3	129.1	20.4	12086.1	1.69	11.8
1997	40869.5	2.8	15	3.6	123.6	18.8	12106.1	2.76	11.9

1998	44045.1	7.8	14.2	5.6	121.1	11.1	12587.7	2.53	13.5
1999	45978.6	4.4	13.2	3.4	126.8	17.7	14302.2	2.08	15.1
2000	49335.1	7.3	12.2	3.5	130.5	29	16072.8	2.27	16.4
2001	51447.2	4.3	10.8	5.6	113.5	19.8	16920.5	4.23	19.9
2002	54936.7	6.8	10.4	4.1	130.6	29.4	19259.1	4.07	19.8
2003	62171.7	13.2	10.5	3.6	134.2	33.1	25261.9	3.33	15.4
2004	71355.2	7.9	10.5	3.8	136.9	36.3	27383.8	5.63	13.8
2005	75193.6	5.4	10.4	3.3	144.67	50.04	29651.2	5.85	11.4
2006	85795.4	13.4	8	6.9	142.72	58.3	36102.7	8.79	11.5
2007	89874.3	5.5	7	8.3	155.4	64.2	36709.5	6.76	9.5
2008	92000.7	2.4	4.5	7.9	163.3	91.48	36626.9	6.95	8.1
2009	88744.5	-3.5	5.5	12.2	163.3	53.56	37582.1	8.85	8.1
2010	90975.1	-1.2	6.4	10.5	152.4	71.21	38625	3.89	8
2011p	88060.8	-1.4	6.3	2.7	91.92	83	38281.4	4.39	8.1
Source: Review of the Economy (Various years) and US Energy Information Administration.									
1999 - 2001	48920.30	5.33	12.07	4.17	123.60	22.17	15765.17	2.86	17.13
2009-2011p	89260.13	-2.03	6.07	8.47	135.87	69.26	38162.83	5.71	8.07
Source: Authors' calculations – average values									

From Table 15 above it can be seen that the reserve to production ratio for Trinidad and Tobago between 1990 and 2011 rose from 9.5 in 1990 to a high of 19.9 in 2001. Subsequently, this rate has fallen to a low of approximately 8 years in 2010 and remained at approximately 8 years for the time period 2008 to 2011. The reserve to production ratio is used to determine the length of time, in years, that a resource will last based on the amount of the resource used per year. No doubt motivated by the reserve to production ration in 2001, the then government introduced the Dollar for Dollar programme. At that point in time the economy was buoyant. The fiscal balance was also in surplus and the debt to GDP ratio was low, giving us the fiscal space.

Similar patterns can also be shown through observation of the trends of real GDP growth. These show fluctuations from year to year with the highest growth being experienced in 2006 at 13.4% and the least growth being experienced in 2009 at -3.5% for the period. Between 2002 and 2006, real GDP growth fluctuated above 5%. Within this same period, government funding for TLE grew from 50% tuition coverage under Dollar for Dollar to the initial GATE Programme in 2004 which extended funding up to 100% based on a means test, to universal 100% tuition coverage in 2006. The year 2006, which showed the highest real GDP growth rate for the period, is of importance to this study as this year ushered in the “oil windfall” GATE programme. Though the economy was “thriving” in the period before 2006 and arguably up to 2008, from 2009 forward, the economic environment has changed. Of note, is the negative real GDP growth being

experienced consistently from 2009 to 2011. However, in the face of negative real GDP growth, a further amendment, to fund students in Technical Vocational Education and Training Programmes, was made to the GATE programme in 2010. This highlights the extension of the programme regardless of the economic position of Trinidad and Tobago.

Over the observed period, the Unemployment Rate has been steadily decreasing to a low of 4.5% in 2008, thereafter there have been marginal increases in the rate of unemployment to 6.3% in 2011. The increase in unemployment between 2009 and 2011 alongside the negative real GDP growth in the same period, presents a warning with regards to the economic state of Trinidad and Tobago. The warning can also be seen in the observation of crude oil production versus the price per barrel. From 2001 to 2009 the production of crude oil has generally been increasing with the exception of a marginal fall in 2006. This has been accompanied by increases in prices from US\$19.80 in 2001 to US\$91.48 in 2008. Thereafter there has been a fluctuation of prices below the 2008 level as well as a sharp decrease in production between 2010 and 2011.

Of further interest to this study is the increase in Trinidad and Tobago's government "*spending on transfers and subsidies...[by] 171 per cent between 1990 and 2004*" (Hosein 2006, 6). Going forward, Transfers and Subsidies as a percentage of GDP between 2005/2006 and 2009/2010 fiscal years have been as follows; 13%, 12%, 12%, 17% and 16% (Greigg 2011). In 2010/2011, the share of GDP comprising Transfers and Subsidies was again 16% (Trinidad and Tobago National Budget Statement 2011, 14). Since the sharp increase in the share of GDP dedicated to Transfers and Subsidies in 2008/2009, this level has been sustained at between 16-17%. This coincides with the negative growth highlighted above and the increase in the unemployment rate.

Noting well that the Government of Trinidad and Tobago depends both on its oil and non-oil revenue to fund expenditure, it is unsettling to see the continued expenditure on the GATE programme in light of persistently reduced R/P ratios, unstable oil prices, negative real GDP growth and increasing unemployment.

Conclusion and Recommendations

From the analysis conducted within this paper, it is clear that the universal subsidising of tertiary level education within Trinidad and Tobago is an inefficient use of rents from the sale of petroleum. The evidence to support this statement was highlighted through review of the 2008/09 Household Budget Survey which showed that 31.3% of households, which comprised persons earning between \$9,000 and \$18,999, accessed GATE in the highest percentage while the majority of households, i.e. 60.6%, which comprised persons earning less than \$9,000 per month accessed GATE in the smallest percentage. A case was then built around this fact to show that persons in the former range could afford to pay tuition fees for the Faculty of Social Sciences of the University of the West Indies from their savings. This group, therefore, should not be included within those given 100% tuition funding for TLE. However, the group earning less than \$9,000 per month, which represents the majority of households in Trinidad and Tobago, should be targeted more efficiently in order to incorporate this groups into TLIs. This opens the door for further study into the underlying reasons for the inequality of access to TLE among income groups in the presence of a universal subsidy. Though this universal subsidy has made significant strides toward making "*tertiary education affordable to all so that no citizen of Trinidad and Tobago will be denied tertiary education because of their inability to pay*" there is room for further analysis of other factors, such as the inability of students to meet the minimum university

entry requirements, which hamper the entry of students into TLIs and, by extension, create inequality of access to the good. However, this analysis would not reduce the need to reassess the disbursement of “transfers”, in the form of a subsidy on TLE, to the income groups which can well afford the same.

Continuing with the analysis of the evidence of the wastage of Trinidad and Tobago’s resources, the sample survey done of the St Augustine Campus of the University of the West Indies on the GATE Programme revealed that the highest percentages of students had parents in jobs either as “Senior Officials and Managers” or “Professionals”. It should be noted that these represent some of the highest income earning categories within Trinidad and Tobago. In addition, when compared to the 2003 study, the disposable income of students increased especially within categories III and IV (*Category III – [students who] have sufficient money to live without having to make many sacrifices Category IV – [students who] have enough so that [they] do not have to go without anything of importance*). This sought to prove the point made by Bloom and Sevilla whereby the availability of a subsidy to both “*credit-constrained*” and “*non-credit constrained*” individuals, would allow the former to use it efficiently but to the latter, it would be “*no more than a transfer*”.

The evidence shown to highlight the wastage of resources was then juxtaposed to the state of the Trinidad and Tobago economy with specific focus on the period 2009 to 2011 where the country has experienced three years of negative real GDP growth alongside low reserve to production ratios and increasing unemployment.

Overall, the paper has been set in the context of a global trend toward the reduction of subsidising of TLE and the movement toward sharing of the burden with the private sector through implementation of tuition fees. This trend works in tandem with the economic analysis of a merit good which recognises the need of the public sector to monetarily contribute to the demand of these goods in accordance with the benefit gained from positive externalities, while recognising the need for a contribution from the consumer in accordance with private benefit gained.

Taking these points into consideration, the overarching recommendation for Trinidad and Tobago with regards to the GATE Programme is to return to the 2004 version of the same whereby 50% tuition was given across the board with a means testing facility being made available for the application for up to 100% tuition coverage for those who truly need it.

Appendix A

GATE- NO. OF YEARS ENROLLED IN UWI						
No. of Years Enrolled in UWI	Level III		Level I & II		All Levels	
		%		%		%
1	2	0.60	250	46.04	252	28.80
2	47	14.16	155	28.55	202	23.09
3	190	57.23	111	20.44	301	34.40
4	62	18.67	16	2.95	78	8.91
5	24	7.23	6	1.10	30	3.43
6	6	1.81	5	0.92	11	1.26
>6	1	0.30	0	0.00	1	0.11
Total	332	100.00	543	100.00	875	100.00

GATE- FAMILY STRUCTURE						
Family Structure	Level III		Level I & II		All Levels	
		%		%		%
Single Parent	85	25.53	138	24.91	223	25.14
Nuclear Family (ie Both Parents)	227	68.17	385	69.49	612	69
Guardians	9	2.70	15	2.71	24	2.71
Living Alone	11	3.30	12	2.17	23	2.59
Other	1	0.30	4	0.72	5	0.56
Total	333	100	554	100		100

GATE- AGREEMENT WITH GATE FUNDING FOR TECHNICAL/VOCATIONAL EDUCATION						
Level of Agreement	Level III		Level I & II		All Levels	
		%		%		%
Agree	235	71.43	370	66.67	605	68.44
Disagree	35	10.64	48	8.65	83	9.39
Unsure	43	13.07	100	18.02	143	16.18
No Opinion	16	4.89	37	6.67	53	6
Total	329	100	555	100	884	100

GATE- OPINION ON THE REPAYMENT OF GATE						
	Level III		Level I & II		All Levels	
		%		%		%
I am aware of the formula for computing the number of years of service to Government	86	25.29	169	29.29	255	27.81
I prefer to serve the required number of years	157	46.18	277	48.01	434	47.33
I prefer to repay the funding	26	7.65	34	5.89	60	6.45
I am not aware of the formula for computing the number of	53	15.59	66	11.44	119	12.98

years of service to Government						
I am not interested in either of the two options	15	4.41	22	3.81	37	4.03
I want to propose another option	3	0.88	9	1.56	12	1.31
Total	340	100	577	100	917	100

GATE- IMMEDIATE PLAN AFTER GRADUATION						
	Level III		Level I & II		All Levels	
		%		%		%
Find a job for myself in the private sector	123	34.36	106	20.50	229	26.17
Have the Government employ me as per the GATE Contract	102	28.49	136	26.31	238	27.20
Read a post graduate certificate/ degree program (full time)	66	18.44	150	29.01	216	24.69
Read a post graduate certificate/degree program (part time)	41	11.45	51	9.86	92	10.51
Set up my own business	18	5.03	59	11.41	77	8.80
Team up with others to form a small/ medium business	8	2.23	15	2.90	23	2.63
Total	358	100	517	100	875	100

Appendix B

Table 4.1 Household Budget Survey 1997/1998

Income Group (TT\$)	Average Size of Household by Income Group of Head	Percentage Distribution of households by Household Income Group	Average Monthly Savings per household by Household Income Group	Per capita Monthly Household Income by Household Income Group	Average Consumption Expenditure per household by Household Income Group	Average Monthly Expenditure on Education by H/hold Income Group
All Income Groups	3.76	100	404.57	1176.02	3157.31	89.73
<500	2.69	2.98	37.35	117.58	942.82	20.16
500-999	2.40	7.53	15.09	318.26	914.43	14.70
1000-1999	3.18	19.01	42.65	467.66	1435.60	33.34
2000-2999	3.77	18.29	111.19	651.49	2154.33	49.79
3000-3999	4.23	13.53	260.52	817.67	2846.74	68.93
4000-4999	4.24	9.74	244.12	1053.72	3191.34	82.14
5000-5999	4.03	6.68	442.10	1357.14	3886.11	87.58
6000-6999	4.31	5.57	573.66	1503.04	4558.00	119.85

7000-7999	4.39	3.57	651.65	1704.83	5253.07	178.65
8000-8999	4.44	2.98	689.19	1907.10	5514.80	151.81
9000-9999	4.04	1.96	557.80	2323.03	5563.51	285.29
10000-10999	4.09	1.45	798.86	2560.33	6365.73	288.17
11000-11999	4.19	1.36	1616.75	2736.84	6377.42	132.30
12000-12999	4.95	0.94	3000.26	2524.33	6902.39	149.91
>12999	3.98	4.42	1097.39	4891.38	10846.55	426.29

Source: CSO Household Budget Survey 1997/98

Appendix C

Table Showing Fiscal Balance and Central Government Debt as a Percentage of GDP in Trinidad and Tobago (1990 to 2011)

Year	Fiscal balance as % of GDP	Central government debt, total (% of GDP)
1990	(1.2)	48.9
1991	(0.2)	50.5
1992	(2.7)	50.1
1993	(0.24)	60.4
1994	0.0	53.5
1995	0.2	51.51
1996	0.5	49.8
1997	0.1	48.1
1998	(1.9)	44.5
1999	(3.2)	42.9
2000	(1.6)	37.7
2001	0.0	35.5
2002	(0.3)	36.4
2003	2.7	31.0
2004	1.98	
2005	5.74	
2006	1.85	16.80
2007	0.66	15.93
2008	2.21	13.52

2009	(4.84)	21.39
2010	(5.2)	
2011	(1.4)	

From the table above, Central Government's Fiscal Balance as a percentage of GDP as well as its Debt as a percentage of GDP are seen. Looking again at the period 2009 to 2011, it can be seen that Trinidad and Tobago has operated with a fiscal deficit for all three years, though this deficit decreased in 2011.

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