

## Research Article

# Do Economics and National Political Governance influence Student-Enrolment at a Private Higher Educational Institution?

Paul Andrew Bourne<sup>1</sup>, Marjorie Charles<sup>2</sup>

<sup>1,2</sup>Northern Caribbean University, Manchester Road, Manchester, Jamaica, WI.

## I N F O

**Corresponding Author:**

Paul Andrew Bourne, Northern Caribbean University, Manchester Road, Manchester, Jamaica, WI.

**E-mail Id:**

paulbourne1@gmail.com

**Orcid Id:**

<https://orcid.org/0000-0003-3787-6180>

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## A B S T R A C T

Witter and Anderson have empirically established that structural adjustment has destroyed many social institutions as well as the agricultural sector in Jamaica. The current work aims to answer the following question, "Do intentional homicide rate, rape rate, and selected macroeconomic indicators such as inflation, unemployment, exchange rate (US \$ to Jamaican dollar), and GDP per capita rates influence student enrolment at a Private Higher Educational Institution?" The purpose of this investigation is to aid policy and decision makers in understanding the role of politics and economics in student-enrolment at tertiary level, and that these should be brought into the discourse of the choice of students to pursue tertiary studies. For the present study, data were taken from publications from government departments on macroeconomics (Planning Institute of Jamaica, 1970-2016; Bank of Jamaica, 1970-2016; and Statistical Institute of Jamaica, 1970-2016) and the online computer system at a Private Higher Educational Institution (1970-2016). Data were recorded, stored, retrieved, and analyzed, using the Statistical Packages for the Social Sciences (SPSS) for Windows, Version 24.0. The level of significance that is used to determine statistical significance is less than 5% (0.05) at the 2-tailed level of significance. The findings revealed that Gross Domestic Product (GDP) per capita positively influences student-enrolment at the Private Higher Educational Institution, and that it is the most significant predictor of student-enrolment. The results also revealed that inflation, exchange rate, intentional homicide and GDP per capita are predictors of student-enrolment, with these four independent factors accounting for 97.4% of the variability in annual enrolment at the Private Higher Educational Institution-GDP accounting for most of the variance in student enrolment (i.e. 90.6%). With continued dwindling market share of students, the Institution must diversify its product offerings to include the wider public and the government.

**Keywords:** Intentional Homicide, Student Enrolment, Macroeconomic Conditions, Substitution-Effect of Enrolment

## Introduction

The Jamaican economy, like many other economies has, over the years, been negatively impacted by downturns in the global economy as well as structural adjustments (Downes, 2009; Witter & Anderson, 1991; Rapley, 2002). Currently, there is much optimism for recovery and growth as countries emerge from recession. According to World Economic Outlook (IMF 2017), global recovery, though cyclical, is steady and is forecast to accelerate 2017-2018. Economists are cautiously optimistic that some growth will be experienced in the Jamaican economy as a result. Understandably, Jamaica, for its part has experienced all the repercussions of the cyclical nature of the global economy with its acute vulnerability to external shocks; and especially since the 1970s the 'cracks' in the local economy have been widening alarmingly, despite the input and efforts under the governance of both political parties. The impact of such global economic decline in Jamaica has manifested itself in low to no growth, high public debt (currently 122% of GDP according to the World Bank) and an overall sluggish economic growth. While successive governments have attempted to stabilize the Jamaican economy and stimulate growth, with the assistance of, inter alia, the World Bank, the IMF and the IDB, and while there continues to be improvement in the economy, continued prudent macro-economic and "liability management" are imperative for continued and sustained growth required to eradicate poverty.

In addition to the low economic growth rate - 1.7% in 2016 (World Bank), Jamaica has been experiencing high levels of crime and violence as well as high levels of unemployment (Bourne, 2009; Bourne, Pinnock, & Blake, 2012; Bourne, Sharpe, Beecher, et al., ; Bourne, Sharpe, Evans, et al., 2017; Bourne, Peterkin, Anderson, et al., 2016), especially among the youth. STATIN figures for October 2016 indicate that the unemployment rate was 12.9% generally and 28.6% among the youth, although according to Focus Economics (2017) improvements in the global economy as well as policy support from external sources such as international monetary organizations could be the catalysts needed to increase growth which would in turn lead to a reduction in unemployment and realize a 1.9 to 2% growth in the Jamaican economy in 2017. It is within this socioeconomic context that A Private Higher Educational Institution operates;- that of the optimism for a brighter future, juxtaposed against the reality of minimal economic growth, high unemployment rates as well as high levels of crime and violence. This is amid falling enrolment levels and severe financial challenges. Such scenario gives rise to pressing questions which must be posited, the response to which policy makers and management of the Institution must take cognizance, as part of the environmental scanning,

which is essential, in order to make meaningful, informed decisions as they chart the way forward. The main question this study seeks to address, therefore, is the extent to which macroeconomic conditions and political governance in Jamaica impact enrolment at A Private Higher Educational Institution and the implications of such for the continued "success" of the Institution, especially in light of heightened competition for student enrolment and attendant scarce resources.

Over the last 10 years, particularly since 2010, Private Higher Educational Institutions have been experiencing a downward spiraling of its student enrolment and the challenge seems unabated in spite of the change in leadership (i.e. senior officers). Much speculation has ensued in both private and public fora, with little empirical examination of the matter as regards the reason for the declining student population (enrolment). Recently (2016-17 academic year), the administration of the Mandeville, Manchester, based University resolved that all decisions would be based on a more empirical premise, which allowed for the employment of a statistician, (Paul Andrew Bourne) in order to achieve this objective. Accordingly, therefore, the research will answer the following question "Do intentional homicide rate, rape rate, and selected macroeconomic indicators such as inflation, unemployment, exchange rate (US \$ to Jamaican dollar), and GDP per capita rates influence student enrolment at A Private Higher Educational Institution?" In attempting to answer the aforementioned research question, the researcher will develop a predictive model, using the previously mentioned variables, to determine the nature of factors, the degree of their influence and predictability of those factors using an econometric model by way of ordinary least square analyses (i.e., multiple linear regression analysis) as well as other objectives and test some hypotheses that are listed below:

## Research Objectives

1. To determine whether social indicators (i.e., rape and intentional homicide rates) and selected macroeconomic indicators (i.e. inflation, unemployment, Gross Domestic Product (GDP), exchange rate (US \$ to Jamaican \$) influence student enrolment at A Private Higher Educational Institution ;
2. To determine the degree of predictability of social and economic model that influences student enrolment at A Private Higher Educational Institution ;
3. To evaluate the extent of each predictive factor on the dependent variable, student enrolment, at A Private Higher Educational Institution.

## Hypotheses

H<sub>0</sub>: Rape, intentional homicide rates, inflation, exchange rate (i.e. US \$ to Jamaican dollar), unemployment and GDP

have not significantly influenced student enrolment at A Private Higher Educational Institution in the last 47 years

$H_0$ : Rape rates in Jamaica inversely influenced student enrolment at A Private Higher Educational Institution in the last 47 years

$H_0$ : Intentional homicide rates have inversely influenced student enrolment at A Private Higher Educational Institution in the last 47 years

$H_0$ : Inflation rates negatively influenced student enrolment at A Private Higher Educational Institution in the last 47 years

$H_0$ : Exchange rate (i.e. US \$ to Jamaican dollar) positively influenced student enrolment at A Private Higher Educational Institution in the last 47 years

$H_0$ : Unemployment rates positively influenced student enrolment at A Private Higher Educational Institution in the last 47 years

$H_0$ : Reduction in GDP per capita in Jamaica has positively influenced student enrolment at A Private Higher Educational Institution in the last 47 years

### Empirical and Theoretical Framework

A plethora of studies has been conducted on enrolment at the higher education level including such on macroeconomic factors that influence student enrolment (Smith, 2015; Tsiligiris, 2012; World Bank, 2000). In fact, the World Bank conducted a study on enrolment in higher education among developing nations in 2000 and found that immediate attention is needed in the following areas: 1) funding-the need to mix private and public funding in order to assist students, 2) resources-the efficient and effective use of physical and human capital to connect developing nations with the international intellectual mainstream agencies and people, and 3) governance-“the Task Force’s proposal of a set of principles of good governance (acknowledged by many as the central problem facing higher education in developing countries) and tools that promote their implementation. The conclusion is that better management will lead to the more effective deployment of limited resources” (World Bank, 2000, p. 11). The World Bank’s research has set the framework for an examination of governance and macroeconomic factors influencing student enrolment in higher education. A decade and a half later, Smith (2015) opined that “College enrolment numbers tend to be cyclical. A poor economy forces many adult learners into the classroom to retrain or hone their skills, but when it improves, enrolments decrease as they return to the workforce.” Even before 2015, Tsiligiris (2012) had indicated that. The immediate shorter-term impact of the economic crisis has been at the institutional micro level. Lower student numbers on certain programmes – the most

expensive ones and those with lower job prospects – have led senior managers in universities to prepare for the worst by making plans to reduce staff at all levels and rationalize their portfolio of programmes.

From perusal of empirical and theoretical studies, therefore, it can be unequivocally concluded that the macroeconomic conditions in a nation, developing and otherwise, influence student enrolment in higher education. Hence, a theoretical framework is needed for this study that will explain how the work will be framed and interpreted herein. In a personal conversation, Waller explained a theoretical framework:

A theoretical framework is a self-conscious set of (a) fundamental principles or axioms (ethical, political, philosophical) and (b) a set of rules for combining and applying them (e.g. induction, deduction, contradiction, and extrapolation). A theoretical framework defines the objects of a discourse, the permissible ways of thinking about those objects, and so determines the kinds of knowledge about the objects that can be produced legitimately within the framework” (Cubitt, S, personal communication, October 6, 2005 in Waller, 2006, 25).

The science of research is therefore not only expressed in natural (or pure) sciences like chemistry, physics, medicine, mathematics and metaphysics; but it is also in the theoretical framework and the methodology that are applied to the investigation. For centuries, the theoretical framework Positivism, has been used to guide methodologies that were primarily quantitative (Kuhn, 1996; Balashov & Rosenberg, 2002) and accounts for discoveries like Newton’s Law “ $F=ma$ ” (Force is equal to product of mass and acceleration). This theoretical framework guided scientific attitude as science was embodied in proof, verification, validation and objectification. This explains the preponderance of inquiries that utilize the positivist and post-positivist theoretical framework and methodologies to examine attendance and/or enrolment.

### Crotty (2005) Remarkd

We describe the philosophical stance that lies behind our chosen methodology. We attempt to explain how it provides a context for the process and grounds its logic and criteria... (and) this is precisely what we do when we elaborate our theoretical perspective (p.7).

Such an elaboration is a statement of the assumptions brought to the research task. It is driven by a particular theoretical thinking, which is reflected in the methodology (Crotty, 2005, 7). As such, this work employed a similar empirical and theoretical framework utilized by Andrianov to examine the influence of macroeconomic factors (i.e., unemployment rate, GDP, and exchange rate) on enrolment in Canadian post-secondary institutions. According to Andrianov, “The ARDL [Autoregressive Distributed Lag]

approach is better suited for small samples, such as the present study; this framework can estimate the long run and short run components of the model simultaneously thereby removing the problem associated with omitted variables and autocorrelation. This approach can distinguish dependent and independent variables. In the empirical model we represent the long-run relationship between total enrolment and its major determinants in a linear logarithmic..." (p. 1) in the form of

$$\ln(\text{ENRT}) = \beta_0 + \beta_1 \ln(\text{GDP}) + \beta_2 \ln(\text{UNEMA}) + \varepsilon \quad (1)$$

where  $\ln(\text{ENRT})$  denotes the lagged enrolment rate for time period  $I$ ;  $\ln(\text{GDP})$  means lagged gross domestic product for time period  $I$ ;  $\ln(\text{UNEMA})$  indicates lagged employment and exchange rates for time period  $i$ ;  $\beta_0$  denotes the constant and  $\beta_{1-2}$  are coefficients of variables GDP, unemployment and exchange rate.

For this study, evaluations were made of all the variables to establish whether they should be lagged. Hence, the independent variables were expanded to include 1) inflation, 2) rape rates, and 3) homicide rates. Based on normality test, this study tests the following hypotheses (see Equations 2 & 3):

$$E_t = \beta_0 + \beta_1 \text{GDP}_t + \beta_2 U_t + \beta_3 \ln(R_t) + \beta_4 H_t + \beta_5 \ln(I_t) + \beta_6 \text{ER}_t + \varepsilon \quad (2)$$

where  $E_t$  denotes number of enrolled students for time period  $t$ ;  $\ln R_t$  denotes natural lagging rape rate for time period  $t$ ;  $\ln H_t$  denotes natural log intentional homicide rate for time period  $t$ ;  $\text{GDP}_t$  means gross domestic product per capita for time period  $t$ ;  $U_t$  denotes unemployment rate for time period  $t$ ;  $\text{ER}_t$  denotes the exchange rate (US \$ to Jamaican \$) for time period  $t$ .

Equation [3] was in keeping with the recommendation of Andrianov as it relates to autocorrelations:

$$\ln(E_t) = \beta_0 + \beta_1 \ln(\text{GDP}) + \beta_2 \ln(U) + \beta_3 \ln(R_t) + \beta_4 (H_t) + \beta_5 \ln(I_t) + \beta_6 \ln(\text{ER}_t) + \varepsilon \quad (3)$$

## Methods and Materials

For the present study, data were taken from publications from government departments on macroeconomics (Planning Institute of Jamaica, 1970-2016; Bank of Jamaica, 1970-2016; and Statistical Institute of Jamaica, 1970-2016). The timeframe for the present study was from 1970 through to 2016. Data were recorded, stored, and retrieved using the Statistical Packages for the Social Sciences (SPSS) for Windows, Version 24.0. The level of significance that is used to determine statistical significance is less than 5% (0.05) at the 2-tailed level of significance. Descriptive statistics were calculated for all the independent variables (Babbie, 2010; Leedy and Ormrod, 2010; Neuman, 2014)-inflation, unemployment, exchange rates-as well as homicide and rape rates and the dependent variable (i.e. enrolment at the Private Higher Educational Institution). Pearson's Product

Moment Correlation was performed on all the explanatory and outcome variables. The three critical assumptions of multiple linear regression (i.e. normality, multi-collinearity, and linearity) were tested. Normality assumption was tested by way of skewness (Afifi, Clark, and May, 2004). The closer to zero the skewness value was, the more likely the distribution was a normal one. As it relates to multi-collinearity, the acceptable value for tolerance which does not indicate a problem of multi-collinearity for this study was six (Afifi, Clark, and May, 2004; Longjian, 2018). For this study all the tolerance values were below six.

## Findings: Data analyses and Interpretations

For the study period (1970-2016), approximately 5 decades on average, 2,154 students were enrolled at the Private Higher Educational Institution in various programmes of study. A skewness value of 0.559 indicates that there are errors in the dataset, but that they are not problematic to distort the arithmetic mean from being a good indicator of the average (see Table 1). This is because the normality assumption is not violated (see Table 2), indicating that the data meet the normality assumption whether Shapiro-Wilk or Kolmogorov-Smirnov tests are used. In fact, there are no extreme outliers that are within the enrolment data (see Figure 1).

**Table 1. Enrolment at A Private Higher Educational Institution, 1970-2016**

Details	Descriptive Statistics
Enrolment	2,154±2,416, 95%CI: 1,445-to-2,863
	$S_k=0.559$ , Kurtosis = -1.497

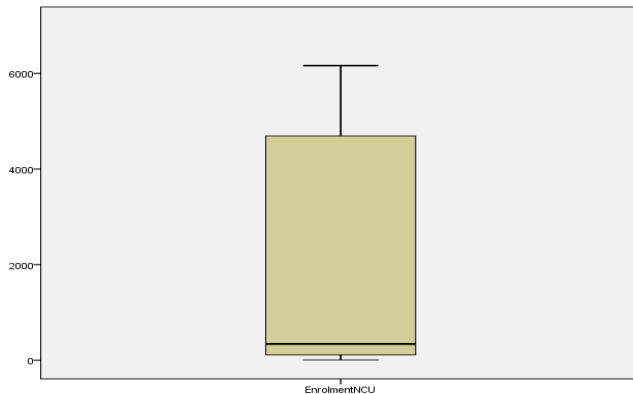
**Table 2. Tests of Normality**

	Kolmogorov-Smirnov <sup>a</sup>			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	P value
Enrolment the Private Higher Educational Institution	.284	47	.000	.769	47	<0.0001

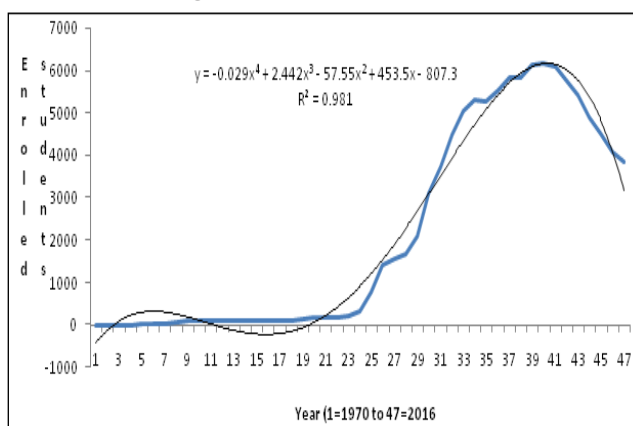
a. Lilliefors Significance Correction

Figure 2, depicts a frequency distribution and polygon of annual number of students who were enrolled in different programmes at the Private Higher Educational Institution across Jamaica. The enrolment pattern at the Private Higher Educational Institution is best fitted by a polynomial function (see Figure 2), which captures 98.2% of the data points. Over the period of study, enrolment at the Private Higher Educational Institution peaked in 2010 and has been geometrically declining ever since.



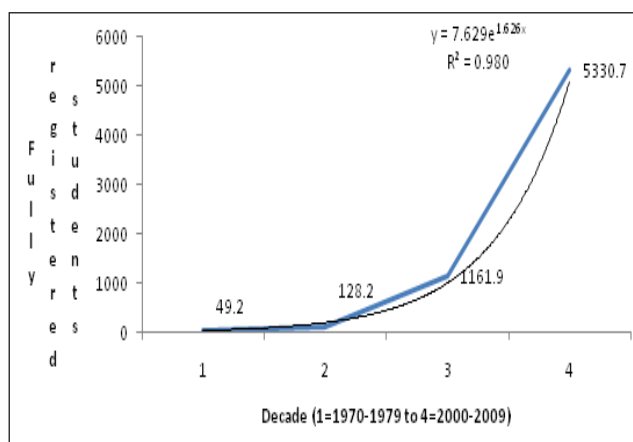


**Figure 1.Box-plot of annual number of students enrolled at the Private Higher Educational Institution, 1970-2016**



**Figure 2.Frequency distribution and polygon of annual enrolment at the Private Higher Educational Institution, 1970-2016**

Figure 3 shows number of students enrolled for each decade beginning 1970 and ending 2000-to-2009. Student enrolment at the Private Higher Educational Institution had been exponentially increasing for 3 decades (1980-89 to 2000-2009), which is best fitted by function  $y = e^x$  and this accounts for 98.03% of the data points.



**Figure 3.Enrolment by decades**

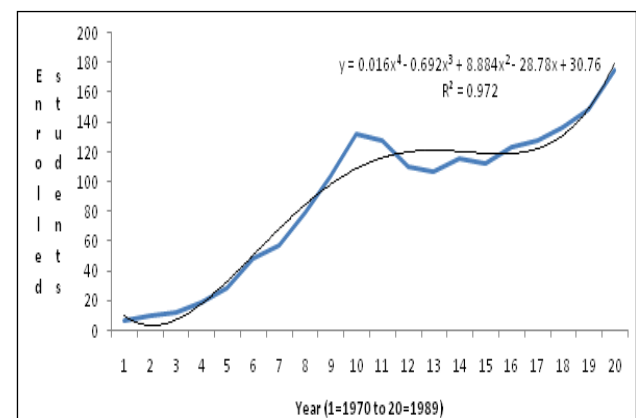
Note: 1 = 1970-1979; 2 = 1980-1989, 3= 1990-1999; 4= 2000-2009

Table 3 presents student enrolment by 5-year period at the Private Higher Educational Institution and by average enrolment and percentage change for each consecutive period. The highest percentage increase in student enrolment at the Private Higher Educational Institution for the studied period occurred in 1975-1979 over the previous 5-year period, in which the figure exponentially rose by 473.97%. In the last 5-year period (2010-2014), student enrolment declined by almost 10%, which is the first time in the almost 5-decade period. On examination of the data, the decrease in student enrolment began in 2000-2004, when the increase was at a reducing rate and, in fact, in 2005-2009 when the increase exponentially declined by 23.6%.

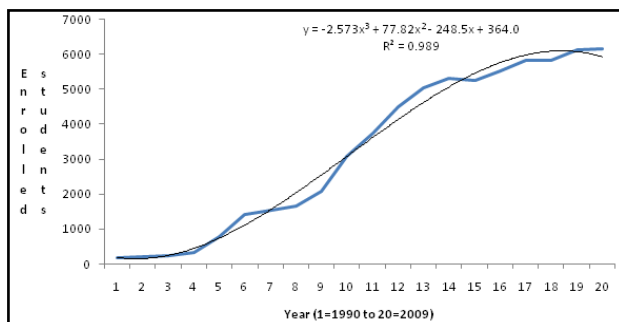
**Table 3.Studentenrolment by 5-year period, average and percentage change by period**

5-year period	Average enrolment	% Change
1980-1974	14.6	
1975-1979	83.8	473.97
1980-1984	114.4	36.52
1985-1989	142.2	24.30
1990-1994	353.4	148.52
1995-1999	1,970.4	457.56
2000-2004	4,768.4	142.00
2005-2009	5,893.0	23.58
2010-2014	5,326.6	-9.61

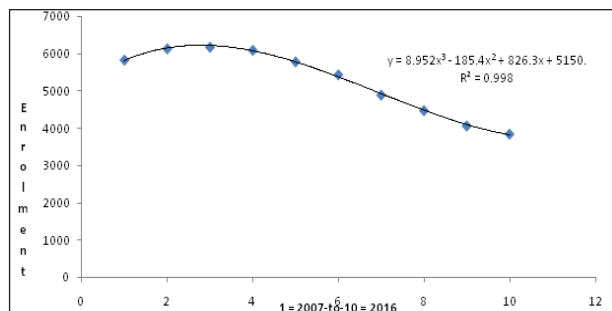
Student enrolment at the Private Higher Educational Institution is depicted diagrammatically for different periods and these are presented in Figures 4-6, with best fitted functions to the top left of each diagram. It should be noted that in the decade 2007-2016, student enrolment began shifting from a polynomial to a linear function, particularly in the last 7 years (see Figure 7).



**Figure 4.Studentenrolment from 1980 - 1989**

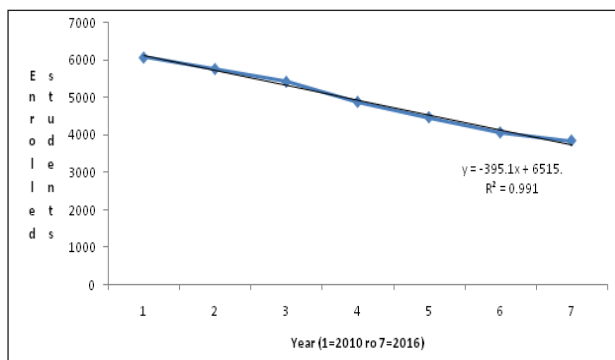


**Figure 5. Student enrolment from 1990 - 2009**



**Figure 6. Student enrolment from 2007-2016**

Figure 7, depicts the linear function of student enrolment at the Private Higher Educational Institution since 2010, with  $y = -mx + c$ . This means that the Private Higher Educational Institution has been experiencing constant reduction in student enrolment from 2010-2016.

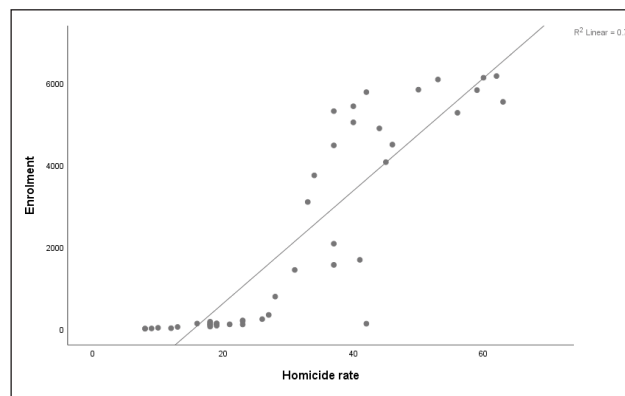


**Figure 7. Student Enrolment from 2010-2016**

## Bivariate Analyses

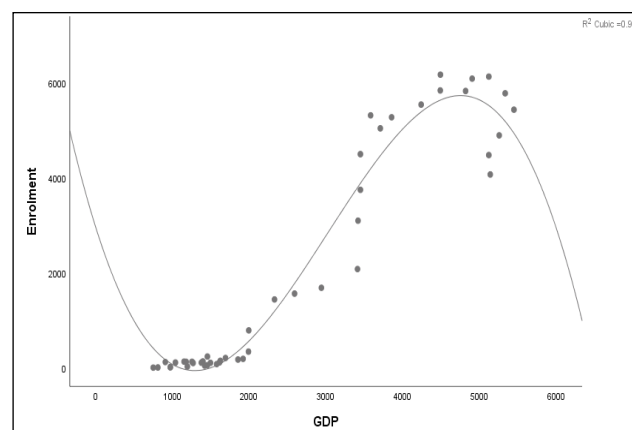
Figure 8, depicts a scatter plot and best fitted frequency polygon for a bivariate relationship between annual enrolment at the Private Higher Educational Institution by intentional homicide rate in Jamaica, using data from 1970 - 2016. A cyclical function is exhibited between annual enrolment at the Private Higher Educational Institution and intentional homicide rate for Jamaica. A positive relationship between the two aforementioned variables occurs when the intentional homicide rates lie between 15 and 60 homicides per 100,000 Jamaican population. Whenever the intentional homicide rate in Jamaica exceeds 60 per 100,000 population, an inverse association exists

between student enrolment and intentional homicide rate. This means that for most of the studied period, a positive correlation existed between student enrolment at the Private Higher Educational Institution and intentional homicide rate. Such a finding suggests that murders in the wider society are directly contributing to student opting to study at the Private Higher Educational Institution instead of at other universities or colleges in Jamaica.



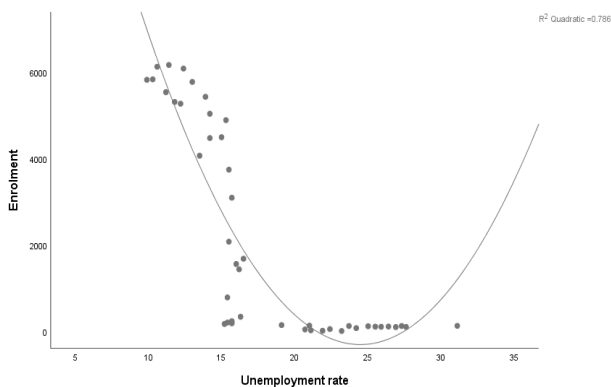
**Figure 8. Student enrolment by intentional homicide**

Gross Domestic Product (GDP) per capita is an indicator of income. Figure 9 gives a clear position of the incomes' role in annual student enrolment at the Private Higher Educational Institution. It shows that people will substitute higher education for other products at incomes less than US \$1000 and vice versa when income exceeds US \$5,000. Furthermore, income has strong positive correlation with student enrolment at the Private Higher Educational Institution, when income lies between \$1000 and \$5000. This suggests that people will forgo higher education whenever income exceeds US\$5000 and less than US \$1000, and this indicates a substitution effect for other goods during those times. Simply put, the very poor and very rich are less likely to enroll at the Private Higher Educational Institution, and this speaks of the income status of the population at the Private Higher Educational Institution.



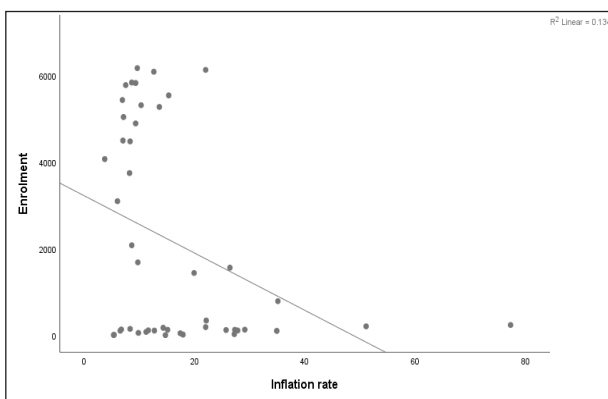
**Figure 9. Student enrolment by GDP per capita**

Figure 10 depicts a scatter plot with a superimposed frequency curve of student enrolment at the Private Higher Educational Institution and the unemployment rate in Jamaica from data for 1970 - 2016. The Figure shows an inverse correlation between the two aforementioned variables. It should be noted here that student enrolments at the Private Higher Educational Institution have been relatively stable during the times when unemployment rates were between 20 and 27%.



**Figure 10. Student enrolment by unemployment rate**

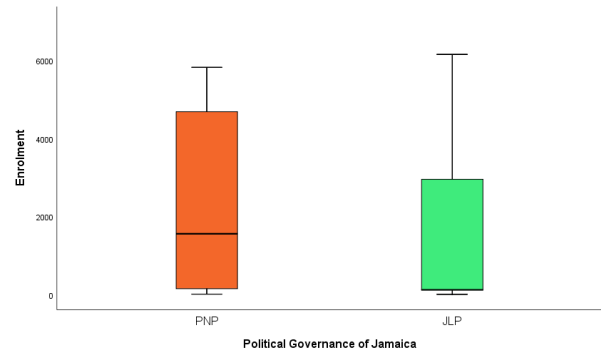
The relationship between student enrolment at the Private Higher Educational Institution and inflation rates for Jamaica is depicted in Figure 11. An inverse correlation exists between the two aforementioned variables, indicating that when inflation is low, student enrolment is high and vice versa. This suggests that people will substitute other products for higher education whenever inflation is high, and the opposite holds true when inflation is low.



**Figure 11. Student enrolment by inflation rate**

Figure 12 shows a box-plot of student enrolment by governing political party for the studied period (1970 - 2016). The bold line in the rectangular box represents the median (i.e., middle of the data point or the average of the distribution). Furthermore, using the arithmetic mean, the average number of students enrolled at the Private Higher Educational Institution during the time when the PNP governed Jamaica was 2,372 $\pm$ 2,295 compared to 1,684 $\pm$ 2,716 during the JLP's time of governance of the

society. In fact,  $t = -0.791$ ,  $P = 0.437$  and this indicates that there is no statistical difference between enrolment at the Private Higher Educational Institution during the administration of the JLP or the PNP (Levene's test,  $F = 0.458$ ,  $P = 0.502$ ).



**Figure 12. Box-plot of student enrolment at the Private Higher Educational Institution and governance of the Jamaican society**

### Enrolment and Macroeconomic Conditions

Table 4 presents descriptive statistics on student enrolment at the Private Higher Educational Institution, selected macroeconomic indicators in Jamaica (i.e., inflation, GDP per capita, unemployment, exchange rate in US \$ to Jamaican \$), and social conditions such as rape and intentional homicide rates in Jamaica. The sample for this study is 47; but for the purpose of the multiple regression analysis 39 of those were used for analysis (i.e., 83.0% response rate). On average, for the 47 years used to conduct the analysis, the mean annual student enrolment was 2,270 $\pm$ 2,283. Furthermore, the average (i.e., mean) rape rate in Jamaica was 45.2 per 100,000 population $\pm$ 10.5 compared to an intentional homicide rate of 32.5 per 100,000 $\pm$ 15.6, which indicates that in absolute terms it is more likely for someone to be raped than murdered in Jamaica. In fact, there is more of a rape phenomenon in Jamaica than an intentional homicide phenomenon, although much alarm surrounds the latter issue. This means that many Jamaicans are suffering psychologically from the rape phenomenon and this silent issue is of greater prevalence than homicide. Furthermore, Jamaica has experienced double digit inflation and unemployment rates for approximately 4 decades and the average foreign exchange rate (Jamaican and US \$) was \$34.90 Jamaican for US \$1. For the same studied period, student enrolment at the Private Higher Educational Institution has averaged (i.e., mean) 2,270 people $\pm$ 2,483 people.

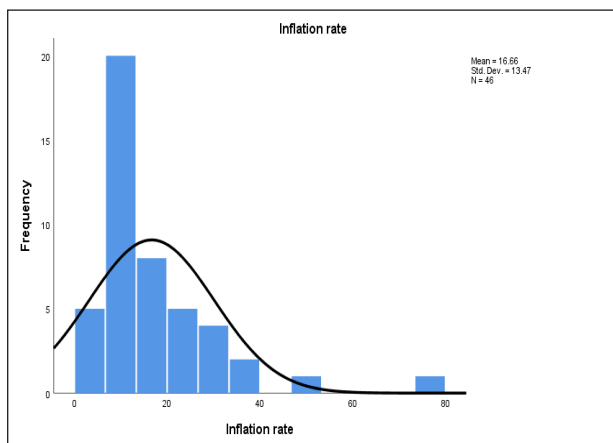
### Testing assumptions of Linear Model

#### Assumption 1 (i.e., Normality)

The issue of normality was checked for each variable, which was done by way of skewness test. Descriptive analyses

**Table 4.Descriptive statistics on social indicators (rape and intentional homicide rates) and selected macroeconomic indicators (i.e. inflation, GDP, unemployment, exchange rate of conversion of US \$1 into Jamaican \$) and enrolment at the Private Higher Educational Institution, 1970-2016**

Details Social indicators:	Mean±SD, 95% CI
Rape rate (including carnal abuse) per 100,000 population	45.2±10.5, 41.8 – 48.6
Intentional homicide rate per 100,000 population	32.5±15.6, 27.5 – 37.6
Macroeconomic indicators	
Inflation rate	16.9±13.8, 12.4 – 21.9
Unemployment rate	17.5±5.2, 15.8 – 19.2
Gross Domestic Product (GDP) per capita	2,708.7±1,489.1, 2,226.0 – 3,191.4
Exchange rate (US \$1 to Jamaican \$)	34.9±31.4, 24.4 – 44.7
Enrolment at the Private Higher Educational Institution	2,270.1±2,842.5, 1,465.3 – 3,074.8



**Figure 13.Frequency distribution of inflation rate**

were done for each variable and these are reflected in Annex 1. From Annex 1, only inflation had a skewness of over one, with the others having a value of less than 0.6. The frequency distribution of inflation is reflected in Figure 13, below.

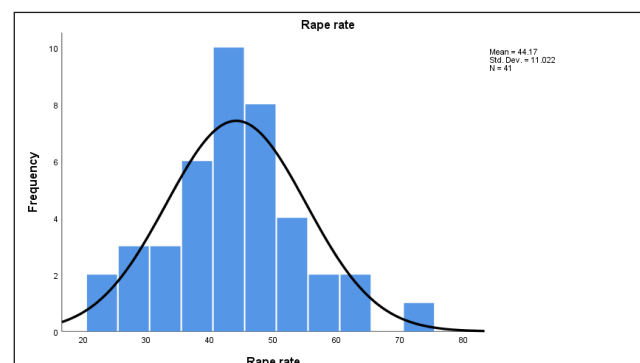
In addition, normality tests were conducted on all the other variables excluding inflation in an effort to obtain whether they are normal or otherwise (see Table 5). It is clear from the actual frequency distribution (see Figure 14), that there is an extreme outlier and therefore both inflation and rape rate should be normalized.

**Table 5.Tests of Normality**

	Kolmogorov-Smirnov <sup>a</sup>			Shapiro-Wilk		
	Stat-istic	df	Sig.	Stat-istic	df	Sig.
rape rate	.079	39	.200*	.988	39	.953
homicide rate	.136	39	.065	.943	39	.048
unemployment rate	.214	39	.000	.918	39	.007
GDP	.197	39	.001	.887	39	.001
exchange rate	.193	39	.001	.886	39	.001
Enrolment at A Private Higher Educational Institution	.269	39	.000	.768	39	.000

\*. This is a lower bound of the true significance.

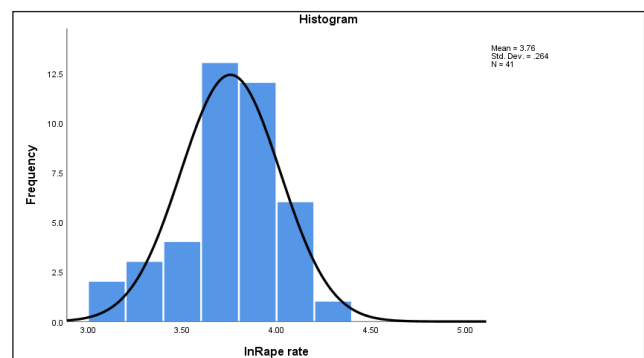
a. Lilliefors Significance Correction



**Figure 14.Frequency distribution and superimposed frequency curve**

### Normalization of Inflation and Rape Rates

These two variables were normalized by way of transformation using natural logarithm and the results are displayed below (Figures 15 & 16):



**Figure 15.Frequency Polygon of Loge Rape Rates**



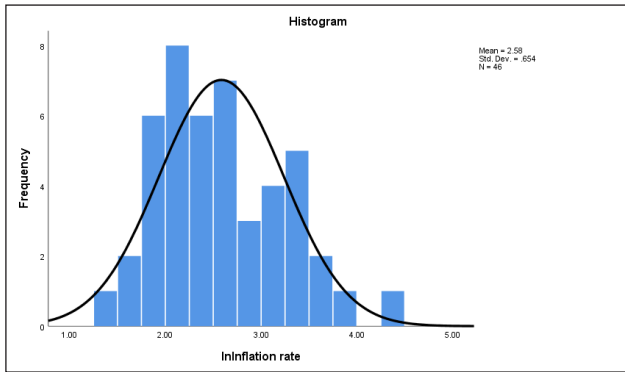


Figure 16. Frequency Polygon of Loge Inflation Rates

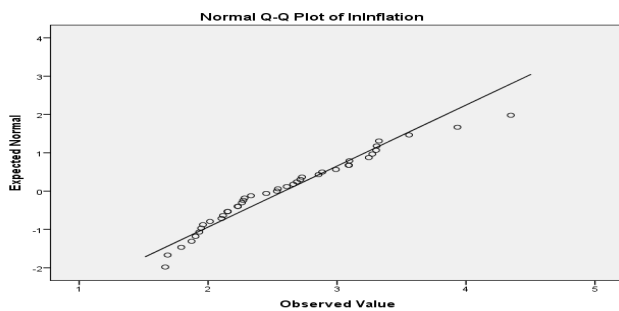


Figure 17. Normal Q-Q plot ( loge inflation)

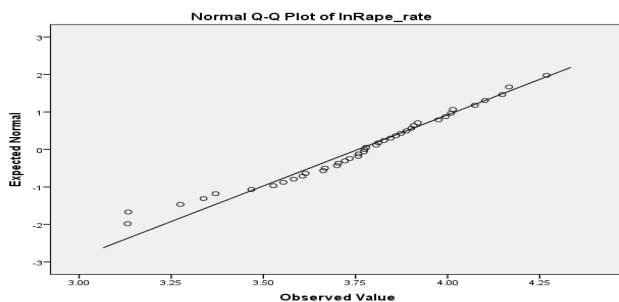


Figure 18. Normal Q-Q plot (loge rape rate)

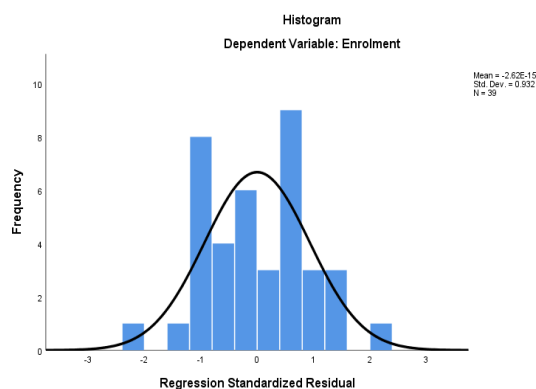


Figure 19. Frequency of regression standardized residual

### Normality of the independent variable

Figure 19, shows that six (6) independent variables are normally distributed in the linear model (i.e., student enrolment at the Private Higher Educational Institution).

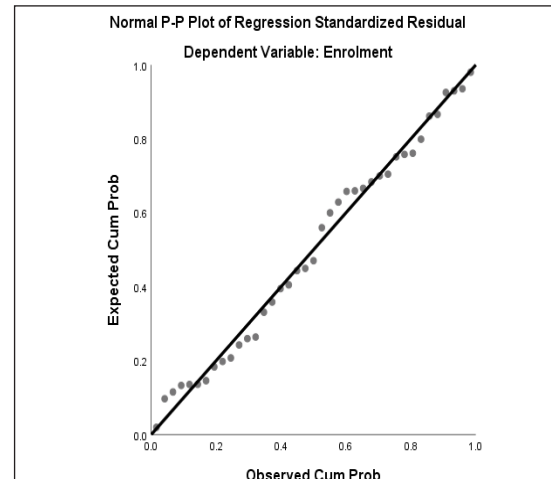


Figure 19. Frequency of regression standardized residual

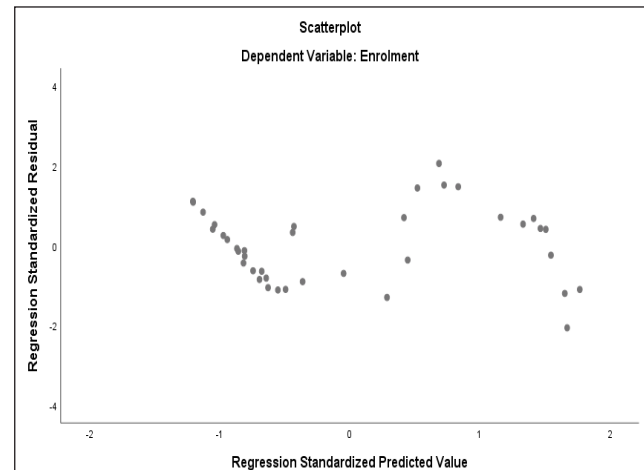


Figure 21

It can be deduced from Figure 21 that normality and linearity were adhered to and that a linear model can be built for this work.

Table 6, provides information that the aforementioned variables fit a linear model for enrolment ( $F[6, 32] = 118.061$ ,  $P < 0.0001$ ).

Table 6. ANOVA<sup>a</sup>

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	224060 399.900	6	373433 99.990	118. 061	<0.0 001 <sup>b</sup>
	Residual	101217 59.980	32	31630 4.999		
	Total	234182 159.900	38			

a. Dependent Variable: Enrolment at A Private Higher Educational Institution

b. Predictors: (Constant), InRape rate, In inflation, homicide rate, unemployment rate, exchange rate, GDP

Rape, intentional homicide rates, inflation, exchange rate (i.e., US \$ to Jamaican dollar), unemployment and GDP did not significantly influence student enrolment at A Private Higher Educational Institution in the last 47 years

Or

$$E_t \neq f(\ln R_t, H_t, \ln I_t, GDP_t, U_t, ER_t)$$

where  $E_t$  denotes number of enrolled students for time period  $t$ ;  $\ln R_t$  denotes natural log rape rate for time period  $t$ ;  $\ln H_t$  denotes natural log intentional homicide rate for time period  $t$ ;  $GDP_t$  means gross domestic product per capita for time period  $t$ ;  $U_t$  denotes unemployment rate for time period  $t$ ;  $ER_t$  denotes the exchange rate (US \$ to Jamaican \$) for time period  $t$ .

Table 7 is a bivariate correlation of all the variables on investigation for this study. Based on Table 7, strong bivariate statistical correlation existed between student enrolment at the Private Higher Educational Institution and 1) homicide ( $r_{xy} = 0.886$ ,  $P < 0.0001$ ); 2) exchange rate ( $r_{xy} = 0.930$ ,  $P < 0.0001$ ); 3) unemployment rate ( $r_{xy} = -0.791$ ,  $P < 0.0001$ ); and 4) GDP ( $r_{xy} = 0.956$ ,  $P < 0.0001$ ). On the other hand,  $\ln$ inflation and  $\ln$ rape rates moderately influenced student enrolment at the Private Higher Educational Institution, ( $r_{xy} = -0.393$ ,  $P < 0.0001$ ) and ( $r_{xy} = 0.449$ ,  $P < 0.0001$ ) respectively. It should be noted here that unemployment and inflation inversely correlated with student enrolment at the Private Higher Educational Institution, where intentional homicide and rape rates as well as the exchange rate and GDP per capita positively influenced student enrolment at the Private Higher Educational Institution.

Some strong statistical correlations ( $r_{xy} > 0.7$  and over) existed between 1) GDP and homicide; 2) GDP and exchange rate; 3) GDP and unemployment; 4) exchange rate and homicide, 5) exchange rate and unemployment. Furthermore, these may be creating high interaction among the independent variables and therefore instability of the predictor estimates. Hence, it can be concluded that all the variables have an influence on student enrolment, which means that we can reject the null hypothesis above.

**Table 7. Pearson's Product Moment Correlations of enrolment, homicide, rape, GDP, and unemployment rates**

		Enrolment at A Private Higher Educational Institution	Homicide rate	Exchange rate	Unemployment rate	GDP	In Inflation rate	In Rape rate
Pearson Correlation	Enrolment at A Private Higher Educational Institution	1.000	.886	.930	-.791	.956	-.393	.449
	Homicide rate	.886	1.000	.850	-.733	.857	-.174	.517
	Exchange rate	.930	.850	1.000	-.814	.965	-.266	.610
	Unemployment rate	-.791	-.733	-.814	1.000	-.804	.094	-.551
	GDP	.956	.857	.965	-.804	1.000	-.398	.570
	InInflation rate	-.393	-.174	-.266	.094	-.398	1.000	-.094
	InRape rate	.449	.517	.610	-.551	.570	-.094	1.000
Sig. (1-tailed)	Enrolment at A Private Higher Educational Institution	.	<0.0001	<0.0001	<0.0001	<0.0001	.007	.002
	Homicide rate	<0.0001	.	<0.0001	<0.0001	<0.0001	0.144	<0.0001
	Exchange rate	<0.0001	<0.0001	.	<0.0001	<0.0001	0.051	<0.0001
	Unemployment rate	<0.0001	<0.0001	<0.0001	.	<0.0001	0.285	<0.0001
	GDP	<0.0001	<0.0001	<0.0001	<0.0001	.	0.006	<0.0001
	InInflation rate	0.007	0.144	0.051	0.285	0.006	.	0.285
	InRape rate	0.002	<0.0001	<0.0001	<0.0001	<0.0001	0.285	.

N	Enrolment at A Private Higher Educational Institution	39	39	39	39	39	39	39
	Homicide rate	39	39	39	39	39	39	39
	Exchange rate	39	39	39	39	39	39	39
	Unemployment rate	39	39	39	39	39	39	39
	GDP	39	39	39	39	39	39	39
	lnInflation rate	39	39	39	39	39	39	39
	lnRape rate	39	39	39	39	39	39	39

Using the 'Enter Method' in multiple regression, it can be concluded that the seven variables account for 95% of the variability in student enrolment at the Private Higher Educational Institution; but the Durbin-Watson indicate that there is multicollinearity. Using the linear function below (Eqn (1.1), this will provide an explanation of stability of the model—the multicollinearity and to determine what should be done in this case for a final linear model that has stable predictor estimates (Table 8).

$$E_t = f(\ln R_t, H_t, \ln I_t, GDP_t, U_t, ER_t) \quad (1.1)$$

Table 6, below, presents coefficients for the estimates of each predictive variable in the model; but there are some issues that must be examined before a final model can be established for stable usefulness. There are some value inflated factors (VIF) or tolerance that clearly indicated multicollinearity – 1) exchange rate and 2) GDP per capita. Scholars have recommended a minimum tolerance of

**Table 8. Model Summary<sup>b</sup>**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.978 <sup>a</sup>	.957	.949	562.410	.957	118.061	6	32	0.000	1.127

a. Predictors: (Constant), lnRape \_rate, lnInflation, homicide rate, unemployment rate, exchange rate, GDP

b. Dependent Variable: Enrolment at A Private Higher Educational Institution

**Table 10. Model Summary<sup>d</sup>**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.956 <sup>a</sup>	.914	.912	738.413	.914	392.492	1	37	0.000	
2	.965 <sup>b</sup>	.930	.926	673.336	.016	8.498	1	36	0.006	
3	.973 <sup>c</sup>	.946	.941	600.650	.016	10.240	1	35	0.003	0.816

a. Predictors: (Constant), GDP

b. Predictors: (Constant), GDP, homicide rate

c. Predictors: (Constant), GDP, homicide rate, lnRape \_rate

d. Dependent Variable: Enrolment at A Private Higher Educational Institution

**Table 11. ANOVA<sup>a</sup>**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	214007774.500	1	214007774.500	392.492	.000 <sup>b</sup>
	Residual	20174385.350	37	545253.658		
	Total	234182159.900	38			

Table 9.Coefficients of OLS regression<sup>a</sup>

Model B		Unstandardized Coefficients		Standardized Coefficients	t	Sig. Lower Bound	95.0% Confidence Interval for B		Correlations			Collinearity Statistics	
		Std. Error	Beta				Upper Bound	Zeroorder	Partial	Part	Tolerance	VIF	
1	Constant	7265.134	2250.599		3.228	.003	2680.813	11849.455					
	Homicide rate	47.601	12.123	.299	3.927	.000	22.907	72.295	.886	.570	.144	.232	4.305
	Exchange rate	24.433	13.160	.309	1.857	.073	-2.372	51.238	.930	.312	.068	.049	20.465
	Unem ployment rate	-55.557	32.609	-.117	-1.704	.098	-121.980	10.866	-.791	-.288	-.063	.288	3.478
	GDP	.597	.322	.358	1.852	.073	-.059	1.254	.956	.311	.068	.036	27.680
	In Inflation rate	-482.969	203.772	-.122	-2.370	.024	-898.039	-67.900	-.393	-.386	-.087	.511	1.958
	InRape rate	-1791.052	482.991	-.174	-3.708	.001	-2774.871	-807.232	.449	-.548	-.136	.612	1.635

a. Dependent Variable: Enrolment at A Private Higher Educational Institution

2	Regression	217860407.700	2	108930203.900	240.261	.000 <sup>c</sup>
	Residual	16321752.150	36	453382.004		
	Total	234182159.900	38			
3	Regression	221554825.900	3	73851608.650	204.699	.000 <sup>d</sup>
	Residual	12627333.960	35	360780.970		
	Total	234182159.900	38			

a. Dependent Variable: Enrolment at A Private Higher Educational Institution

b. Predictors: (Constant), GDP

c. Predictors: (Constant), GDP, homicide rate

d. Predictors: (Constant), GDP, homicide rate, InRape\_rate

**Table 12. Coefficients<sup>a</sup>**

Model B	Unstandardized Coefficients		Standardized Coefficients	t	P value Lower	95.0% Confidence Interval for B		Correlations			Collinearity Statistics	
	Std. Error	Beta				Upper	Zero-order	Partial	Part	Tolerance	VIF	
1	Constant	-2046.769	247.910		-8.256	<0.0001	-2549.082	-1544.456				
	GDP	1.594	.080	.956	19.811	<0.0001	1.431	1.757	.956	.956	.956	1.000
2	Constant	-2370.359	251.846		-9.412	<0.0001	-2881.126	-1859.592				
	GDP	1.238	.142	.742	8.689	<0.0001	.949	1.527	.956	.823	.382	.265
	Homicide rate	39.597	13.584	.249	2.915	0.006	12.048	67.146	.886	.437	.128	.265
3	Constant	3168.115	1745.288		1.815	0.078	-375.008	6711.238				
	GDP	1.359	.133	.815	10.249	<0.0001	1.090	1.629	.956	.866	.402	.243
	Homicide rate	42.233	12.145	.266	3.477	0.001	17.576	66.889	.886	.507	.136	.264
	InRape rate	-1574.017	491.879	-.153	-3.200	0.003	-2572.584	-575.450	.449	-.476	-.126	.673

a. Dependent Variable: Enrolment at A Private Higher Educational Institution

0.10 (Tabachnick and Fidell, 2001) and 0.20 (Menard, 1995) and 0.25 (Huber and Stephens, 1993) as acceptable level of tolerance. In this case, the foreign exchange rate tolerance was 0.049 and 0.036 for GDP, and this indicates multicollinearity between both variables, which means that one of these should be omitted from the linear model.

Although all six (6) variables fit a linear model for student enrolment at the Private Higher Educational Institution ( $F[6, 32] = 118.061, P < 0.0001$ ), individually, the exchange rate, unemployment rate and GDP per capita were not statistically contributing to the model and therefore, there

is no need to include them into the model, so the model should read:

$$E_t = f(\ln R_t, H_t, \ln I_t) \quad (1.2)$$

Final equation should read:

$$E_t = 7,265 + 47.601(H_t) - 482.969(\ln I_t) - 1791.052(\ln R_t) \quad (1.3)$$

Equation [1.3], has excluded the issue relating to multicollinearity, hence the parameter estimates are stable and therefore present one that adheres to the assumptions of ordinary least square regression (OLS).



### Stepwise Method (Alternative Method)

Using 'Stepwise method' it was found that GDP per capita was a most significant predictor of student enrolment at the Private Higher Educational Institution, accounting for 91.2% of the variability in enrolment, and that homicide as well as rape and carnal abuse rates contributed 1.6% to enrolment. The Stepwise method used three models to explain the predictors of student enrolment at the Private Higher Educational Institution and the each fit a linear model (see Table 8- F value, and  $P < 0.05$ ), with the final model accounting for 94/1% of the variability in student enrolment at the Private Higher Educational Institution.

Table 9 presents the parameter estimates for the statistically significant variables that account for changes in student enrolment at the Private Higher Educational Institution, with model 1 (i.e., GDP per capita) contributing the most to enrolment followed by homicide and lastly by rape and carnal abuse rates in Jamaica. It should be noted that all the tolerances are at the minimum acceptable value and this speaks to the stability of using these estimates to predict the outcome variable (i.e., student enrolment at the Private Higher Educational Institution).

$$E_t = f(\ln R_t, H_t, GDP) \quad (1.4)$$

Final equation should read:

$$E_t = 3,168.115 + 1.359(GDP_t) + 42.233(H_t) - 1,574.017(\ln R_t) \quad (1.5)$$

Lagging all variables

Testing the lagged hypothesis

$$\ln(E_t) = \beta_0 + \beta_1 \ln(GDP) + \beta_2 \ln(U) + \beta_3 \ln(R_t) + \beta_4 (H_t) + \beta_5 \ln(nl_t) + \beta_6 \ln(ER_t) + \varepsilon \quad (3)$$

Using stepwise regression analysis, Table 10 shows that of the six independent variables above, only four emerge as significant factors of lagged enrolment at the Private Higher Educational Institution:  $\ln(GD)$ ,  $\ln(\text{exchange rate})$ ,  $\ln(\text{homicide rate})$  and  $\ln(\text{inflation rate})$ . Those four independent factors account for 97.4% of the variability in annual enrolment at the Private Higher Educational Institution, which is expressed by the final model (i.e., Model 4), with each model explaining the contribution of each factor beginning with model 1 accounting for most of the variance in enrolment (i.e., 90.6%).

Table 11 depicts the analysis of variance (ANOVA), which means that the four factors fit a linear function of enrolment ( $F[4,34] = 356.45$ ,  $P < 0.0001$ ). Furthermore, with 38 cases and 4 independent variables this means that the ratio is 9.5 to 1, which is an adequate sample size as it is more than the normal ratio of 5 to 1.

**Table 13. Model Summary<sup>e</sup>**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.953 <sup>a</sup>	.909	.906	.61103	.909	367.582	1	37	.000	
2	.978 <sup>b</sup>	.956	.954	.42880	.048	39.132	1	36	.000	
3	.986 <sup>c</sup>	.973	.970	.34390	.016	20.970	1	35	.000	
4	.988 <sup>d</sup>	.977	.974	.32168	.004	6.002	1	34	.020	0.996

a. Predictors: (Constant),  $\ln GDP$

b. Predictors: (Constant),  $\ln GDP$ ,  $\ln \text{exchange\_rate}$

c. Predictors: (Constant),  $\ln GDP$ ,  $\ln \text{exchange\_rate}$ ,  $\ln \text{homicide\_rate}$

d. Predictors: (Constant),  $\ln GDP$ ,  $\ln \text{exchange\_rate}$ ,  $\ln \text{homicide\_rate}$ ,  $\ln \text{inflation\_rate}$

e. Dependent Variable:  $\ln \text{Enrolment}$

**Table 14. ANOVA<sup>a</sup>**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	137.241	1	137.241	367.582	<0.0001 <sup>b</sup>
	Residual	13.814	37	.373		
	Total	151.055	38			
2	Regression	144.436	2	72.218	392.770	<0.0001 <sup>c</sup>
	Residual	6.619	36	.184		
	Total	151.055	38			

3	Regression	146.916	3	48.972	414.091	<0.0001 <sup>d</sup>
	Residual	4.139	35	.118		
	Total	151.055	38			
4	Regression	147.537	4	36.884	356.450	<0.0001 <sup>e</sup>
	Residual	3.518	34	.103		
	Total	151.055	38			

a. Dependent Variable: lnEnrolment

b. Predictors: (Constant), lnGDP

c. Predictors: (Constant), lnGDP, lnexchange\_rate

d. Predictors: (Constant), lnGDP, lnexchange\_rate, lnhomicide\_rate

e. Predictors: (Constant), lnGDP, lnexchange\_rate, lnhomicide\_rate, lnInflation\_rate

**Table 15. Ordinary Least Square (OLS) regression of macroeconomic and social conditions in Jamaica on lagged enrolment at the Private Higher Educational Institution**

Model B		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B		Zero-order	Partial	Tolerance	VIF
		Std. Error	Beta				Lower Bound	Upper Bound				
1	(Constant)	-19.151	1.339		-14.304	.000	-21.864	-16.438				
	lnGDP	3.304	.172	.953	19.172	.000	2.955	3.653	.953	.953	1.000	1.000
2	(Constant)	-9.765	1.770		-5.516	.000	-13.355	-6.175				
	lnGDP	1.891	.256	.546	7.383	.000	1.372	2.411	.953	.776	.223	4.487
	lnexchange_rate	.572	.091	.462	6.256	.000	.386	.757	.943	.722	.223	4.487
3	(Constant)	-9.464	1.421		-6.659	.000	-12.349	-6.578				
	lnGDP	1.446	.227	.417	6.363	.000	.985	1.908	.953	.732	.182	5.492
	lnexchange_rate	.409	.081	.330	5.015	.000	.243	.574	.943	.647	.180	5.546
	lnhomicide_rate	1.070	.234	.283	4.579	.000	.596	1.545	.930	.612	.205	4.882
4	(Constant)	-6.102	1.911		-3.194	.003	-9.985	-2.219				
	lnGDP	1.013	.276	.292	3.666	.001	.452	1.575	.953	.532	.108	9.284
	lnexchange_rate	.494	.084	.400	5.894	.000	.324	.664	.943	.711	.149	6.711
	lnhomicide_rate	1.207	.226	.319	5.349	.000	.748	1.665	.930	.676	.192	5.199
	lnInflation_rate	-.268	.109	-.084	-2.450	.020	-.490	-.046	-.289	-.387	.579	1.726

Table 12, deals with the coefficients of those significant predictors of lagged enrolment at the Private Higher Educational Institution and can be captured by [4], below:

$$\ln(E_t) = -6.102 + 1.013\ln(\text{GDP}_t) + 1.207(H_t) - 268(\ln(I_t) +$$

$$0.494\ln(ER_t) + \varepsilon \quad (4)$$

or

$$E_t = e^{(-6.102 + 1.013\ln(\text{GDP}_t) + 1.207(H_t) - 268(\ln(I_t) + 0.494\ln(ER_t) + \varepsilon)} \quad (5)$$

## Recommendations

The value of the current study is also based on the recommendations that are forwarded here for the readers' perusal, particularly those in Jamaica. These are 1) higher educational institutions need to include political governance in their planning and decision-making apparatus as this will foster in their recruitment planning, 2) governments should begin to provide financial aid/assistance for private higher educational institutions' students in terms of grants and scholarships as this will increase the human capital stock of the society, and 3) further empirical studies are needed in the area of - i) politics and students' choice of attending college/university, ii) whether political administration should be a part of how higher educational institutions recruit or non-prospective students during a particular political party in the governance of society as the current findings show that political governance is a factor in determining people's choice to attend tertiary education.

## Conclusion

Student enrolment at A Private Higher Educational Institution can be lagged linear model of social and macroeconomic indicators in Jamaica. Whether student enrolment at the Private Higher Educational Institution is modeled by 'Stepwise' or the 'Entry' method, some 94.1% and 94.9% respectively, of the factors are accountable for the variability in student enrolment at the Private Higher Educational Institution. There is a slight difference in factors for each method as in the Stepwise approach the factors were lagged rape and carnal abuse rate; intentional homicide rate and GDP per capita compared to lagged rape and carnal abuse rate; intentional homicide rate and lagged inflation rate by way of the Entry method. This means that the high correlation between inflation and GDP creates a problem of multicollinearity, and this is rectified by the elimination of either one or the other factor. Utilizing variables that were not lagged revealed problematic tolerance (i.e.,  $Tolerance \geq 2.5$ ) and this supports the rationale for a lagged linear model. Clearly, whenever the variables are not lagged as recommended by Andrianov (2017), some extremely high standard errors as well as tolerance in excess of 2.5 emerged which is not the case in lagging the variables. Hence, the recommendations by Andrianov on lagging the variables removed the problem of autocorrelations and this, therefore, is a representation of the ideal model (equation [4]) to explain annual enrolment at A Private Higher Educational Institution.

Although intentional homicide is a cruel act that leaves many people in bereavement, enrolment at the Private Higher Educational Institution significantly benefits from this social killer. Policy makers at the Private Higher Educational Institution need to understand this fact and use it to the advantage of the University. The approach that should be

taken to use intentional homicide to the advantage of the Private Higher Educational Institution is that of selling Mandeville as a safer place to live, study and raise families. In addition, tuition fees should be held constant (or fixed) for some time, which will allow for the opportunity to address other critical issues such as the quality of the physical plant.

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### Annex I: Descriptives

			Statistic	Std. Error
Enrolment	Mean		2270.05	397.514
	95% Confidence Interval for Mean	Lower Bound	1465.33	
		Upper Bound	3074.78	
	Median		788.00	
	Std. Deviation		2482.476	
	Range		6150	
	Skewness		.520	.378
	Kurtosis		-1.588	.741
Rape rate	Mean		45.10	1.673
	95% Confidence Interval for Mean	Lower Bound	41.72	
		Upper Bound	48.49	
	Median		44.00	
	Std. Deviation		10.447	
	Range		48	
	Skewness		.255	.378
	Kurtosis		.263	.741
Homicide rate	Mean		32.56	2.493
	95% Confidence Interval for Mean	Lower Bound	27.52	
		Upper Bound	37.61	
	Median		31.00	
	Std. Deviation		15.566	
	Range		54	
	Skewness		.434	.378
	Kurtosis		-.856	.741
Exchange rate	Mean		34.58	5.022
	95% Confidence Interval for Mean	Lower Bound	24.42	
		Upper Bound	44.75	
	Median		35.35	
	Std. Deviation		31.363	
	Range		100	
	Skewness		.537	.378
	Kurtosis		-.948	.741
Inflation rate	Mean		16.90	2.216
	95% Confidence Interval for Mean	Lower Bound	12.42	
		Upper Bound	21.39	
	Median		12.60	
	Std. Deviation		13.836	
	Range		72	
	Skewness		2.702	.378
	Kurtosis		9.335	.741



Unemployment	Mean		17.46	.836
rate	95% Confidence Interval for Mean	Lower Bound	15.77	
		Upper Bound	19.16	
	Median		15.70	
	Std. Deviation		5.218	
	Range		18	
	Skewness		.529	.378
	Kurtosis		-.877	.741
GDP	Mean		2708.72	238.446
	95% Confidence Interval for Mean	Lower Bound	2226.01	
		Upper Bound	3191.43	
	Median		1995.00	
	Std. Deviation		1489.096	
	Range		4537	
	Skewness		.500	.378
	Kurtosis		-1.217	.741

### Annex 2

No	Year	Enrolment	Rape rate	Homicide rate	Exchange rate	Inflation	Unemployment	GDP	JLP
1	1970	6	23	8	0.77	14.7		752	1
2	1971	9	29	8	0.77	5.3		812	1
3	1972	12	28	9	0.9	5.4	23.2	974	0
4	1973	18	34	12	0.91	17.9	21.9	974	0
5	1974	28	23	10	0.91	27.2	21.1	1196	0
6	1975	48	26	13	0.91	17.4	20.7	1421	0
7	1976	57	32	18	0.91	9.8	22.4	1456	0
8	1977	79		19	1.41	11.2	24.2	1578	0
9	1978	103		18	1.76	34.9	26.9	1271	0
10	1979	132		16	1.78	29.1	31.1	1153	0
11	1980	128	36	42	1.78	27.3	27.3	1256	1
12	1981	110	35	23	1.78	12.7	25.9	1378	1
13	1982	106	41	18	1.92	6.5	27.6	1497	1
14	1983	115	37	19	3.94	11.6	26.4	1615	1
15	1984	112	39	21	5.58	27.8	25.5	1041	1
16	1985	123	37	19	5.5	25.7	25.01	909	1
17	1986	128	39	19	5.51	15.1	23.7	1179	1
18	1987	136	43	19	5.51	6.7	21	1398	1
19	1988	149	47	18	5.77	8.3	19.1	1625	1
20	1989	175	46	18	7.24	14.3	15.2	1855	0
21	1990	190	42	23	12.22	22	15.7	1921	0
22	1991	208	45	23	22.99	51.1	15.4	1692	0

No	Year	Enrolment	Rape rate	Homicide rate	Exchange rate	Inflation	Unemployment	GDP	JLP
23	1992	239	45	26	25.11	77.3	15.7	1457	0
24	1993	342	53	27	33.29	22.1	16.3	1991	0
25	1994	788	44	28	35.35	35.1	15.4	1995	0
26	1995	1438	65	31	37.25	19.9	16.2	2330	0
27	1996	1561	71	37	35.51	26.4	16	2591	0
28	1997	1683	60	41	36.65	9.7	16.5	2940	0
29	1998	2077	55	37	39.2	8.6	15.5	3410	0
30	1999	3093	49	33	43.08	6	15.7	3417	0
31	2000	3742	50	34	43.08	8.2	15.5	3448	0
32	2001	4492	47	46	46.08	7	15	3448	0
33	2002	5034	44	40	48.54	7.1	14.2	3707	0
34	2003	5307	50	37	57.93	10.3	11.8	3581	0
35	2004	5267	48	56	61.34	13.6	12.2	3854	0
36	2005	5533	40	63	62.5	15.3	11.2	4238	0
37	2006	5830	43	50	65.88	8.6	10.3	4487	0
38	2007	5819	41	59	69.06	9.3	9.9	4817	0
39	2008	6121	54	60	72.92	22	10.6	5119	1
40	2009	6162	44	62	88.49	9.6	11.4	4489	1
41	2010	6078	55	53	87.38	12.6	12.4	4902	1
42	2011	5770	49	42	86.08	7.5	13	5332	1
43	2012	5426	63	40	88.99	6.9	13.9	5446	0
44	2013	4887	59	44	100.77	9.3	15.3	5254	0
45	2014	4472		37	114.6	8.3	14.2	5119	0
46	2015	4064		45	120.42	3.7	13.5	5138	0
47	2016	3845							1