ADFJ ISSN 2522 – 3186.

African Development Finance Journal

VOLUME 8 (II)

Effects of Income Generating Activities and Donor Funds on Liquidity of Public Universities in Kenya

Hillary Ngugi Mbugua

Dr James Gatauwa

Dr Fredrick Warui Waweru

Effects of Income Generating Activities and Donor Funds on Liquidity of Public Universities in Kenya

By: Hillary Ngugi Mbugua[1], James Gatauwa (PhD)[2] and Fredrick Warui Waweru (PhD)[3]

Abstract

The issue of public universities' financial difficulties is a global one. To determine how well-equipped our universities are to function better, research on the liquidity of public institutions must be crucial. Stakeholders that are keen to address the financial challenges public universities face are particularly interested in how universities fund their operations. The study's main goal was to evaluate how donor financing and income-generating activities affected Kenya's public universities' liquidity. Two theories provided guidance for the study: general systems theory and resource dependency theory. Causal research design was adopted in the study. All 31 Kenyan chartered public universities made up the study's population, which was conducted over the course of five years, from the 2016–2020 fiscal years. Because of the minimal number of public colleges, a census was conducted. Descriptive analysis and inferential analysis utilizing a panel data regression model were used to analyze the data. The Office of the Auditor-General provided the quantitative secondary data used in the investigation. The study guaranteed that all data acquired was used exclusively for the study and secured research permits from NACOSTI. The study found that Income generating activities and donor funding though they contribute largely to the universities finances, they have minimal effect on liquidity of these universities. The study recommends that universities should enhance donor engagement initiatives to cultivate long-term relationships and secure sustainable funding sources. They should also prioritize streamlining their methods for generating revenue and in need to alleviate future liquidity issues, universities should diversify revenue streams, investigate creative income-generating activities, and improving resource utilization efficiency.

Keywords: Income Generating Activities, Liquidity, Public Universities, Donor Funding

1. Introduction

As public universities in Kenya increasingly struggle to satisfy their financial obligations, the liquidity of these institutions has become a critical concern. Maintaining adequate financial flow to pay for operating costs like salaries, electricity, and debt servicing is extremely difficult for many colleges. Reduced government support, growing operating expenses, and inefficiencies in revenue production all contribute to this financial strain. Consequently, some colleges run the risk of going bankrupt, which makes it harder for them to continue operating efficiently since it causes

[1]*Department of Accounting and Finance, Kenyatta University, Kenya, E-Mail: Jhillary41@gmail.com*
[2]*Department of Accounting and Finance, Kenyatta University, Kenya, E-Mail: jmgatauwa@gmail.com*
[3]*Department of Accounting and Finance, Kenyatta University, Kenya, E-Mail: warui.waweru@ku.ac.ke*

delays in paying employees and suppliers. In order to guarantee these institutions' long-term viability, stakeholders must reevaluate the funding models and financial management procedures used by these organizations.

Liquidity corresponds to the ability of an organization to meet short-term needs without difficulty. (Marwa, 2015). Liquidity is very important for a company because it can go bankrupt even if it is doing well. Financial Indicators. Almost most of the public universities in Kenya has seen prolonged years with a problem of funding their day to day operations.

Income-generating activities involve any other business ventures that universities engage in to raise extra finances. According to Kiamba (2005), this is necessary to avoid over-reliance of universities on government funding, therefore, engaging in resourceful activities to earn more income to finance their activities. This led to the introduction of productive ventures, hiring out University facilities and consultancy services. These non-academic commercial units include restaurants bakeries, guesthouses, farms, cyber-cafés, mortuaries and bookshops.

Research by Thuva and Muturi, (2017) on the performance of IGAs in JKUAT found out that the university formed its own company as a means of raising extra income to the university. JKUAT Enterprises was formed as a limited company fully owned by JKUAT. The notion behind this formation was to help in commercializing its innovations. The enterprise comprised of divisions which include Consultancy, Products, ICT and EDC divisions. There is also an administration division whose mandate is to operate all the income generation units. All these activities are carried out to enable the university to generate extra income for its operations.

Ouma (2007) carried out a study on reducing resource dependence by state universities in Kenya and South Africa on government support and discovered that both nations faced comparable issues with public university finance. To try and resolve the funding crisis both countries applied different measures one being donor funding. Donor funding sorted after included donations from alumni and other willing players like corporations. The study concluded that Kenya public universities had less success in generating income from donations hence not a reliable source for revenue for these institutions. Dependence on donor funding is less predictable mostly because it all depends

on the magnanimity of donors. It largely depends on finding new donors now and again because it's unhealthy to depend on one donor throughout.

Sandra (2020) carried out a study on Donor driven designs on universities and found out that in the United States almost a third of research grants in universities is derived from donor funding while in the United Kingdom donor funding amounts to 15% of research grants in the year 2016. Due to the continued reduction of funding in universities by the state, the universities are left relying on donor funding to cater for their operations. Most of these donor funds are mostly used to cater for new campus architecture to be used by the university. Although universities are in dire need of these donations they must come up with teachings and researches that have social contribution towards the society so as to make them competitive alongside other worthy causes and organizations that are also in need of donor funding. They must have activities that go in hand with the interests of donors because donors tend to donate more to noble causes and those that they believe are worthwhile.

Universities need to finance their operations without relying on the traditional methods but to look for other avenues they can venture in to raise more capital. The only way to avoid poor financial performance in any organization is by having a better financing structure which is greatly needed in our public universities in Kenya.

1.2   Research Problem

Studies by Ogot (2002) and Onyuma & Okumu (2015), only focused on the impact of income-generating activities as one of the sources of extra income to universities and its effect on the overall performance of universities. Though they have been effective, income-generating activities generate small amount of surplus with the ever-rising budget deficits of universities. The impact of Module II programs has resulted in an increase in disposable income to universities and their significance will become more when universities continue to implement them (Kiamba, 2004).

A study by Ouma (2007), emphasized the alternative methods applied by universities to access more funds. The study focused on donor funding in universities and its effects on universities. The study concluded that donor funding is less predictable mostly because it all depends on the

magnanimity of donors and hence one cannot fully depend on donor funding completely. Ouma (2012), found out that due to decreased government funding to universities, the introduction of Module II programs helped universities to generate extra income but this program was dealt a big blow when the government lowered the entry-level of universities from B to C+ hence reducing the number of students being enrolled to module II program resulting in decreased revenue.

Regarding the finances and liquidity of Kenya's public universities, a study of earlier research and literature reveals a knowledge and research vacuum in the present literature. The aforementioned literature demonstrates that despite increased state efforts to improve public university funding through various financing models, these institutions' financial performance is still lacking (CUE, 2019), and the findings regarding public university funding remain conflicting, with various scholars reaching differing conclusions (Kamaan, 2014). Considering how poorly Kenya's public colleges are doing financially, this report is essential. Therefore, this study's goal is to investigate the financial possibilities and liquidity concerns that these organizations face.

1.3 Objectives and Hypothesis

This study sought to:

 (a) Examine the effect of income generating activities on the liquidity of public universities in Kenya.

 (b) Examine the effect of donor funds on the liquidity of public universities in Kenya.

The study was based on the following two hypotheses:

 (a) H_{01}: Income generating activities have no significant impact on the liquidity of public universities in Kenya.

 (b) H_{02}: Donor funds have no significant impact on the liquidity of public universities in Kenya.

2. Literature Review

2.1 Theoretical Framework

2.1.1 Resource Dependency Theory

Pfeffer and Salancik established the hypothesis in 1978. In terms of the resources that the organization gathers and uses for its growth, the theory focuses on how external influences impact the behavior and performance of organizations. It attempts to explain why institutions that rely

more on outside funding to survive struggle to grow because outside forces track and regulate their progress.

According to Heatley (2018), the theory attempts to analyze the importance of a resource to a business and what would happen to the organization in question if the resource were unavailable. An organization's purpose is to lessen reliance on other entities for resources it requires to operate by getting resources on their own methods. The theory suggests a number of ways to deal with the problem of dependency, including as political action, inter-organizational partnerships, and joint ventures (Hillman et al., 2009).

Government capitation, which accounts for 48% of public university revenue, is a major source of funding for these institutions (CUE, 2016). This implies that these universities might not be able to function without government funding. In order to offset the government funding they get and lessen their reliance, the idea aims to advise universities to find alternative sources of income.

2.1.2 General Systems Theory

The theory was originally developed by Ludwig von Bertalanffy in 1936. He saw General System Theory as an integrated unit and compared it to an organizational management. A system is a collection of parts brought together to attain a set target. If a part of the system fails, then the whole system cannot function well. Using a computer as an example, without a mouse, or keyboard, the computer cannot function at all.

According to Mbirithi (2013), a system in general can be said to be having inputs, processes and outputs. Inputs may include resources such as, finances, workers among other resources. All these inputs are processed to meet the organizational goals.

Financing options available to an organization is like a system that is concerned with the general finances of an institution. In our universities available options include but not limited to: government capitation, tuition and other fees, income generating activities and donor funding, CUE (2016). All these components need to all be able to contribute to their maximum for these institutions to perform better financially. The theory states that when one of the components is

removed the rest will struggle to meet their required targets. Therefore, all the components of the financial structure should be utilized to the maximum so as to achieve the maximum results.

2.2 Empirical Review

2.2.1 Income Generating Activities and Liquidity

Murage and Onyuma (2015), carried out a study on the financial performance of income-generating activities at Egerton University from 2003 to 2012. They used university income statements which were audited from which they computed financial ratios, from which financial performance of IGAs for ten years was analysed. Comparing Module II programs to other income-generating activities (IGAs), the study's empirical results showed that they produced the highest returns over the study period. According to the report, IGAs had a 3.02 times liquidity ratio and an average return on investment of 24%. The study concluded that although the IGAs undertook by the University had positive returns in combating financial hardship in the institution they have not being effective since they generated little as compared to the huge deficit the university experienced. To improve the financial performance of the university more need to be done to make sure that IGAs undertaken by the university can generate more income that can supplement other sources of finance applied for the general Well-being of the university financial performance.

According to Thuva and Muturi, (2017), in their study on determinants of the financial performance of IGAs among public Universities, they found out that IGAs in public universities are affected by operating costs and internal controls. The study ruled out any effects of liquidity and unit structure on the financial performance of IGAs. The study recommends that IGAs in public universities should maintain positive liquidity levels to suit present needs, even though they have no effect on performance levels. For IGAs to perform better as they are intended to, management should manage their operating costs effectively and also have strong internal controls so as they can minimize wastage and maximize returns from these activities. Based on this study IGAs contributed much to the overall financial performance of the institution and if recommended observations are observed IGAs can contribute more to the overall financial performance of the institution.

2.2.2 Donor Funding and Liquidity

Donor funding entails individuals, organizations, or nations making contributions through aid towards a certain project. Donors in higher education target areas like human resource development, research, and capacity building to help smooth the running of these higher learning institutions. Research by Riechi, (2012), found out that development expenditure in universities if funded by over 90 percent donor grants and is hugely used for research activities in Kenyan public universities. Development expenditure is very critical in universities as it enables universities to bring up structures like lecture halls, libraries, and other amenities that may facilitate smooth learning in these institutions.

Research carried out on the trends in funding of university libraries in Kenya by Kavulya, (2006), the researcher found out that three main sources of funding are available to libraries which include, funding from the university itself, user fees, donor funding and generation of income. A reduction of funding from the parent university has faced many libraries which has been caused by reduced funding of the universities from the government. These reductions have resulted in libraries seeking more donor funding to enable them to deliver more services to their users. Although very useful, donor funding has its shortcomings including, sustainability since they run for a specific time. They create a vacuum when their intended time-lapses leaving behind problems for the funded institution to replace that funding. Another challenge for donor funding is the relevance of donated materials. Do the materials donated relevant to university libraries or the university at large since the recipient institutions have less control of materials being donated but receive anything given to them. All these challenges addressed by Kavulya, (2006), raise more eyebrows at donations available to public universities in Kenya and the way they help in curbing their financial performance.

Donor funding is a great alternative way of funding universities to help reduce the shortage created by a reduction in government funding but it has its challenges and higher learning institutions need to create ways to mitigate these challenges so that they can utilize donor funding to the fullest. For donor funding to be efficient in helping the financial situation in our public universities, it must be reliable and relevant to the prevailing situations in our public universities in Kenya today.

2.3 Conceptual Framework

A conceptual framework is a graphical representation of the relationships between multiple research concepts, variables and points of interest. The image below shows how funding options are related to financial performance in Kenyan public universities.
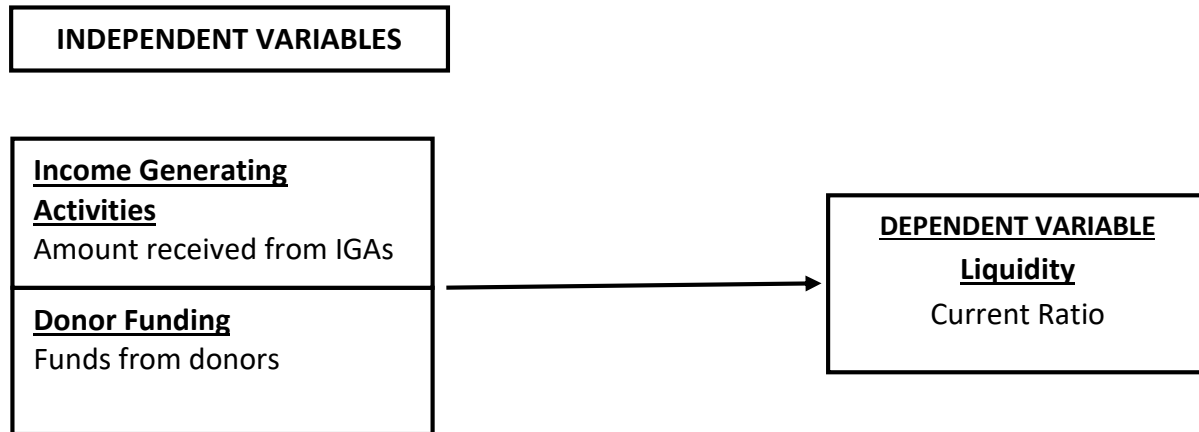
```
┌─────────────────────────────┐
│   INDEPENDENT VARIABLES      │
└─────────────────────────────┘


┌──────────────────────────┐                    ┌──────────────────────────┐
│ Income Generating        │                    │   DEPENDENT VARIABLE     │
│ Activities               │                    │      Liquidity           │
│ Amount received from IGAs│ ────────────────▶  │    Current Ratio         │
│                          │                    │                          │
│ Donor Funding            │                    └──────────────────────────┘
│ Funds from donors        │
│                          │
└──────────────────────────┘
```

Figure 1: Conceptual Framework.

3. Research Methodology

In this study, positivism is used as the guiding concept, where the researcher acts independently and impartially (Žukauskas, Vveinhardt, & Andriukaitienė, 2018). Causal design was used in this study. The design is used to determine the causes and effects of a particular relationship and focuses on the investigation of a particular problem (Wunsch & Gourbin, 2020). The study covered a five-year period from 2016-2020. The study population was all 31 accredited public universities. According to Burns and Burns (2008), the target population is defined as the people who are the subjects of a research study that aims to determine solutions to a problem. Using the census technique, all 31 public universities were selected for the investigation. This was in line with Mbuthia and Gatauwa (2022) who argued that for small populations falling below 200, the ideal scenario is including all of them in the study. This study used panel data regression model to find out how independent variables affect the dependent variable. Orodho (2007) defines regression analysis as a statistical technique for finding correlations between variables. The study used regression to analyze the relationship between dependent and independent variables.

The model was as below:

$$Y_{it} = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \varepsilon it\ldots\ldots\ldots\ldots\ldots\ldots\ldots.$$

Where:

Y_{it} = Liquidity measured by Current Ratio

X_1 = Income generating activities

X_2 = Donor funds

$β1\ β2\ β3\ β4$ = Regression Coefficients

$εit$ = Error term

4.   Results and Discussions

Using samples from 2015–16 to 2019–20, the study looked at each of the 31 public institutions' fiscal years. Five fiscal years' worth of data were collected from every public university. According to the World Bank (2020), Kenya's higher education industry has recently suffered financial difficulties. The primary source of funding for Kenyan colleges has always come from donations, but the World Bank research cautions that in recent years, this support has grown more irregular and unpredictable.

4.1 Descriptive Statistics Analysis

The study sort to analyse the liquidity of all public universities in Kenya. This was gotten to by averaging the current assets and current liabilities of the universities. The descriptive statistics for variables are highlighted in Table 1.

Table 1: Summary of Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Y1 (Liquidity)	31	6.536153	4.367905	1.260755	24.16949
X1 (Income generation)	31	7.19e+08	1.05e+09	0	4.57e+09
X2 (Donor funds)	31	7.74e+07	1.28e+08	0	5.49e+08

The table presents descriptive statistics regarding the liquidity of public universities, indicating an average liquidity (Y1) value of approximately 6.54. This implies that the universities' liquidity levels are generally satisfactory. However, the 4.37 standard deviation suggests that there is a sizable variation in liquidity among the institutions. This outcome is consistent with Mbugua et al. (2024) findings, which show that colleges with moderate to high liquidity generally have better financial health and longer-term sustainability. The discrepancies in these universities' financial situations are highlighted by the large variety of liquidity levels, which range from 1.26 to 24.17.

Institutions at the lower end of this range might struggle to meet short-term obligations, but those at the higher end are likely better equipped to handle their current financial needs. This finding is consistent with the research conducted by Sharma and Morris (2018), who highlight the need of maintaining consistent liquidity to effectively manage financial risks and uncertainties.

Income Generating Activities variable (X1) has a mean of 719 million which shows how important the variable is as a source of income for public universities. The variable has a standard variation of 1.05 billion showing variability in income received among public universities. Income generation spans from zero to 4.57 billion, reflecting diverse financial capacities across the all-public universities. This result contradicts the perspective presented by Chan and Wong (2018), which posits that revenue-generation strategies among public universities often align with national or regional economic trends, leading to more homogenous practices and results. These disagreements highlight the complexity of financial dynamics in higher education and underscore the need for a nuanced understanding of factors affecting liquidity and resource allocation in public universities. According to Breneman et al. (2018), universities have pursued alternative revenue streams to counteract declining public funding. The substantial standard deviations for income-generating activities also show significant variation in income generation amongst universities. This aligns with Archibald and Feldman (2015), who highlighted the reliance of income-generation strategies on individual universities' unique circumstances and resource availability. Furthermore, although significant standard deviations imply heterogeneity in revenue production, they might also represent the variety of strategies that universities have used, such as corporate partnerships, research commercialization, and entrepreneurial endeavors, leading to a range of results, in contrast to Brown and Taylor's (2020) claim that income-generating tactics at universities are uniform.

The donor funds (X2) have an average score of 77.4 million which is comparatively smaller but still notable source of external funding. The standard deviation of 128 million indicates the variability in the amount of donor funds received. There is some variation in the amount of donor funding across the institutions, as indicated by the range from zero to 549 million. Kim and Lee (2019) study propose that donor funding can introduce significant variability in university finances, potentially leading to disparities in resource allocation and institutional priorities.

Hutchins and Bruce (2018) observed that economic situations may impact donor support, which aligns with this study results. According to Meer and Sivanathan's (2018) study, donor funding and university reputations significantly influence fundraising efforts. These studies demonstrate the complexity of donor support and the significance of considering a range of criteria to comprehend its unpredictability.

4.2 Diagnostic Tests

The diagnostic tests conducted aimed to verify whether the panel data adhered to the primary assumptions of linear regression.

4.2.1 Multicollinearity Test

Multicollinearity tests were used in the regression model to assess the degree of linear relationship between the explanatory variables. Typically, the primary tests used to determine collinearity are the Variance Inflation Factor and Tolerance Values. Table 2 shows the results.

Table 2: Multicollinearity Results

Variable	VIF	1/VIF
X1 (Income Generating Activities)	1.00	0.995663
X2 (Donor Funding)	1.00	0.995663
Mean VIF	1.00	

Table 2 indicates the VIF analysis performed on the regression model's explanatory variables. Two variables in a regression model, X1 (Income generating activities) and X2 (Donor funding) are shown in the table along with their respective Variance Inflation Factor (VIF) values. Since VIF values close to 1 indicate that the predictor variables are not correlated with one another, both variables have a VIF of 1.00, showing no multicollinearity. This result is further supported by the reciprocal of VIF (1/VIF), which for both variables is roughly 0.996, indicating a high tolerance level. The regression coefficients in this model are stable and not inflated by intercorrelations among the predictors, as indicated by the Mean VIF of 1.00, which further supports the idea that multicollinearity is not an issue. This suggests that the estimates produced by the model should be accurate and dependable.

4.2.2 Test for Normality

Normality tests are performed to ensure that a given sample follows a normal distribution, which is a fundamental assumption in many statistical studies and models. In this study, the Shapiro-Wilk test was used. Table 3 indicate the results.

Table 3: Normality Test Result

Variable	Obs	W	V	z	Prob>z
Y1	31	0.81328	6.082	3.741	0.00009
X1	31	0.65098	11.369	5.037	0.00000
X2	31	0.69709	9.867	4.743	0.00000

Field et al. (2018) state that for data to be considered normal, the skewness and kurtosis values must not be higher than 2 and 10. These criteria provide guidance for interpreting normality tests by ensuring that data distributions follow the characteristics of a normal distribution. The Shapiro-Wilk test results indicate that there is a considerable divergence from normalcy for every variable. This suggests that analyses or models depending on assumptions requiring normalcy may need to be modified or re-examined because these assumptions may not hold true for these variables.

4.2.3 Test for Heteroskedasticity

Garson (2012) states that heteroscedasticity denotes unequal variability in regression disturbances over several observations. To confirm the validity of the regression analysis, the study used a Breusch-Pagan/Cook-Weisberg test to look for heteroscedasticity in the regression model's disturbances. The results are displayed in Table 4.

Table 4: Heteroskedasticity Tests Results

Breusch-Pagan / Cook-Weisberg test for Heteroskedasticity
Ho: Constant variance
Variables: fitted values of y1
chi2(1)   =   2.10
Prob > chi2 =   0.1476

Wooldridge et al. (2016) state that the Breusch-Pagan/Cook-Weisberg test determines whether the regression model's disturbances are heteroscedastic. If a regression model's error variance fluctuates (heteroskedasticity) or is constant (homoskedasticity), it can be determined using the Breusch-Pagan / Cook-Weisberg test for heteroscedasticity. The variance is constant, which is the null hypothesis (Ho) of the test. With a corresponding p-value of 0.1476, the test statistic (chi-squared) in the presented results is 2.10. We are unable to reject the null hypothesis since the p-value is higher than the standard significance level of 0.05. This implies that the model's residuals' constant variance assumption is plausible because there isn't much evidence of heteroscedasticity.

4.2.4 Autocorrelation Test

Autocorrelation is defined as the relationship between the values of a variable and its lag values (Uyanto, 2020). To determine whether serial correlation existed in the dataset, this study employed the Breusch-Godfrey LM test. The results are displayed in Table 5.

Table 5: Autocorrelation Test Results

lags(p) |	chi2	df	Prob > chi2
1	0.041	1	0.8392

H0: no serial correlation

The test was run in this instance with one lag (p = 1), yielding a p-value of 0.8392 and a chi-squared statistic of 0.041. We are unable to reject the null hypothesis since the p-value is significantly greater than the typical significance level of 0.05. This suggests that the model's error components are independent throughout time, which is a desired quality for the validity of many statistical conclusions, and that there is no evidence of serial correlation in the residuals.

4.2.5 Stationarity Test

According to Ajewole et al. (2020), the Augmented Dickey-Fuller (ADF) test is used to evaluate the stationarity of time series data. By examining whether a series has a unit root, this test detects non-stationarity. The ADF test was employed in this investigation. Table 6 presents the findings.

Table 6: Stationarity Test Results

	Test Statistic	1% Critical Value	5% Critical Value	10% Critical Value
Y1	-5.577	-3.716	-2.986	-2.624
X1	-7.315	-3.716	-2.986	-2.624
X2	-5.939	-3.716	-2.986	-2.624

Variables in a time series context are stationary, according to the ADF test results. Based on the provided test statistics, it seems that each variable's test statistics fall below the crucial values at the 1%, 5%, and 10% significance levels. This suggests that the series are stationary for each of these variables, allowing us to reject the null hypothesis of non-stationarity at a significance level of 1%.

4.2.6 Model Specification Test

According to Hässler et al. (2020), the Link test assesses the functional form of a regression model by examining the significance of additional higher-order elements. In order to improve accuracy and fit, a big p-value indicates that the model's specification is insufficient and necessitates the addition of new terms. Table 7 indicate the link test results for the model specification.

Table 7: Specification Test Results

y1	Coef.	Std. Err.	T	P>|t|	[95% Conf. Interval]
_hat	-.8588534	4.697238	-0.18	0.856	-10.48071 8.763002
_hatsq	.1460516	.3644747	0.40	0.692	-.6005411 .8926442
_cons	5.74543	15.14906	0.38	0.707	-25.28602 36.77688

The table shows the findings of a regression study in which the dependent variable was regressed on the square of the predicted values (_hatsq), the constant term (_cons), and the predicted values of "liquidity" (_hat). _hat is not statistically significant, as shown by its coefficient of -0.8589 and huge standard error of 4.6972, which result in a t-value of -0.18 and a p-value of 0.856. Similarly, there is no statistical significance shown by the coefficient for _hatsq, which is 0.1461 with a standard error of 0.3645, t-value of 0.40, and p-value of 0.692. Once more demonstrating lack of significance, the constant term's coefficient is 5.7454 with a high standard error of 15.1491,

resulting in a p-value of 0.707. The large confidence intervals surrounding each coefficient indicate a high degree of uncertainty in the estimates. Overall, the findings show that there is no clear evidence of a relationship between the dependent variable and either the linear or quadratic component of the anticipated "liquidity" is not substantially associated with it.

4.2.7 Bi-variate Correlation Analysis Results

Examining the associations between variable pairs in a dataset is made easier with the use of bivariate correlation analysis. It offers details on possible correlations between variables before moving on to more thorough studies. Patterns, such as significantly positive or negative correlations between variables, can be observed by looking at the correlation coefficients. These trends may guide future research or modeling initiatives. Table 8 displays the findings of the bi-variate correlation study.

Table 8: Bi-variate Correlation Analysis Results

	Y1	X1	X2
Y1	1.0000		
X1	-0.1790	1.0000	
X2	0.1819	-0.0659	1.0000

The correlation matrix for the following three variables is shown in the table: Y1, X1 and X2. The diagonal values of 1.0000 signify that every variable has an ideal connection with itself. Y1 and X1 have a weak negative correlation of -0.1790, meaning that while the relationship is not strong, Y1 tends to drop slightly as X1 increases.

The correlation coefficient between Y1 and X2 is 0.1819, indicating a weak positive link that suggests Y1 tends to rise slightly in tandem with X2. In conclusion, the correlation coefficient between X1 and X2 is -0.0659, suggesting a very weak negative association. The variables do not appear to have strong linear links with one another, as evidenced by the generally poor correlations between the variables.

4.3 Panel Regression Analysis

The ANOVA (Analysis of Variance) findings for a regression model with 31 data are shown in the table. There are two predictors in the model, and its overall significance is indicated by an F-statistic of 0.91 and a p-value of 0.4136. The model is not statistically significant since the p-value is higher than the traditional significance level of 0.05, which indicates that the predictors do not collectively account for a statistically significant portion of the variance in the dependent variable. With an R-squared of 0.0611, the model can only account for 6.11% of the variation in the dependent variable, which is a very little amount of variation. The model does not appear to provide a better fit than the one obtained from taking the simple mean of the data, as indicated by the adjusted R-squared, which is negative (-0.0059) and takes the number of predictors into consideration. The average difference between the observed and anticipated values is 4.3809, which is represented by the Root Mean Square Error (Root MSE). All things considered, the model does a poor job of explaining the variance in the dependent variable, and its predictors don't seem to have much of an effect. Table 9 shows the results of the regression analysis.

Table 9: Regression Analysis Results

Source	SS	Df	MS			
Model	34.9810503	2	17.4905251	Number of obs = 31		
Residual	537.376814	28	19.1920291	$F(2, 28)$ = 0.91		
Total	572.357864	30	19.0785955	Prob > F = 0.4136		
				R-squared = 0.0611		
				Adj R-squared = -0.0059		
				Root MSE = 4.3809		
Y1 (liquidity)	**Coef.**		**Std. error**	**t value**	**p>|t|**	**95 % conf. interval**
X1(Income generating activities)	-6.99e-10		7.65e-10	-0.91	0.368	-2.27e-09 8.68e-10
X2 (Donor funding)	5.84e-09		6.28e-09	0.93	0.360	-7.01e-09 1.87e-08
_cons	6.586999		1.09225	6.03	0.000	4.349626 8.824372

Thus, the regression equation for factors influencing financial liquidity of public universities can be can be expressed as:

$Y_{it} = -6.99X_1 + 5.84x_2$

Whereby:

X1 = Income Generating Activities

X2 = Donor Funding

4.3.1 Hypothesis Testing

Income generating activities (X1) have a coefficient that is quite near to 0, indicating a negligible impact on liquidity. This effect is not statistically significant at the traditional 0.05 level, according to the p-value of 0.368. This indicates that there isn't much evidence to support the idea that X1 affects Y1. Since zero is included in the confidence interval, it is further evidence that the effect may very well be nil.

Donor funding (X2) has a very modest coefficient, indicating that its impact on Y1 is negligible. This coefficient is not statistically significant at the 0.05 level, with a p-value of 0.360. This suggests that X1 has little to no impact on Y1. The conclusion that there might not be a meaningful effect is supported by the fact that 0 is included in the confidence interval for this coefficient.

With a p-value of 0.000, the intercept term is statistically significant and shows a large impact on Y1 when X1 and X2 are both zero. When both independent variables are zero, the estimated liquidity is represented by the coefficient value of 6.587. The statistically significant p-value and positive coefficient indicate that the baseline liquidity level differs significantly from zero.

4.3.2 Discussion of the Hypotheses

The coefficient for X1 (Income generating activities) shows the coefficient having no statistical significance impact on Y1 as per our current regression. This implies that as income generation increases, liquidity levels tend to remain the same. This interpretation resonates with findings from scholarly studies. For instance, Gupta and Shah (2021) discovered that increased income generation could enhance liquidity in specific sectors by facilitating better debt and expense management. Additionally, Chen et al. (2018) suggested that in specific economic contexts,

heightened income generation might not necessarily lead to decreased liquidity, as businesses may opt to retain more cash to mitigate risks. These differing perspectives underscore the multifaceted relationship between income generation and liquidity, warranting further research for a comprehensive understanding.

From the results, the variable X2 (donor funding) are not statistically significant in explaining variations in liquidity. This theory is supported by several publications and research, which recognise the difficulties in figuring out how donor funds affect institutions' liquidity. For example, research conducted by Smith et al. (2018) on the efficacy of donor money in education produced contradictory findings, with donor monies having little effect on academic achievements. Similarly, studies on the impact of donor help on economic growth by Jones and Williams (2020) point to difficulties in determining the efficacy of aid because of things like recipient nation policies and governance. On the other hand, in particular situations, some research supports the importance of donor funds. According to research by Duvendack and Mader. (2020), donor funds, for example, may significantly enhance healthcare outcomes and access in low-income nations. Furthermore, Ricciardi et al.'s research from 2020 on the function of donor monies in environmental conservation highlights the beneficial effects of donor assistance for initiatives to conserve biodiversity.

5   Conclusion and Recommendations

While potentially beneficial for financial growth of universities, Income generating activities contributes a big chunk of the university finances. Liquidity levels tend to decrease slightly with an increase in income from generating activities. There is need for further studies into the management of universities finances to better understands and manage the liquidity levels of public universities.

Despite their considerable heterogeneity, donor funds have minimal impact on university liquidity. Their unpredictable nature suggests they may not significantly influence liquidity levels, prompting the need to diversify funding sources to maintain steady liquidity amidst sporadic variations in donor contributions. This underscores the importance of strategic financial planning

and resource allocation to effectively navigate the complexities of monetary interactions within universities.

5.1 Recommendations for Practice

Universities should enhance donor engagement initiatives to cultivate long-term relationships and secure sustainable funding sources. Donor generosity and support can be increased by putting donor appreciation programs into place, planning fundraising activities, and giving donors regular updates on the impact of their contributions. This can go to enhance the available resources available to public universities for their day to day operations.

Universities should put in place affordable financial controls and procedures to handle the substantial impact that income generation has on liquidity. Optimizing financial resources and enhancing operational liquidity management can be achieved by streamlining administrative procedures, finding cost-saving opportunities, and implementing effective budgeting techniques. Universities should prioritize streamlining their methods for generating revenue. To alleviate future liquidity issues, this may entail diversifying revenue streams, investigating creative income-generating activities, and improving resource utilization efficiency.

5.2 Recommendations for Policy

While donor funds did not significantly impact liquidity, policymakers should advocate for enhanced transparency and accountability in managing donor contributions. Implementing policies and guidelines for the efficient utilisation and reporting of donor funds can improve trust and confidence among donors, potentially leading to increased contributions over time.

In light of the inverse relationship between income generation and liquidity, policymakers should establish financial resilience policies for public universities. This may include developing contingency funds, implementing risk management strategies, and ensuring adequate financial buffers to mitigate the adverse effects of income fluctuations on liquidity.

References

Ajewole, K. P., Adejuwon, S. O., & Jemilohun, V. G. (2020). Test for stationarity on inflation rates in Nigeria using augmented dickey fuller test and Phillips-persons test. *J. Math*, *16*, 11-14.

Archibald, R. B., & Feldman, D. E. (2015). *The changing economic structure of American universities*. Cambridge University Press.

Breneman, D. W., Finney, J. R., & McClellan, S. C. (2018). The funding of public higher education. In P. Altbach & J. J. F. Forest (Eds.), *International handbook of higher education* (pp. 387-409). Springer.

Brown, K., & Taylor, L. (2020). The influence of resource availability on universities' income-generating strategies. *Journal of Higher Education Management*, 35(1), 71-84.

Chan, K., & Wong, C. (2018). The influence of economic trends on revenue generation in public universities. *Journal of Higher Education Finance*, 44(4), 305-322.

Chen, J., Liu, Y., & Wang, X. (2018). The relationship between income generation and liquidity in Chinese firms: An empirical analysis. *International Journal of Financial Research*, 5(2), 29-42.

Duvendack, M., & Mader, P. (2020). Impact of financial inclusion in low-and middle-income countries: A systematic review of reviews. *Journal of Economic Surveys*, *34*(3), 594-629.

Field, A. P., Miles, J. B., & Field, Z. V. (2018). Discovering statistics using IBM SPSS statistics. London: Sage.

Garson, G. D. (2012). *Testing statistical assumptions*. Statistical associates publishing Asheboro, NC

Gupta, A., & Shah, D. (2021). The role of income generation in liquidity management: A sectoral analysis. *Global Journal of Management and Business Research*, 19(1), 81-95.

Hässler, T., Ullrich, J., Bernardino, M., Shnabel, N., Laar, C. V., Valdenegro, D., ... & Ugarte, L. M. (2020). A large-scale test of the link between intergroup contact and support for social change. *Nature Human Behaviour*, *4*(4), 380-386.

Hillman, A. J., Withers, M. C., & Collins, B. J. (2009). Resource Dependence Theory: A Review. *Journal of Management*, 35(6),1404-1427.

Hutchins, B., & Bruce, B. (2018). The influence of economic conditions on donor support for universities. *Journal of Education and Learning*, 7(1), 11-17.

Jones, M., & Williams, T. (2020). The influence of donor aid on economic development: A critical analysis. *World Development*, 108, 105503.

Kiamba, C. M. (2005). *The Experience of Privately Sponsored Studentship and other Income Generating Activities at the University of Nairobi*. Nairobi: University of Nairobi Press.

Kim, Y., & Lee, J. (2019). The effects of donor funding on university finances: A case study of public universities. *Journal of Higher Education Finance*, 45(2), 117-138.

Mbugua, H. N., Gatauwa, J. M., & Warui, F. W. (2024). Effects of government capitation and tuition fees on liquidity of public universities in Kenya. International Academic Journal of Economics and Finance, 4(3), 194-213.

Mbuthia, J. N, Gatauwa, J. M. (2022). Corporate sustainability practices and financial performance of firms listed in the Nairobi Securities Exchange, Kenya. International Academic Journal of Economics and Finance, 3(7), 89-112.

Ricciardi, V., Wane, A., Sidhu, B. S., Godde, C., Solomon, D., McCullough, E., ... & Mehrabi, Z. (2020). A scoping review of research funding for small-scale farmers in water scarce regions. *Nature Sustainability*, *3*(10), 836-844.

Sharma, R., & Morris, A. (2018). Financial risk management in public universities: The role of liquidity. *Journal of Higher Education Management*, 29(3), 255-273.

Sherstobitova, A. A., Iskoskov, M. O., Kaziev, V. M., Selivanova, M. A., & Korneeva, E. N. (2020). University financial sustainability assessment models. In *Smart Education and e-Learning 2020* (pp. 467-477). Springer Singapore.

Smith, A., Jones, B., & Williams, C. (2018). The effectiveness of donor funding in education: A comprehensive review. *Journal of Educational Research*, 45(2), 201-215.

Thuva, M. S., & Muturi, W. M. (2017). Determinants of Financial Performance of Income Generation Units among Public Universities: Case Study of Jomo Kenyatta University of Agriculture and Technology Enterprises Limited, 3,2223-2234.

Uyanto, S. S. (2020). Power comparisons of five most commonly used autocorrelation tests. *Pakistan Journal of Statistics and Operation Research*, 119-130.

Wangenge-Ouma, G. (2012), Public by Day, Private by Night: Examining the private lives of Kenya's public Universities. *European Journal of Education*, 47: 213-227.

Wooldridge, J. M., Wadud, M., & Lye, J. (2016). *Introductory econometrics: Asia pacific edition with online study tools 12 months*. Cengage AU.

Wunsch, G., & Gourbin, C. (2020). *Causal assessment in demographic research. Genus, 76(1),*1-
    20.

Žukauskas, P., Vveinhardt, J., & Andriukaitienė, R. (2018). Philosophy and paradigm of scientific
    research. *Management Culture and Corporate Social Responsibility*, 121.