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Full Length Research

# Financial Development and Economic Growth in Kenya: Granger Causality Approach

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## **Abstract**

During the last two decades, there has been a large amount of empirical work examining the relationship between financial development and economic growth. However, the findings of these studies indicate that there is no consensus on the effect of financial development on economic growth. In the empirical literature, some argue that an efficient financial sector leads to economic growth while others maintain that it is growth that leads to financial development. Others provide evidence that there is a two way-causality between financial sector development and economic growth while others find no relationship between financial development and economic growth. This study was therefore to determine the causal link between financial sector development and economic growth in order to establish if it is supply leading hypothesis or demand leading hypothesis in Kenya using Granger Causality approach for the period 1970 to 2020. The results of this study revealed that financial development exerts a positive and statistically significant effect on economic growth in Kenya hence confirming supply leading hypothesis. From policy perspective, the policy makers need to formulate financial sector reform policies to ensure a well-functioning financial system that promotes domestic credit especially to productive sectors of the economy.

**Key Words: Economic Growth, Financial Development, Causality, Kenya**

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## **INTRODUCTION**

While there is a significant number of empirical and theoretical work on the relationship between economic growth and financial development, there is no consensus on the effect of financial development on economic growth. Indeed a number of theoretical and empirical analyses indicate that financial development leads to economic growth. Studies that support this view include those of Tadesse and Abafia(2019),Mollaahmetoglu and Akcali(2019), Ndako (2017)Allen and Leonce Ndikumana(1998), Habibullah and End (2006), Galindo (2007), Ang (2008); Giuliano and Ruiz-Arranz(2009) and Nkoro and Uko (2013). These studies maintain that a well-developed financial sector creates strong incentives for investment and also fosters trade and business linkages besides technological diffusion. This is mainly through mobilizing savings for productive investment which thus promotes economic growth. Another school of thought believes that economic growth creates demand for financial services and therefore economic growth precedes financial development. Studies that advocate this view include Pinshi1(2020),Ismail and al (2019),Hasan(2018), Sunde (2013),

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Odhiambo (2008), Wagabaca, (2004) and Agbetsiafa (2003). Another strand holds that financial advancement plays a minimal role, if any, on economic growth (Lucas, 1988) and Adusei (2012). In the recent past however, there has been empirical evidence that there exist a bi-directional relationship between economic growth and financial development Fowowe, (2010)

This study therefore attempts to determine the direction of causality between financial development and economic in Kenya using Granger causality approach over the period 1970-2020. Studying the causal relationship between financial development and economic growth in Kenya is relevant since the country has witnessed significant development in the financial sector in the last decade. In addition previous empirical work has revealed that we cannot make a generalization on the relationship between financial development and economic growth across countries. It is for this reason therefore this study focuses on Kenya.

Utilizing data for the period 1970-2020 in a time series framework for Kenya the findings on causality test showed that there is a uni-direction causality running from financial development to economic growth. This means that financial development granger causes economic growth in Kenya. This implies that financial development boosts economic growth through the channel of increased investment in the country. This finding confirms the supply leading hypothesis.

This paper is organized as follows. Section II presents empirical literature on the finance growth nexus. Section III presents the data and methodology. Section IV presents results and discussion and section V presents conclusion.

## EMPIRICAL LITERATURE REVIEW

In the empirical literature there is a general belief that financial development has a positive effect on economic growth that is supplying leading hypothesis. However there is theoretical and empirical work supporting that this effect is non-existent and that financial development is as a result of economic growth that is demand following hypothesis Blanco (2011). Gupta and Rao (2018) study the causal relationship between financial development and economic growth in BRICS economies. Using the Toda - Yamamoto causality test from 1996 to 2016, they find that there is no consistency in causality between the financial sector and economic growth among the BRICS countries.

Nkoro and Uko (2013) examined the financial sector development-economic growth nexus in Nigeria. In their study, they employed co-integration/Error Correction Mechanism (ECM) with annual dataset covering the period 1980-2009. Five variables, namely; ratios of broad money stock to GDP, private sector credit to GDP, market capitalization-GDP, banks deposit liability to GDP and Prime interest rate were used to proxy financial sector development while real gross domestic product proxy growth. The empirical results show that there is a positive effect of financial sector development on economic growth in Nigeria. This confirms the supply leading hypothesis.

Abubakar and Gani (2013) examine the long run relationship between financial development indicators and economic growth in Nigeria over the period 1970-2010. Using the Johansen and Juselius (1990) approach to co integration and Vector Error Correction Modelling (VECM), the study revealed that in the long-run, liquid liabilities of commercial banks and trade openness exert significant positive influence on economic growth.

Levine *et al.* (1997) argued that financial sector promotes economic growth in that it facilitates risk diversifications, mobilizes resources, improves resource allocation, leads to better governance and control and expedites exchange of goods and services. All these avenues through which a financial system impacts on economic growth can be viewed as doing so via accumulation of capital and technology advancement.

According to a study by King and Levine (1993) where they conducted cross-section analysis to examine the link between financial development and economic growth over the period 1960 to 1989, the authors used the ratio of liquid liabilities of banks and nonbank institutions to GDP, ratio of bank credit to the sum of bank and central bank credit, ratio of private credit to domestic credit and ratio of private credit to GDP as a measure of financial development. The results of the study revealed that the level of financial development predicts future economic growth and future productivity advances. The authors conclude that there is a causal relationship that runs from financial development to economic growth.

Neusser and Kugler (1998) conducted an empirical study on the finance-growth relationship for 13 Organization for Economic Cooperation and Development (OECD) countries for the period 1970 to 1991. Using time series analysis, the study revealed a positive relationship between financial development and growth

Levine *et al.* (2000) examined the relationship between financial development for 71 countries over the period 1960 to 1995. The authors used the ratio of liquid liabilities to GDP, ratio of domestic assets plus central bank domestic assets to GDP and ratio of credit issued to private enterprises to nominal GDP as measures of financial development. The authors found that there exists a positive relationship between financial system and economic growth.

By employing cross-section data analysis during the period 1960 to 1999 for 159 countries, Khan and Senhadji (2003) examined the relationship between financial development and economic growth. The authors used the two-stage least

squares (2SLS) method to address the problem of potential endogeneity in the underlying relationship. The results of their study indicated that financial development has a positive and statistically significant effect on economic growth.

Chistopoulos and Tsionas (2004) examined the relationship between financial development and economic growth for ten (10) developing countries using panel data analysis. In their study, they used the ratio of total bank deposits liabilities to nominal GDP as a measure of financial development. The authors found that there exist evidence of long-run causality running from financial development to economic growth, however; there was no evidence of bi-directional causality. Further the study did not find any short-run causality between financial deepening and output. The authors suggested that improving financial markets will have an effect on growth that is delayed but nevertheless significant.

By using time series data analysis, Fatima (2004) examined the causal relationship between financial development and economic growth in Morocco for the period 1970 to 2000. The author used the ratio of liquid liabilities (M3) to GDP, ratio of domestic credit provided by the banking sector to GDP and domestic credit to the private sector to GDP as measures of financial development. By employing the Granger causality test, the findings of the study showed that there exist a short-run relationship between financial development and economic growth.

Khan *et al.* (2005) examined the relationship between financial development and economic growth in Pakistan during the period 1971 to 2004. By using autoregressive distributed lag method, the findings showed that financial depth has a positive impact on economic growth in the long-run. However the relationship was insignificant in the short-run. The ratio of investment to GDP exerted positive influence on economic growth in the short-run although this was also insignificant in the long-run. The study further indicated that there exists a positive impact of real deposit rate on economic growth.

Sanusi and Salleh (2007) investigated the relationship between financial development and economic growth in Malaysia over the period 1960 to 2002. The authors used ratio of broad money to GDP, credit provided by the banking system, and deposit money banks to GDP as a measure of financial development. By using autoregressive distributed lag (ADL) model, it revealed that that ratio of broad money to GDP, and credit provided by the banking system have positive and statistically significant impact on economic growth in the long-run. In addition, they found that a rise in investment will stimulate economic growth in the long-run.

By employing panel data analysis for 15 member-countries of the Organisation for Economic Co-operation Development (OECD) and 50 non-members of OECD countries, Apergis *et al.* (2007) examined the relationship between financial depth and economic growth. The results showed a positive relationship between financial depth and economic growth.

Kiran *et al.* (2009) used panel data analysis and Fully Modified OLS (FMOLS) to investigate the relationship between financial development and economic growth for ten (10) emerging countries during the period 1968 to 2007. The authors employed ratio of liquid liabilities to GDP, bank credit to GDP, and private sector credit to GDP as measure of financial development. The authors found that financial development has a positive and statistically significant effect on economic growth.

Karbo and Adamu (2011), while examining the relationship between financial development and economic growth in Sierra Leone over the period 1970-2008 using the method of principle of components to construct an index for financial development and autoregressive distributed Lag (ARDL) model, the results revealed that financial development exerts a positive and statistically significant effect on economic growth and investment is an important channel through which financial development feeds on economic growth.

By employing autoregressive distributed lag approach, Ezzo (2009) investigated the causal relationship between financial development and economic growth in the Economic Community of West African States (ECOWAS) countries over the period 1960 to 2005. Using the ratio of M2 to GDP as an indicator of financial depth, the study found a positive long-run relationship between financial development and economic growth in four countries-Cote d'Ivoire, Guinea, Niger and Togo and negative long-run relationship in Sierra Leone and Cape Verde. The results of the causality test showed that financial development causes economic growth only in Cote d'Ivoire and Guinea. Based on these results, the author concluded that the relationship between financial development and economic growth cannot be generalized across countries because these results are country specific.

Pinshi (2020) conducted a study on the causal nature between financial development and economic growth in Democratic Republic of Congo using Granger Causality test during the period 2004-2019. The results indicated the existence of a one-way causality from economic growth to financial development. This result confirm the demand following hypothesis.

Ismail and al., (2019), carried out the study on the link between financial development and economic growth in Malaysia over the period 1990 - 2013. The authors used Johansen cointegration test to determine the existence of a relationship of long run relationship between the variables used and the Granger causality test to determine the direction of the relationship for the variables. The results revealed that long-run relationship between financial development and economic growth which supported the existence of a causality that goes from economic growth to financial development. In a similar study, Hasan (2018) investigated the relationship between financial development

and economic growth in Indonesia. The results of the study showed that economic growth has a very significant effect on financial development. Hence the hypothesis of a Demand following was confirmed. In another study by Bist (2018) also studies this relationship for the case of African and other low-income countries. The results indicated the existence of Demand following hypothesis.

In other empirical studies which have confirmed leading hypothesis include those of

Beck and al. (2000), Odhiambo (2008), Nazlıoğlu and al. (2009), Ductor and Grechyna (2015) have argued that increased growth generally leads to development of the financial sector. In a study by Kar and Pentecost (2000) using Granger causality and co-integration test to determine the relationship between financial development and economic growth. The results showed that economic growth promotes financial development in Turkey. In addition, Al-Tammam (2005) found that there is a co-integration between financial development and economic growth in Oman, Saudi Arabia and Kuwait, and that the causality ranged from economic growth to financial development in all countries in the short and long run.

According to a study by Allen and Ndikumana (2000) in which they examined the relationship between financial development using several measures of financial development to investigate the role of financial intermediaries in promoting economic growth in Southern Africa, the authors found that there exists a positive relationship between financial development and economic growth thus supporting demand leading hypothesis.

## DATA AND METHODOLOGY

### Data

This study utilized annual time series data for the period 1970-2020. Real per capita GDP growth was used to measure the economic growth. While two variables namely the ratio of credit to private sector to GDP and bank deposits liabilities were used as a proxy for financial development. All the variables were obtained from World Development Indicators (WDI), International Financial Statistics Year Book published yearly by the IMF and World Economic Outlook (WEO) as well as Penn World Tables. The data obtained was be deflated by GDP deflator to convert them into real values in order to remove inflationary effects.

### Model Specification

In order to determine the causality between financial development and economic growth, this study employed Granger causality test. This was to test whether lagged values of one variable help to predict changes in another, or, whether one variable in the system helps to explain the time path of the other variables. Hence, a variable  $fd$  (financial development in this context) is said to granger cause another variable economic growth,  $y$  ( $fd \rightarrow y$ ) if past values  $fd$  can predict present values of  $y$ . If causality is in one direction from  $fd$  to  $y$  we have a unidirection causality while if  $fd$  granger causes  $y$  and  $y$  granger causes  $fd$ , we have bi-directional or feedback causality. In this case, we represent it as ( $y \leftrightarrow fd$ ). The test for Granger causality is performed by estimating equations of the following form.

$$\Delta \ln y_t = \beta_0 + \sum_{i=1}^p \beta_{1,i} \Delta \ln y_{t-i} + \sum_{i=0}^p \beta_{2,i} \Delta \ln fd_{t-i} + \mu ECM_{t=1} + \varepsilon_t$$

$$\Delta \ln fd_t = \delta_0 + \sum_{i=1}^p \delta_{1,i} \Delta \ln fd_{t-i} + \sum_{i=0}^p \delta_{2,i} \Delta \ln y_{t-i} + \eta ECM_{t=1} + \nu_t$$

Where  $\varepsilon_t$  and  $\nu_t$  are white noise disturbance terms (normally and independently distributed),  $p$  are the number of lags necessary to induce a white noise in the residuals, and the  $ECM_{t-1}$  is the error correction term from the long-run relationship.  $fd_t$  is said to granger cause  $y_t$  if one or more  $\beta_{2,i}$  ( $i = 1, \dots, p$ ) and  $\mu$  are statistically significant different from zero. Similarly,  $y_t$  is said to granger cause  $fd_t$  if one or more  $\delta_{2,i}$  ( $i = 1, \dots, p$ ) and  $\eta$  are statistically significant different from zero. A feedback or bi-directional causality is said to exist if at least  $\beta_{2,i}$  and  $\delta_{2,i}$  ( $i = 1, \dots, p$ ) or  $\mu$  and  $\eta$  are significantly different from zero.

## Analysis Techniques

### Descriptive Statistics

In order to gain an understanding of the behaviour of the variables in the model, this study employed descriptive analysis. This involves calculating the mean, standard deviation, standard errors, maximum and minimum values of the variables over time and making economic intuition about their behaviour. In addition correlation matrix was used to check which variables are highly correlated so as to avoid the problem of multicollinearity which is a common problem in time series data.

## ANALYSIS AND DISCUSSIONS OF RESULTS

This chapter presents the results and discussions. First, it presents descriptive analysis, secondly, it presents unit root test using Augmented Dickey-Fuller (ADF) test so as to identify whether the variables are stationary in order to avoid the problem of spurious results and inconsistent estimates which arise due to non-stationary series.

### Descriptive Analysis

**Table 1.** Descriptive Statistics

Variable	Obs	Mean	Std-Deviation	Min	Max
$\ln y$	43	9.215	1.322	6.925	11.286
$\ln cps$	43	0.417	0.547	-0.656	3.106
$\ln bdl$	43	-5.830	1.565	-8.527	-3.386
$\ln pi$	43	-5.781	1.118	-7.7900	-4.299
$\ln gc$	43	-2.1497	1.105	-5.1096	-1.431
$\ln op$	43	4.122	0.157	3.856	4.434
$\ln tot$	43	1.668	0.661	0.733	5.219

**Notes:**  $\ln y$  = Real GDP per capita,  $\ln cps$  = Credit to private sector as a ration of GDP,  $\ln bdl$  = Bank deposit liabilities  $\ln pi$  = Private Investment as a ratio of GDP,  $\ln gc$  = real government consumption as a ratio of GDP,  $\ln op$  = Openness of the Economy,  $\ln tot$  = Terms of Trade. Note all the variables are expressed in natural log.

The results in Table 2. show that the real GDP per capita and bank deposit liabilities have relatively larger variation compared to the other variables. For example, the real per capita income ranges between 6.925 and 11.286 while bank deposit liabilities range between -8.527 and -3.382. This suggests that bank deposit liabilities have higher volatility compared to other variables in the model. This may indicate that development outside the banking sector may be volatile since it is determined by many other exogenous factors such as the prevailing investment climate and the overall macroeconomic environment. Real GDP per capita is the second variable with high volatility as shown by relatively large standard deviation as well as the range. This is because it is influenced by many other macroeconomic variables. The openness of the economy, on the other hand, has the smallest variation among the variables. This may imply that development outside the economy have not had any significant impact on the domestic economy. The other variables seem to have virtually the same variation. In particular credit to the private sector, private investment and government consumption, have almost the same variation.

### Correlation Matrix

Table 2 presents simple correlation coefficients between real GDP per capita and the explanatory variables. The results show a fairly high correlation coefficient (0.6196) between real GDP per capita and bank deposit liabilities and are statistically significant at 1 percent. These results suggest that the higher the bank deposit liabilities the higher the economic growth is. On the other hand, credit to private sector has a relatively low correlation coefficient (0.4748) which is statistically significant at 1 percent. This is an indication of inadequate credit to the potential private investors in

Kenya. This is further confirmed correlation coefficient (0.4498) between private investment and the real GDP per capita. The correlation coefficient between real GDP per capita and government consumption, openness of the economy as well as the terms of trade is negative. The negative correlation between real GDP per capita and government consumption means that when the government increases its expenditure on consumption, then less financial resources will be available for development purposes and hence low economic growth. The negative relationship between real GDP per capita income and terms of trade is due to the fact that the terms of trade reflect the macroeconomic stability in the country so that if there is macroeconomic instability, this will cause an increase in the terms of trade which influences economic growth of a country negatively. While openness of the economy implies that increased competition between domestic private investors and foreign investors may lead to crowding out of the domestic private investment yet it is important in promoting economic growth of a country.

**Table 2.** Correlation Coefficients between Real GDP Per capita and Macroeconomic Variables between 1970-2020

$\ln y$	$\ln cps$	$\ln bdl$	$\ln pi$	$\ln gc$	$\ln op$	$\ln tot$
$\ln y$	1.0000					
$\ln cps$	0.4748***	1.0000				
$\ln bdl$	0.6196***	0.5082***	1.0000			
$\ln pi$	0.4498**	0.5333***	0.2622	1.0000		
$\ln gc$	-0.5807***	-0.3459**	-0.5805***	-0.3893**	1.0000	
$\ln op$	-0.2023	-0.0478	-0.2523	0.0896	-0.2128	1.0000
$\ln tot$	-0.1154	-0.4862***	0.0911	0.3482**	0.0211	-0.0853

**Note:** \*\*\* Significant at 1 percent and \*\* significant at 5 percent using two tail test.

### Unit Root Test

The bound test to co-integration does not require unit root be conducted. However, in order to ensure the validity of ARDL, it is important to carry out unit-root test. This is to ensure that the variables are not integrated of higher order than  $I(1)$ . This is because most of the time series variables are non-stationary. Non stationary series refers to a variable that has a mean and variance which is time dependent. This implies that there is no long-run mean to which the series reverts to and the variance goes to infinity as time approaches infinity and theoretical autocorrelations do not decay but, in finite sample correlogram dies out slowly (Enders, 1995). A stationary series, on the other hand, has a constant mean and variance which implies that a stationary series exhibits mean reversion in that it fluctuates around a constant long-run mean, has a finite variance which is time-invariant and has a theoretical correlogram that decay as lag length increases.

Non- Stationarity of time series has been regarded as a problem in econometrics analysis. This is because a non stationary series yields regression results that are robust in terms of diagnostic test statistics even when there is no economic sense in the regression analysis. Regression analysis makes economic sense only for data which is not subject to a trend. Since virtually all economic data series contain trends, it follows that these series have to be detrended before any sensible regression analysis can be performed and valid inferences drawn appropriately. A non stationary series can be transformed into stationary series by differencing. The number of differencing a non stationary series to make it stationary is equal to the order of integration or the number of unit root that exist in a non stationary series. While differencing of a non stationary series solves the problem of spurious results, it leads to a loss of important information about long-run properties of the variables. Thus to recover the loss of information due differencing, one has to estimate an error correction model which combines both the short-run and long-run properties of the regression model.

To test for unit-root in the variables, there are a number of approaches. However, the most recommended methods are the Augmented Dickey-Fuller (ADF) test and the Phillip-Perron (PP) test. In this study, Augmented Dickey-Fuller (ADF) test was used because it corrects for the problem of autocorrelation.

Table 3 presents unit root test results which reveal that all the variables are non-stationary at their levels. However, after differencing once, all the variables became stationary implying that the variables are integrated of order one.

**Table 3.** Results of the Unit Root Tests Using Augmented Dickey-Fuller (ADF)

Variable	Level	First Difference	Order of Integration
$\ln y$	-0.654	-3.685 ***	I(1)
$\ln cps$	-1.503	-5.637***	I(1)
$\ln pi$	-1.435	-4.321***	I(1)
$\ln gc$	-0.107	-6.013***	I(1)
$\ln tot$	-1.241	-4.130***	I(1)
$\ln bdl$	-1.401	9.756***	I(1)

**Notes:** The null hypothesis is that the series is non stationary or the series has a unit root. \*\*\* Significant at percent

### Co-integration Analysis

Since the variables are integrated of the same order, then the next step is to check if the variables have long-run relationship. In this study, bounds test for co integration was used and the results for co integration analysis between real GDP per capita and the regressors are presented in Table 4. The critical values were obtained from Narayan (2004) which are considered to be suitable for ARDL specification using small sample size as used in this study compared to those developed by Pesaran *et al.* (2001). Due to relatively small sample size and the annual data, a lag length of two (2) was used in the bounds test. Pesaran and Shin (1999) and Narayan and Siyabi (2005) suggest that a maximum of two lags is sufficient.

**Table 4.** Bounds Test Results for Co integration Relationship

Test Statistics	Value	Lag	Significance Level	Bounds Critical values	
				I(0)	I(1)
F-Statistics	5.43	2	1%	5.412	4.753
			5%	4.241	5.162
			10%	3.218	3.635

**Source:** Critical values were obtained from Narayan (2004)

From the results above (Table 4), the F-statistic of the model is 5.43 which is larger than the upper critical bound (5.642) at 1 percent level of significance, which implies that there exists a long-run relationship among the real GDP per capita and regressors in the model.

### Granger Causality Test between Financial Development and Economic Growth

In the empirical literature, the direction of causality between economic growth and financial development is highly debatable. Some studies have found a bi-directional causality while others find a uni-direction causality running from economic growth to financial development or from financial development to economic growth while others find no causality. In this study granger causality test is conducted to check the direction of causality between financial development and economic growth and the results are presented in Table 5 below.

**Table 5.** Granger Causality Test between Financial Development and Economic Growth

Direction	F-Statistic	P-Value	Conclusion
$\ln cps \rightarrow \ln y$	3.48	(0.0410)**	Uni-directional Causality running from financial development to economic growth
$\ln y \rightarrow \ln cps$	1.59	0.2178	
$\ln bdl \rightarrow \ln y$	2.96	(0.0348)**	Uni-directional Causality running from financial development to economic growth
$\ln y \rightarrow \ln bdl$	1.74	0.1231	

**Note:** \*\* Significant at 5 percent.

$\ln cps$  = Credit to Private Sector.

$\ln y$  = Real GDP per Capita (proxy for Economic Growth).

$\ln bdl$  = Bank Deposit Liabilities.

The results show that there exists a uni-directional causality running from financial development to economic growth in Kenya. This finding is consistent with those of Spears (1992), Rousseau and Wathtel (1998), Eidta and Jordan (2007) of Botswana and Adusei (2012) who found that financial development causes economic growth regardless of the measure of financial development used. This result further confirms supply leading hypothesis which says that financial development supports economic growth. However, the findings of this study contrast studies by Odhiambo (2009), Fowewe (2010), Rachdi and Mbarek (2011) who found that economic growth Granger causes financial development.

## CONCLUSION

This paper was set out to determine the direction of causality between financial development and economic growth in Kenya using Granger causality test. The results on causality test showed that there is a uni-direction causality running from financial development to economic growth. This means that financial development granger causes economic growth in Kenya. This implies that financial development boosts economic growth through the channel of increased investment in the country. This finding confirms the supply leading hypothesis.

From policy perspective this implies that there is need for the government of Kenya to further carry out reforms in the financial sector both in the short-run and long-run so as to continue to promote economic growth. This means that the policy makers need to make policies that can lead to establishment of financial institutions in the rural areas which have limited access to financial services and create enabling legal environment for efficient allocation of credit to the private sector. Further in order to boost the availability of credit in the financial sector the government should reduce its borrowing so as to make available credit to private sector who in turn would borrow and invest leading to economic growth. This reduction can be done through either rationalizing the budget deficit with a view to obviate borrowing or meeting borrowing requirements from external sources.

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