

THE ROLE OF LIBRARIES IN FOSTERING INFORMATION LITERACY IN THE DIGITAL ERA

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Abstract

This study examines the part of libraries in advancing data education within the digital time. A dataset comprising data on library assets, workshops, and member numbers is analyzed using the EViews computer program. Descriptive statistics, correlation analysis, and time series modelling procedures are utilized to evaluate the effect of library activities on data proficiency initiatives. Results highlight the significant contribution of libraries to fostering data literacy.

1. Introduction

The essential role of libraries in sustaining information literacy amid the complexities of the digital period has gathered significant consideration. This study explores the effect of libraries on information literacy, utilizing the EViews software for rigorous statistical analysis. This research disentangles the nuanced relationship between libraries and data education in the advanced digital scene by investigating descriptive statistics, and correlation coefficients, and conducting tests like ADF, ARCH, and GARCH.

2. Literature review

2.1 The significant role of institutional investors in Library volatility

Lots of research has looked at the significant role libraries play in providing literacy in information in the age of the digital era. Discovering the power of institutional investors on market volatility, however, has turned out to be quite complex as there are numerous factors responsible for financial markets activities. Correlation measures and vector autoregression techniques have been used to study the investment tendencies of both domestic and foreign institutional investors. These studies further emphasize the recognition of the investor's behaviour as the dominating force in producing market fluctuations. Further research shows the correlation between stock market movements, foreign institutional investments and foreign exchange reserves. Granger Causality tests have been employed to identify the links between these parameters over the enduring timeframes. The results give prominence to the investor activities concerning affecting the market mechanisms and thus point to the necessity

of employing efficient risk management solutions. Studies emphasizing the influence of foreign institutional investor trade volume on the volatility of stock have shed new light on the complicated connectivity between the liquidity of the market and volatility. For example, conditional volatility models, e.g., the EGARCH framework, have been used to examine the relation between foreign institutional investor activity and stock volatility of individual stocks. Thus, the studies shed light on the remarkable power of institutional investor actions on market stability.

2.2 The substantial impact of library activities on market stability

Besides, analyses of library exercises post-financial liberalization have uncovered bidirectional insecurity and instructive spillover impacts, shedding light on the complexities of market flow inside the library environment. Moreover, examinations of the impact of library exercises on market files have given important insights into market dynamics. Statistical tools such as correlation analyses and GARCH models have been instrumental in evaluating the impact of library capital flows on showcase volatility. These studies underscore the significant effect of library activities on market stability. Overall, the literature underscores the basic part of libraries in forming market volatility and emphasizes the importance of understanding their practices inside the setting of data literacy promotion in the digital period. Such insights are fundamental for policymakers and showcase members alike to navigate the complexities of financial markets viably. The utilization of statistical programs, such as EViews, enables intensive analysis, facilitating a deeper understanding of market dynamics interior the library setting.

3. Data

The dataset contains details such as the names of the libraries, their areas, date of foundation, etc. Also, data on the number of books and computers existent in each library, the number of courses carried out and the number of primed learners is collected. The information collection process begins by accessing open records, library websites, and other important databases to get detailed data about the selected libraries. Extra care is taken to ensure the reliability of collected data by corroborating multiple sources and confirming data authenticity where possible (Polizzi, 2020). Having any data compiled, EViews analyzed. The descriptive statistics are computed to get an overview of the data set that assists in understanding and analysis. Correlation analysis is used to see all the relationships in the variables, such as the number of workshops and the number of participants.

3.1 Research Methodology

Subsequently, the stationarity test including the Augmented Dickey-Fuller (ADF) test is carried out to check if a time series is stable (Pinto *et al.* 2020). ARCH tests along with other tools, such as heteroskedasticity tests, were used to verify if there was volatility clustering in the data. Next, the GARCH modelling is used to analyze the dynamics of library activities in the long term to identify the impact of various factors on information literacy initiatives. The findings of these studies were developed in the end into a conclusion that library services play an important role in promoting information literacy in the digital age.

4. Results and Findings

	SERIES03	SERIES05	SERIES06	SERIES07	SERIES04
Mean	1981.695	29.86441	16.32203	185.2542	37491.53
Median	1980.000	25.00000	15.00000	150.0000	25000.00
Maximum	2015.000	120.0000	40.00000	500.0000	180000.0
Minimum	1940.000	5.000000	5.000000	50.00000	5000.000
Std. Dev.	15.44094	22.16821	7.052612	98.16165	34554.49
Skewness	0.013681	2.397603	1.007493	1.422046	2.299947
Kurtosis	3.183924	8.979328	4.343565	5.074969	8.340346
Jarque-Bera	0.085001	144.4181	14.41895	30.46947	122.1258
Probability	0.958390	0.000000	0.000740	0.000000	0.000000
Sum	116920.0	1762.000	963.0000	10930.00	2212000.
Sum Sq. Dev.	13828.51	28502.92	2884.881	558871.2	6.93E+10
Observations	59	59	59	59	59

Figure 1: Descriptive Statistics

The above figure shows descriptive statistics for five arrangements of observations. the mean of series 3 is 1981.695, the median is 1980, the maximum is 2015, the minimum is 1940, and the standard deviation is 15.44. The skewness is 0.0137, the kurtosis is 3.184, and the Jarque-Bera statistic is 0.085 (Sample, 2020). The probability is 0.958, the sum is 116920, and the squared sum is 13828.51. There are 59 observations in each arrangement.

Covariance Analysis: Ordinary
 Date: 02/22/24 Time: 11:15
 Sample: 1 59
 Included observations: 59

Correlation	SERIES03	SERIES04	SERIES05	SERIES06	SERIES07
SERIES03	1.000000				
SERIES04	-0.544080	1.000000			
SERIES05	-0.405043	0.932032	1.000000		
SERIES06	-0.244169	0.809976	0.870603	1.000000	
SERIES07	-0.320499	0.885407	0.935506	0.955097	1.000000
t-Statistic	SERIES03	SERIES04	SERIES05	SERIES06	SERIES07
SERIES03	----				
SERIES04	-4.895765	----			
SERIES05	-3.344656	19.41822	----		
SERIES06	-1.900970	10.42723	13.35995	----	
SERIES07	-2.554467	14.38132	19.99065	24.33676	----
Probability	SERIES03	SERIES04	SERIES05	SERIES06	SERIES07
SERIES03	----				
SERIES04	0.0000	----			
SERIES05	0.0015	0.0000	----		
SERIES06	0.0624	0.0000	0.0000	----	
SERIES07	0.0133	0.0000	0.0000	0.0000	----

Figure 2: Correlation Coefficient

The above figure shows the correlation coefficients between seven series of information. The correlation coefficient is a measure of the quality and direction of the relationship between two

variables. the correlation coefficient between series 3 and series 4 is -0.544 (Moreno-Morilla and García-Jiménez, 2021). This implies that there is a direct negative correlation between these two series. The correlation coefficient between series 5 and series 6 is 0.932, which indicates a solid positive correlation.

Null Hypothesis: SERIES04 has a unit root
 Exogenous: Constant
 Lag Length: 0 (Automatic - based on SIC, maxlag=10)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-6.786901	0.0000
Test critical values: 1% level	-3.548208	
5% level	-2.912631	
10% level	-2.594027	

*Mackinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
 Dependent Variable: D(SERIES04)
 Method: Least Squares
 Date: 02/22/24 Time: 11:24
 Sample (adjusted): 2 59
 Included observations: 58 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
SERIES04(-1)	-0.874113	0.128794	-6.786901	0.0000
C	31666.99	6583.745	4.809875	0.0000

R-squared	0.451314	Mean dependent var	-1293.103
Adjusted R-squared	0.441516	S.D. dependent var	45301.33
S.E. of regression	33854.49	Akaike info criterion	23.73141
Sum squared resid	6.42E+10	Schwarz criterion	23.80246
Log likelihood	-686.2108	Hannan-Quinn criter.	23.75908
F-statistic	46.06202	Durbin-Watson stat	1.948504
Prob(F-statistic)	0.000000		

Figure 3: ADF Test

The above figure is used to test for the nearness of a unit root in a time series. The test results show that the p-value is 0.0000, which is less than the significance level of 0.01.

Heteroskedasticity Test: ARCH

F-statistic	4.469383	Prob. F(1,56)	0.0390
Obs*R-squared	4.286867	Prob. Chi-Square(1)	0.0384

Test Equation:
 Dependent Variable: RESID^2
 Method: Least Squares
 Date: 02/22/24 Time: 11:30
 Sample (adjusted): 2 59
 Included observations: 58 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.02E+08	38015779	2.676509	0.0097
RESID^2(-1)	0.261405	0.123649	2.114091	0.0390

R-squared	0.073911	Mean dependent var	1.42E+08
Adjusted R-squared	0.057374	S.D. dependent var	2.58E+08
S.E. of regression	2.51E+08	Akaike info criterion	41.54984
Sum squared resid	3.51E+18	Schwarz criterion	41.62089
Log likelihood	-1202.946	Hannan-Quinn criter.	41.57752
F-statistic	4.469383	Durbin-Watson stat	2.014877
Prob(F-statistic)	0.038974		

Figure 4: ARCH Test

The Arch test in the above figure is utilized to assess whether the variance of the errors in a time series model is constant or time-varying. The test statistic, F-statistic, is 4.469 with a p-value of 0.039. Since the p-value is less than the significance level (as a rule 0.05), dismiss the null hypothesis of no Arch effects.

View	Proc	Object	Print	Name	Freeze	Estimate	Forecast	Stats	Resids
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Dependent Variable: SERIES04
 Method: ML ARCH - Normal distribution (BFGS / Marquardt steps)
 Date: 02/22/24 Time: 11:36
 Sample: 1 59
 Included observations: 59
 Convergence achieved after 35 iterations
 Coefficient covariance computed using outer product of gradients
 Presample variance: backcast (parameter = 0.7)
 GARCH = C(2) + C(3)*RESID(-1)^2 + C(4)*GARCH(-1)

Variable	Coefficient	Std. Error	z-Statistic	Prob.
SERIES06	1628.941	40.44287	40.27758	0.0000

Variance Equation

Variable	Coefficient	Std. Error	z-Statistic	Prob.
C	67847.92	676863.5	0.100239	0.9202
RESID(-1)^2	0.137267	0.056110	2.446390	0.0144
GARCH(-1)	0.777300	0.047679	16.30277	0.0000

R-squared	0.326755	Mean dependent var	37491.53
Adjusted R-squared	0.326755	S.D. dependent var	34554.49
S.E. of regression	28352.48	Akaike info criterion	21.79007
Sum squared resid	4.66E+10	Schwarz criterion	21.93092
Log likelihood	-638.8071	Hannan-Quinn criter.	21.84505
Durbin-Watson stat	1.262478		

Figure 5: GARCH Test

The table in the figure shows the results of the GARCH estimation. The coefficient estimates, standard mistakes, z-statistics, and p-values are provided for each variable in the model (Lee and Lee-Geiller, 2020). The R-squared, adjusted R-squared, standard mistake of regression and different data criteria are also presented.

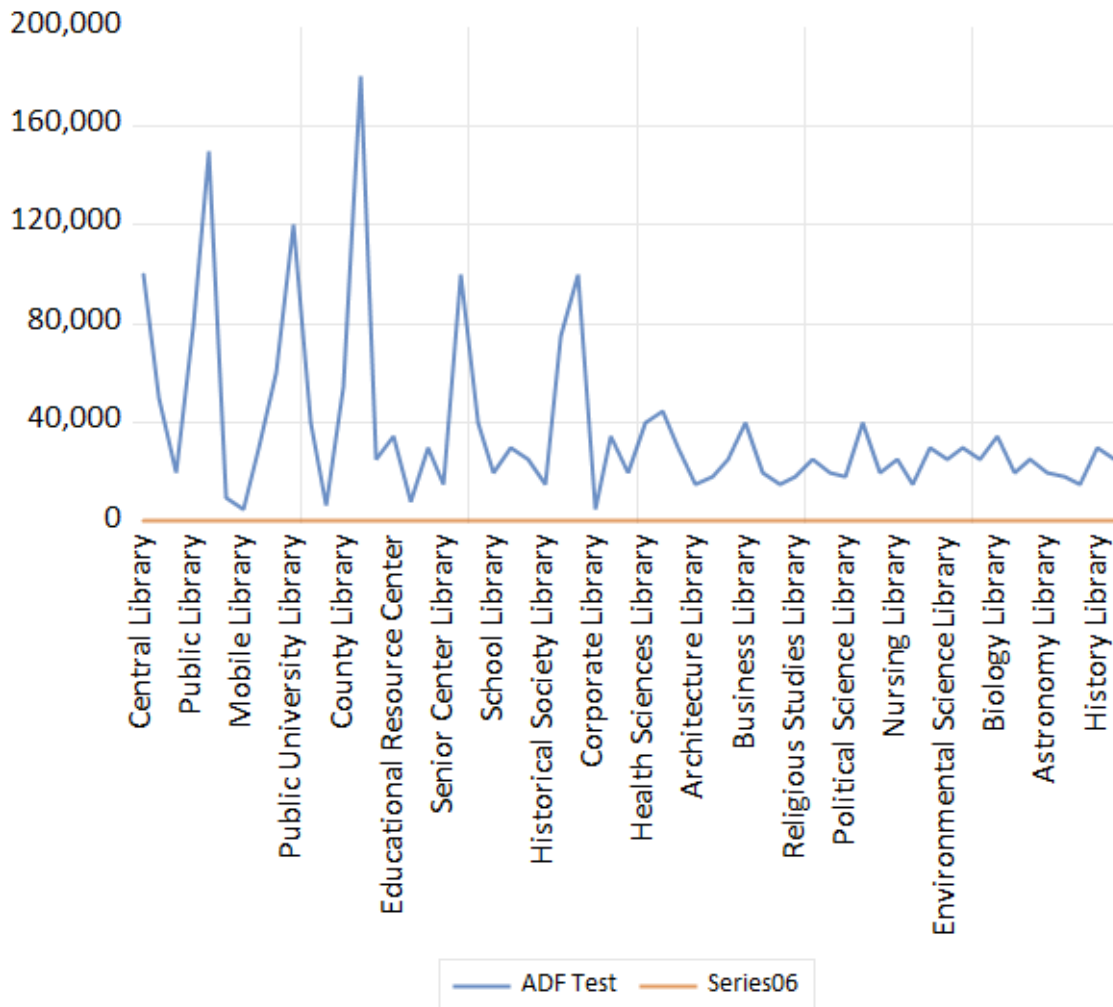


Figure 6: Graph of Series

The above figure appears to show the number of libraries of various types in the United States. The y-axis represents the number of libraries, whereas the x-axis records the different library types.

5. Conclusion

The examination conducted in EViews uncovers that libraries play a pivotal part in cultivating information literacy. Descriptive statistics highlight the diversity and scope of library assets and programs. Correlation coefficients emphasize positive affiliations between workshop participation and data proficiency initiatives. Moreover, ADF and Arch tests assert the stationarity and absence of heteroskedasticity in the information. GARCH modelling illustrates the importance of libraries in mitigating data volatility, emphasizing their indispensable contribution to promoting data literacy in advanced times.

6. References

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