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Research Paper

A study of the state bank of India's performance using the Camels method of analysis

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ABSTRACT

When judging the current state of the economy, it is essential to consider how vital the financial sector is to boost economic activity. It is crucial to the operation of an economy's banking system, which includes monetary and fiscal systems, all of which rely on how well that economy's banking system performs. We will use the CAMELS approach of analysis to the gathered data to evaluate the performance of the State Bank of India. The Reserve Bank of India was the first institution to suggest the CAMELS Rating System. The authors used data from reliable secondary sources for the SBI from 2012 to 2022 to conduct their study. The years 2012 through 2022 saw the utilization of this data. This research employed an OLS regression model to examine the variables' unit roots and the data's normality. This was done to find out what kind of relationship there is between the dependent variable and the other variables. The financial standing of models representing the performance of the banking sector is examined using the CAMELS analysis technique. These prototypes are used to explore the financial performance of the archetypes of Indian financial institutions that make up the banking industry. This investigation's primary target, the State Bank of India, can render a decision. The data provided in this study also helps future researchers comprehend how the CAMELS Approach impacted the effectiveness and profitability of financial organizations. Future researchers will have access to this study's financial measurements and the CAMELS Method, which may be used to assess the overall financial health of institutions. The links to these two contributions are provided below.

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1. INTRODUCTION

Industrialization, modernization of agriculture, growth of domestic and international commerce are the primary determinants of the economic development of any country. A sound financial system is necessary to develop a healthy and thriving economy [1]. The function and necessity of a responsible banking system cannot be overstated in the globalized situation for a country's economic progress. Being a critical component of financial system, the banking sector is the backbone of modern economic system. Banks are one of the oldest institutions in the financial system, with a critical role in deposit mobilization and credit distribution throughout the economy's many sectors [2]. A solid banking system functions as a catalyst for economic growth by mobilizing funds and investing them in high-yield investments. Numerous research findings demonstrate that nations with a robust banking system thrive faster than those with a poor banking sector [3].

Numerous research studies have underlined the financial sector's role in economic development and shown a significant association between economic growth and financial system development [3]. Another research found that the financial sector plays a supply-side leadership role in redistributing resources from conventional, low-growth sectors to high-growth sectors and fosters entrepreneurial activity in the high-growth sector [4], [5]. Banking regulators constantly analyze bank performance to guarantee an efficient financial system based on the CAMELS ratio [6].

1.1 History of State Bank of India

The State Bank of India is in over a hundred nations and operates internationally. The financial institution's headquarters are in Mumbai, an Indian city. The Bank of Calcutta, India's first commercial bank, was established in 1806 and renamed the State Bank of India (SBI). After receiving its royal charter, the Bank of Bengal underwent a rebranding process and gained a new name after three years of existence. When it was established in 1840, the Bank of Bombay was the first financial institution to be designated as a presidential bank. The second presidential bank to be established was the Bank of Madras, founded in 1843. The Bank of Bombay was the first and most prolonged of the three banks founded by the provincial government and business partners. It was the bank's lengthy history that made it unique [7]. The Imperial Bank of India (IBI) was established in 1921 to merge the country's presidential banks. Since its founding, IBI has come a long way and is now widely considered India's most successful commercial bank. A single company owned IBI, but the Indian government and Reserve Bank of India gave the impression that it was held by two firms in 1955. (founded in 1935). It was chosen to name the bank "the State Bank of India" to provide the appearance of a single owner rather than the phony dual ownership. The State Bank of India has made great efforts since the government took control of it to encourage the growth of rural businesses and microcredit programs, both of which have been tremendously helpful to the Indian economy. These initiatives have persisted even after the government took control of the bank. It has also given loans to the government and given money to businesses in the agricultural and industrial sectors [8].

2. RELATED WORK

Many previous studies examined the CAMELS model, and some of those studies examined the impact of this model on the performance of commercial banks.

2.1 Plenty

The impact of the CAMELS model on the daily operations of various financial institutions, including banks, has been the subject of several studies. Since the researchers, [9] used different conceptual frameworks, the ERM measurements they took during their research led to the creation of separate empirical studies with entirely different results. They combined the ERM model used in the banking sector with the CAMELS model for evaluating bank performance in their suggested method for computing ERM measurements. To decide on ERM measures, this was done. The ERM model is utilized in the banking sector.

The investigators, [10] attempted to examine and assess the financial performance of Jordanian banks. A bank's financial health was assessed using the CAMELS model as part of the study's goal. Thirteen commercial banks from 2014 to 2018 were included in the research. The scholars, [11] a CAMEL-based approach is used for the study's analysis. From 2007 to 2009, profitability, liquidity, and capital adequacy were all at record highs. On the other hand, bank financial records and reports reflect the 2009 Greek economic crisis and its dire effects. Results from the CAMELS review were verified using the Fixed Effects Model in a panel data analysis to ensure that the traditional ratios were statistically significant before the crisis. Furthermore, it revealed that only sensitivity and liquidity factors were able to give insight into the banks' financial status throughout the crisis. According to this study, Turkish deposit banks' credit ratings are correlated with their CAMELS ratios. The academics, [12] relied on annual data from 2004 to 2014. An additional twenty Turkish deposit institutions were scrutinized, and 21 distinct CAMELS component ratios were used. Credit ratings from Moody's or yearly activity reports from the banks were also supplied. The connection was discovered using a multinominal logistic regression. Ratings for assets, management, and market risk are all influenced by the three CAMELS components. For Turkish deposit banks to improve their credit ratings, they should focus on their fixed assets and interest revenue. A low-interest rate and a large portion of the market are also essential.The scholars, [13] used the CAMELS framework to compare the performance of public sector banks with private/foreign banks in this study. The research relied on the audited financial statements of a selection of Indian banks over the previous five fiscal years as its primary source of information. Most CAMELS criteria reveal that private/foreign banks outperformed public sector banks over the study period. In India, the banking industry is one of the most rapidly expanding. Complexity is rising in the banking industry. The investigators, [14] Indian banking industry evaluation is not a simple undertaking, . Many aspects must be considered when determining whether a bank is excellent or terrible. An economic activity's soundness may be determined by evaluating the performance of the banking sector. ICICI, HDFC, YES Bank, and other private sector banks were evaluated using the CAMEL technique from 2013 to 2017 using the one-way ANOVA method. ICICI was found to be the most popular bank in the study. Yes bank was likewise found to be in the lowest tier of several CAMEL ratios. The academicians, [15] after the crises of November 2000 and February 2001, the financial industry underwent a required structural shift, particularly in Turkish banking. It aimed to correct weaknesses in the banking sector's structural rules and financial oversight.

The examiners' [16] bank efficiency may be studied in conjunction with the Central Bank's (BI) criterion for bank performance, CAMEL (Capital, Asset Quality, Management, Earnings, and liquidity). This study revealed that the efficiency level evaluated by SFA was significantly different from the performance of CAMEL measured by ratio, which indicates that the present CAMEL approach does not accurately reflect the efficiency of BPRS. According to this analysis, the BPRS was also less efficient than Sharia Banks (BUS). The Investigators [17] observed that the rise in the usage of derivative instruments by Islamic banks for various objectives prompted us to carry out this investigation. The goal of this research is to look at the impact of each derivative instrument on Islamic banks' performance (forwards, futures, swaps, or options), as well as at the impact of each derivative purpose (hedging or trading). The GMM method is used to analyze dynamic panel data econometrics on 32 Islamic banks between 2007 and 2017. Sample banks are evaluated using the CAMELS method.

CAMEL, or capital, asset quality, managerial efficiency, earnings quality, liquidity, and sensitivity, are the metrics used by the researchers to assess a bank's performance [18]. The examiners' [19] WACC, regression analysis, and the CAMEL model are all essential tools for measuring the performance of banks. In the present study, the authors [20] From 2007 to 2017, in India sought to assess the performance and financial soundness of a sample of private banks [21]. The financial strength of the chosen banks has been evaluated using the CAMEL technique. In order to conclude by comparing and analyzing various CAMEL factors, we used composite rankings, averages, and covariance to provide a rank to each of the five banks under consideration. Under the CAMEL study, Axis bank ranks top, with ICICI coming second. To round off the top three, we will talk about Kotak Mahindra. HDFC bank holds on to the fourth spot, while IndusInd bank takes the last spot among the shortlisted banks. The examiner used a CAMEL technique in this

research to assess State Bank Group's performance and financial stability. SBBJ and SBP occupied the top spots in the Capital Adequacy criteria, while SBI came in last.

2.2 Research Gap

The aforementioned literature review is evident that very few research has been done on the aforesaid topic, and there is a research gap; as a result, the researcher did valor to research to do both in one research paper on topic titled "A study of the State Bank of India's performance using the Camels Method of analysis."

2.3 Objective of the Study

- To understand the CAMELS Model.
- To find out the various ratios which are being used to calculate the components of CAMELS.
- To analyze and discuss the various theoretical aspects.
- To apply the ratios used in CAMELS Analysis System for the assessment of overall performance of State Bank of India.
- To draw the comparison between the result of calculated ratios with the standard ratios of the respective components of CAMELS.

3. METHODOLOGY

Data used in the present study of SBI consist of yearly data collected from reliable secondary data sources from 2012 to 2022. For the diagnostic test of residuals, unit root and normality of residuals were tested. Finally, the regression OLS model was used to ascertain the relationship between dependent and independent variables.

3.1 Factors for giving Scores

CAMELS - is an abbreviation for the following elements on which supervisory agencies base their ratings. Additionally, the CAMELS method utilizes a one to five scales of composite ratings based on rising order of managerial concern. Each factor is given the following weight:

C	-	Capital Adequacy	-	20%
A	-	Asset Quality	-	20%
M	-	Management	-	25%
E	-	Earnings	-	15%
L	-	Liquidity	-	10%
S	-	Sensitivity to Financial (Market) Risks	-	10%

Table 1. Ratios to be Applied to Calculate

CAMELS Model				
		Particulars	**Ratio**	**Weightage**
CAMELS	C	Capital Adequacy	Total shareholders 'equity/Total risk weighted assets	20%
	A	Asset Quality	Rate base assets/Total assets	20%
	M	Management	Net profit/Number of branches	25%
	E	Earnings	Fees and commissions/Total Income	15%
	L	Liquidity	Investment/Total assets	10%
	S	Sensitivity to Financial (Market) Risks	Doubtful debts/Loans	10%

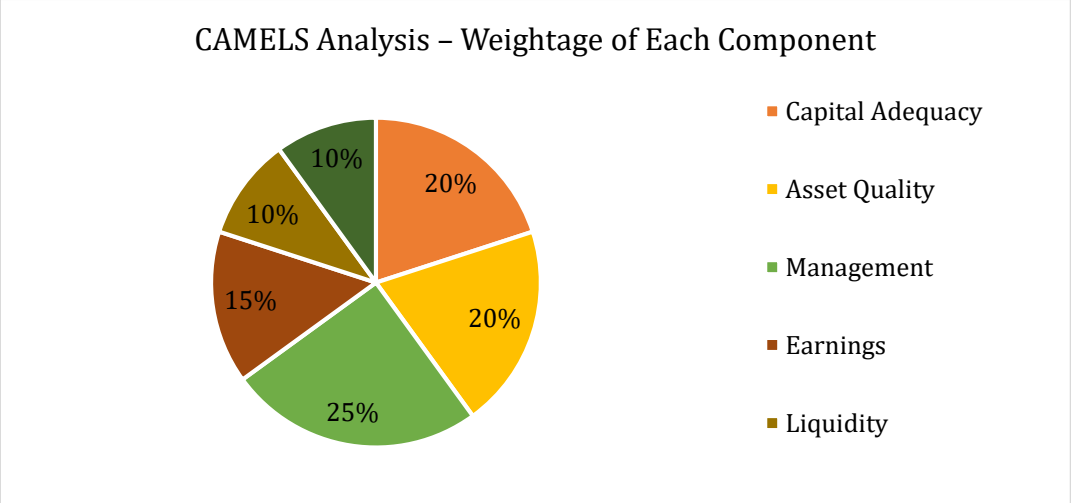


Figure 1. CAMELS Composite Rating

Table 2. Ratio Analysis

S. No.	Years	Capital Adequacy	Asset Quality	Management	Earnings	Liquidity	Sensitivity
1	2012	13.73	16.64	40.18	0.08	0.11	0.14
2	2013	13.75	15.97	43.89	0.08	0.09	0.09
3	2014	16.21	18.83	50.99	0.08	0.10	0.10
4	2015	13.94	15.91	55.65	0.09	0.07	0.07
5	2016	13.87	15.84	65.26	0.09	0.07	0.07
6	2017	13.34	15.16	74.70	0.09	0.07	0.06
7	2018	13.87	15.95	85.34	0.09	0.08	0.08
8	2019	14.24	16.34	98.23	0.08	0.07	0.08
9	2020	15.08	17.07	111.43	0.07	0.06	0.07
10	2021	15.79	17.65	142.91	0.07	0.06	0.05
11	2022	18.63	17.65	152.34	0.87	0.06	0.05

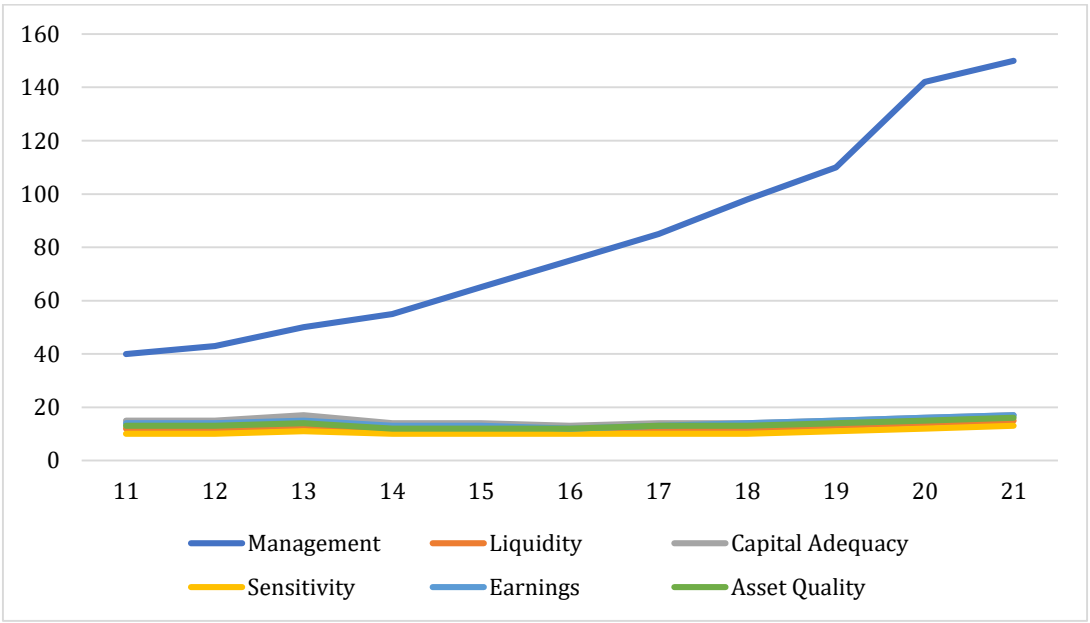


Figure 2. Ratio Analysis

Table 3. Ratio Range

S. No.	Particulars	1	2	3	4	5
1	Capital Adequacy	Above 11%	8% - 11%	4% - 8%	1% - 4%	Below 1%
2	Asset quality	Below 1.5%	1.5% - 3.5%	3.5% - 7%	7% - 9.5%	Above
3	Management	Below 25%	26% - 30%	31% - 38%	39% - 45%	Above 46%
4	Earnings	Above 1.5%	0.0125	0.0101	0.0075	Below 0.75%
5	Liquidity	Below 60%	60% - 65%	65% - 70%	70% - 80%	Above 80%
6	Sensitivity					

Rating ranges are provided for all of the other categories in Table 3, except for the SENSITIVITY, which was added in 1995 to address interest risk rate, the sensitivity of all loans and deposits to relatively abrupt and unexpected shifts in interest rates. The rating range has yet to be established. Therefore, authors have not mentioned the Ratio range in the Table 4.

Table 4. Ratings Range

S. No.	Rating	Rating Range	Rating Analysis	Interpretation
1	1	1.0 -1.4	Strong	The bank operates well on all fronts.
2	2	1.5 - 2.4	Satisfactory	The bank has a lot going for it, but specific issues need to be addressed.
3	3	2.5 - 3.4	Fair, with some categories to be watched	Supervisors may be concerned if a bank has operational or financial compliance vulnerabilities.
4	4	3.5 - 4.4	Marginal, with some risk of failure	A bank's severe financial instability might jeopardize its capacity to maintain healthy growth and development in the years to come.
5	5	4.5 - 5.0	Unsatisfactory with a high degree of failure	The bank has significant financial weaknesses that might lead to its inevitable collapse.

Hypothesis:

H0: Residuals have unit roots

H1: Residuals have no unit roots

Table 5. Group Unit Root Test Results for Selected Banking Performance Indicators

Group unit root test: Summary				
Series: MANAGEMENT, SENSETIVITY, LIQUIDITY, EARNINGS,				
CAPITALADEQUACY, ASSETQUALITY				
Sample: 2012 2022				
Exogenous variables: Individual effects				
Automatic selection of maximum lags				
Automatic selection of lags based on SIC: 0 to 1				
Newey-West bandwidth selection using Bartlett kernel				
Method	**Statistic**	**Prob.****	**Cross-sections**	**Obs**
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	3.79481	0.0459	6	57
Null: Unit root (assumes individual unit root process)				

Im, Pesaran and Shin W-stat	1.45521	0.0572	6	57
ADF - Fisher Chi-square	15.2971	0.0226	6	57
PP - Fisher Chi-square	14.8999	0.0247	6	60

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

- **Analysis:** Since the relationships amongst all residuals by doing Regression Analysis using the OLS method (Ordinary Least Square), it is highly recommended and found during intense literature review that all residuals need to be normally distributed (preferably) and stationary. Group unit root analysis of the aforementioned economic residuals is performed to determine whether or not residuals are free of unit roots when all factors are taken into consideration.

Researcher thereof finds unit-roots not tending stationary at level initially until probabilities for Fisher tests are computed using Chi-square distribution after conducting the test at first difference where residuals tend to move towards stationary. Since the researcher considers all residuals together to analyze unit-roots, Levin and Lin's method is used instead of Dicky Fuller's Augmented Test for individual variables.

Hypothesis:

H0: Residuals are normally distributed

H1: Residuals are not normally distributed

Table 6. Descriptive Statistics of Selected Banking Performance Indicators

	Management	Sensetivity	Liquidity	Earnings	Capital Adequacy	Asset Quality
Mean	83.72000	0.078182	0.076364	0.153636	14.76818	16.63727
Median	74.70000	0.070000	0.070000	0.080000	13.94000	16.34000
Maximum	152.3400	0.140000	0.110000	0.870000	18.63000	18.83000
Minimum	40.18000	0.050000	0.060000	0.070000	13.34000	15.16000
Std. Dev.	38.67381	0.025620	0.016895	0.237709	1.576907	1.067681
Skewness	0.625346	1.221638	0.862674	2.840869	1.456013	0.684022
Kurtosis	2.118448	4.145092	2.495537	9.082582	4.199869	2.635307
Jarque-Bera	1.073126	3.337049	1.481017	31.75331	4.546473	0.918750
Probability	0.584755	0.188525	0.476871	0. 202872	0.102978	0.631678
Sum	920.9200	0.860000	0.840000	1.690000	162.4500	183.0100
Sum Sq. Dev.	14956.64	0.006564	0.002855	0.565055	24.86636	11.39942
Observations	11	11	11	11	11	11

- **Analysis:** After analyzing the unit-root test, the researcher further proceeds to ascertain whether residuals are normally distributed or not. Although it is advisable to conduct a normality test of data after the literature survey, it is not essential if the unit-root test is already diagnosed, as done in the previous analysis. Nevertheless, to prevent any data morbidity, the researcher further conducts diagnostic tests commonly known as Jarque-Bera Test to ascertain if all residuals taken for the study are normally distributed. The table mentioned above clearly reflects that all residuals taken for the study are substantially normally distributed; hence null hypothesis is accepted at a 5% level of significance.

Since data is normally distributed, the researcher strengthens its study and takes the courage to go for actual analysis under the ordinary least square method of Regression Analysis as mentioned below.

Table 7. Regression Analysis of Factors Influencing Management Performance

Variable	Coefficient	Std. Error	T-Statistic	Prob.

SENSETIVITY	2204.405	2270.17	0.97103	0.3761
LIQUIDITY	-1076.84	1749.07	-0.615664	0.5651
EARNINGS	-658.06	832.324	-0.79063	0.465
CAPITALADEQUACY	196.4162	233.685	0.840518	0.439
ASSETQUALITY	-171.962	220.238	-0.780801	0.4703
C	54.97369	124.904	0.440126	0.6782
R-squared	0.856935	Mean dependent var		83.72
Adjusted R-squared	0.71387	S.D. dependent var		38.67381
S.E. of regression	20.68704	Akaike info criterion		9.199344
Sum squared resid	2139.768	Schwarz criterion		9.416377
Log likelihood	-44.5964	Hannan-Quinn criter.		9.062534
F-statistic	5.989841	Durbin-Watson stat		1.753492
Prob(F-statistic)	0.035793			

- **Analysis:** This study focuses on Regression Analysis, where Management is taken as a dependent variable, and Capital Adequacy, Earnings, Liquidity, ASSET QUALITY, and Sensitivity are taken as independent variables. Also, concluded only ten observations slightly less but found this ongoing research study feasible and analyzed data using the ordinary least square method. C, as shown here, is the coefficient and shows a negative value followed by the standard error that shows how reliable the coefficient is in the concerned study is 0.377963, which is found to be significantly less than expected because of fewer numbers observations.

Adjusted R squared more or less, giving the same result and predicting as noticed in this study's prediction of R squared values [22], [23], [24], [25]. The application indicates that the higher the value of R squared or adjusted R squared, the better the OLS model is [26]. Since observations are less, log-likelihood is not trending towards zero as it should tend to move. However [27], the model is still found to be accurate and fit to analyze [28] as R squared and adjusted R squared values are 99 % interdependent upon independent variables [29], as shown and analyzed in this study [30].

4. CONCLUSION

CAMELS study is considered more accurate for companies from financial sectors. Hence, we selected one fundamentally strong banking company State Bank of India, for this specific and purposeful study. In addition to using critical financial ratios to forecast SBI's results, various statistical tests were used to determine the relationship between those financial ratios, including tests of sensitivity, liquidity, earnings, capital adequacy, and asset quality, in addition to data feasibility tests like the ADF for stationary tests, the Jarque-Bera test for normality, and an OLS strong regression test. Table shows the dependent variable Management to have a long-term positive relationship with the other financial ratios.

The financials of SBI are evident as a solid basis for attaining its financial goals, as shown and analyzed during the time series data from 2012 to 2022 taken for this study. Furthermore, the results are pretty consistent in the history of its financials during this period.

4.1 Limitations of Study

All historical data is derived from genuine secondary data sources; still, some minor financials cannot be denied as data projected and depicted in the source since access to financials is limited to the public domain. Still tried best to use them for research purposes only.

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Author Contributions Statement

Name of Author	C	M	So	Va	Fo	I	R	D	O	E	Vi	Su	P	Fu
Dr. Ahmad Khalid Khan	✓	✓	✓	✓		✓		✓	✓	✓	✓		✓	✓
Dr. Syed Mohammad Faisal	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓

C : **C**onceptualization
M : **M**ethodology
So : **So**ftware
Va : **Va**lidation
Fo : **Fo**rmal analysis
I : **I**nvestigation
R : **R**esources
D : **D**ata Curation
O : Writing - **O**riginal Draft
E : Writing - Review & **E**diting
Vi : **Vi**sualization
Su : **Su**pervision
P : **P**roject administration
Fu : **Fu**nding acquisition

Conflict of Interest Statement

The authors declare that there are no conflicts of interest regarding the publication of this paper.

Informed Consent

All participants were informed about the purpose of the study, and their voluntary consent was obtained prior to data collection.

Ethical Approval

Not Applicable.

Data Availability

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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