

## **Moroccan Banks Analysis Using CAMEL Model**

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**ABSTRACT:** The present paper analyzes the performance of major Moroccan financial institutions for the period 2001-2011 using CAMEL approach. The research aims to evaluate Moroccan financial institutions' capital adequacy, asset quality, management, earnings and liquidity and then determine financial performance, operating soundness and regulatory compliance of Moroccan financial institutions. The application of CAMEL model to major Moroccan financial institutions for the period 2001 to 2011 allows us to obtain a ranking of banks. We applied debt equity ratio for the analyze of capital adequacy parameter, loan loss provisions to total loans for the analyze of assets quality parameter, return on equity for analyzing management quality parameter, return on assets to analyze earnings ability and deposits on total assets ratio to analyze liquidity ability.

**Keywords:** CAMEL approach; financial institutions; Morocco

**JEL Classifications:** G20; G21

### **1. Introduction**

CAMEL is a system of rating for on-site examinations of banks. Officially known as the Uniform Financial Institutions Rating System (UFIRS), CAMEL is a supervisory rating system adopted by the Federal Financial Institutions Examination Council (FFIEC) on 1979. CAMEL stipulates the evaluation of financial institutions on the basis of five critical dimensions which are: Capital adequacy, Asset quality, Management, Earnings and Liquidity. Sensitivity to market risk, a sixth dimension was added in 1997 and the acronym was changed to CAMELS (Opez, 1999). These components are used to reflect financial performance, operating soundness and regulatory compliance of financial institutions. They are defined as follows (FEDERAL REGISTER, 1997):

- The Capital adequacy is rated upon different factors inter alia: The level and quality of capital and the overall financial condition of the institution, the ability of management to address emerging needs for additional capital, the nature, trend, and volume of problem assets, and the adequacy of allowances for loan and lease losses and other valuation reserves, balance sheet composition, including the nature and amount of intangible assets, market risk, concentration risk, and risks associated with nontraditional activities, risk exposure represented by off-balance sheet activities, the quality and strength of earnings, and the reasonableness of dividends...
- The ratings of a financial institutions' Asset quality is based upon, but not limited to, an assessment of the following evaluation factors: the adequacy of underwriting standards, soundness of credit administration practices and appropriateness of risk identification practices, the level, distribution, severity, and trend of problem, classified, nonaccrual, restructured, delinquent, and nonperforming assets for both on- and off-balance sheet transactions, the adequacy of the allowance for loan and lease losses and other asset valuation reserves, the credit risk arising from or reduced by off-balance sheet transactions, such as unfunded commitments, credit derivatives, commercial and standby letters of credit, and lines of credit, the diversification and quality of the loan and investment portfolios...

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- The Management is rated upon different factors inter alia: the level and quality of oversight and support of all institution activities by the board of directors and management, the ability of the board of directors and management, in their respective roles, to plan for, and respond to, risks that may arise from changing business conditions or the initiation of new activities or products, the adequacy of, and conformance with, appropriate internal policies and controls addressing the operations and risks of significant activities, the accuracy, timeliness, and effectiveness of management information and risk monitoring systems appropriate for the institution's size, complexity, and risk profile, the adequacy of audits and internal controls to: promote effective operations and reliable financial and regulatory reporting; safeguard assets; and ensure compliance with laws, regulations, and internal policies.
- Financial institution's earnings is rated upon different factors inter alia: the level of earnings, including trends and stability, the ability to provide for adequate capital through retained earnings, the quality and sources of earnings, the level of expenses in relation to operations, the adequacy of the budgeting systems, forecasting processes, and management information systems in general...
- Liquidity is rated based upon inter alia, these factors: the adequacy of liquidity sources compared to present and future needs and the ability of the institution to meet liquidity needs without adversely affecting its operations or condition, the availability of assets readily convertible to cash without undue loss, access to money markets and other sources of funding, the level of diversification of funding sources, both on- and off-balance sheet, the degree of reliance on short-term, volatile sources of funds, including borrowings and brokered deposits, to fund longer term assets, the trend and stability of deposits...
- Sensitivity to market risk is rated based upon, but not limited to, an assessment of the following evaluation factors: the sensitivity of the financial institution's earnings or the economic value of its capital to adverse changes in interest rates, foreign exchange rates, commodity prices, or equity prices, the ability of management to identify, measure, monitor, and control exposure to market risk given the institution's size, complexity, and risk profile, the nature and complexity of interest rate risk exposure arising from nontrading positions.

Each of these six components is rated on a scale of 1 (best) to 5 (worst). A composite rating is considered as the indicator of a bank's current financial condition and is ranges between 1 (best) and 5 (worst). Rating 1 indicates that the financial institution is sound, exhibit strong performance and risk management practices. Rating 2 indicates that the financial institution is fundamentally sound and only moderate weaknesses are present. Rating 3 indicates that the financial institution exhibit a degree of supervisory concern in one or more component. Rating 4 indicates that the financial institution is unsafe and has unsound practices with serious financial problems while rating 5 means that the financial institution is extremely and critically unsound and inadequate risk management practices. Thus, Banks with ratings of 1 or 2 are considered to present few, if any, supervisory concerns, while banks with ratings of 3, 4, or 5 present moderate to extreme degrees of supervisory concern (Padmalatha , 2011).

The present paper analyzes the performance of major Moroccan financial institutions for the period 2001-2011 using CAMEL approach. The research aims to evaluate Moroccan financial institutions' capital adequacy, asset quality, management, earnings and liquidity and then determine financial performance, operating soundness and regulatory compliance of Moroccan financial institutions.

The paper is organized as follows. In section 2, we review the existing literature on performance financial institutions' analysis using CAMEL approach. The methodology adopted and data used in this paper are presented in section 3 while section 4 is devoted to the presentation of results. Finally, section 5 offers conclusions.

## **2. Literature Review**

Barr et al. (2002) show that "CAMEL rating criteria has become a concise and indispensable tool for examiners and regulators" and found that there is "a significant relationship between CAMELS ratings and efficiency scores". Thus, various studies have focused on the application of CAMEL approach to financial institutions. Said and Saucier (2003) used CAMEL rating methodology to evaluate Capital adequacy, Assets and Management quality, Earnings ability and Liquidity position of

Japanese Banks. Prasuna (2004) analyzed the performance of 65 Indian banks using CAMEL model and concluded that better service quality, innovative products and better bargains were beneficial because of the prevailing tough competition. Sarker (2005) examined Bengali Islamic banks using CAMEL model which enabled the regulators to get a Shariah benchmark to supervise and inspect Islamic banks and financial institutions from an Islamic perspective. Nurazi and Evans (2005) show that Adequacy ratio, Assets quality, Management, Earnings, Liquidity and bank size are statistically significant in explaining bank failure. Gupta (2008) analyzed the performance of 30 Indian private banks using Camel Model for the period 2003-2007 and gave rating to top five and bottom five banks.

Siva and Natarjan (2011) tested the applicability of CAMEL norms and its consequential impact on the performance of SBI Groups. The authors found that CAMEL scanning helps banks to diagnose its financial health and alert the bank to take preventive steps for its sustainability. Olweny and Shipo (2011) analyze the determinants of bank failures in Kenya. They found that Asset quality and liquidity are the determinants of Kenyan bank failures. Reddy and Prasad (2011) analyzed the performance of rural Indian banks using CAMEL model. Chaudhry and Singh (2012) analyzed the impact of the financial reforms on the soundness of Indian Banking through its impact on the asset quality. The study identified the key players as risk management, NPA levels, effective cost management and financial inclusion. Mishra (2012) analyzed the performance of different Indian public and private sector banks over the decade 2000-2011 using CAMEL approach and found that private sector banks are at the top of the list, with their performances in terms of soundness being the best. Mishra and Aspal (2013) evaluated the performance and financial soundness of State Bank Group using CAMEL approach and rated different banks using through Capital adequacy, Asset quality Management efficiency, Earning Quality, and Liquidity. Ongore and Kusa (2013) concluded that the financial performance of commercial banks in Kenya is driven mainly by board and management decisions, while macroeconomic factors have insignificant contribution. Gupta (2014) analyzed public banks in India and found that there is a statistically significant difference between the CAMEL ratios and thus the performance of all the public financial institutions.

### 3. Methodology

The purpose of this paper is to analyze the performance of major Moroccan financial institutions for the period 2001-2011 using CAMEL approach, to evaluate Moroccan financial institutions' capital adequacy, asset quality, management, earnings and liquidity and to determine financial performance, operating soundness and regulatory compliance of Moroccan financial institutions. To do this, we first define different ratios used to evaluate Moroccan financial institutions capital adequacy, asset quality, management, earnings and liquidity.

According to literature review above, we use in the present paper following ratios to evaluate capital adequacy, asset quality, management, earnings and liquidity:

- **Capital adequacy** =  $\frac{\text{Debt}}{\text{Equity}}$ , this ratio represents the degree of leverage of a bank and indicates the relative proportion of shareholders' equity and debt used to finance a company's assets;
- **Asset quality** =  $\frac{\text{Loan loss provisions}}{\text{Total loans}}$ , evaluate the proportion of bad loans over total loans;
- **Management quality** =  $\frac{\text{Net income}}{\text{Total loans}}$ , measures a corporation's profitability by revealing how much profit a company generates with the money shareholders have invested;
- **Earnings ability** =  $\frac{\text{Net income}}{\text{Total assets}}$ , measures bank's profitability relative to its assets and thus the bank's overall performance;
- **Liquidity position** =  $\frac{\text{Deposits}}{\text{Total assets}}$ , estimates the proportion of deposits over total assets and thus liquidity risk.

Due to the unavailability of the data for factor S, i.e. sensitivity to market risk, the data has been analyzed using the rest of the 5 factors using ratios. Results obtained are then analyzed and we calculate a Composite ratio of Moroccan banks using CAMEL model which allow us to rank financial institutions studied.

The data used in this paper are obtained from annual reports and annual financial statements of the commercial Moroccan banks for the period 2001-2011 of major Moroccan financial institutions: ATTIJARIWABA BANK (AWB), BANQUE CENTRALE POPULAIRE (BCP), BANQUE MAROCAINE POUR LE COMMERCE ET L'INDUSTRIE (BMCI), BANQUE MAROCAINE DU COMMERCE EXTERIEUR (BMCE BANK), CREDIT AGRICOLE DU MAROC (CAM) and CREDIT DU MAROC (CDM).

#### 4. Results

Table 1 presents CAMEL rating of capital adequacy, asset quality and management quality ratios. The analysis of capital adequacy parameter (debt equity ratio), which represents the degree of leverage of a bank and indicates the relative proportion of shareholders' equity and debt used to finance a company's assets, shows that AWB is in the top position with a debt equity ratio equal to 0,026, followed by BMCE (0,032), BMCI (0,036), CDM (0,045) and BCP (0,048). CAM is in the last position (0,080). High ratio indicates less protection for depositors and creditors.

Results of assets quality parameter, which evaluates the proportion of bad loans over total loans, shows that BMCI is in the top position with a loan loss provisions to total loans ratio equal to 0,001 followed by BMCE (0,003), CDM (0,009), CAM (0,01) and AWB (0,016). BCP is in the last position with a ratio equal to 0,017. Since a high ratio means a bad quality of assets, we can conclude that BMCI has the best assets while BCP has the worst ones.

Results of management quality parameter, defined as return on equity, which measures the profitability of a bank, shows that BCP is in the top position with return on equity ratio equal to 1,040 followed by AWB (0,891), BMCI (0,740), BMCE (0,363) and CDM (0,327). CAM is in the last position with a ratio equal to 0,262.

**Table 1. CAMEL rating of capital adequacy, asset quality and management quality ratios**

		Bank	2001	2002	2003	3004	2005	2006	2007	2008	2009	2010	2011	Average	Rank	
		Capital adequacy	Debt Equity Ratio	BMCE	0,047	0,050	0,046	0,042	0,037	0,030	0,023	0,021	0,019	0,019	0,017	0,032
BMCI	0,034			0,040	0,038	0,035	0,037	0,029	0,035	0,067	0,029	0,029	0,027	0,036	3	
CAM	0,112			0,096	0,083	0,056	0,073	0,109	0,078	0,070	0,061	0,071	0,066	0,080	6	
AWB	0,054			0,045	0,041	0,032	0,027	0,021	0,016	0,013	0,012	0,011	0,010	0,010	0,026	1
BCP	0,057			0,093	0,093	0,063	0,109	0,031	0,026	0,015	0,013	0,008	0,016	0,016	0,048	5
CDM	0,070			0,070	0,069	0,064	0,053	0,041	0,033	0,025	0,023	0,023	0,023	0,023	0,045	4
Asset quality	Loan loss provisions/ Total loans	Bank	2001	2002	2003	3004	2005	2006	2007	2008	2009	2010	2011	Average	Rank	
		BMCE	0,005	0,005	0,006	0,006	0,002	0,001	0,002	0,003	0,000	0,000	0,002	0,002	0,003	2
		BMCI	0,001	0,001	0,001	0,001	0,001	0,000	0,001	0,001	0,001	0,002	0,004	0,002	0,001	1
		CAM	0,020	0,013	0,009	0,008	0,008	0,009	0,015	0,008	0,006	0,005	0,005	0,005	0,010	4
		AWB	0,102	0,010	0,011	0,012	0,011	0,006	0,005	0,003	0,005	0,005	0,005	0,005	0,016	5
		BCP	0,005	0,007	0,033	0,030	0,071	0,009	0,009	0,006	0,005	0,004	0,011	0,011	0,017	6
		CDM	0,011	0,012	0,013	0,007	0,009	0,007	0,006	0,007	0,008	0,009	0,010	0,010	0,009	3
Management quality	Return on Equity	Bank	2001	2002	2003	3004	2005	2006	2007	2008	2009	2010	2011	Average	Rank	
		BMCE	0,162	0,178	0,257	0,319	0,399	0,468	0,766	0,508	0,317	0,303	0,316	0,363	4	
		BMCI	0,400	0,399	0,422	0,454	0,470	0,565	0,474	3,093	0,608	0,616	0,634	0,740	3	
		CAM	0,217	0,086	0,049	0,011	1,474	0,523	0,096	0,080	0,122	0,107	0,119	0,262	6	
		AWB	0,237	0,287	0,316	0,356	0,631	1,000	1,109	1,222	1,450	1,558	1,635	0,891	2	
		BCP	0,660	0,280	0,416	0,672	0,713	1,096	1,064	1,272	1,730	2,474	1,057	1,040	1	
		CDM	0,125	0,152	0,216	0,267	0,462	0,359	0,329	0,433	0,491	0,416	0,348	0,327	5	

Table 2 presents CAMEL rating of earnings ability and liquidity ability ratios. Results of earnings ability, represented by return on assets, show that BMCI has the higher return on assets with

a ratio of 0,026 followed by CAM (0,015), AWB (0,010) and BCP and CDM (0,009) while BMCE has that lower return on assets (0,007).

The analysis of the last CAMEL component, which is liquidity ability represented by deposits on total assets ratio shows that BCP is the best hedged against liquidity risk with a ratio equal to 0,266 followed by CAM with a ratio equal to 0,664, BMCI with a ratio equal to 0,750, BMCE with a ratio equal to 0,784 and AWB (0,785). In the last position, we find CDM with a ratio equal to 1,490.

**Table 2. CAMEL rating of earnings ability and liquidity ability ratios**

Earnings ability	Return on assets	Bank	2001	2002	2003	3004	2005	2006	2007	2008	2009	2010	2011	Average	Rank
		BMCE	0,005	0,005	0,007	0,008	0,009	0,010	0,013	0,007	0,004	0,004	0,004	0,004	0,007
BMCI	0,011	0,012	0,012	0,012	0,012	0,012	0,012	0,012	0,156	0,014	0,014	0,013	0,026	1	
CAM	0,018	0,006	0,003	0,000	0,078	0,035	0,004	0,004	0,004	0,005	0,005	0,006	0,015	2	
AWB	0,007	0,008	0,008	0,007	0,010	0,014	0,013	0,012	0,012	0,012	0,013	0,012	0,010	3	
BCP	0,007	0,003	0,004	0,006	0,006	0,017	0,015	0,009	0,012	0,013	0,013	0,011	0,009	4	
CDM	0,006	0,007	0,009	0,010	0,016	0,011	0,008	0,009	0,010	0,008	0,007	0,007	0,009	4	

  

Liquidity ability	Deposits on total assets	Bank	2001	2002	2003	3004	2005	2006	2007	2008	2009	2010	2011	Average	Rank
		BMCE	0,785	0,766	0,818	0,825	0,814	0,841	0,821	0,787	0,762	0,729	0,678	0,678	0,78
BMCI	0,850	0,840	0,822	0,807	0,740	0,674	0,707	0,698	0,708	0,718	0,685	0,685	0,75	3	
CAM	0,456	0,524	0,582	0,643	0,775	0,808	0,676	0,701	0,718	0,715	0,711	0,711	0,66	2	
AWB	0,847	0,872	0,835	0,824	0,835	0,847	0,811	0,740	0,683	0,690	0,654	0,654	0,79	5	
BCP	0,053	0,028	0,023	0,047	0,046	0,850	0,847	0,164	0,187	0,346	0,339	0,339	0,27	1	
CDM	8,207	0,854	0,853	0,884	0,883	0,863	0,864	0,761	0,735	0,760	0,724	0,724	1,49	6	

The overall ranking considering all the parameters of CAMEL for the period 2001 to 2011 is represented in table 3. Results of the composite ranking of Moroccan banks using CAMEL model show that CDM is ranked in the first position with a composite ratio equal to 4,4, followed by CAM with a composite ratio equal to 4, BMCE and BCP with a composite ratio equal to 3,4, AWB with a composite ratio equal to 3,2 and, in the last position, BMCI with a composite ratio equal to 2,2.

**Table 3. Composite ranking of Moroccan banks using CAMEL model**

Bank	C	A	M	E	L	Average	Rank
BMCE	2	2	4	5	4	3,4	3
BMCI	3	1	3	1	3	2,2	5
CAM	6	4	6	2	2	4	2
AWB	1	5	2	3	5	3,2	4
BCP	5	6	1	4	1	3,4	3
CDM	4	3	5	4	6	4,4	1

### 5. Conclusion

The application of CAMEL model to major Moroccan financial institutions for the period 2001 to 2011 allows us to obtain a ranking of banks. We applied debt equity ratio for the analyze of capital adequacy parameter, loan loss provisions to total loans for the analyze of assets quality parameter, return on equity for analyzing management quality parameter, return on assets to analyze earnings ability and deposits on total assets ratio to analyze liquidity ability. Results obtained from the analyze of different ratios show that CDM is the best ranked with a CAMEL average of 4,4, followed by CAM (4), BMCE and BCP (3,4), AWB (3,4) and BMCI (2,2).

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