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The Impact of Banking Market power on Financial Stability According to the CAMEL Model: An Applied Study of the Iraqi Banking Market for the Period 2010-2020

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Abstract
This study aims to examine the nature of banking market power in Iraq and assess its impact on financial stability using the CAMEL model indicators. A sample of 15 Iraqi banks, representing the national banking system, was selected for the period 2010–2020. Data were obtained from the annual Financial Stability Reports issued by the Central Bank of Iraq to calculate the Herfindahl–Hirschman Index (HHI) as a measure of market power, alongside the CAMEL model indicators for banking stability: capital adequacy, asset quality, management quality, profitability, and liquidity. To test the research hypotheses, a simple regression model was applied to the annual aggregated data of the sample banks. The results indicate that the Iraqi banking market exhibits a high level of concentration and, consequently, substantial market power, which exerts a direct influence on financial stability in line with the stability–competition theory. Therefore, preserving the current market structure is likely to strengthen financial stability; however, it is equally important to sustain competitive dynamics to prevent the emergence of an oligopolistic market structure.

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Keywords: Market Power, Banking Financial Stability, HHI Model, CAMEL Model

1. Introduction

The Iraqi economic system possesses a set of distinctive characteristics that differentiate it from other economic structures. These characteristics shape the smooth flow of financial resources through the banking sector and enable it to fulfill its intermediary role. Consequently, the soundness and stability of the financial system are critical for attracting investments and capital, as well as for channeling them effectively to support sustainable economic development. Banks, by virtue of their intermediary function, serve as a cornerstone in promoting financial stability and facilitating the efficient allocation of funds among economic units. Within the frameworks of both the competition–stability and fragility–stability theories, the probability of bank failure can rise due to various internal and external factors, potentially undermining system stability. Among the most notable of these factors is market power—the capacity of a bank or a group of banks to influence prices or shape market conditions to their advantage, such as through the determination of interest rates or the imposition of fees. Excessive market power may lead dominant banks to consolidate their influence and strengthen their control over pricing mechanisms. In light of these considerations, the present study seeks to investigate the impact of banking market power on a range of financial indicators that serve as proxies for financial stability, as measured through the CAMEL model. The banking sector constitutes a fundamental pillar of the financial system in any national economy. Ensuring the growth and soundness of its performance directly contributes to the expansion and stability of other economic sectors. Banks play a vital role in channeling financial surpluses within the market and society toward investment opportunities that maximize returns. Consequently, any factor that disrupts the smooth functioning of this process can generate perceptions of risk or erode confidence, ultimately reducing the volume of surpluses available for productive use.

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In this context, the stability of the banking system is essential for sustaining the momentum of economic growth.The significance of this research stems from the critical role of the banking sector as the primary component of the financial system. The growth and resilience of this sector are prerequisites for the stability of diverse economic activities. Conversely, disruptions in the intermediation process may impede the operations of the banking system and, in turn, compromise the stability of the overall economy. In light of this, the Iraqi banking sector has undergone substantial transformations and reforms in recent years to align with the demands of modern banking practices and advanced financial tools. These reforms have largely focused on enhancing performance and efficiency while optimizing the use of available instruments to maximize value creation.

2. Literature review

Assessing the degree of banking market power is a critical concern for both researchers and regulators, given its relationship to market concentration, competitive dynamics, and the efficiency and profitability of banking operations. According to the *quiet life* hypothesis, market power allows large firms to operate without significant competitive pressure, thereby reducing their incentives to improve product quality or enhance managerial practices. This complacency can ultimately diminish efficiency (Hicks, 1935) [25]. In the banking sector, such dynamics may enable institutions with substantial market shares to increase prices and boost short-term profits. However, over the long term, inadequate loan monitoring and excessive operating costs may erode efficiency and weaken competitiveness (Rhoades & Rutz, 1982) [26]. Conversely, the *efficient structure* hypothesis posits that dominant institutions secure market share by leveraging economies of scale, lower operating costs, and diversified product portfolios. These advantages facilitate mergers or acquisitions of smaller competitors, thereby increasing market concentration while simultaneously enhancing the efficiency of firms within the sector (Demsetz, 1973) [27]. Marquez (2002) [28] identifies a negative relationship between competition and efficiency in the banking sector. According to his findings, banks tend to prioritize the growth of asset quantity over asset quality to capture a larger market share. As market competition intensifies, customers are more inclined to switch providers, which diminishes banks' incentives to maintain strong customer relationships. Consequently, the quality of loan portfolios and operational efficiency decline. Market power, therefore, has a significant impact on bank performance. Factors such as bank size and income diversification contribute positively to enhancing efficiency (Kozak & Wierzbowska, 2021) [29]. In general, market power should be analyzed within the framework of the competition–stability relationship, which encompasses two contrasting perspectives. The first, known as the competition–fragility hypothesis, argues that increased competition undermines stability by eroding profits, thereby reducing banks' capacity to absorb shocks and incentivizing excessive risk-taking by banks and their managers (Fungacova & Weill, 2013) [30]. Conversely, some scholars contend that competition enhances financial stability by preventing large banks from exploiting market power to impose excessively high interest rates on customers, a scenario that could otherwise lead to systemic instability (Troug & Sbia, 2015) [31].

Market Power

Banking market power refers to the concentration of capital within a small number of dominant, large banks, a phenomenon that often results in monopolistic conditions where these major banks overshadow smaller competitors (Rinkevičiūtė & Martinkute-Kauliene, 2014) [34]. The increasing influence and size of emerging global banking players raise concerns regarding financial stability. Consequently, a thorough examination of the current market structure within the banking sector is essential to assess the implications of these developments (Bikker & Haaf, 2002) [33]. Advocates of market power highlight several benefits, including enhanced efficiency of banking institutions, reduced vulnerability to banking crises, relatively greater resilience, and the potential for higher profitability. Moreover, monitoring a smaller number of large banks is simpler, thereby lowering the risk of bank failures. However, market power also entails notable drawbacks, such as a reduction in credit supply, diminished social and economic welfare due to monopolistic pricing behaviors, increased systemic risk linked to the larger size of dominant banks, and reduced competition, which may adversely affect economic growth (Mohammed *et al*., 2015) [32]. Market power is commonly measured using the Herfindahl–Hirschman Index (HHI), a statistical metric of market concentration widely employed by researchers and antitrust authorities globally (Florian, 2014) [35]. Since 1982, the U.S. Department of Justice has extensively utilized the HHI as a tool to evaluate mergers and their effects on market structures. According to the Structure–Conduct–Performance (SCP) paradigm, first proposed by E. Mason in the early 1930s (Matyjas, 2014) [36], market structure significantly influences firm behavior and consequently impacts overall performance. High market concentration facilitates collusive practices among banks, enabling them to set prices that deviate from those expected in perfectly competitive markets, where smaller firms lack individual price-setting power.

In general, the relationship between market concentration and market power is nonlinear. Non-competitive behaviors foster concentration, which in turn increases market power. However, beyond a certain threshold, further increases in concentration do not significantly enhance market power (Cetorelli, 1999) [37].

Banking Financial Stability

Financial stability refers to the absence of financial crises and the prevention of their contagion across financial systems, institutions, and markets (Raheemah *et al*., 2018, p. 298) [21]. Banks hold a unique position due to their role in transforming short-term deposits into long-term loans and processing payments, with the large volume of outstanding transactions making any problem in one bank prone to rapid spread to others (Gjedrem, 1999, p. 389) [7]. Accordingly, banking financial stability is defined as the absence of adverse impacts on the real economy arising from imbalances or risks within the financial system—comprising financial institutions and markets combined (Canoy *et al*., 2001, p. 33) [3]. Stability is achieved when the intermediation process is conducted efficiently by a network of financial institutions supported by robust financial infrastructure, without disruptions (Khan, 2011, p. 553) [12]. Jahn and Kick (2012) [8]. describe financial stability as “a stable state in which the banking system and its core functions perform with economic efficiency, including resource allocation, risk distribution, and payment

settlement" (p. 8). Similarly, Swamy (2014, p. 28) defines banking stability as a state sought by the financial system characterized by efficient resource allocation, effective identification and management of financial risks, absorption of shocks, secure payment and transfer mechanisms, stabilization of asset and price fluctuations, and guidance toward economic prosperity. Banks demonstrate financial stability when they execute intermediation functions smoothly, thereby fostering trust among users (Mostak & Sushanta, 2015, p. 15) [17]. Consequently, the financial system and its functions operate at optimal performance levels without being adversely affected by crises or fluctuations in external or internal environments (Mohamed, 2013, p. 269) [16]. The financial soundness of individual banks and the long-term stability of the banking system are critical for achieving sustainable development (Amadi *et al*., 2021, p. 105) [2]. Instability may manifest either at the individual bank level or at the systemic level (Klaas & Vagizova, 2014, p. 159) [13]. The CAMELS model serves as a framework for evaluating the financial and managerial soundness of lending institutions (Al-Khazraji & Al-Araji, 2020, p. 329) [1]. by assessing the overall condition of banks, identifying strengths and weaknesses, and determining their soundness (Masood *et al*., 2016, p. 39) [15]. This model provides a basis for financial examinations through several key indicators: capital adequacy, asset quality, management quality, profitability, and liquidity (Nikkeh *et al*., 2022, p. 65) [19]. The evaluation process involves analyzing banks' balance sheets and income statements to monitor their operational effectiveness (Kazem & Alwan, 2020, p. 340) [10]. The CAMELS framework gained global acceptance following recommendations by the U.S. Federal Reserve (Christopoulos *et al*., 2011, p. 12) [4].

The model includes the following key indicators:

1. Capital Adequacy: A crucial metric in assessing banks' financial stability, capital serves as a buffer against various risks faced by banks (Venkatesh & Suresh, 2014, p. 20) [24].
2. Asset Quality: Among the most significant determinants of a bank's strength are its assets, particularly loans and advances, which require continuous evaluation (Jarrah *et al*., 2019, p. 356; Khadka, 2019, p. 12) [9, 11].
3. Management Quality: This encompasses human resource policies, general management, information systems, internal auditing, control mechanisms, and strategic planning. It reflects the management's capability to supervise, support operations, and respond effectively to risks from changing business conditions or new products (Nguyen *et al*., 2020, p. 180; Ferrouhi, 2014, p. 623) [18, 6].
4. Profitability: Bank profitability is assessed based on profit levels, the capacity to generate capital from retained earnings, the quality and sources of profits, expense management, and the adequacy of budgeting systems. Return on equity is commonly used as a profitability measure (Ferrouhi, 2014, p. 623; Ross, 2015, p. 70) [6, 22].
5. Liquidity: The bank's ability to meet its obligations to depositors is critical. Adequate liquidity supports profitability and reflects the bank's capacity to satisfy demands and obligations without incurring unacceptable losses (Nguyen *et al*., 2020, p. 180; Venkatesh & Suresh, 2014, p. 20) [18, 24].

3. Research Methodology

Research Design

This study adopts a descriptive research design to review the research variables. Additionally, an experimental and applied approach is employed to test the research hypotheses, specifically examining the impact of market power on indicators of banking financial stability.

Research Data

A purposive sampling method was utilized to select Iraqi banks for measuring and analyzing the research variables and their anticipated relationships. Ten banks were randomly chosen after excluding certain institutions that could potentially bias the results, including those established after 2010 and banks associated with operational difficulties or allegations of corruption. The banks included in the research sample are detailed in Table 1.

Table 1: Research sample (in Millions)

Bank	Code	2010		2020	
		Capital	Asset	Capital	Asset
Iraqi Islamic Bank	BIIB	51,192	80,416	250,000	839,956
Bank of Baghdad	BBOB	100,000	961,000	250,000	1,419,000
Trade Bank of Iraq	BCOI	60,000	204,163	250,000	616,949
Iraqi Investment Bank	BUOI	75,000	246,091	250,000	571,480
Middle East Bank	BIME	66,000	580,125	250,000	692,410
United Investment Bank	BUND	150,000	518,000	250,000	810,510
National Bank of Iraq	BNOI	50,000	307,000	300,000	893,000
Gulf Commercial Bank	BGUC	75,000	272,031	250,000	510,000
Babylon Bank	BBAY	50,000	201,242	300,000	446,067
Sumer Bank	BSUC	70,500	120,000	250,000	333,000
Elaf Islamic Bank	BELF	50,000	196,000	250,000	306,652
Union Bank of Iraq	BIBI	50,000	108,563	250,000	490,000
Kurdistan International Bank	BKUI	100,000	390,465	250,000	1,474,000
Ashur Bank	BASH	57,000	139,371	250,000	474,000
Mansour Investment Bank	BMNS	75,000	172,410	252,000	1,287,419

Research variables

Table 2. summarizes the set of tools the researcher used to measure the research variables:

Table 2: Measurement tools for research variables

Variable	Index	Code	The equation	
Market Power	HHI	X	$HHI = \sum_{i=1}^{n} S^2$	
Banking Financial Stability	CAMEL	Y1	Capital Adequacy	CAR=(Tier1+Tier2+Tier3)/RWA
		Y2	Asset Quality	Non-performing debt ratio = Total non-performing debt / Equity
		Y3	Management Quality	Management quality = Total loans / Total deposits
		Y4	Profitability	ROE = Net income / Total equity
		Y5	Liquidity	Liquidity = Liquid assets / Total deposits and equivalents

In order to measure the power of the market, the global Herfindahl-Hirschman Index was used. The year 2010 recorded the highest score of (3950), while the year 2022 recorded the lowest score of (1920), noting that the general standard for a high market strength is (HHI>1800). Figure 1. The HHI results confirm that the Iraqi market enjoys a strong and highly concentrated position, particularly during the period 2010-2018. This is due to the significant dominance of five government-owned banks over banking operations in Iraq, which, in turn, contributes to this concentration. However, despite this dominance, they do not make significant changes to prices and fees and adhere to the instructions of the Central Bank. The gradual decline over the aforementioned period is the result of a gradual increase in the number of private banks, which, while there were 20 banks in 2010, rose to more than 80 banks in 2024. This reflects the erosion of the market share of the five largest banks and the beginning of increased competition

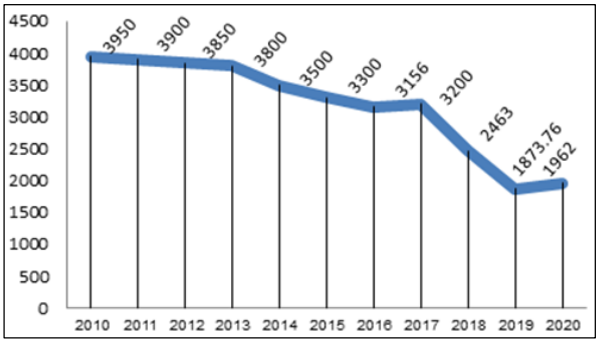

Fig 1: Hhi Index In The Iraqi Banking Market

Table 3. summarizes the arithmetic mean of the Camille model indicators (capital adequacy, asset quality, management quality, profitability, and liquidity) annually for the research sample and for the period 2010-2020.

Table 3: of the annual arithmetic mean of CAMEL model indicators for the research sample for the period 2010-2020

Year	Capital Adequacy	Asset Quality	Management Quality	Profitability	Liquidity
2010	102	0.088	0.46	0.084	1.056
2011	101.8	0.078	0.52	0.085	1.354
2012	110.3	0.052	0.51	0.081	1.113
2013	119.7	0.044	0.628	0.082	1.117
2014	149.8	0.045	0.58	0.046	1.155
2015	152.8	0.08	0.503	0.028	1.238
2016	172.3	0.077	0.52	0.035	1.452
2017	173.5	0.105	0.54	0.02	1.525
2018	187.2	0.136	0.51	0.009	1.312
2019	171.4	0.138	0.528	0.015	1.289
2020	122.4	0.15	0.543	0.028	1.422

Describes the all results of Mean calculating the index of CMEL. At the level of capital adequacy, the year 2018 recorded the highest arithmetic mean of (187%), while the year 2012 recorded the lowest arithmetic mean of (101.8%) at the level of the research sample, which confirms that the banks in the research sample enjoy relatively high adequacy, specifically by directing the Central Bank to raise the bank's capital to more than (250) billion dinars. As for the level of asset quality, the year 2020 recorded the highest arithmetic mean of (15%), and the year 2013 recorded the lowest arithmetic mean of (4%) for the research sample, thus confirming the rise in overdue debts in the Iraqi banking system.

As for the Management Quality Index, the highest average was recorded in 2013 (63%), while the lowest average was recorded in 2010 (46%). As for the Profitability Index, the highest arithmetic average was recorded in 2011 (8.5%), while the lowest average was recorded in 2018 (0.9%), which confirms a significant decline in banking profitability. As for the Liquidity Index, the highest arithmetic average was recorded in 2017 (152%), while the lowest average was recorded in 2010 (105%). The results confirm the increase in banking liquidity.

Hypothesis Testing

According to the research variables and the nature of the data generated by the research variable measurement tools, five hypotheses will be tested to ensure consistency with the hypothetical model in Figure

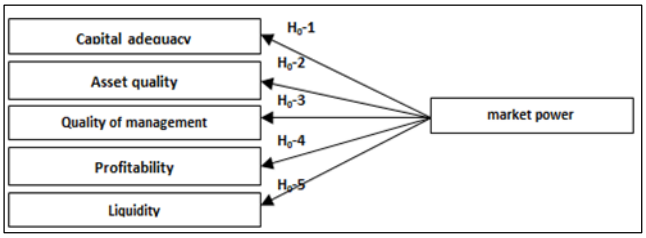

Fig 4: hypothentical model

Prior to testing the research hypotheses, the data were prepared. The Kolmogorov–Smirnov and Shapiro–Wilk tests were conducted, revealing that the data were not normally distributed. To address this, the data were transformed using the natural logarithm. Subsequently, the unit root test (Dickey-Fuller) was performed, yielding insignificant results. Consequently, the data were lagged by one period (lag = 1), after which the test was repeated, producing a significance level of 0.00. Table 3.

Table 3: Results of the Hypothesis test

Model: Simple Regression Method: Least Squares Path: Market Power → Banking Financial Stability Independent Variable: Market Power					
Parameters	**Y1**	**Y2**	**Y3**	**Y4**	**Y5**
Ceof.	0.444	0.528	0.68	0.585	0.263
Prob>chi2	0.000	0.000	0.000	0.000	0.001
R^2	0.155	0.296	0.42	0.315	0.061
α	0.005	0.06	-0.056	0.004	-0.001
P>IZI	0.000	0.000	0.000	0.000	0.001
Z	5.47	8.28	10.86	8.66	3.26
Std.Err.	0.081	0.063	0.062	0.067	0.08
Wald chi2	29.91	68.54	118.04	75.04	10.61

Presents the results of hypothesis testing: H1-1**:** There is a statistically significant effect of market power on capital adequacy, according to the CAMELS model, with an impact coefficient of 0.263 and significance at the 0.001 level. This supports the acceptance of the alternative hypothesis. H1-2: There is a statistically significant effect of market power on asset quality, with an impact coefficient of 0.585 and significance at the 0.00 level, confirming the second alternative hypothesis. H1-3: There is a statistically significant effect of market power on management quality, with an impact coefficient of 0.680 and significance at the 0.00 level, confirming the third alternative hypothesis. H1-4: The effect of market power on profitability has an impact coefficient of 0.528 and significance at the 0.00 level, supporting the fourth alternative hypothesis. H1-5: There is a statistically significant effect of market power on liquidity, with an impact coefficient of 0.444 and significance at the 0.00 level, confirming the fifth alternative hypothesis. Overall, these results confirm the validity of H1: there is a statistically significant effect of market power on the operational efficiency variables within the CAMELS model of financial stability.

4. Results

The findings from measuring the research variables indicate that the Iraqi banking sector exhibits strong market power characterized by a high degree of concentration. This concentration stems from the market structure, where for an extended period, five banks have dominated the sector. Although each bank operates as a distinct legal entity, they remain under the regulatory control of the Central Bank of Iraq. These dominant banks command the majority of banking operations and financial liquidity within the market. This concentration has significantly influenced the competitive dynamics faced by private banks, limiting their market competitiveness. Simultaneously, it has provided greater flexibility and centralized control over fund flows, facilitating effective monitoring and oversight by the Central Bank. This market dominance, combined with the sector's competitive structure and the broader context of the Iraqi economy, supports the fragility-stability model. This is evidenced by the observed positive and direct impact of market power on banking financial stability. The Iraqi economy is characterized by a weak industrial base and a heavy dependence on oil revenues. Most economic activity is driven by foreign trade and elevated domestic consumption, primarily funded through public sector salaries. This economic structure has constrained the banking sector's development, with banks traditionally focusing on conventional operations and lacking motivation for diversification or innovation. However, the introduction of the currency auction system since 2010 has fostered sector growth and increased competition to some extent. The growing preference of individuals for private banks over the five major quasi-governmental banks has reduced market power concentration, though it has not compromised overall market stability. This is corroborated by the Herfindahl–Hirschman Index (HHI) results, which indicate that market power remains within acceptable limits. In general, market power enhances the capacity of dominant banks, which in turn improves aggregate capital adequacy due to higher capital availability. It also incentivizes these banks to apply stricter credit granting standards, as they remain the most reliable or accessible options, thereby improving asset quality. Additionally, market power contributes to better management quality by enabling banks to accumulate expertise, benefit from economies of scale, and reduce costs. Ultimately, these factors lead to increased profitability and liquidity. Therefore, the positive effect of market power on these financial stability indicators suggests enhanced stability within the Iraqi banking sector.

5. Recommendations

Maintain relative market power while fostering a competitive environment for private banks. Launch initiatives supporting private banks and regularly reassess banking financial stability in light of evolving economic conditions and international trends. Such reassessments could challenge existing assumptions about the relationship between competition and stability, potentially shifting perspectives on market power and promoting a more open market structure.

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