

Comparative Study on the Capital Adequacy Ratio between Developed Countries and Emerging Countries Analysis based on Panel Data

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Abstract

This study investigates the influence of four macroeconomic factor -inflation, interest rate, broad money, and real growth rate -on the capital adequacy ratio (CAR) of six countries over the period 1998–2019. Using panel data regression with fixed effects selected via the Hausman test, the analysis compares developed nations (United States, United Kingdom, European Union) and emerging nations (China, Malaysia, Indonesia). The results show that for developed economies, inflation, interest rate, and broad money have significant effects on CAR, while for emerging economies, only the real growth rate is statistically significant. These findings suggest that capital regulation in developed countries is more sensitive to macroeconomic conditions, whereas emerging economies' bank capital adequacy relies more on internal or micor-prudential factors. Policy implications are discussed.

Keywords

Capital Adequacy Ratio, Macroeconomic Factors, Panel Data, Developed Economies, Emerging Econom.

1. Introduction

The capital adequacy ratio (CAR) is a key indicator of a banking system's resilience, measuring a bank's capital relative to its risk-weighted assets. Regulators and policymakers focus on maintaining a minimum CAR to protect depositors and ensure financial stability (Chalermchatvichien et al., 2014). While existing literature has examined the relationship between macroeconomic variables and bank capital buffers, most studies focus on single countries or regions. Few have systematically compared developed and emerging economies using long-span panel data with a unified set of macroeconomic variables.

This study addresses that gap by examining how inflation, interest rates, broad money, and real growth rates influence CAR in six countries (USA, UK, EU, China, Malaysia, Indonesia) from 1998 to 2019. The specific research questions are:

What is the impact of each macroeconomic factor on the capital dequacy ratio of developed and emerging economies? How do these influences differ between developed and emerging nations? The main aim is to investigate the impact of macroeconomic factors on the CAR of the banking system in developed and emerging countries. The objectives are fivefold: to determine the impact of (i) interest rate, (ii) inflation, (iii) broad money, (iv) real growth rate on CAR, and (v) to compare the overall influence between the two groups.

$$\text{CAR} = \frac{\text{Tier 1 capital} + \text{Tier 2 capital}}{\text{Risk Weighted Assets}} \times 100$$

Table 1. Explanation of the coefficients

Tier 1	Tier 2	Risk Weighted Assets
It consists of common shares	Debts (bond)	The total value of a bank's assets
Preferential shares	Optionally fully convertible debentures	Higher-risk assets are weighted heavier than low-risk assets
These are highly liquid instruments i.e. can be sold easily to gather cash	Less liquid	Requiring more capital to support

2. Research Question and Research Aim

The following questions are framed around the research aim and objectives. The first examines the impact of macroeconomic factors on the capital adequacy ratio of developed and emerging economies. The second compares the influence of macroeconomic factors on the capital adequacy ratio of emerging and developed nations.

The study's main aim is to investigate the impact of macroeconomic factors on the capital adequacy ratio of the banking system in developed and emerging countries. The objectives of the study are five. Firstly, to determine the interest rate's impact on the capital adequacy ratio of developed and emerging economies. Secondly, to determine the impact of inflation on the capital adequacy ratio of developed and emerging economies. Thirdly, to determine the impact of broad money on the capital adequacy ratio of developed and emerging economies. Fourthly, to determine the impact of the growth rate on the capital adequacy ratio of developed and emerging economies. Lastly, to determine the influence of macroeconomic factors on the capital adequacy ratios of developed and emerging economies.

Developed and emerging economies tend to differ in their macroeconomic variables due to differences in the way the economy operates. There is greater stability in developed nations' financial and banking systems than in emerging nations. Furthermore, monetary policy actions in developed economies tend to be more powerful than in emerging nations. Therefore, changes in monetary policy actions also have a strong influence. This study examines how different macroeconomic variables influence the capital adequacy requirement of the banking system in developed and emerging economies.

3. Comparison between Developed and Emerging Economies

Table 2. Relationship between macroeconomics variable and capital adequacy ratio

Variable	Developed nation	Developing nation
Capital Adequacy Ratio and Inflation rate	Negative and Significant	Insignificant
Capital Adequacy Ratio and Growth rate	Positive and Insignificant	Significant and positive
Capital Adequacy Ratio and interest rate	Negative and Significant	Insignificant
Capital Adequacy Ratio and broad money supply	Positive and Significant	Insignificant

The study's main aim was to conduct a comparative study on the macroeconomic factors' influence on the countries' capital adequacy ratios. The results show a significant influence of macroeconomic factors on the capital adequacy ratio of developed countries. In contrast, macroeconomic factors do not influence the capital adequacy ratio of emerging countries. Only

real growth significantly influences the capital adequacy ratio of the emerging nation. Thus, based on the study's results, the null hypothesis stands to be rejected, which states that there is no influence of the macroeconomic factors on the capital adequacy ratio.

The following table summarises the results obtained:

3.1. Impact of Macroeconomic Variables on the Capital Adequacy

The study results align with those of Junos et al. (2021), which examined a sample of 20 countries, including both developed and developing nations, between 2008 and 2017. The study's results indicated that macroeconomic factors, such as growth rate and money supply, significantly affect companies' capital adequacy. Similarly, the study by Kalifa and Bektas (2017) found that all the variables, including inflation, exchange rate, money supply, broad money, and interest rate, significantly influence the banks' capital adequacy ratio. However, it also stated that the influence of the macroeconomic variables on the developing nations' CAR is lower and insignificant. In other words, there is an insignificant influence of the macroeconomic factors found on the developing nations' CAR. Therefore, in the current study, the combined results are positive signs.

However, there are contradictory results found in the study by Hewaidy and Alyousef (2018). The characteristics of the banks significantly influence the capital ratios of the banks, such as the net interest margin, asset quality and management quality. In contrast, there is no such influence of the macroeconomic variable, such as the growth of GDP, inflation or interest rate, on the capital adequacy ratios.

3.2. Impact of Macroeconomic Variables on the Capital Adequacy of Developed Economies

In the United States, the United Kingdom, and the European Union, banks need to maintain high capital adequacy ratios to sustain economic markets under the influence of macroeconomic factors. In the developed economy, inflation, interest, and broad money have significantly influenced the capital adequacy ratio. The inflation rate has shown an influence on capital adequacy when the inflation in the economy is more than the markets are more uncertain. In other words, when the inflation in the economy rises, people are not willing to spend more and want to save more. Therefore, the banks are left with a higher capital level.

Many uncertain macroeconomic factors in financial markets affect economic fluctuations. The emergence of the banking supervision mechanism will reduce market turmoil to a certain extent. However, the occurrence of financial crises is unpredictable, which means banking supervision has limitations. The purpose of ensuring the stability of the bank's capital adequacy ratio is to reduce bank risks, thereby reducing the occurrence of economic crises. If a financial crisis happens, both the banking regulatory regime and risk assessment will be affected (Claessens, S. and Horen, N.V.; 2015). For example, the Bank of England has the banks' minimum capital requirement (Joe Wallace; 2025). For all banks, supervisory expectations are limited to developed economies. When banks have large quantities of long-term loans, the liquidity of bank capital will decrease (Kalifa, W., & Bektas, E. 2018). Therefore, after the financial crisis, banks and financial institutions usually conduct stricter checks on asset liquidity to strengthen regulatory mechanisms. This is to improve the supervision mechanism. Then, the bank capital adequacy ratio is also one of the variables to balance market development (Schornmaker, D.; 2015).

In contrast, the borrowing will also have an influence that impacts the risk of solvency and liquidity in the banks. This influences the company's requirement for holding capital. The interest rate has a negative influence on the capital adequacy ratio. The bank deposits and lending flow decrease when the economy's interest rate rises. The high deposits lead to a decline in the money supply in the economy, so the recession starts. There are higher deposits

in the banks. The central bank demands that there is a need to have more safety against insolvency. If the demand for money rises, the bank will not be able to manage the risk. Therefore, the banks need to maintain a higher capital adequacy level due to the long-term. The results of the current study for the developed economies are similar to those obtained from Yüksel and Ozsari (2017). Meanwhile, the results are similar to those of Syed and Aidyngul (2020), who stated that there is a significant impact on the interest rate, broad money and inflation of the companies' capital adequacy. Similarly, in the study by Kanngiesser, et al. (2019), the developed nations, including Spain, Germany, Italy, and France, were examined, and the results of the study stated that there is a significant influence of the macroeconomic variables on the capital buffer of the banks. It showed that in the event of uncertainties like inflation rise, the banks prefer to hold a high level of capital adequacy. Therefore, it can be said that capital adequacy significantly influences the capital adequacy level of developed nations.

3.3. Impact of Macroeconomic Variables on the Capital Adequacy of Emerging Economies

In China, Malaysia, and Indonesia, banks are only influenced by real growth ratios in economic markets under the influence of macroeconomic factors. The study results contributed to the previous literature, which can be helpful for policymakers of the different countries of emerging nations. While formulating the fiscal and monetary policies, the authorities can understand the impact of such policy changes on the various macroeconomic variables and the capital adequacy level of the banks. From the results, it can be stated that the macroeconomic variables changes in the developed nations have more influence on the capital regulation and no such influence on the capital regulations of the emerging nations. Therefore, the results found that with the occurrence of the adverse impact, there is a positive influence on capital adequacy, increasing with the crises.

The study's results showed the insignificant influence of the macroeconomic factors, except for the real growth rate, on the capital adequacy ratio. The results are similar to Hewaidy and Alyousef's (2018) research, which undertook a sample of the banks in Kuwait. Then, it found that there is no such influence of the macroeconomic factors on the capital adequacy levels. Similarly, a study conducted on the case of the Indian banks by Anshu and Gakher (2019) found that there is no such influence of the macroeconomic variable on the capital adequacy of the banks. Furthermore, Pradhan & Shrestha (2016) also found that taking the sample of the small country that is Nepal, found no influence of the macroeconomic variables on the capital adequacy ratio. From the past evidence, the current results are supported. The macroeconomic variables do not influence the changes in the macroeconomic variables.

The study found contradictory results to the previous studies (Kalifa & Bektas, 2017) that found a significant influence of the macroeconomic variables on the CAR of emerging nations. Similarly, Anshu and Gakher (2019) and Loan and Khue (2021), found a significant influence of the various macroeconomic factors on the CAR of emerging nations. It is due to the economic market model part change, for example, the stock markets in China (Mahmoud, B.; Elgazzar, S. and Hanafy, K.; 2015). In the context of the results of the current study, the three countries undertaken as emerging nations, including China, Malaysia and Indonesia, have found no influence of the macroeconomic factors except the real growth rate. Therefore, the growth rate determines the capital adequacy level in these countries. While inflation, interest rate, and broad money do not influence the capital adequacy ratio.

4. Conclusion

This study compared the impact of macroeconomic factors on capital adequacy in developed and emerging economies using panel data from six countries (1998–2019).

The key findings are:

For developed economies (USA, UK, EU), CAR is significantly influenced by inflation, interest rate, and broad money, with high explanatory power ($R^2=60\%$).

For emerging economies (China, Malaysia, Indonesia), CAR is only affected by the real growth rate; inflation, interest rate, and broad money have no statistically significant effect.

Possible explanation: Emerging economies' bank capital management may rely more on internal factors (e.g., asset quality, regulatory requirements, ownership concentration) and less on macroeconomic fluctuations. Additionally, the transmission mechanism of monetary policy may be weaker or slower in these countries, reducing the direct impact of interest rates and inflation on bank capital decisions.

Policy implication:

In developed economies, central banks and macroprudential authorities should monitor inflation and interest rate movements when adjusting policy, as these directly affect bank capital buffers. Stability-oriented policies (e.g., credible inflation targeting) help maintain predictable capital adequacy levels.

In emerging economies, policymakers should focus on real growth dynamics and strengthen the transmission channels of monetary policy. Improving bank-level risk management and gradually moving towards market-based interest rates may increase the sensitivity of CAR to macroeconomic conditions over time.

Limitations and future research: The study aggregates EU countries as a single entity and excludes bank-specific variables. Future research could incorporate micro-level bank data, extend the country sample, and explore non-linear relationships.

References

- [1] Anshu, & Gakher, D. K. (2019). A study of macroeconomic factors influencing capital adequacy ratio of schedule commercial bank in India. *International Journal of Research and Analytical Reviews*, 6(2).
- [2] Claessens, S., & Horen, N. V. (2015). The impact of the global financial crisis on banking globalization. *IMF Economic Review*, 63(4), 868–918.
- [3] Hewaidy, A. M., & Alyousef, H. Y. (2018). Bank-specific and macroeconomic determinants of capital adequacy ratio: Evidence from Kuwaiti banks. *European Journal of Economics, Finance and Administrative Sciences*, 99, 5–20.
- [4] Junos, S., Ma'in, M., & Jalil, S. A. (2021). Assessing the impact of macroeconomic variable and macroprudential policy element on the capital adequacy ratio. *International Journal of Academic Research in Business and Social Sciences*, 11(8), 390–411.
- [5] Wallace, J. (2025, December 2). U.K. loosens bank capital demands for first time since financial crisis. <https://structuredfinance.org/bank-of-england-lowers-capital-requirements-for-u-k-banks/>
- [6] Kalifa, W., & Bektas, E. (2018). The impact of bank-specific and macroeconomic variable on the capital adequacy ratio: evidence from Islamic banks. *Applied Economics Letters*, 25(7), 477–481.
- [7] Loan, M. T., & Khue, T. T. (2021). Internal and macroeconomic factors affecting the capital adequacy ratio of commercial banks in Vietnam. *Academy of Strategic Management Journal*, 20(3).
- [8] Mahmoud, B., Elgazzar, S., & Hanafy, K. (2015). Impact of macroeconomic variables on stock markets: Evidence from emerging markets. *International Journal of Economics and Finance*, 8(1), 195.
- [9] Pradhan, P. D. R. S., & Shrestha, R. (2016, June 11). Impact of bank specific and macroeconomic variables on the performance of commercial banks of Nepal [Online]. pp. 1–17.
- [10] Syed, A. A., & Aidyngul, Y. (2020). Macro economical and bank-specific vulnerabilities of nonperforming loans: A comparative analysis of developed and developing countries. *Journal of Public Affairs*, 22(2).

[11]Yüksel, S., & Ozsari, M. (2017). Influencing factors of capital adequacy ratio of the deposit banks: A panel regression analysis for Turkish banking sector. https://paris2017.econworld.org/papers/Yuksel_Ozsari_Influencing.pdf