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## ESTIMATING WEIGHTED BANK BETA INDEX UNDER MACRO EFFECTS IN VIETNAM IN INDUSTRY 4.0 AND ROLES OF DIGITAL TRANSFORMATION FOR BETTER RISK MANAGEMENT INFORMATION SYSTEM

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### ABSTRACT

The applications of mathematics in finance have been developed widely in recent years. In our study, authors aim to propose weighted beta index formula in banking industry and then, factors that affect bank sustainable development, as well as risk management policies and strategies for commercial banks in Vietnam financial market. This study mainly use combination of quantitative methods (statistics, calculation formulas) and qualitative methods including synthesis, inductive and explanatory methods. Our study results show that first, because mean value of weighted beta in period 2011-2020 higher than beta in 2011-2016 time, we need to pay attention to risk management solution in bank system. Second, as CPI has negative impact while G, IM and R has positive impact on weighted beta: and Risk free rate have higher effects on market risks of banks, Ministry of Finance, State bank of Vietnam and relevant agencies need to control GDP growth as well as rates of Treasury bonds and lending rate (not increase so much) toward benefits for managing risk. And do not need to reduce CPI too much. Then we also mention the roles of digital data and transformation to help us to build better risk model and management information system at banks.

**Key words:** weighted beta index formula, Vietnam banks, beta CAPM, inflation, economic development, Vietnam  
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