

## **ABSTRACT**

*This study aims to examine the effect of carbon emission intensity on firms' financial performance and to evaluate the moderating role of commitment to the Science Based Targets initiative (SBTi). Using a panel dataset of 2,514 firms across 13 Asia-Pacific countries, the analysis employs panel data regression with Stata 17. Financial performance is measured through both accounting-based (Return on Assets/ROA) and market-based (Tobin's Q) indicators. The regression results reveal that CI has a negative and significant impact on both ROA ( $p < 0.01$ ) and Tobin's Q ( $p < 0.10$ ), indicating that higher carbon emissions tend to reduce profitability and firm value.*

*The moderating effect of SBTi is found to be statistically insignificant in mitigating the negative relationship between CI and financial performance. However, firm participation in SBTi shows a direct and significant positive effect on market valuation (Tobin's Q), suggesting that such sustainability commitments are positively perceived by investors, even if they do not immediately offset the financial impact of carbon emissions.*

*Further analysis based on country classification (advanced vs. developed countries) reveals that the negative impact of CI on financial performance is consistent across both groups. Nevertheless, in developing countries, SBTi adoption has a significantly positive effect on both ROA and Tobin's Q, unlike in developed countries. This implies a stronger effect of sustainability efforts in emerging markets. Additionally, sectoral analysis shows that CI negatively affects ROA in both carbon-intensive and non-carbon-intensive sectors. However, SBTi adoption only demonstrates a significantly positive effect on Tobin's Q in non-carbon-intensive sectors, where environmental initiatives may still be novel and thus more valued by the market. Overall, the findings highlight the importance of regional and sectoral contexts in assessing the financial relevance of corporate sustainability strategies.*

*Keywords: Carbon Emission, Firm Performance, SBTi*

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