

# Does credit quality affect the market capitalization of public MSMEs? An insight from transnational economies

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## Abstract

Market capitalization (market cap) is indispensable for the growth of micro, small and medium enterprises (MSMEs) as it strengthens their credit quality and improves internal stability. However, market cap strategies of MSMEs particularly located in developing Asian economies are under limelight due to the decreasing credit quality. Accordingly, this study aims to explore the methods to optimize the market cap of Asian MSMEs by contextualizing the factors of credit quality. We operationalized non-performing loans (NPLs), loans outstanding (LO), and non-bank financing (NBF) as the indicators of credit quality and examined their impact on market cap. The panel data between 2011 to 2020 was analyzed to estimate the impact of credit quality on the market cap of sampled MSMEs. The findings show that LO and NBF have a significant (strong/moderate) and positive, whereas NPLs have an insignificant and positive effect on the market cap. This study contributes to suggesting economic diversification strategies by capturing a better market share for MSMEs coupled with dynamic indicators of credit quality.

**Keywords:** Market capitalization; credit quality; MSMEs non-performing loans; outstanding bank loans; non-bank financing

## 1. Introduction

Micro, small, and medium enterprises (MSMEs) are recognized as potential drivers of economic growth and financial transformation in developing countries as they contribute to sustainable economic growth, employment opportunities, and social stability of countries with limited resources (Dasaraju and Tambunan, 2023). According to the World Bank's topical collection on 'Understanding Poverty', 2 out of 3 private sector jobs and 62% of the domestic workforce in Asian businesses are concentrated in MSMEs. The economists and economic data of international organizations such as the World Bank, International Monetary Fund (IMF), and Asian Development Bank (ADB) indicate that MSMEs account for 40% of the national income (GDP) and generate most formal jobs (7 out of 10) in emerging economies (Endris and Kassegn, 2022). Although MSMEs are the key strategic players in the economies of developing Asian economies, the sector continues to face serious challenges due to a lack of support from regulatory authorities and financial institutions (Qi et al., 2025).

MSMEs in developing and least-developed countries (LDCs) face numerous challenges such as a lack of unified policy and regulatory framework, access to basic infrastructure, women's participation in entrepreneurship, and

information and capacity gaps (Kumar and Roy, 2025; Lee et al., 2024). Among these challenges, the limited availability of financial resources and access to financing facilities are considered major obstacles to the growth of Asian MSMEs (Baños-Caballero et al., 2016; Chang et al., 2022; Kumar and Rao, 2015; Kersten et al. 2017; Liu, 2018). These challenges arise due to variances in financial conditions among different countries reducing the market capitalization (market cap) which is often linked to economic growth and financial stability of firms (Dokmen et al. 2015; Raza and Jawaid, 2014; Said et al., 2022). The characteristics of Asian MSMEs largely differ due to the differences in access to financial resources, for example, the financial gap to GDP for certain countries including the Philippines, Afghanistan Myanmar, and Indonesia is high (Kumar et al., 2025). Whereas, this gap is lower for Vietnam, India, Thailand, and Malaysia. MSMEs operating in countries characterized by a wide financial gap to GDP have lower access to bank credit as banks tend to avoid investing in risky ventures (Ben Amor et al., 2022). Taking together the wide finance-to-GDP gaps and the unavailability of credit from banks, little is known about the available methods to maintain a reasonable credit quality for the regular functioning of MSMEs in developing countries. This leads to the first research question (RQ1) of this study.

RQ1: How to optimize the market cap of MSMEs operating in developing countries?

A recent report by ADB (2021) highlighted banks' propensity to finance large companies compared to MSMEs as financial portfolios of large firms are publicly available and are properly audited indicating that MSMEs require unconventional financing to boost their credit quality. Following the need to optimize the credit quality requirements of MSMEs, jurisdictions in emerging economies have developed new methods of financing which cater to their financial needs as well as create an MSMEs-friendly capital market ecosystem. Reflecting on the findings of seminal studies on unconventional financing methods, MSMEs may use debt financing to improve their credit quality as it is readily available, decreases capital cost, and improves firms' value (Rhoudri and Ougoujl, 2024). In this regard, MSMEs' non-performing loans (NPLs), loans outstanding (LO), and non-bank financing (NBF) can be used to fulfill financing needs to optimize the credit quality. Prior studies have suggested the effectiveness of these methods to improve MSMEs' value, resolve credit issues, and increase their market cap (Beck et al., 2008; Beltrame et al., 2023; Yoshino and Taghizadeh-Hesary 2017). A few developing countries such as Bangladesh, Pakistan, and Vietnam have employed these financing strategies, and MSMEs in these regions captured larger market cap compared to the MSMEs that continued relying on conventional financing methods. However, these assumptions are normative and conceptual, and empirical literature lacks convincing evidence about the effectiveness of unconventional methods in improving the market cap of MSMEs. Accordingly, our second research question (RQ2) is as follows;

RQ2: How do unconventional financing methods improve the market cap of MSMEs in developing countries?

The plethora of literature on the market cap of MSMEs in Europe and developing countries indicate good performance of market cap and a direct impact on economic growth. A multiple regression analysis of a recent study confirmed that innovative investments positively improve the market cap of European firms (Puertas et al., 2022). Another study on the development and innovation of MSMEs' stock market deliberated a limited and short-term impact on the economic growth of Hong Kong, Singapore, Thailand, and Malaysia (Nguyen et al., 2020). Similarly, the findings of a few novel studies on the market cap of Indian MSMEs established that the strategic distribution of Indian MSMEs may improve their market cap to enhance their contribution to economic development (Amutha, 2022; Bhatia and Kumari, 2024). An emerging study on a developing country projected that the social inclusion of minorities improves the market cap of MSMEs for optimal economic development (Alalawi et al., 2025). Some

seminal studies have also linked improvements in the capital market of MSMEs to positive changes in market cap and economic growth (Demirgüç-Kunt and Levine, 1996; Kolapo and Adaramola, 2012; Kumar, 2014; Quaidoo 2011; Tudor et al., 2014). The findings of these studies associated different factors to maximize the market cap of MSMEs which can be classified as firm level and country specific elements (Lu and Beamish, 2001).

To the best of the researcher's knowledge and an in-depth survey of the literature revealed the lack of studies on the relationship between credit quality and the market cap of MSMEs. The dearth of studies mainly exists due to over emphasize laid by scholars on investigating the market cap of small and medium enterprises (SMEs) (Serrasqueiro and Maças Nunes, 2008). Even these studies on market cap of SMEs primarily focus on examining their financial performance by linking it to non-financial measures of internationalization, product innovation and pricing, and communication strategies (Falahat et al., 2020). Whereas, financial instruments such as credit quality and market cap are integral components of financial performance raising concerns whether the financial measurements employed by past studies can be used for estimating financial performance. Taking together the conceptual gaps in literature and the lack of consistency in the findings of previous studies on MSMEs, the current research aims to unpack the factors associated to market cap of MSMEs located in Asia.

Accordingly, the present study aims to document the emerging indicators of credit quality and their impact on the market cap of MSMEs in developing Asian countries. Our research expects to deliver several novel contributions to the knowledge and for practical consideration. First, the findings of this study empirically link the determinants of credit quality and their impact on the market cap of MSMEs contributing to the existing applications of credit quality as an innovative strategic financing tool which can be used to manage the dynamic business environment. Second, the current study suggests new methods of optimizing the market cap of MSMEs through an established financing tool (credit quality) which contributes to probing recommendations to the regulators of developing Asian countries looking for recognized and long-term solutions to maximize the market cap. Third, the practitioners of MSMEs may consider the outcome of this research to improve their financial portfolios by leveraging suggested methods to optimize market cap which eventually contributes to improving the financial performance, expansion, and conversion of MSMEs to large firms. Fourth, our findings expect to offer theoretical and methodological underpinnings to investigate the impact of credit quality on the market cap of MSMEs contributing to laying the foundation for future studies in similar research domains.

The remaining study covers literature review and hypothesis development in section two. The research methods employed for data collection and analysis are outlined in section three. The main findings are reported and discussed in section four. Finally, section five concludes this research.

## **2. Literature review**

### *2.1 Indicators of credit quality*

Nasdaq and Fitch Ratings defined it as the ability of borrower to repay the interest on loans and described it as the predetermined mixture of debt and equity used for financing a company's assets and operations. From a company's perspective, equity is considered expensive yet a permanent source of financing as it has higher financial flexibility. Some scholars describe credit quality as the outcome of market conditions, decisions taken by the corporates, and credit ratios of fund providers (Kumar et al., 2020). The fundamental theories of described it as an indicator of the riskiness of a company's borrowing (Modigliani and Miller, 1958). The dynamic changes

in the business environment led to the modification of the estimation methods used for measuring credit quality (Ardalan, 2017).

The research on credit quality has trended in finance literature over seven decades and different concepts and determinants of credit quality are projected by the researchers (Abdullah and Tursoy, 2021; Czerwonka and Jaworski, 2021; Krištofik et al. 2022). The extant literature indicates the prevalence of two main theories of the credit quality known as the trade-off theory and the pecking order theory (Martinez et al., 2019). The past studies on the factors influencing the credit quality of a company indicate that a number of factors contribute to organizational decision-making implying that firms' internal conditions, external environment, and attributes are key to credit quality. Prior studies have grouped these factors of credit quality into three broad categories known as the firm, industry, and the economic conditions of host countries (Hall et al., 2004; Psillaki and Daskalakis, 2009; Jøeveer, 2013; Moritz et al., 2016; Kenourgios et al. 2019). The underlying differences between large firms and MSMEs make it difficult to unify the common factors of credit quality hence, it is essential to categorize the determinants of MSMEs (Ang, 1992).

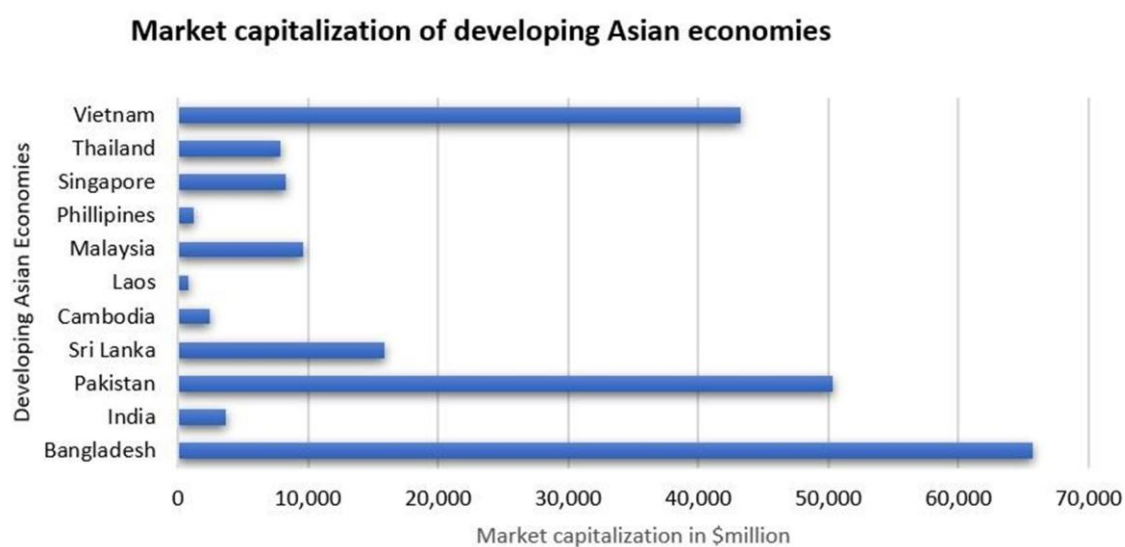
Similarly, the significance of the determinants of MSMEs' credit quality has remained a cornerstone of research on MSMEs for more than two decades (Daskalakis et al., 2017). The research on the determinants of credit quality in MSMEs was driven by two main factors (1) considerable differences in the financing mechanism of MSMEs compared to large firms and (2) underlying conditions for the estimation of the determinants of credit quality. Torrès and Julien (2005) applied an established theory to highlight the significance of managerial decision-making and the specifications of MSMEs and concluded both factors as important determinants of credit quality. Some studies have also contextualized the macroeconomic factors to the credit quality of MSMEs as macroeconomic conditions may alter available financing options and firms may require adjustments in their leverage to stay in a safe macroeconomic state (Choe et al., 1993; Hackbarth et al., 2006). In the context of Asian MSMEs, previous studies concluded that multiple factors serve as the determinants of capital including firm-specific (Czerwonka and Jaworski, 2021), macroeconomic variables, short and long-term debt ratios (Daskalakis et al., 2017), trade credit, corporate governance, and bankruptcy (Narayan et al., 2011), and low credit risk (Li et al., 2019). Nonetheless, the studies on the determinants of the credit quality of MSMEs have focused on the conditions and methods of maximizing credit quality and do not highlight the effectiveness of these determinants in enhancing the market cap of firms.

## *2.2 MSMEs' Market cap*

Wall Street Prep defines market cap as 'the total value of a firm's common shares outstanding to its equity holders.' It is often used interchangeably with equity value as it determines a firm's value of its common equity on the latest market close. Bankers and finance academicians describe market cap as the market value of a firm which is the actual price paid to buy a company's shares. The size and growth of a company are considered important indicators of the success and failure of a publicly listed company (Dias, 2013). Over the years, different methods and measurements of market cap have evolved due to its implementation in different industries such as banking (Aali-Bujari et al., 2017), housing (Laquatra et al. 2002), and energy (Ewing and Thompson, 2016) to estimate growth and developments. However, a common method to estimate market cap is multiplying the number of shares of the company by the current price of the shares.

Although the market cap of MSMEs has a positive impact on growth and innovation both in the short and long term (Kuvshinov and Zimmermann, 2022; Panagiotidis, 2005), the prevalence of limited financing renders it difficult to hold this claim. This is because the capital markets in Asian countries are still underdeveloped and the financial market is still dominated by banks (Abdulrahman Anam et al., 2011; Van Anh Do, 2022). This indicates that the source of bank funding is still determined by bank credit. According to the ADB report (2018) dominance of bank credit for MSMEs in Malaysia is almost 90 percent, China 80 percent, and India 70% highlighting the need for alternative financing sources for sustainable market cap. A recent report by ADB (2021) on the market cap of MSMEs confirm fluctuations in the growth of MSMEs due to the differences in the credit quality in Asian economies (see Figure 1). The report also highlighted the need for financial training programs for MSMEs for better financial literacy and optimal growth of market cap.

Figure 1. Market cap of MSMEs in developing Asian countries.



Accordingly, the present study aims to investigate the available options for optimizing the credit quality in a way that the market cap of Asian MSMEs shows an upward trend. The present study is motivated due to several factors such as the dominance of MSMEs in developing Asian economies contributing to sustainable economic growth, job creation, and investment. Further, a large number of Asian MSMEs have limited access to the capital markets due to their sizes therefore, it is interesting to investigate how these MSMEs fulfill their financing needs to maintain their market cap.

Market Cap can be explained through the lens of different finance theories (Narayan et al. 2011). The decision to optimize the credit quality or financial leverage is guided by the composition of debt and equity as it directly affects the market value of the firm (Stephie Tsai et al., 2021). Hence, it is inferred that the optimum combination of debt and equity affects the cost of capital eventually influencing the market cap of firms. In an effort to maximize shareholder profits, global organizations frequently increase debt capital with taxes to maximize shareholders' profits allowing equity holders to avoid sharing the profits and gain a fixed return (Kumar & Shah, 2009). However, a high debt may increase the risk of a high cost of capital and place the market cap of firms in a risky position. Indeed, firms are required to carefully identify the mechanisms used for enhancing the credit quality so that the market cap remains stable.

### *2.3 Hypothesis development*

An overview of corporate finance literature indicates the prevalence of trade off- and pecking order theories in determining the factors influencing firms' credit quality (Martinez et al., 2019). A few studies have validated the use pecking order theory in analyzing the factors affecting credit quality in firms (Due Hoang Quan, 2002; Frank and Goyal, 2008; Tong and Green, 2005). Generally, pecking order theory suggest firms using their internal financing sources to gain capital instead of external debt and equity sources which is not a feasible option for MSMEs which are attributed to have limited financial resources (Frank and Goyal, 2008). Following the context of this study, the presents study employs the trade-off theory to analyze the impact of credit quality on the market cap of MSMEs in developing Asian economies. This theory was developed by Myers (1984) and Myers and Majluf (1984), who modified Kraus and Litzenberger (1973) and Modigliani and Miller's (1958) concepts about market value of a firm in an ideal capital market is independent of credit quality. The dynamic changes in the business environment transformed these assumptions leading to predict that the credit quality and market value of a firm are interconnected (Ardalan, 2017). The changes in the assertions of trade-off theory are also confirmed by a few other studies and are applicable to MSMEs (Kumar et al., 2020).

The rudiments of trade-off theory predict that credit quality optimization in MSMEs relies upon the factors such as financial distress and bankruptcy as it creates tax benefits and provides debt financing (Martinez et al., 2019). Debt enables tax shields and offers opportunities for managers to create incentives for the optimization of shares in the capital (Czerwonka and Jaworski, 2021). Past studies on enhancing the financing in MSMEs have also confirmed the significance of institutional and macroeconomic factors to optimize the market cap of firms (Jõeveer, 2013; Kenourgios et al. 2019). Accordingly, firms need to consider these factors while deciding to enhance credit quality through debt financing. The trade-off theory further argued that the costs of servicing debt led to financial difficulties and bankruptcy which may result in incentives for the reduction of debt implying that firms need to balance the debt benefits and costs to optimize credit quality (Baxter, 1967; Kim, 1978). Hence, firms looking to optimize their credit quality are expected to select debt financing options having equal servicing costs and benefits (Ivashina et al., 2022). The modified version of the trade-off theory further asserts that indebtedness or repayment of debts/loans at a predetermined pace maximizes the credit quality of firms (Kayhan and Titman, 2007; Leary and Roberts, 2005). These assumptions guided us to contextualize the debt financing options containing the above features to optimize credit quality and their impact on the market cap of MSMEs.

Following the logic of the trade-off theory on the significance of institutional factors in deciding financing decisions, it is projected that NPLs can be used to optimize the credit quality of MSMEs (Chen and Lee, 2023; Hall et al., 2000). The relationship between NPLs and credit quality is complex due to multifaced nature and impact on firms' credit and debt financing. NPLs are characterized by weak institutions and poor macroeconomic conditions leading to higher NPLs (Ozili et al., 2020). These features of NPLs also fit into MSMEs in Asian economies implying that higher NPLs may negatively affect the credit quality of MSMEs. Firms with higher NPLs are expected to face the higher credit risk and difficulty in obtaining debt financing which may increase their risk reducing market cap of such firms. The findings of past studies have confirmed the management of NPLs as a policy tool to optimize the credit quality for a better market share of firms (Ding & Sickles, 2018; Grosse-Rueschkamp et al., 2019). Based on the proceeding discussion, the first research hypothesis (H1) is as follows;

*H1: NPLs affect the market cap of MSMEs.*

Another assumption of trade-off theory outlines that financial distress and bankruptcy create a tax shield that may serve as a financing tool (Burger et al., 2022; Martinez et al., 2019). MSMEs in Asian economies often require such financing to optimize credit quality as bankruptcy and the need for tax shields are prevalent in these economies due to the lack of conventional financing (Daskalakis et al., 2017). LO frequently attributed to bankruptcy and tax shield may serve as a financing tool to increase the credit quality of MSMEs. The findings of numerous studies have linked LO to capital formation for enhancing the market value of firms (Hoque et al., 2011; Leary, 2009; Lucey & Zhang, 2011). The above argument leads us to propose the second research hypothesis as follows;

*H2: LO affect the market cap of MSMEs.*

Another perspective of trade-off theory asserts that getting indebted and repaying loans at a predetermined pace enhances credit quality (Scot, 1976). This logic can be applied to NBF for improving the credit quality of MSMEs lack funding from conventional credit providers. MSMEs in developing economies are often face problems in obtaining financing from banks forcing them to fulfill their financing needs through private equity, venture capital, hedge funds, crowdfunding, peer-to-peer lending, and other. Such financing is obtained at a higher interest rate raising issues in establishing optimal credit quality for firms which alternatively influence market cap of firms. NBF is critical for financing routine operations and fulfilling the capital requirements of MSMEs. Prior studies on maximization of credit quality through NBF have highlighted its impact on increasing the market share of firms (Allen et al., 2015; Cebenoyan and Strahan, 2004; Gropp and Heider, 2010). Thus, our third hypothesis (H3) is as follows;

*H3: NBF affect the market cap of MSMEs.*

### **3. Methods**

#### *3.1 Sampling and data*

This study investigates whether credit quality characterized by NPLs, LO, and NBF influence the market cap of MSMEs in developing Asian economies between 2011-2020. To achieve the objectives of this study, we followed Ali et al.'s (2023) methodological approach in sampling, data collection, and data analysis. The selection of the time is crucial for this study as MSMEs in Asian economies experienced significant growth during this period (Tumiwa and Nagy, 2021). The market cap of MSMEs was relatively higher at the start of 2011 and started stabilizing onwards till 2020 therefore, we expect a clear difference in the economic growth of developing countries selected for this study. Altogether, 730 MSMEs operating in five different sectors (agriculture, manufacturing, transportation and communication, Construction and Wholesale and retail trade) of developing Asian economies namely Bangladesh, India, Pakistan, Indonesia, Laos, Malaysia, and Singapore are sampled in this research. These Asian economies have the highest number of MSMEs and are considered major economic contributors hence, the selection of these economies is expected to offer interesting insight into the indicators of credit quality and market cap.

#### *3.2 Experimental variables*

This study operationalized four main variables. The credit quality is operationalized as an explanatory variable and represented by NPLs, LO and NBF. While the market cap is an outcome variable and is represented by MC. Following the empirical assumptions of this research, it is projected that the credit quality indicated by NPLs, LO,

and NBF of MSMEs may influence (positively/negatively) the market cap of developing countries. Credit quality is determined by creating proxies of NPLs, LO, and NBF, whereas, the market cap is estimated through a proxy of the total value of common shares held by equity holders. The use of proxies and dummy variables to estimate our variables is common in finance research hence, it is expected that our proxies are likely to represent the experimental variables (Czerwonka & Jaworski, 2021; Daskalakis et al., 2017).

Credit quality is an explanatory variable and is represented by the proxies of NPLs, LO, and NBF. These are estimated by total non-performing loans, loans outstanding, and non-bank financing received by MSMEs and represented in local currencies. The use of these proxies to determine market cap is relevant as NPLs, LO, and NBF are recognized as exceptional indicators of credit quality and past studies have also employed these proxies to investigate the credit quality of firms (Dokmen et al. 2015; Raza and Jawaed, 2014).

Market cap is a response variable, indicated by MC proxy and estimated by the total value of common shares held by the equity holders. The use of the total value of common shares held by equity holders is consistent with the findings of previous studies highlighting that the total value of common shares held by equity holders determines the actual market cap of a firm (Dias, 2013; Kumar, 2014; Panagiotidis 2005).

LEV is a control variable which is the proxy of leverage and computed by the ratio of total debt divided by total assets. It is used as a control variable of NPLs as the firms with higher NPLs are likely to engage in riskier lending to achieve high returns required to settle their debt obligations (Ghosh, 1997; Kim Quoc Trung, 2022). CRs is operationalized as a control variable and is estimated by the credit ratings assigned to MSMEs. Firms LO in a credit quality is assessed by the credit rating agencies to assign different ratings often used to assess the level of risk. Firms with higher credit ratings exhibit lower LO and vice versa which may influence their credit quality (Benmelech and Dlugosz, 2009; Langohr and Langohr, 2010). We also employed MSMEs' size (SIZE), profitability estimated by a proxy of return on assets (ROA), and consumer price index (CPI) determined by the proxy of annual inflation rate (INF) as control variables. These variables are imported from extant literature to prevent the issues of bias and capture heterogeneity in the credit quality and market cap over the years. Past studies analyzing the impact of credit quality on the market cap of MSMEs have deliberated that SIZE, ROA and CPI are exceptional indicators of market cap of firms (Kumar, 2014; Li et al., 2019) hence, it is crucial to control these variables while estimating market cap through other indicators to ensure the robustness of results. The research variables of this study are tabulated in Table 1.

Table 1. Research variables and their measurements.

| Variables            | Type        | Symbol | Effect | Source                                                     | Estimations                                                                            |
|----------------------|-------------|--------|--------|------------------------------------------------------------|----------------------------------------------------------------------------------------|
| Market cap           | Dependent   | MC     | ±      | Manual data collection from ADB reports on MSEM's monitor. | It is estimated by adding the total value of common shares held by the equity holders. |
| Non-performing loans | Independent | NPLs   | ±      | Manual data collection from ADB reports on MSEM's monitor. | Log of total non-performing loans in local currencies.                                 |
| Loans outstanding    | Independent | LO     | ±      | Manual data collection from ADB reports on MSEM's monitor. | Log of total loans outstanding in local currencies.                                    |
| Non-bank financing   | Independent | NBF    | ±      | Manual data collection from ADB reports on MSEM's monitor. | Log of total non-bank financing received by MSMEs in local currencies.                 |

|                    |         |      |   |                                                            |                                                                                                                                                                                                                                                                |
|--------------------|---------|------|---|------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Leverage           | Control | LEV  | ± | Manual data collection from ADB reports on MSEM's monitor. | It is computed by the ratio of total debt divided by total assets.                                                                                                                                                                                             |
| Credit ratings     | Control | CRs  | ± | Manual data collection from ADB reports on MSEM's monitor. | We use respective countries' regulations about liquidity requirements for MSMEs to assign credit ratings. MSMEs that meet minimum liquidity requirements are estimated as '1' and '0' is assigned to MSMEs which do not fulfill formal liquidity requirements. |
| MSMEs' Size        | Control | SIZE | ± | Manual data collection from ADB reports on MSEM's monitor. | This was estimated by the natural logarithm of annual growth in total assets.                                                                                                                                                                                  |
| Return over assets | Control | ROA  | ± | Manual data collection from ADB reports on MSEM's monitor. | It is estimated by the ratio of net income divided by total assets                                                                                                                                                                                             |
| Inflation rate     | Control | INF  | ± | World Bank & ADB                                           | INF was estimated by computing the annual inflation rate.                                                                                                                                                                                                      |

### 3.3 Econometric model

While measuring the effect of credit quality on the market cap, it is essential to ensure the reliability and validity of results by employing a relevant approach. Generally, time-based panel data suffer from endogeneity and causality issues in statistical analysis which may affect the results of the study (Blundell and Bond, 1998). Hence, it is essential for researchers to carefully identify a suitable technique to overcome these issues in self-reported data through an appropriate statistical model (Ali et al., 2023; Bell and Jones, 2015). The panel data can be analyzed using ordinary least squares (OLS), 2-stage least squares (2SLS), and generalized method of moments (GMM) techniques. These techniques have their pros and cons such as OLS uses pooled regression through a single regression of large datasets which may contain endogeneity and heterogeneity issues (Gujarati and Porter, 2009). 2SLS may allow addressing these problems to some extent however it fails to record the dynamism between latent variables. Following the dynamic nature of our datasets and surge for eliminating the endogeneity and heterogeneity issues, GMM regression approach is preferred in this study to examine the impact of credit quality indicators (NPLs, LO, and NBF) on the market cap of MSMEs.

Thus, the GMM regression model is as follows;

$$MC_{it} = \emptyset 0 + \emptyset 1NPL_{sit} + \emptyset 2LO_{it} + \emptyset 3NBF_{it} + \emptyset 4C_{it} + \alpha_i + \epsilon_t \quad (1)$$

In Equation (1) MC is the market cap and a response variable;  $\emptyset$  is the coefficient of the degree of change; NPLs, LO, and NBF are the explanatory variables which represents non-performing loans, loans-outstanding, and non-bank financing, C is control variables; i determines each firm, t is the year, and  $\alpha_i$  symbolizes the error term.

Since NPLs, LO, and NBF are the indicators of credit quality, therefore, to test the hypothetical linkage (H1, H2, and H3) we created following econometric models;

$$MC_{it} = \emptyset 0 + \beta 1MC_{it-1} + \emptyset 1NPL_{sit} + \emptyset 2LEV_{it} + \emptyset 3CR_{sit} + \emptyset 4SIZE_{it} + \emptyset 5ROA_{it} + \emptyset 6INF_{it} + \alpha_i + \epsilon_t \quad (2)$$

$$MC_{it} = \emptyset 0 + \beta 1MC_{it-1} + \emptyset 1LO_{it} + \emptyset 2LEV_{it} + \emptyset 3CR_{sit} + \emptyset 4SIZE_{it} + \emptyset 5ROA_{it} + \emptyset 6INF_{it} + \alpha_i + \epsilon_t \quad (3)$$

$$MC_{it} = \emptyset 0 + \beta 1 MC_{it-1} + \emptyset 1 NBF_{it} + \emptyset 2 LEV_{it} + \emptyset 3 CR_{sit} + \emptyset 4 SIZE_{it} + \emptyset 5 ROA_{it} + \emptyset 6 INF_{it} + \alpha_i + \epsilon_{it} \quad (4)$$

In equations (2), (3), and (4) MC is the market cap and a response variable;  $\emptyset$  is the coefficient of the degree of change;  $\beta 1 MC_{it-1}$  represents the first lagged of the dependent variable; NPLs, LO, and NBF are the explanatory variables which represents non-performing loans, loans-outstanding, and non-bank financing, LEV, CRs, SIZE, ROA, INF are control variables;  $i$  determines each firm,  $t$  is the year,  $\mu$  is the time effect (fixed), and  $\alpha_i$  symbolizes the error term.

The variables used in above econometric models are expected to establish panel data models containing time and cross-sectional features. Hence, it is established that our datasets are superior and may allow controlling heterogeneity problems often arise in cross-sectional data. Our datasets are assorted, extendible, and significant to record the higher number of observations to render integrated results (Gujarati and Porter, 2009). Based on the nature of data and the operationalization of the variables i.e., NPLs, LO, and NBF are endogenous to MC, it is inferred that our models are valid. Further, the validity of GMM regression technique can also be verified from the facts that it has the ability to restrict large panel data into small sample observations and produce robust results which do not rely on cross-sectional tests. To verify these assertions, we conducted Sargan and Arellano-Bond tests and found that instrumental variables do not contain autocorrelation (AR) problems delineating that GMM regression is suitable for data analysis.

### 3.4 Data analysis procedures

This research attempts to draw a correlation between credit quality and the market cap of MSMEs in developing countries by hypothesizing the impact on market cap. Indeed, the credit quality of MSMEs over the years has contributed to optimizing the market cap of developing countries motivating us to verify whether the indicators of credit quality (NPLs, LO, and NBF) improve the total value of MSMEs' common shares held by equity holders of the countries sampled in this research. This study uses secondary data which was obtained from the World Bank and Asian Development Bank (ADB) databases. These datasets are freely accessible from [<https://data.worldbank.org/topic/economy-and-growth>; <https://documents1.worldbank.org/curated/en/275161635138844218/pdf/Non-Performing-Loans-in-East-Asia-and-the-Pacific-Practices-and-Lessons-in-Times-of-COVID-19.pdf>; <https://www.adb.org/sites/default/files/publication/832521/road-map-online-platform-trade-nonperforming-loans.pdf>; <https://www.adb.org/sites/default/files/institutional-document/872636/adb-financial-report-2022.pdf>] and do not require permissions to use for research endeavors as both institutions regularly publish annual datasets of financial indicators of global MSEM. The panel data between 2011-2020 of market cap, and credit quality indicators (non-performing loans, loans outstanding, and non-banking financing) was drawn from ADB and the World Bank databases and was processed to Stata software for testing research hypotheses using GMM regression technique.

## 4. Results and discussion

The descriptive statistics of the main variables i.e., non-performing loans (NPLs), loans outstanding (LO), Non-bank financing (NBF), and market cap (MC) are reported in Table 2. It is notable that both predictor and outcome variables have positive mean and standard deviation values and have a meaningful distribution peak confirming the positive trend of NPLs, LO, NBF, and MC. The index values of 7.2597, and 6.1770, and 8.5749 shows the high

performance of NPLs, LO, and NBF and the values 3.2187, 2.882, and 5.9411 represents the low performance of NPLs, LO, and NBF from the panel of selected market cap indicators of MSMEs and is positively influenced by positive means and standard deviation values of NPLs, LO, and NBF. Further, an increase in the number of NPLs, NBF, and LO is likely to affect the market cap leading to infer that these indicators of credit quality may improve the market cap of MSMEs operating in developing Asian countries.

Table 2. Descriptive statistics of variables.

| Variables | Mean   | Std. Dev. | Min    | Max     | Skewness | Kurtosis | Obs |
|-----------|--------|-----------|--------|---------|----------|----------|-----|
| MC        | 4.7286 | 1.2739    | 2.7931 | 6.9649  | 0.2814   | 2.0928   | 730 |
| NPLs      | 5.2423 | 1.1919    | 3.2187 | 7.2597  | -0.0818  | 2.2965   | 730 |
| LO        | 5.0580 | 1.0891    | 2.8882 | 6.1770  | -0.8784  | 2.4234   | 730 |
| NBF       | 6.8541 | 0.7558    | 5.9411 | 8.5749  | 1.1430   | 3.5475   | 730 |
| LEV       | 2.4092 | 0.2413    | 0.7473 | 0.9126  | 0.8234   | 4.3728   | 730 |
| CRs       | 2.8686 | 2.5401    | 1.7826 | 7.4173  | 2.4485   | 3.3891   | 730 |
| SIZE      | 2.3771 | 2.5432    | 2.1718 | 18.4865 | 4.1531   | 2.5835   | 730 |
| ROA       | 3.0571 | 3.3680    | 0.7835 | 3.1832  | 1.4438   | 6.1846   | 730 |
| INF       | 2.1860 | 2.3648    | 3.8260 | 7.9843  | 4.1235   | 4.1638   | 730 |

The correlation matrix (Table 3) indicates the correlation between the variables of this research. We observe that NPLs, LO, and NBF are positively correlated with MC. Moreover, the correlation between NPLs, LO, and NBF was strong implying that these determinants of credit quality may significantly influence MC. Also, NPLs, LO, and NBF were negatively correlated with LEV establishing that these determinants of credit quality may not improve leverage of MSMEs in selected Asian countries. Another striking feature was a weak and positive correlation of NPLs and NBF with CRs, IR, SIZE, ROA, and INF delineating that NPLs and NBF can be leveraged as a tool to improve credit quality.

Table 3. Correlation matrix.

| Variables | MC     | NPLS    | LO      | NBF    | LEV    | CRs    | SIZE    | ROA | INF |
|-----------|--------|---------|---------|--------|--------|--------|---------|-----|-----|
| MC        | 1      |         |         |        |        |        |         |     |     |
| NPLS      | 0.5506 | 1       |         |        |        |        |         |     |     |
| LO        | 0.5178 | 0.83462 | 1       |        |        |        |         |     |     |
| NBF       | 0.4328 | 0.0461  | 0.04582 | 1      |        |        |         |     |     |
| LEV       | 0.0482 | -0.0319 | -0.0365 | -0.248 | 1      |        |         |     |     |
| CRs       | 0.0718 | 0.3116  | 0.3472  | 0.3385 | 0.0852 | 1      |         |     |     |
| SIZE      | 0.4675 | 0.3018  | 0.0396  | 0.5732 | 0.4619 | 0.0835 | 1       |     |     |
| ROA       | 0.2465 | 0.3580  | 0.4478  | 0.0861 | 0.0517 | 0.2961 | -0.3621 | 1   |     |
| INF       | 0.3186 | 0.0827  | 0.4718  | 0.0861 | 0.3290 | 0.4289 | 0.1285  | 1   |     |

The correlations between observable variables conferred that the econometric models of this study do not exhibit multicollinearity issues. This assertion is also verified by performing the Variance Inflation Factor (VIF) test. The results of the VIF test are presented in Table 4. The coefficients of VIF are less than the minimal threshold

(VIF > 10) which confirms that our regression models do not contain serious multicollinearity problems (Bring, 1994).

Table 4. Results of VIF test.

| Variables | VIF  | 1/VIF |
|-----------|------|-------|
| MC        | 0.87 | 1.145 |
| NPLs      | 1.33 | 0.751 |
| LO        | 1.27 | 0.787 |
| NBF       | 0.82 | 1.219 |
| LEV       | 0.76 | 1.315 |
| CRs       | 0.52 | 1.923 |
| SIZE      | 0.93 | 1.075 |
| ROA       | 0.81 | 1.234 |
| INF       | 1.25 | 0.800 |
| Mean VIF  | 0.95 |       |

Before testing the hypotheses, we addressed endogeneity issues in self-aggregated data. Usually, the problems of serial correlation, heteroskedasticity, multicollinearity, and heterogeneity can be resolved by employing GMM regression technique. To check heterogeneity problems, we tested cross sectional independence using Driscoll and Kraay's (1998) approach. The results of cross-sectional dependence presented in Table 5 confirms cross-sectional data independence.

Table 5. Cross-sectional dependence results.

|                              | MC    | NPLs  | LO    | NBF   | LEV   | CRs   | SIZE  | ROA   | INF   |
|------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Cross-sectional independence | 0.532 | 0.642 | 0.352 | 0.765 | 0.520 | 0.490 | 0.235 | 0.518 | 0.616 |
| Off-diagonal elements        | 0.414 | 0.517 | 0.347 | 0.365 | 0.406 | 0.427 | 0.292 | 0.381 | 0.702 |
|                              | MC    | NPLs  | LO    | NBF   | LEV   | CRs   | SIZE  | ROA   | INF   |
| Cross-sectional independence | 1.325 | 1.237 | 0.765 | 0.762 | 0.627 | 0.751 | 0.563 | 0.817 | 0.375 |
| Off-diagonal elements        | 0.628 | 0.751 | 0.574 | 0.454 | 0.307 | 0.718 | 0.494 | 0.637 | 0.295 |

The endogeneity issues were further checked by testing the cross-sectional coefficient value using Slope heterogeneity test. The results of Slope heterogeneity are presented in Table 6. It is notable that cross-sectional coefficients are identical which indicates that heterogeneity issues are not likely to affect the results of this study. Thereby, GMM regression technique is suitable for analyzing the self-aggregated data.

Table 6. Results of Slope heterogeneity.

| Models | Statistics     | Coefficient | <i>p</i> |
|--------|----------------|-------------|----------|
| MC     | Slope          | 0.747       | 0.238    |
|        | Adjusted slope | 0.783       | 0.498    |

To test the hypothetical propositions, we used different GMM regression models to analyze our 730 firm-year observations to capture the impact of the indicators of credit quality (NPLs, LO, and NBF) on market cap of MSMEs operating in the selected economies. The results of GMM regression analysis are presented in Table 7. A generic overview of the GMM regression indicates that NPLs, LO, and NBF are positively (significant/insignificant) associated with MC.

Table 7. Results of GMM regression analysis.

| <b>Dependent variables</b>     | <b>Model 1<br/>MC</b> | <b>Model 2<br/>MC</b> | <b>Model 3<br/>MC</b> | <b>Model 4<br/>MC</b> | <b>Model 5<br/>MC</b> | <b>Model 6<br/>MC</b> |
|--------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Lagged of dependent variables  | 0.058*<br>(0.021)     | 0.047**<br>(0.024)    | 0.041*<br>(0.019)     | 0.045**<br>(0.026)    | 0.038*<br>(0.018)     | 0.030**<br>(0.007)    |
| NPLs                           | 0.023<br>(0.010)      | 0.028***<br>(0.015)   | 0.024**<br>(0.012)    | 0.018<br>(0.022)      | 0.036***<br>(0.014)   | 0.026**<br>(0.009)    |
| LO                             | 0.018*<br>(0.007)     | 0.014***<br>(0.011)   | 0.021***<br>(0.004)   | 0.024*<br>(0.008)     | 0.017***<br>(0.005)   | 0.015**<br>(0.001)    |
| NBF                            | 0.028<br>(0.004)      | 0.029**<br>(0.002)    | 0.023**<br>(0.006)    | 0.038<br>(0.019)      | 0.032***<br>(0.006)   | 0.031**<br>(0.003)    |
| LEV                            | 0.036*<br>(0.016)     | 0.031***<br>(0.011)   | 0.037**<br>(0.020)    | 0.024**<br>(0.015)    | 0.021**<br>(0.014)    | 0.029*<br>(0.002)     |
| CRs                            | -0.043**<br>(0.020)   | 0.026***<br>(0.014)   | 0.025**<br>(0.010)    | -0.032*<br>(0.004)    | 0.036**<br>(0.012)    | 0.029**<br>(0.005)    |
| SIZE                           | 0.038*<br>(0.007)     | 0.046**<br>(0.021)    | 0.029*<br>(0.012)     | 0.033*<br>(0.011)     | 0.036***<br>(0.013)   | 0.048*<br>(0.019)     |
| ROA                            | 0.019*<br>(0.008)     | 0.017***<br>(0.004)   | 0.028**<br>(0.012)    | 0.034<br>(0.021)      | 0.025***<br>(0.010)   | 0.039**<br>(0.018)    |
| INF                            | -0.033*<br>(0.019)    | -0.029**<br>(0.008)   | -0.037*<br>(0.028)    | -0.036*<br>(0.017)    | -0.048***<br>(0.015)  | -0.041*<br>(0.024)    |
| Constant                       | 0.356***<br>(0.017)   | 0.243*<br>(0.227)     | 0.358***<br>(0.214)   | 0.265*<br>(0.318)     | 0.346**<br>(0.126)    | 0.374**<br>(0.243)    |
| Annual effect                  | Yes                   | Yes                   | Yes                   | Yes                   | Yes                   | Yes                   |
| AR(1) <i>p</i> values          | -2.08<br>(0.03)       | -2.04<br>(0.02)       | -2.16<br>(0.01)       | -2.17<br>(0.02)       | -2.21<br>(0.01)       | -2.19<br>(0.01)       |
| AR(2) <i>p</i> values          | -2.38<br>(0.18)       | 0.44<br>(0.21)        | 0.52<br>(0.13)        | 0.67<br>(0.33)        | 0.61<br>(0.19)        | 0.58<br>(0.26)        |
| Hansen test's <i>p</i> -values | 0.67                  | 0.58                  | 0.63                  | 0.55                  | 0.60                  | 0.53                  |
| Obs.                           | 713                   | 708                   | 697                   | 708                   | 693                   | 708                   |

Note. The definition and explanation of variables are available in Table 1.

Notes: \*\*\*, \*\* and \* denote 1%, 5% dan 10%.

*p*-values in parentheses indicate significance level.

To confirm the robustness of the empirical results, we performed an additional GMM regression test by switching the predictors with interest rate (IR) which indicates the macroeconomic condition essential for fulfilling the

financing needs of MSMEs and is estimated by computing the annual lending rates in the selected countries. The results of robustness checks estimated the impact of IR on market cap of MSMEs. The results of GMM regression presented in Table 8 indicates that our results are consistent with earlier findings (Table 7) as MC obeys an overall significant positive impact by IR.

Table 8. Robustness checks.

| <b>Dependent variables</b>     | <b>Model 1<br/>MC</b> | <b>Model 2<br/>MC</b> | <b>Model 3<br/>MC</b> | <b>Model 4<br/>MC</b> | <b>Model 5<br/>MC</b> | <b>Model 6<br/>MC</b> |
|--------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Lagged of dependent variables  | 0.036**<br>(0.017)    | 0.051***<br>(0.032)   | 0.043*<br>(0.012)     | 0.031**<br>(0.016)    | 0.057***<br>(0.033)   | 0.039**<br>(0.018)    |
| IR                             | 0.019**<br>(0.009)    | 0.042***<br>(0.021)   | 0.038**<br>(0.020)    | 0.026**<br>(0.015)    | 0.039***<br>(0.024)   | 0.035***<br>(0.021)   |
| LEV                            | 0.017**<br>(0.008)    | 0.012**<br>(0.004)    | 0.022**<br>(0.009)    | 0.020**<br>(0.002)    | 0.024***<br>(0.012)   | 0.027**<br>(0.014)    |
| CRs                            | -0.028*<br>(0.006)    | 0.019***<br>(0.009)   | 0.016**<br>(0.003)    | -0.018**<br>(0.001)   | 0.022***<br>(0.010)   | 0.024**<br>(0.016)    |
| SIZE                           | 0.042**<br>(0.022)    | 0.033**<br>(0.018)    | 0.038*<br>(0.015)     | 0.046**<br>(0.014)    | 0.027**<br>(0.020)    | 0.045**<br>(0.013)    |
| ROA                            | 0.020*<br>(0.005)     | 0.024**<br>(0.009)    | 0.021***<br>(0.016)   | 0.038<br>(0.015)      | 0.019***<br>(0.003)   | 0.028**<br>(0.018)    |
| INF                            | -0.031**<br>(0.012)   | -0.035***<br>(0.013)  | -0.042**<br>(0.031)   | -0.046*<br>(0.027)    | -0.028**<br>(0.012)   | -0.029**<br>(0.016)   |
| Constant                       | 0.245**<br>(0.024)    | 0.352**<br>(0.232)    | 0.247***<br>(0.138)   | 0.354**<br>(0.208)    | 0.235***<br>(0.118)   | 0.462**<br>(0.315)    |
| Annual effect                  | Yes                   | Yes                   | Yes                   | Yes                   | Yes                   | Yes                   |
| AR(1) <i>p</i> values          | -2.12<br>(0.03)       | -2.07<br>(0.02)       | -2.18<br>(0.01)       | -2.11<br>(0.02)       | -2.13<br>(0.01)       | -2.20<br>(0.01)       |
| AR(2) <i>p</i> values          | -2.22<br>(0.18)       | 0.53<br>(0.21)        | 0.63<br>(0.13)        | 0.58<br>(0.33)        | 0.51<br>(0.19)        | 0.66<br>(0.26)        |
| Hansen test's <i>p</i> -values | 0.61                  | 0.65                  | 0.31                  | 0.52                  | 0.50                  | 0.55                  |
| Obs.                           | 708                   | 712                   | 687                   | 698                   | 708                   | 708                   |

Note. The definition and explanation of variables are available in Table 1.

Notes: \*\*\*, \*\* and \* denote 1%, 5% dan 10%.

*p*-values in parentheses indicate significance level.

The theoretical assumptions outlined in H1 indicate that NPLs positively affect the market cap of MSMEs. The results of GMM regression in Table 7 (models 1, 4) represent that NPLs together with all control variables have an insignificant positive effect on MC ( $\beta = 0.023$ ,  $p < 0.01$ ;  $\beta = 0.018$ ,  $p < 0.01$ ) confirming the acceptance of H1. We employed the cumulative value of total shares held by equity holders to estimate the market cap of MSMEs in developing Asian economies. Although NPLs have positively improved the market cap of MSMEs, it is insignificant indicating that NPLs may serve as a temporary solution for optimizing the credit quality hence MSMEs need to find potential alternative sources of financing. This result is consistent with the findings of (Ding and Sickles,

2018; Grosse-Rueschkamp et al., 2019; Ozili et al., 2020) deliberated that the risky nature of NPLs may hinder the growth of firms in a long run.

The impact of LO on MC is examined by hypothesizing H2. We estimated LO using the log of total loans outstanding. The results of GMM regression in models 2 and 5 disseminate that LO has a significant (strong) positive effect ( $\beta = 0.014$ ,  $p > 0.01$ ;  $\beta = 0.017$ ,  $p > 0.01$ ) confirming that H2 is supported. This result validates the studies of (Hoque et al., 2011; Leary, 2009; Lucey & Zhang, 2011) highlighting that LO is often used as a tax shield and retrieve other financial benefits under bankruptcy cover by MSMEs which eventually allows firms to maximize their credit quality to ensure better market cap (Martinez et al., 2019).

Similarly, the effect of NBF on MC is investigated by referring to H3. NBF was estimated through the log of total non-bank financing received by MSMEs. The regression coefficients of MC under models 3 and 6 (Table 7) signify that NBF has a significant (moderate) positive impact on MC ( $\beta = 0.047$ ,  $p > 0.01$ ;  $\beta = 0.041$ ,  $p > 0.01$ ) confirming that H3 was also accepted. This finding is also consistent with the dynamic logic of trade-off theory highlighting that innovative and unconventional sources of financing may help firms in improving market cap (Ardalan, 2017; Scot, 1976; Czerwinka and Jaworski 2021). Further, this result is consistent with prior studies of Allen et al. (2015), Cebenoyan and Strahan (2004), and Gropp and Heider (2010) deliberated that MSMEs may use unconventional tools for financing routine business activities and repayment of loans at a predetermined pace.

Overall, the empirical findings of this research (correlation and GMM regression analysis presented in Tables 3 and 7 have confirmed that credit quality can be used to optimize market capitalization of MSMEs operating in developing Asian countries addressing the RQ1 of this study. Further, the regression and robustness results performed in Tables 7 and 8 asserted that different factors of credit quality (NPLs, LO, and NBF) render different (significant/insignificant) impact on market cap verifying the narrative that a careful selection of appropriate financing method is crucial for maximizing the market cap of MSMEs answering RQ2 of this study and verifying our theoretical assumptions presented in H1, H2, and H3.

## 5. Conclusion

Our study has conceptualized that the indicators of credit quality namely NPLs, LO, and NBF may improve the market cap of MSMEs of developing Asian countries. The present study documents empirical evidence by suggesting credit quality as the tool to maximize the market cap of MSMEs by employing the trade-off theory. The panel data between 2011-2020 was drawn from the World Bank and ADB databases to examine whether NPLs, LO, and NBF improve the market cap of MSMEs in seven (Bangladesh, India, Pakistan, Indonesia, Laos, Malaysia, and Singapore) developing economies in Asia. The statistical analysis suggested that the determinants of credit quality may have a positive effect on the MC of MSMEs operating in Asian countries. Further, LO and NBF are significant positive predictors of MC whereas, NPLs is a positive indicator of MC.

### 5.1 Research contribution

The findings of the present study contributed to the expounding literature on the strategies to optimize the market cap of firms by implementing credit quality as the instrument of change to positively influence the market cap. This research established the theoretical linkage between NPLs, LO, NBF, and MC which contributes to laying the theoretical foundation for future researchers investigating MC linkage with credit quality research domains. Following the growing trend of the market cap of MSMEs, our research highlights that unconventional

financing methods such as NPLs, LO, and NBF may improve the market cap implying that these determinants of credit quality may become a promising research paradigm that contributes to creating innovative financing solution for MSMEs in developing countries. Finally, our statistically tested and validated model contributes to offering a generic insight into a relatively new research area of credit quality determinants for MSMEs which can be contextualized by other large firms for understanding the preliminary ingredients essential to resolve financing issues for capturing a better market share.

### *5.2 Implications for practice*

The results of this study have important implications for the regulators, policymakers, and practitioners of MSMEs in Asia as well as worldwide. The findings determined that credit quality is a key driver to optimize market cap hence regulators need to ensure that a market enabling legislative infrastructure is created so that MSMEs maintain certain level of credit quality for consistent market cap. The empirical results also disseminated that NPLs, LO, and NBF are positive (significant/insignificant) indicators of market cap which may lead policymakers to design customized training programs for entrepreneurs of MSMEs to guide on the strategic use of these indicators for optimization of market cap. Another crucial aspect of the results of this study was an insignificant impact of NPLs on market cap which can be leveraged by managers of MSMEs to suggest temporary and readily available capital optimization strategies to the owners of MSMEs.

### *5.3 Limitations and future research*

The main limitations of this study are associated with the theoretical model, research instrument, data collection procedures, and data analysis techniques. The researchers have critically discussed and logically explained the theoretical components of our model, however, the construct of credit quality operationalized in this research may not directly represent its actual state as various factors (internal and external) and underlying conditions may affect the availability of NPLs, LO, and NBF which may hinder the implementation of these determinants as credit quality. Hence, future studies are encouraged to investigate the influence of underlying (micro and macro) conditions on capital structure. This research has employed simple proxies and dummy variables to estimate outcome variables whereas, certain proxies such as the total value of common shares held by equity holders are controversial and may not represent the actual market cap hence, future studies are recommended to consider additional proxies and variables such as profitability, tangibility, etc. for better representation of market cap. The use of GMM regression technique has largely addressed the endogeneity and heterogeneity issues in self-aggregated data by following established statistical procedures, however, the endogeneity issues may still persist thus, future studies are encouraged to consider additional measures and techniques such as difference-in-difference, generalized, two-and three-stage least squares regression to ensure the robustness of results.

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