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International Journal on Research and Development - A Management Review

ISSN: 2319-5479
Volume 14 Issue 01, 2025

Assessing The Impact of Credit Access on Msmes: A Review of Issues and Challenges in The Chemical And sPharmaceutical Sectors

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Peer Review Information	Abstract
<p>Submission: 21 April 2025 Revision: 20 May 2025 Acceptance: 15 June 2025</p> <p>Keywords</p> <p>MSMEs, credit facilities, chemical industry, pharmaceutical industry, green funding, AI, blockchain, financial awareness, economy, sustainability.</p>	<p>MSMEs are vital to growth and innovation in the chemical and pharmaceutical industry because they are crucial for economic development, while the issue of credit constraints remains significant. This paper discusses some key factors that affect credit access namely, inadequate credit from institutions, highsecurity interests, and inadequate knowledge on how to access as well as maintain credit among MSMEs. Using case examples, the study demonstrates how credit can unlock growth for MSMEs necessary for increasing production rates, switching to sustainable technologies, and framing production in research. Such best cases show that credit access intervention has made a positive impact on the increase in revenues, better compliance with the environmental standards and competitiveness of products in the international markets. AI, blockchain or even green financing remain trends that still hold great potential for MSMEs. Technological productivities such as credit AI-driven credit assessment models and blockchain technologies increase transparency efficiency and the accessibility while the green financing mechanisms such as the green bonds ensure that the MSMEs align to sustainability. The result highlights the importance of policy integration between policymakers, financial institutions, and industry stakeholders about the original barriers encountered in credit delivery. Thus, this research calls for policy adjustments, ICT technology utilization, and interventions to fill the credit gap and support the sustainable development and financial stability of the chemical and pharmaceutical industries. In light of the above findings, the study provides practical implications toward innovation and competitiveness of MSMEs to enhance overall economic development.</p>

INTRODUCTION

A. Background

Introduction of MSMEs and Their Importance to the Global and Indian Economy

Micro, Small, and Medium Enterprises (MSMEs) are crucial contributors to the Global Economy

(Adukia,2012) since they act as growth, employment, and innovation agents. MSMEs hold unique importance both statistically and economically, as they account for a sizable portion of GDP and exports and play a crucial role in industrial production. MSMEs in India

contribute about 30% to the national GDP and 48% to the country's total export earnings; besides employing over 110 million people (Bisht & Singh, 2020). They play a crucial role in mitigating socio-economic problems like poverty and uneven economic distribution, making them essential in achieving sustainable development goals and objectives (Maheshkar & Soni, 2021; Sharma et al., 2021).

The global economy has continuously recognised the centrality of MSMEs in promoting growth and managing inequalities. For instance, MSMEs in Kenya have been reliable in enhancing economic stability despite some problems, such as credit constraints (Wanjau, 2013). Likewise, similar to their counterparts in the developed world, the MSMEs in India have emerged as vital change agents, proving their dynamism in the emerging globalised world (Das, 2007; Singh et al., 2018).

Impact of the MSMEs on the Chemical and Pharmaceutical Industries

Chemical and pharmaceutical industries are among the most competitive industries in the global market facing high rates of technology and innovation. MSMEs form a significant part of these sectors, as they are big producers and exporters in the country. In India, these enterprises play the vital role of satisfying the increasing needs of the population, including the inhabitants of the rural and hard-to-reach areas, for cheap and qualitative medication (Lahkar et al., 2023). Their input can also be seen towards the growth of generics, active pharmaceutical ingredients (APIs), and speciality chemicals where India has carved a niche for itself in the global pharmaceutical business (Hattiangbire & Harkal, 2022).

In addition, chemical industry MSMEs are relevant to promoting innovation and sustainability in the organization. They motivated the usage of green technologies and employing sustainable measures that are in sync with the global standards towards this education (Kumar, 2020). But the primary challenges are that these enterprises lack sufficient infrastructures, policy constraints, restricted credit facilities, and others (Sharma et al., 2021; Maheshkar & Soni, 2021).

Credit Requirement: A Key Element in Development and Creativity of MSMEs

Significant credit is essential for the development and growth of MSMEs which act as a fundamental necessity. They help these enterprises to finance new-generation technologies extend the extent of business and increase their capability to compete both locally and internationally. However, the amount of funds available to these businesses is a serious limitation to their operations especially in the developing world. In India, due to the absence of a proper formal funding solution, most of the

MSEs have been forced to borrow from informal channels, which are costly and unprofitable (Argade et al., 2025; Siddiqui, 2016).

Microfinancing, venture capital and the popular peer-to-peer financing models can be seen as solutions to these challenges. Research has indicated that microfinance has increased the income and productivity of MSMEs mainly the manufacturing and service industries (Wirawan, 2024; Okon, 2018). Besides, the Credit Guarantee Fund Trust for Micro and Small Enterprises (CGTMSE) and Pradhan Mantri MUDRA Yojana (PMMY) have enhanced the extent of credit facilitation for the Indian MSMEs. However, there is still a significant credit deficiency in the MSME segment even after each of these innovations. Based on current projections, the total untapped credit requirement for the MSME sector in India exceeds USD 400 billion, pointing to the rising importance of structural change in financing and policies (Argade et al., 2025).

LITERATURE REVIEW

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Across the world, employment creation is just as important an area where MSMEs have proven to be effective. In the United States and the European Union, small and medium enterprises have been found to contribute most of the employment opportunities within the chemical sector thereby fostering both growth in the country's economy and the industrial growth (Sharma et al., 2021). These enterprises stake themselves and are very beneficial to local economies because they each awaken entrepreneurship and unemployment problems where employment is scarce in countries like India and Kenya (Wanjau, 2013; Lahkar et al., 2023).

Relevance to Regional Development and Industrial Diversification

Chemical and Pharmaceutical industries especially MSMEs are a key driver for development in rural and semi-urban areas as they create employment. They assist close the gap in regional development since they open branches in areas that are still in the developmental stage. For instance, pharmaceutical and medicinal product MSMEs in India have ensured the provision of medicines in rural areas through the production of cheaper generic drugs (Maheshkar & Soni, 2021). Likewise, chemical industry MSMEs have encouraged industrial diversification through investment in specific sub-groups like Agrochemicals, Dyes & Specialty Chemicals (Kumar, 2020).

The incorporation of MSMEs in remote areas of the country also provides a catalytic effect on the local economy. For instance, existences of MSMEs trigger the establishment of other related industries, the improvement in infrastructure, and the promotion of various skill development programs (Argade et al., 2025). This, in turn, props up business and entrepreneurial sectors, leading to improvements in the standards of living of people in a specific region. Further, due to their support to the concept of industrial diversification, MSMEs facilitate the diversification hence giving the economy a base that is not easily reliant on traditional industries

thereby preparing the economy for changes in the market (Sharma & Rai, 2023).

B. Innovation & R&D

Research and Innovation output

Both chemical and pharmaceutical industries are innovative, and the MSMEs play crucial roles in advancing innovations. These enterprises sometimes take up new ideas and experiment with them due to their quick action and energy to transform ideas into innovation. For instance, MSMEs in the pharmaceutical industry have played an important role in the modern development of generic drugs, biosimilars, and active pharmaceutical ingredients (APIs) and the provision of affordable healthcare to the world (Lahkar et al., 2023).

MSMEs have a key role in sectors like the chemical industry, especially influencing fields like green chemistry, sustainable production and advanced materials. Through such investment, these enterprises have strengthened their competitiveness and also promoted the strides in the industry (Ramann.et.al). This research also shows that MSMEs with high R&D intensity have higher prospects in export markets hence the need to promote an innovation-oriented environment (Khanna&Singh,2018;Wirawan,2024).

Role of MSMEs in Speciality Chemicals and Pharmaceutical Products Creation

A critical aspect of MSMEs is effectively meeting the market's needs by developing speciality products. In the pharmaceutical industry, the MSMEs have significantly contributed towards research and innovation of orphan drugs, personalized medicine, and the biopharmaceutical sector which targets unmet medical needs (Hattimbire & Harkal, 2022). Its versatility enables them to concentrate on specific niches of the market to quickly adapt to trends and novel opportunities, which makes them key stakeholders in the healthcare system. In the same way, the chemical industry MSMEs have done wonders in speciality chemicals, performance additives, and advanced materials that are useful for hi-tech applications. These enterprises have thus defined their specific market segments and carved a special value proposition which has made them more innovative and profitable (Kumar, 2020). Moreover, because of their versatility, and the fact that they employ a relatively small number of workers, MSMEs can safely try out new technologies and other types of changes that improve industrial innovation (Okon, 2018). Beyond their economic impacts, this study revealed that MSMEs in chemical and pharmaceutical industries have additional responsibilities. There is no doubt that through employment, regional development and

innovation, these enterprises have become invaluable in the global industrial systems. However, to bring the potential to the level of realization, there is a need for supportive policies, credit facilities improvement, and an R&D ecosystem for MSMEs (Sarkar, 2014). Along with these challenges, the solution has a positive impact on the development of both chemical and pharmaceutical industries, providing sustainable economic growth and social development.

ACCESSIBILITY OF CREDIT FOR MSMEs A. Structural Barriers Absence of Hedges and Credit Status

Among the most prominent constraints arising from the structural factors that work against MSMEs in terms of credit access is inadequate collateral. Financial institutions look for collateral in mostly tangible assets to cover lending risks and since many MSMEs especially those in the initial stages have limited access to tangible assets, they are locked out. This problem is more acute in developing economies such as India for the reason that most small enterprises are characterized by low levels of fixed capital investment (Siddiqui, 2016). Additionally, most MSMEs operate without a proper structure, and most of the financial records are not documented well, which reduces their perceived creditworthiness (Sharma & Rai, 2023).

High Interest Rates and Stringent Repayment Terms

Interest rates remain high for MSMEs compared to large firms, and affordable credit remains an issue due to its high costs. Moreover, repayment periods or conditions set by the formal sources of finance can be less flexible and this, in turn, puts off the MSMEs from borrowing because the repayment terms are usually strict. Anything that hampers their operating recharge or funding for growth and developmental activities affects consumer durables industries' profitability and prospectively (Argade et al., 2025). This structural disadvantage deepens financial risks especially among the MSMEs in sectors that are capital-intensive such as chemicals and pharmaceuticals (Lahkar et al., 2023).

B. Institutional Barriers Few Penetration of Structured Financial Institutions

Restricted utilization of formal credit institutions in rural and semi-urban areas greatly contributes to the credit constraints of the MSMEs. As research has observed the increase in financial inclusion, most MSMEs are not served by the formal sector since the market lacks appropriate financial services. In India, there are regional imbalances in financial intermediation and arguably the relative absence of banking infrastructure particularly disadvantages rural

MSMEs leading to financial exclusion (Khanna & Singh, 2018).

Outright Flows and Credit Disbursement Inefficiencies

When all the SMEs can access loans in the market, the processes of credit delivery take time hence delaying the funds. Too many procedures, documentation formalities, and non-disclosure of procedures in the loan sanction delay ownership of timely credit. These inefficiencies become more significant in the chemical and pharmaceutical industries where timely investment in raw materials and production processes is a significant factor in sustaining competitiveness among the MSMEs (Maheshkar & Soni, 2021).

C. Policy Barriers Lack of Coordination in Government Sectors and Ministers

Although there are a plethora of government interventions designed for credit delivery to the MSMEs, the following challenges hinder efficiency; For instance, the CGTMSE that reduces collateral requirements has helped, but the coverage is still wanting (Khanna & Singh, 2018). Furthermore, such programs' limited effectiveness stems from inadequate coordination between the financial institutions and policymakers (Nanda & Kumar, 2023).

Lack of Basic and Advanced Understanding of MSME Owners in Financial Matters

Poverty of credit information is another factor since a significant percentage of the MSME owners have little or poor information on the available financial products and services. However, due to this awareness, they fail to access government-sponsored schemes and other occasional non-traditional sources of funds. Research shows that financial literacy interventions' massive effects can be witnessed on the funding and finance management capabilities of MSMEs (Okon, 2018; Wirawan, 2024).

Risk Perception of Chemical and Pharmaceutical MSMEs

There is always a high-risk perception of chemical and pharmaceutical sector MSMEs due to some of the following challenges. Such factors as the risks associated with the release of chemicals in the environment and the health risks associated with chemical production (Lahkar et al., 2023), the ever-toughening regulatory policies on the manufacturing of drugs influence this risk perception (Kumar, 2020). Therefore, financial institutions tend to perceive these enterprises as credit risky thus limiting their credit access (Hattiangbire & Harkal, 2022).

Costs of Regulation and Its Effects on Financial Stability

In this paper, it has been pointed out that dealing with environmental and safety requirements poses a major challenge to MSMEs within the chemical and pharmaceutical industries. They are not only expenditure that limits their funding provision but also spending that limits their funding for innovation and growth. However, frequent changes in regulatory requirements place the enterprises and financial risks that go along with that making the credit funding even less appealing for formal financial institutions to participate in. (Lahkar et al., 2023).

Therefore, MSMEs experience numerous problems with credit access due to structural, institutional, policy, and specific sector factors. Solving these problems involves learning how to increase SMEs' financial management awareness, improving the credit delivery mechanism and ensuring that government ordinances are sensitive to the MSMEs situations. Through these barriers' reduction, policymakers and financial organizations can unleash the full potential of MSMEs, and stimulate innovations, employment opportunities as well as overall economic growth.

SOURCES OF FINANCE AND CREDIT FACILITIES

A. Government Initiatives

Explanation of Schemes Including the Concept of Credit Guarantee Fund Trust for Micro and Small Enterprises (CGTMSE)

Amongst the major structural constraints mentioned above the Credit Guarantee Fund Trust for Micro and Small Enterprises (CGTMSE) was founded with the specific purpose of providing credit without collateral as a security to the MSMEs. This has helped many an MSME to secure funds without having to pledge physical security and thereby cut down on informal funding (Kaur, 2023). However, the scheme has been acclaimed for its shortcomings, particularly in reaching out especially, the rural population where literacy and finances hardly prevail. Additionally, it has been found that many MSME owners lack knowledge of the documentation essential to secure CGTMSE benefits; this even hampers its effectiveness (Gupta & Kumar, 2023).

Advantages and Disadvantages of Financial Policies of Sectors

Unfortunately, the sector-specific financial policies that the Indian government introduced do not perform up to expectations. For example, the cases within the chemical and pharmaceutical MSMEs lack proper mechanisms for overcoming high-risk perceptions of the corresponding segment. Furthermore, funds set by such policies often fail to meet the capital-intensive demands of such sectors. Mishra et.al revealed that the disbursement rates for these policies are much

lower than forecasted mainly caused to administrative issues and complicated entrance criteria.

B. Role of Banks and NBFCs Trends in Lending to MSMEs

In the financial market banks and Non-Banking Financial Companies NBFCs perform a crucial role in providing credit to the MSMEs. The available data suggest that there is a gradual rise in the overall volume of lending to the MSME sector due to regulatory directions and efficient technology intervention (Reddy, 2020). Nevertheless, the lending dynamics continue to lean towards the urban base of the MSMEs, with the rural players continuing to struggle with a severe credit crunch. This urban bias tends to slow down the proportional development of MSMEs principally in the underdeveloped sectors of the economy (Patil & Desai, 2023).

Pros and cons of lending to risky sectors for banks and NBFCs

Sometimes, chemical and pharmaceutical industries are considered to be high-risk industries for several reasons including uncertainty due to regulatory issues, operational risks and changeable market conditions. As a result, both the banking institutions and NBFCs are reluctant to finance the MSMEs in such sectors. Also, the absence of specific risk assessment tools for industries makes the decision even more difficult for lenders. As noted by Nair and Shukla (2024) credit appraisal difficulties could be addressed by adopting individualised approaches in credit appraisal aimed at persuading financial providers to intensify credit accessibility.

EFFECTS OF CREDIT ON THE MSMEs A. Operational Performance Effects on Production Capacity and Supply Chain Efficiency

Credit both directly and indirectly influences the output of the MSMEs since it allows them to expand operations, source for inputs and improve machinery (Dixit, 2015). In the case of the chemical and pharma material subsector that frequently calls for sophisticated equipment and precision inputs, a timely supply of credit can also maintain continuity of operations. The study conducted by Sharma et al. (2023) pointed out that those MSMEs that received credit more frequently had an enhanced accessibility of 25% to their supply chain compared to those independently financed. Furthermore, working capital resources help MSMEs to be ready and timely in meeting the customers' demands, problems, and changes and, therefore, ensure reliability and flexibility in value chains as noted by Kaur, Rao & Singh, (2023).

Effect on the Quality of Products and Compliance with Industry Standards

Credit access also enhances the improvement of quality control mechanisms and compliance to other strict industry standards, especially in industries such as the production of pharmaceutical products where regulatory compliance is paramount. As highlighted by Verma & Gupta (2023), those MSMEs which obtained loans to acquire quality certifications or to address compliance issues saw their products receive a 30 percent market boost. This goes to show how credit helps MSMEs to effectively compete with bigger companies in terms of safety and quality compliance.

B. Financial Performance Importance For Profit and Cost Control

Access to adequate credits can contribute to the optimal control of costs and therefore increase profitability. For instance, chemical and pharmaceutical manufacturing SMEs experience varying prices of raw materials and therefore making purchases in large quantities more reasonable. Credit facilities enable these enterprises to bargain for better contractual terms with suppliers and control inventories (Patel & Desai, 2023). In addition, less reliance on expensive sources of informal credit means that more company's operating income is translated into profitability rather than being used to pay off usurious interest costs (Banerjee, 2023).

C. New Opportunities, Expansion, and Growth

Market diversification and the global competitiveness of the retail industry during those turbulent years as its contribution

An analysis of the role that credit access has on the ability of MSMEs to penetrate new home and export markets is presented here below. For instance, chemical manufacturing SMEs using credit to enhance the production line can sell their products that meet the demand of the global markets. According to the Ministry of Micro, Small, and Medium Enterprises (2024, export financing helped increase international revenue by 40%. Likewise, pharmaceutical MSMEs with credit for R and D have developed new formulations and thus have a competitive advantage internationally (Reddy, 2020).

An Analysis of MSME Credit Concessions and its Impact Concerning Successful Case Studies

Different examples of credit benefiting MSMEs are given below to understand how credit can work miracles. An MSME in pharmaceuticals in Gujarat started a new form of generic drugs through a government-sponsored loan thus grabbing a good market in India (Gupta & Kumar, 2023). The same was true of a chemical-laden

MSME in Maharashtra which received venture capital funding for environment-friendly manufacturing, thus increasing its brand image and pulling global buyers (Das et al., 2024). They show how credit has the potential to deliver growth and innovation where it matters.

Future direction: Trends & opportunities

Technology-Driven Solutions

Advanced credit scoring systems with the use of AI and data analysis enhance credit risk assessment of MSMEs much more effectively than traditional approaches. Business performance and market trends are input for the machine learning algorithms that minimize default risks and speed up loan processing (Sharma et al., 2024). Various fin-tech using AI have reduced bureaucratic hindrances when it comes to granting credit. For chemical and pharmaceutical MSMEs, risks such as regulatory concerns are sectoral and can be mitigated by the use of AI models thereby increasing their prospects of borrowing. AI credit solutions positively impacted the approval rates for chemical material MSMEs, growing by 18% in two years, as stated in the research by Das et al., 2023.

Blockchain technology also offers secure and public financing, which is one of the key aspects of a company. Fashioned this way, fraud risks and poor fund utilization as well, are kept at bay since blockchain is a system of recording that cannot be altered. Banerjee (2023) stresses that blockchain manages trade financing; smart contracts ease cross-border MSMEs buying. Reducing the dependence on middlemen decreases the cost of usage and enhances access to the decentralized platforms. According to Patel and Desai (2023), the use of blockchain has consequently reduced loan disbursement cycles by 30% enhancing MSME cash flows.

Green Financing

Nowadays globalization creates important chances for the MSMEs which work in the field of chemical and the pharmaceutical industry due to the current trend of sustainability. Green financing refers to the financing of environmentally sustainable projects including the adoption of green energy and reducing pollution. The choice of sustainable practices in manufacturing has boosted the image of the brands and enabled the MSMEs to gain better market linkages (Verma & Gupta, 2023). For instance, chemical sector MSMEs seeking to develop biodegradable products have been identified and seized. Collar niche markets, whereas pharmaceutical sector MSMEs that championed green chemistry have decreased waste and energy use – as well as boosted competitiveness (Reddy, 2020).

Green bonds are another promising product exploring low-interest opportunities for financing environmentally sustainable projects. Bose (2013) found out that firms who obtained green bonds experienced a 20% saving on their energy expenses in one year. Further, other government policies such as RBI's decision to include renewables projects in priority sector lending have opened credit avenues for green projects (Gupta & Kumar, 2023). However, some of the factors encompassing awareness and compliance costs act as negative predictors limiting the expansion of the use of advanced technologies (Kaur, 2023).

Policy Innovations The Case of MSME Financing: Paving the Way for International Best Practices

The players must consider the top-performing practices in the world to improve the financing of MSME firms in India. MSME supporting policies are innovative as seen with the German and South Korean governments. For instance, the German Mittelstand model of high value includes competitiveness of public/private partnerships and guaranteed future support for SMEs as strategic economic players (Kaur, Rao & Singh, 2023).

International Best Practices Regarding the Financing of MSMEs

Some literature from other developed countries can serve as a great source for the improvement of financing of MSMEs in India. For example, Germany and South Korea have adopted many new policies aimed at helping the MSME sector to flourish. For instance, Germany's 'Mittelstand' model overemphasizes PPPP and places contingent financial incentives for SMEs so that they remain relevant in the economy (Rao & Singh, 2023). Likewise, South Korea's government-backed credit guarantee programs have eased the risk perception profiles of the financial institutions hence boosting the SME credit in high-risk sectors (Kumar 2023 & Reddy, 2020).

Applying similar approaches in India could help fill the existing void in MSME financing. New policies that enhance partnerships between banks, fintech firms, and government organizations could strengthen the financial sector. Second, extending tax and subsidy support to private players for financing MSME is also expected to increase access to credit further (Sharma et al., 2023).

IMPLICATIONS AND DIRECTIONS FOR RESEARCH A. Enhancing legal and regulatory environments

Strengthening and Expanding the Reach of Professional Financial Institutions

To enhance credit delivery to MSMEs, especially chemical and pharmaceutical firms, the existing financial institutions need to extend their operations to less-banked areas. As part of the strategy, which entails increasing the branch networks in rural and semi-urban areas and circulating mobile banking units, reaching the uncovered MSMEs becomes possible (Rao et al., 2023). Furthermore, enhancing the capacity of financial institutions means better evaluations of risk sectors, like the chemical MSMEs about environmental regulatory compliance by the governments, as suggested by Singh and Verma (2024).

Exploring the area of public-private partnership in funding of MSMEs

Learning from the missing-middle phenomenon, it's always possible to connect government policies to private initiatives through PPPs. Particularly when it comes to MSME's financial needs, PPPs can contribute to the development of effective collaborations between government agencies, financial organizations, and fintech businesses that will result in the offer of appropriate financial solutions (Patel & Desai, 2023). For instance, a PPP model could include a credit guarantee from the government in collaboration with an assessment from the fintech company to ensure a lesser risk of default by the private lenders while trying to fulfil the credit needs of MSMEs (Verma et al., 2024).

B. Building Financial Literacy The Self-employment Development Training for MSME Owners

Thus, FS owners should be offered specific financial literacy programs; and materials on cash flow, credit, and formal financial systems. It is also agreed that workshops that run in regional languages and in a locally culturally sensitive way will also see better uptake (Kumar et al., 2023). For chemical and pharmaceutical MSMEs, these programs should also comprise the following topics: understanding regulatory compliance and sustainable financing.

Awareness Creation of Credit Schemes and Opportunities

One idea which can be implemented is to create a single online portal that would contain all necessary information, including a schedule of credit schemes and conditions together with the ways to apply for it. This platform should provide resources for each sector including, green finance for chemical and pharma MSMEs (Das, et.al, 2017). This information can be spread by government and industry associations in trade fairs, industry seminars and on social media platforms as mentioned by Patel in the year 2023.

C. Leveraging Technology Promoting the MSME's Transition to Fintech

Digital lending platforms with the client being an MSME and credit access through mobile-based applications can be of great value in supporting complex decision-making in MSME credit access. To increase their uptake, the government could encourage the use of fintech tools among MSMEs by providing for instance; tax exemptions or grants for MSMEs using fintech tools (Reddy, 2020). Furthermore, for consumers to utilise fintech convenience, companies must consider creating smooth and easily understandable layouts, and hire professionals to provide communication in different languages (Kaur & Singh, 2024).

Raising Efficiency of Credit Risk Assessment Tools Through Incentives

The MSMEs have distinct credit risk assessment problems that can be solved by the new advanced models based on artificial intelligence and machine learning techniques. For instance, it is used in the development of models of credit scoring by integrating other data sources into MSMEs such as utility payments and online purchases for the creditworthiness of those who have no credit records (Mishra, et al.). The government could offer grants or co-funding for such innovations if fintech startups are involved in developing them (Sen et al., 2024).

D. Sector Specific Interventions Developing the Financial Products for Chemicals and Pharmaceuticals MSMEs

Due to the differences in their financial requirements, new financial products in the chemical / pharmaceutical sector must be introduced to meet the needs of chemical and pharmaceutical MSMEs. For example, lower rates of interest credit facilities ought to be available for investing in sustainable production technologies or pollution-controlling equipment (Roy & Das, 2023). Thirdly, loan repayment could be made flexible, to coincide with these industries' revenue generation periods, so that during low-demand seasons, pressure from high loan repayments would not be as strong (Verma, 2024).

From the regulatory viewpoint to enhance creditworthiness

This paper established that lack of regulatory compliance continues to pose a major challenge for chemical and pharmaceutical MSMEs seeking credit. This is because the rationalisation of licensing and environmental clearance mechanisms can improve their creditworthiness and mobilise more financial contributions (Kaur et al. & Gupta, 2023). Such associations could cooperate with the policy-makers to make

these processes efficient and cost-effective (Nair & Bose, 2023). In addition, financial institutions could provide consultancy services on the regulatory structure facing the MSMEs to enhance their compliance and hence, credit access (Patil, 2024).

CONCLUSION

The paper demonstrates how credit facilities have been important, especially to the chemical and pharmaceutical sub-sector in the diversification, expansion, and export competence of the MSMEs in Nigeria. Nevertheless, several factors hamper the ability of credit to fully realize its efficiency and credit availability is limited such as limited institutional brokerage, high collaterals, and low financial literacy among MSME owners. These challenges are regressive particularly on SMEs, limiting their capacity to increase production, pursue innovation and meet regulatory requirements. According to Sharma et al. (2024) the firms with limited access to credit compared to the ones with efficient access to financing experience a growth rate of 30% less.

The study reveals that the firms that use credits appropriately have seen immense growth and stability within the MSMEs. For instance, enterprises investing in R&D have developed novel pharmaceutical products, over time growing market competitiveness (Kumar & Reddy, 2023). Likewise, credit-financed green ventures in chemical MSMEs have enhanced compliance with environmental regulations and the subsequent brand image to venture into the niche market (Reddy, 2020; Raj et al., 2023). But such success stories are few and far between, underscoring the need to focus on why credit access remains a challenge.

The gap noted above cannot be closed without coordinated efforts made by various stakeholders. Credit institutions have to deploy emerging solutions including artificial intelligence and blockchain to improve credit check procedures and increase the level of openness. This according to Banerjee (2023) has minimised the fraud risks and the costs of transactions in the use of blockchain in MSME financing while Das et al. (2023) note that the credit risk approval rates of high-risk sectors such as chemicals have been enhanced by AI credit models. Should organizations embrace these technologies, they will go a long way in solving many structural problems currently affecting traditional lending systems (Sthapit 2022). There is, therefore, the need for policymakers to come up with relevant frameworks that will foster the sustainable growth process. Further liberalizing green financing instruments like green bonds and environment-sensitive credit facilities is a

necessity for globalizing MSEs to an ambitious sustainable development agenda (Verma & Gupta, 2023). While the Reserve Bank of India has extended priority sector lending to renewable energy projects this direction is not enough, more efforts have to be made to spread awareness and reduce compliance costs for small firms (Gupta & Kumar 2023).

MSME financing also requires the leaders in the industry to ensure that the necessary environment for funding is supported. Such coordination can enable the provision of suitable financial products to organizations through partnerships with the private sector especially in sectors which have not benefited from such facilities such as chemical and pharmaceutical industries. Gupta & Kumar (2023) showed it has proved the possibility of targeted financial intervention; government-subsidized loans for pharmaceutical MSMEs help them gain a great deal in terms of market share.

Thus, closing the credit gap for MSMEs is possible only through the cooperation of policymakers, financial institutions and other industry players. Climate change, the use of green technologies, the adoption of sustainable practices, and the eradication of systematic barriers are some of the measures essential for the sustainable growth of the chemical and pharmaceutical businesses of the MSMEs. Thus, the adoption of these measures will increase the importance of the functioning of MSMEs and open up opportunities for their qualitative change that will contribute to the development of the economy and the stimulation of competition correspondingly to the demands of the world market.

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