
| RESEARCH ARTICLE

The Effect of Marketing Mix and Technological Integration on the Profitability of Commercial Banks in Bangladesh

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| ABSTRACT

The marketing mix plays a vital role in enhancing profitability of commercial banks in today's digitally-enabled banking industry. This study focuses on analyzing the effect of the four components of marketing mix namely Product, Price, Place, and Promotion on bank profitability among Bangladeshi commercial banks. Furthermore, the study evaluates how technological integration affects the relationship between marketing mix and profitability. The quantitative approach has been used for this research and primary data was collected from 355 respondents via convenience sampling using the questionnaire. The structural equation modelling (SEM) technique has been employed for data analysis using SmartPLS version 4 software. It was observed that all four elements of marketing mix have positive impacts on bank profitability. Additionally, technological integration has an extremely significant impact in strengthening such a relationship. The findings offer practical insights for bank managers, policymakers and marketing professionals seeking to improve financial performance through customer-oriented marketing strategies and digital transformation.

| KEYWORDS

Marketing Mix, Profitability, Technological Integration, Banking, Bangladesh, Performance

| ARTICLE INFORMATION

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1. Introduction

A commercial bank refers to an organization that was set up with the main objective of offering various kinds of financial services in order to ensure economic development in the country (Kinyua & Omagwa, 2020; Sime et al., 2020). The commercial banks in Bangladesh have come under increasing pressure to adapt to the changes in the environment. One of the key areas in which banks should decidedly chart a clear course consists of the 4Ps or the marketing mix: Product, Price, Place (Distribution) and Promotion (Kabir, 2024). Studies indicated that effective management of this component has a positive effect on profitability of commercial banks. Even though the influence of marketing strategies on bank profitability is not fixed and there is thought about the tech-integrated moderation that how it alters or magnifies/lessen the effect of Mix Marketing Strategies (Chen, 2020).

With the changes in the banking industry in Bangladesh, especially in digital banking services; it is important to evaluate how the adaptation of technology has an impact on marketing mix elements and profitability (Islam et al., 2019). Further, penetration of mobile banking, and big data analytics through technological integration have been a godsend in the financial services sector (Kabir et al., 2021; Mhlanga, 2024). Introduction of technology in banking has led to the introduction of innovative products and services besides augmenting operational efficiency facilitate customer satisfaction, customer service quality, and hence value creation (Olunuga, 2023; Romdhane, 2021)

The impact of marketing strategies on improving profit performance has been extensively investigated (Khairuddin et al., 2020). while the moderating role played by technology integration has rarely been stated. Findings of prior research indicate that technology can help banks to bridge the gap between marketing and the customer, tailor product offerings to individual needs,

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and improve pricing strategies – which altogether impact profitability (Olunuga, 2023; Khalaf & Shaer, 2023). In addition, given the better distribution of bank services and more active promotion, banking institutions could be able to create a more sophisticated blend of technological solutions in marketing that would help to increase customer loyalty, market share and profitability (He et al., 2025; Rahman et al., 2024). Based on such context, this study attempts to investigate the moderating effect of technological integration over the nexus between marketing mix and commercial bank profit in Bangladesh. Examining this interaction, the study aims to provide an original perspective for researchers and practitioners within banking (Akther et al., 2023; Hassan et al., 2025; Molla et al., 2022).

The commercial banking industry in Bangladesh has been facing rapid changes in its IT infrastructure as well as customer expectations for the past few years. Marketing strategies, especially with regards to marketing mix are generally classified among the prime profit factors in banking (Islam et al., 2021; Redwanuzzaman & Khan, 2021). However, technological integration has significantly relished its role towards achievement of profitability through these strategies. The banking sector is being transformed by the integration of digital technologies, such as mobile banking, artificial intelligence, big data and automation which changes the way banks connect with customers, provide services and manage their internal processes (Alam et al., 2025; Mekinjić, 2019). However, empirical studies that explore how technological integration moderates the relationship between marketing mix elements and profitability are scarce, especially on the Bangladesh commercial banks.

With several studies recently recognizing the substantial impact of the marketing mix in influencing bank performance (Chen, 2020; Juju & Supriadi, 2024). The banking industry is witnessing technological advancements that may provide a better customer experience, help to optimize operational processes and thus result in profitability (Garg & Kumar, 2024). Yet, the role specific IoT technologies such as on-demand ordering services, virtual reality shopping experiences, iBeacons or RFIDs in conjunction with the 4Ps Product, Price, Place and Promotion—are playing to help drive a profit is unclear (Aliahmadi et al., 2022). In addition, the banking industry in Bangladesh, as a developing country and its finance sector is lagging behind in the term of digital transformation compared to developed economies, such features provide both challenges and opportunities that have not examined so far by literature.

This research is attempting to fill this gap by investigating the moderating effect of technology integration in the relationship between Marketing mix elements and profitability: A case of commercial banks in recession condition, Bangladesh. These will further shed some valuable light on both the enablers and inhibitors of success and provide direction towards formulating bankable digital strategies for sustainable growth and profitability.

In this respect, within the scope of a banking business where the primary focus is on profitability and based on a small number of goals, the main purpose of this paper is to determine the relationship between the marketing mix factors Product, Price, Place, Promotion and Profitability. The study attempts to empirically analysis the impact of technological enablers such as mobile banking and automation on performance of the banks in Bangladesh. Moreover, it examines how technology improves the relationship between marketing mix and profitability

2. Review of Literature

Several studies have examined the relationship between marketing mix strategies, technological integration, and profitability across different sectors worldwide. These studies offer important empirical evidence on how effective marketing practices contribute to customer satisfaction, competitiveness, and financial performance. The relevant literature is reviewed below to establish the research foundation and identify the existing gaps.

2.1 Product and Profitability

The marketing mix element of the “Product” encapsulates the range of financial services that banks provide to cater constantly evolving needs of the customers. Loan and deposit products, credit cards, insurance products and investment services are offered in the banking sector (Al-Afeef, 2020). Research shows that there can be a huge beneficial impact on profitability, when banks are able to provide innovative products as per the needs of their customers and retain them. Personalized banking products, such as mobile banking services allow banks to reach a varied population of customers which in return contributes to raising market share and profitability (Henry et al., 2020). Moreover, digital-first solutions are the need of the hour, so often banks tend to working high on developing their digital products such as mobile wallets and online payment systems; which has become a critical part in today's banking scenario to be competitive (Mori, 2021).

Product mix and profitability in the banking sector are some aspects that form an intricate web of strategic decision making, business dynamics, and risk management processes. Banking profitability is key to the growth and development of financial systems in influencing both the performance of individual banks as well as the overall macroeconomic stability (Onuorah, 2023). In this regard, banks act as intermediaries, mobilizing funds and aiming to maximize their profitability to enhance financial performance and increase their stock prices (Obamuyi, 2013). The capital structure of a bank, which consists of the proportion of

debt and equity, plays a critical role in determining the cost of financing, risk exposure, and compliance with regulatory requirements (Fakiyesi & Olaoye, 2018). Profitability in banks is intrinsically connected with how banks utilize resources, where investment of resources in income-generating assets helps in increasing income and profitability (Ehiedu, 2022).

In the same vein, profitability in the banking sector cannot be separated from the risk level associated with the industry, especially system and idiosyncratic risks.

Hypothesis 1 (H1): There is a positive relationship between innovative product offerings and the profitability of commercial Bank in Bangladesh.

2.2 Price and Profitability

In this case, the term "Price" means price-based competition that includes pricing strategy by the bank through interest rates on loans, account fees, and commissions on financial products. This is a topic of research which states that profit-making may depend- or even rely- on competitive pricing in situations of stiff competition (Marecki & Wójcik-Czerniawska, 2024). This implies that pricing policies that keep prices low for customers while still being profitable for the bank can bring success to a competitive environment in the banking sector (Muparadzi & Rodze, 2021). Dynamic pricing models backed up by big data and predictive analysis algorithms can help the bank take advantage of changes in pricing with respect to market conditions for maximizing profitability (Zhang et al., 2025). However, an extreme focus on price competitiveness will not be good for banks since it leads to low margins. As a result, to maximize profitability for a longer period of time, banks must strike a balance between price competitiveness and maintaining margins (Muparadzi & Rodze, 2021)

In analysing and maximizing the efficiency of bank operations through profitability, an analysis of the price mix is essential, which involves the price charged on lending and deposit services and several other payments that banks make to their customers. The interaction of prices in a bank plays an important role in shaping its income generation strategy and customer management strategy (Mia, 2022; Muparadzi & Rodze, 2021) Bank profitability has a lot to do with the efficient use of its asset and liability portfolio as well as risk management (Konovalova & Čaplinska, 2020). Bank profitability is an important measure of the effectiveness of its operation and plays an important role in economic development (Sousa & Almeida, 2025)

Hypothesis 2 (H2): Competitive pricing positively influence the profitability of commercial Banks in Bangladesh.

2.3 Place and Profitability

Marketing mix factor "place" has to do with the distribution networks through which the bank will offer its products and services to its clients. This was a two-way approach initially where the networks were either in branches; but the proportion of each has been shifting as digital banking changes the channels used. According to the research, it has been possible for banks to make their products and services profitable as well as increase their client base including rural and underdeveloped areas, owing to the adoption of channels such as mobile banking apps (Guzovski et al., 2022). However, in nations such as Bangladesh, which belongs to the category of the developing world, banks are less likely to have branches for customers to visit physically (Albugami, 2022). In addition, the use of ATMs and agents increases the network strength of the banks, serving their services and making them profitable (Rwanyarare & Kalimba, 2023).

The coordinated arrangement of product assortment and location in the banking industry constitutes a complex task, requiring a thorough appreciation of consumer psychology, market conditions, and efficiency. The coordination of the bank's physical facilities, which include the network of its branches and ATMs, together with its financial offerings, plays a critical role in determining its profitability and competitiveness (Arifi, 2023; Nokerov et al., 2023). In assessing the location of its branches, banks need to consider factors such as demographics, economic variables, and the existence of other banks, among others.

Hypothesis 3 (H3): Distribution Channels positively influence the profitability of commercial Bank in Bangladesh.

2.4 Promotion and Profitability

Promotion means the activities conducted by a bank that aims at reaching customers through a convincing way that persuades them to use their products and services. Moreover, promotional tools in the banking industry include advertising campaigns, social media involvement, and loyalty programs. Promotion can help banks to boost their levels of brand recognition as well as customer acquisition and retention through a more cost-effective approach, which may substantially affect the bottom line of banks (Al-Rdaydeh et al., 2025; Chen, 2020). According to recent studies, most banks are adopting digital marketing techniques such as targeted social media ads and individual email ads, when dealing with the customers (Mohamad, 2024). For instance, loyalty programs designed in such a way to promote customers to make use of different services can be considered as one of those factors that will lead to customer retention and profitability (Syed, 2019). Thus, by making sure that marketing strategies adopted by banks match current trends of communication on digital platforms, banks may find themselves better positioned financially (Ghonim & Awad, 2025). The banking industry forms an essential part of the economy and is characterized by stiff

competition, hence necessitating the implementation of various strategic measures for customer attraction, market expansion, and profitability improvement (Sakariya, 2016). Promotional practices involve a wide range of marketing and communication strategies and form a key factor towards influencing customer perception and creating an environment conducive to bank growth (Sabardin, 2023). Banks that adopt relationship marketing strategies in the effort to build trust, show commitment to quality service delivery, and conflict resolution will be more successful in fostering customer loyalty and profitability (Capel & Ndubisi, 2011; Petzer & Roberts-Lombard, 2025). Promotional activities involving various marketing approaches have been found to greatly impact financial performance (Chen, 2020)

Hypothesis 4 (H4): Effective promotional strategies positively impact the profitability of commercial Banks in Bangladesh.

2.5 Technological Integration and Profitability

Technology integration is the process where the company adopts and implements various forms of technologies and digital platforms, including mobile banking, automation, AI, and big data. The use of advanced technology has been shown to enhance operational efficiencies and customer experiences, resulting in profitability due to reduced operational costs, increased customer engagement, new product and service provision that meets the customers' current demands (Osuma & Nzimande, 2024). For instance, the introduction of mobile banking has led to improved customer engagements and greater customer satisfaction, thus enhancing customers' retention and profitability within the bank sector (Ahmadi & Narci, 2022). Furthermore, the bank can adopt big data and AI platforms, which help the organizations analyze customers and develop their offerings based on customer needs. Such an approach enhances the effectiveness of marketing mix, thereby promoting profitability (Lazo & Ebarido, 2023). However, technology adoption has associated risks such as huge initial investments as well as need for frequent upgrade in technology (Chen et al., 2021; Hasan, 2024).

Hypothesis 5 (H5): Technological Integration positively impacts the profitability of commercial Banks in Bangladesh

2.6 Technological integration moderates the relationship between Product and profitability

Strategic investment in technology may greatly change how banking is done by bringing about improvement in financial success and customer satisfaction (J. & Kandi, 2022; N & S, 2026). The application of technology like mobile banking and Automated Teller Machines by India's state-run banks has been seen to result in better performance figures because of reduced costs and improved efficiency (N & S, 2026). In addition to the benefits associated with financial gains, technology adoption allows banks to build strong ties with their customers (Kolodiziev et al., 2021; Nwachukwu et al., 2025). But then again, when financial organizations are moving into the digital world, they have to be careful and ensure that the technologies they invest in lead to profits and do not affect service delivery or compromise the reputation of the organization (Mbama et al., 2018). Considering the inconsistent relationship between technology investments and profitability, it is important for organizations to plan their digital efforts in a way that ensures alignment with their business goals (Nguyen-Thi-Huong et al., 2023). This is especially the case in the public banking industry, where structured approaches towards technology investment are not commonly adopted in comparison to the private banks.

Hypothesis 6 (H6): Technological Integration moderates the relationship between products and profitability of commercial Banks in Bangladesh.

2.7 Technological integration moderates the relationship between Price and profitability

Though the pricing directly affects the profitability of any firm, in the case of banking organizations, technology capability is equally important because it makes pricing strategies much more effective. The technology works as a moderating variable and enhances the effect of pricing through better targeting, reduced costs, and immediate revisions (Berger & Mester, 2003). For instance, banks employing financial technologies can dynamically adjust prices based on customer behaviors, credit scores, or market trends and thus become more profitable (Arif et al., 2024). In contrast, the use of sophisticated pricing strategies may be difficult to implement without appropriate technology capabilities.

Thus, it seems clear that both variables require the development of an integrative approach. Research shows that banks improving their capabilities satisfy both aspects of the list and therefore obtain excellent financial results. Therefore, technology improves both profitability and the relationship between price and profitability.

Hypothesis 7 (H7): Technological Integration moderates the relationship between price and profitability of commercial Banks in Bangladesh.

2.8 Technological integration moderates the relationship between Place and profitability

Technology moderates the relationship between place strategy and profitability by amplifying or dampening the effectiveness of distribution channels. For instance, banks that invest in digital platforms can deliver services more efficiently across wider geographic areas, strengthening the profitability impact of their place strategy (Baldassarre et al., 2023). In contrast, banks that rely heavily on traditional brick-and-mortar branches without integrating digital channels may experience diminishing returns due to higher operating costs and shifting customer preferences (Baldassarre et al., 2023).

Moreover, the integration of customer analytics and digital engagement tools enhances the personalization and responsiveness of service delivery, further improving the return on distribution-related investments (Grassi et al., 2022; Ke & Wel, 2024). Therefore, the extent of technological integration determines how successfully a bank's place strategy translates into improved profitability.

Hypothesis 8 (H8): Technological Integration moderates the relationship between place and profitability of commercial Banks in Bangladesh.

2.9 Technological integration moderates the relationship between Promotion and profitability

Promotion has a significant influence on profitability. However, the influence of promotion varies based on how much technology is used in the banks. In the current study, technology integration has been regarded as a moderating factor that will have an impact on the influence of promotion on profitability (Rizquallah et al., 2025). Banks that employ technology in their processes can be able to create, implement, and measure highly profitable promotional programs. This is indeed a brilliant strategy by such banks because not only do they stand to benefit from targeting their clients, but they can also benefit from behavioral-based personalized messages that increase the promotional ROI (Awad & Ghonim, 2025; Dwivedi et al., 2024). In turn, banks that lack technologically equipped marketing strategies will most likely fail in promoting their products with process inefficiency and profitability being the end results.

At the end of the day, technology enhances client engagement and retention through promotion, which translates to higher profits. In other words, technology does not only facilitate the promotion, but it influences its strategic value.

Hypothesis 9 (H9): Technological Integration moderates the relationship between promotion and profitability of commercial Banks in Bangladesh.

2.10 Discussion about Technology adaption and marketing strategy for profitability

Technological integration refers to the use of advanced digital tools and platforms such as mobile banking apps, automated services, artificial intelligence (AI), and big data analytics in the banking sector to enhance operational efficiency, customer service, and product offerings (Grassi et al., 2022). Nevertheless, the importance of the technology in moderating the effect of marketing mix on profitability has received considerable attention lately. Technological integration does not affect the profitability directly but rather improves the impact of marketing mix variables, including the product, price, place, and promotion, on profitability in the banking industry (Awad & Ghonim, 2025; Rizquallah et al., 2025).

Firstly, it is possible to claim that technological integration positively influences the performance of marketing strategy since it enables banks to implement more effective pricing. Technology helps banks analyze customers' data and, therefore, make more competitive pricing decisions, which positively affects profitability (Adeniran et al., 2024). Secondly, modern trends in product development indicate an essential role of technology since the analysis of data related to customers enables financial institutions to create individualized financial products and, thus, ensure greater profitability and increased satisfaction among clients (Adeoye et al., 2024). Lastly, technology is crucial in terms of improving promotion. Personalized digital marketing helps banks to increase the level of engagement among their clients (Nagaraj, 2025). Digital technologies help expand distribution channels by enabling banks to address new geographic locations. Furthermore, technological integration makes the marketing mix more effective by reducing the resistance involved during the customer experience process. Specifically, it lowers operational expenses, increases customer satisfaction, and offers flexible price promotions, ultimately improving profit levels (Andronie et al., 2023; Loan, 2024). Nevertheless, it should be highlighted that there are certain drawbacks associated with technological integration, including expensive upfront and maintenance costs and employee training needs, which might have an adverse effect on the profitability of banks (Loan, 2024).

Considering the situation in Bangladesh where digital banking is gaining popularity, but still lags behind other countries, the moderating influence of technological integration is of utmost importance. Being able to modify the marketing strategy according to emerging technologies is key to gaining a competitive advantage and, as a result, being profitable.

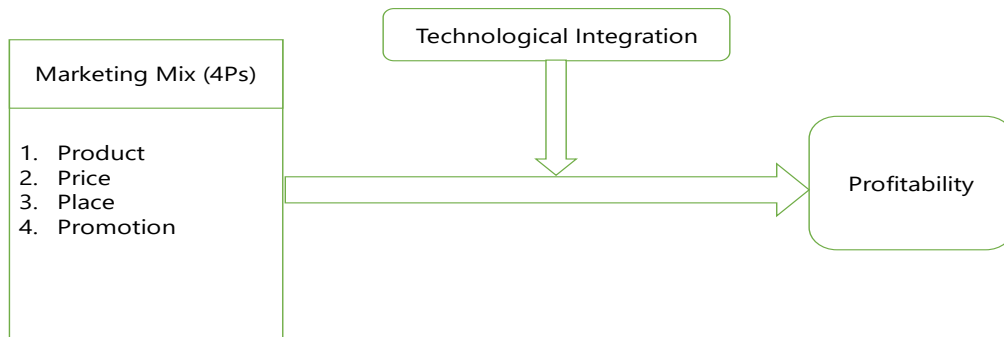
2.11 Conceptual Framework

Marketing Mix Theory (4Ps), introduced by McCarthy, is fundamental to knowing how banks can employ various tactics of product, price, place, and promotions to affect customer behavior and profitability (Bahman et al., 2013). Specifically in the banking industry, product will refer to various banking services offered such as loans and bank accounts, price to the prices charged or cost of service rendered, place to the mode of distribution (like through the branches and online platform), and promotion to all marketing and advertisement activities employed. This theory forms the base for studying the factors that determine the profitability of commercial banks in Bangladesh (Rana-Al-Mosharrafa & Islam, 2021).

Firstly, Resource-Based View (RBV), developed by Barney, is based on a core proposition whereby the emphasis should be put on the utilization of the organization's resources and capabilities to ensure competitive advantage and profit-making (Cuthbertson & Furseth, 2022). In terms of this research, technology will be used as an organizational resource to enhance efficiency, customer experience, and market positioning. B) Profit Making: Banks with good technical equipment will have a greater potential for making profits.

The model created by Davis is the Technology Acceptance Model (TAM), and this framework helps determine how individuals adopt new technologies by analyzing ease of use and usefulness (Carranza et al., 2021; Tran et al., 2023). Regarding the banking industry, the adoption of any technological innovation will result in enhanced customer experience and consequently greater profitability since it influences customer satisfaction and business efficiency. It is possible to apply the Technology Acceptance Model (TAM) to understand how technology affects financial institutions.

Research Framework:



Sources: Adapted from Abidemi et al., 2017

3. Research Methodology

The current research employs a quantitative research methodology due to its need to analyze relationships among variables. The type of problem being investigated and the objectives of the study necessitate the use of structured questionnaires as a means of acquiring numeric data. In this case, the study will employ the quantitative methodology by use of a seven-point Likert scale to determine the perception of 355 bank employees from different ranks. The findings are expected to contribute valuable insights into how marketing strategies, when combined with technological innovation, can enhance the financial performance of commercial banks in the Bangladeshi context.

3.1 Data Collection

In Bangladesh, there are 61 Nos. of commercial Banks and they have numerous Branches across the country. Dhaka City was chosen as it is the most civilized downtown area with the largest number of Banks and customers. Therefore, we have collected data from capital city Dhaka. This quantitative research employed convenience method to collect the required data from a total

of 355 respondents, who were Bankers at Dhaka City, and had experienced their services. A self-administered questionnaire with a 7-point Likert scale was used to collect data for the achievement of the objectives, the determination of the answers to the research questions and the testing of hypotheses. The self-delivery and collection questionnaire copies were the most appropriate method to obtain high response rate from the respondents. A total of 450 questionnaire copies were personally distributed to the respondents, from which 78.89% rate of response were achieved.

The survey instrument was designed based on the literature. This instrument was tested with a pilot sample of 50 customers. No changes were made to the instrument because the respondents did not have any difficulty in understanding the items of the pilot test.

3.2 Data analysis

PLS-SEM approach has been employed for analysis using Smart PLS Version 4.0. In SEM, PLS assesses the structure measurement of the model and the corresponding paths. Factor loadings are calculated using this approach, which are identical with the principal component analysis (Edumadze & Govender, 2024; Kumar et al., 2024). Utilizing PLS permits the author to explore and assess the validity of the research model and its relationships concerning empirical model's significance. As stated by Kumar et al., (2024), PLS offers many advantages to us over others structural modeling approaches because it permits the exploration of non-normally distributed variables. Estimation of path models, too, is possible using PLS and it is appropriate for analyzing both small-sized sample sizes and complex research models (Akter et al., 2017; Hair et al., 2018). Exploration of such a complex relationship in an exploratory study is appropriate using PLS due to scarcity of research done in this regard regarding marketing mix influence on customer loyalty.

4. Results and Findings

This section presents the analysis, results and findings of the study on the effect of Marketing Mix and technological Integration on the profitability of commercial banks in Bangladesh

4.1 Demographic Analysis of the Respondents

To interpret and ensure the applicability and representativeness of the survey data, the demographic profiles of the respondents should be first present. This section presents a brief profile of the respondents including their rank in the bank and number of years in banking industry. The study included 355 bankers from different positions and levels of authority, whose answers depicted a wide-ranging perspective on marketing practices and bank performance. The demographic information serves to verify that respondent perspectives are those of knowledgeable practitioners working in the field and at the policy level in the Bangladesh's banking sector.

Table 1: Designation of the Respondent

	Frequency	Percent	Cumulative Percent
<i>Manager/Divisional Head</i>	91	25.6	25.60
<i>Operation Manager</i>	96	27.0	52.6
<i>Line Manager</i>	46	13.0	65.6
<i>Interactive Officer</i>	101	28.5	94.1
<i>Others</i>	21	5.9	100.0
<i>Total</i>	355	100.0	

Table -1 summarizes the job roles of the 355 respondents. Interactive Officers form the largest group with 101 individuals (28.5%), followed by Operation Managers (96 respondents; 27.0%) and Manager/Divisional Heads (91 respondents; 25.6%). Line Managers account for 46 respondents (13.0%), while 21 respondents (5.9%) fall into the others category

Table 2: Experience in Banking Industry

	Frequency	Percent	Cumulative Percent
<i>Less than 1 year</i>	36	10.1	10.1
<i>1-3 years</i>	85	23.9	34.1
<i>4-6 years</i>	122	34.4	68.5
<i>More than 6 years</i>	112	31.5	100.0
<i>Total</i>	355	100.0	

Table 2 displays the distribution of respondents according to their years of work experience. Among the 355 respondents, the largest proportion (122 individuals, 34.4%) reported having 4 to 6 years of experience, followed closely by those with more than 6 years of experience (112 respondents, 31.5%). Respondents with 1 to 3 years of experience made up 85 individuals (23.9%), while the smallest group (36 individuals, 10.1%) had less than 1 year of experience.

Table 3: Type of Banks

	Frequency	Percent	Cumulative Percent
Public Sector Bank	57	16.1	16.1
Private Commercial Bank	191	53.8	69.9
Foreign Bank	20	5.6	75.5
Islamic Bank	87	24.5	100.0
Total	355	100.0	

The respondents' bank types are illustrated in Table 3. The largest number of respondents (191 or 53.8%) worked in private commercial banks, followed by Islamic banks, where 87 people were working (24.5%). A smaller number of people were respondents in the Public Sector Banks (57, or 16.1%), while the lowest percentage of respondents belonged to the Foreign Banks category (20 respondents or 5.6%).

4.2 Measurement Model

As can be seen from the measurement model, the reliability and convergent validity of all constructs are satisfactory. The structural model shows that the dimensions of the marketing mix (4P's) have positive and significant effects on profitability, whereas technological integration affects profitability much less directly and indirectly. A considerable portion of variability in profitability is explained by the structural model ($R^2 = 0.914$).

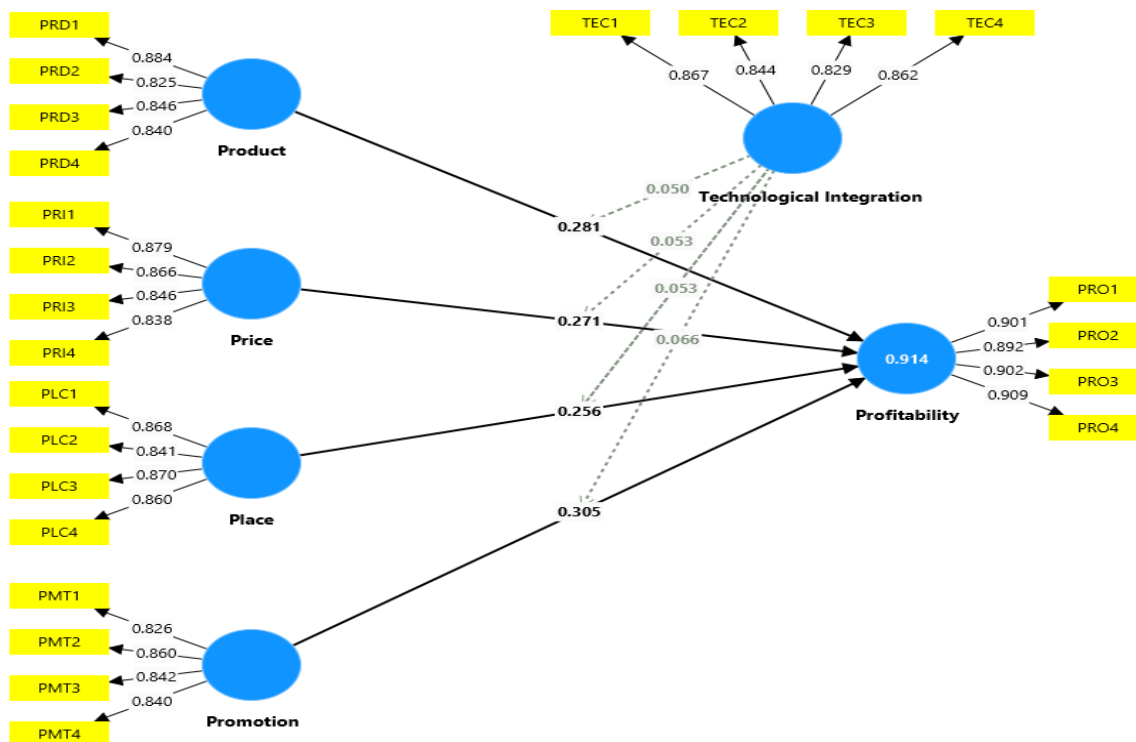


Figure-2: Measurement Model

4.3 Explanation of Outer Loadings Summary

The following table provides an overview of the outer loadings for each construct in the structural model. An outer loading is the extent to which an observed indicator measures its corresponding latent construct. Loadings above 0.70 are generally satisfactory, while those above 0.80 are indicative of a strong relationship between an indicator and its construct. In the present analysis, constructs like 'Place', 'Price', 'Product', 'Profitability', 'Promotion', and 'Technological Integration' have been measured through a number of indicators. Their average loading scores suggest very high reliability and convergent validity for these constructs. The interaction between the 'Technological Integration' construct and other constructs such as 'Price' and 'Product' have been modeled as single indicator constructs, thus yielding perfect loadings of 1.000.

Table 4: Outer Loading

Construct	Average Outer Loading
Place	0.860
Price	0.857
Product	0.849
Profitability	0.901
Promotion	0.842
Technological Integration	0.851
TI × Price	1.000
TI × Product	1.000
TI × Place	1.000
TI × Promotion	1.000

4.4 Reliability Test

The following table illustrates the measures of reliability and validity of each variable included in the research. All results are higher than any threshold generally considered acceptable, which confirms that the variables can be viewed as reliable and valid.

Table 5: Reliability Test

Construct	Cronbach's Alpha	Composite Reliability (rho_a)	Composite Reliability (rho_c)	AVE
Place	0.883	0.886	0.919	0.739
Price	0.880	0.886	0.917	0.735
Product	0.872	0.897	0.912	0.721
Profitability	0.923	0.923	0.945	0.812
Promotion	0.864	0.869	0.907	0.709
Technological Integration	0.873	0.875	0.913	0.724

All variables (Place, Price, Product, Profitability, Promotion, Technological Integration) fulfill the criteria for:

- Reliability (Cronbach’s Alpha, rho_a, rho_c all greater than 0.85)
- Convergent Validity (AVE all greater than 0.70).

4.5 Discriminant Validity

A high positive relationship exists between Technological Integration and Profitability ($r = 0.856$). Marketing mix variables, including Price, Product, Place, and Promotion, have moderately correlated values, recognizing their unique definitions despite a degree of interaction. The correlation between interaction terms such as TI × Price and TI × Product with other variables is relatively weak to moderate, indicating no issues related to multicollinearity..

Table 6: Discriminant Validity

Constructs	Place	Price	Product	Profitability	Promotion	Tech Integration	TI × Price	TI × Product	TI × Place	TI × Promotion
Place		0.057	0.091	0.3	0.081	0.052	0.017	0.026	0.078	0.079
Price	0.057		0.066	0.328	0.091	0.079	0.102	0.041	0.021	0.04
Product	0.091	0.066		0.236	0.063	0.074	0.038	0.131	0.005	0.142
Profitability	0.3	0.328	0.236		0.377	0.856	0.085	0.063	0.181	0.051
Promotion	0.081	0.091	0.063	0.377		0.057	0.038	0.148	0.086	0.021
Tech Integration	0.052	0.079	0.074	0.856	0.057		0.031	0.025	0.101	0.119
TI × Price	0.017	0.102	0.038	0.085	0.038	0.031		0.108	0.108	0.046
TI × Product	0.026	0.041	0.131	0.063	0.148	0.025	0.108		0.082	0.103
TI × Place	0.078	0.021	0.005	0.181	0.086	0.101	0.108	0.082		0.114
TI × Promotion	0.079	0.04	0.142	0.051	0.021	0.119	0.046	0.103	0.114	

4.6 Explained Variance (R² Values)

Coefficient of Determination (R-Square: 0.914): Shows that about 91.4% of the variability in the dependent variable (possibly Profitability) is accounted for by the independent variables in the regression model.

Adjusted Coefficient of Determination (Adjusted R-Square: 0.912): Slightly lower than R square, this accounts for number of predictors in the model. It adjusts R-square downward to penalize the unnecessary predictors.

Table 7: R² Values

Construct	R-square	R-square adjusted
Profitability	0.914	0.912

4.7 Structural Equation Modelling (Boot strapping)

The bootstrapping analysis reveals that the entire paths and loadings are significant statistically ($p < 0.05$). The factors 4P's (i.e., Product, Price, Place, Promotion) directly affect profitability in a significant way, while Technology Integration is also found to have an indirect impact on profitability in a significant manner but to a lesser degree. The model shows a great deal of predictability power, with 91.4% of the variance explained in profitability.

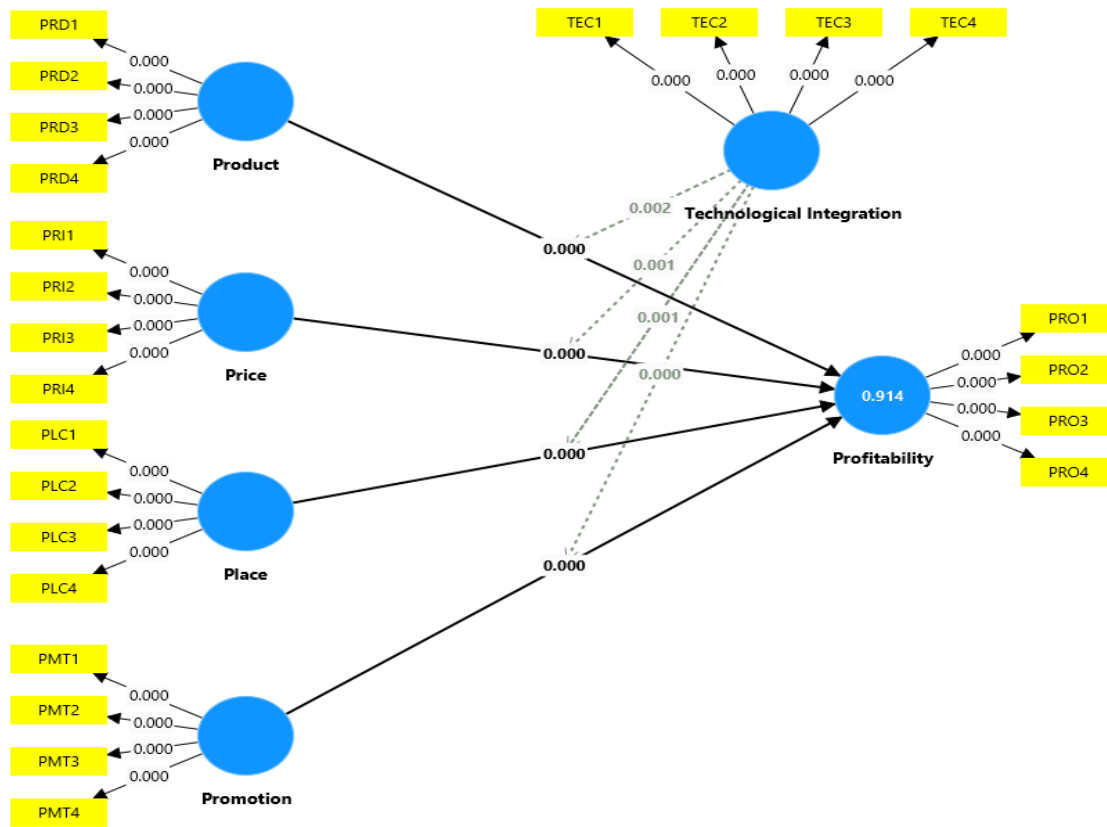


Figure- 03: Structural Equation Modelling

4.8 Hypothesis testing summary with P values

Here is the presentation of the results of the structural model analysis by applying the partial least squares approach to structural equation modelling (PLS-SEM).

Each hypothesized relationship has been found to be statistically significant ($p < 0.05$), thus confirming the theory-based hypotheses. Among all the variables, technological integration shows the highest effect on profitability, which underlines the significance of digital transformation. Moreover, as demonstrated by moderating effects, technological integration positively impacts the efficiency of marketing activities.

Table 8: Hypothesis Testing

Hypothesis	Path	Coefficient (β)	t-Statistic	p-Value	Result
H1	Product → Profitability	0.281	13.062	0.00	Supported
H2	Price → Profitability	0.271	13.425	0.00	Supported
H3	Place → Profitability	0.256	12.885	0.00	Supported
H4	Promotion → Profitability	0.305	14.426	0.00	Supported
H5	Tech Integration → Profitability	0.752	29.821	0.00	Strongly Supported
H6	TI × Product → Profitability	0.050	3.117	0.002	Supported
H7	TI × Price → Profitability	0.053	3.293	0.001	Supported
H8	TI × Place → Profitability	0.053	3.463	0.001	Supported
H9	TI × Promotion → Profitability	0.066	4.002	0.00	Supported

According to the structural model results, all assumptions made in the study have been accepted, which shows that the marketing mix components and technological integration positively affect the profitability of commercial banks in Bangladesh. The product proved to be an influential element with a significant positive influence on profitability ($\beta = 0.281$; $t = 13.062$; $p < 0.05$), followed by price ($\beta = 0.271$; $t = 13.425$; $p < 0.05$), place ($\beta = 0.256$; $t = 12.885$; $p < 0.05$), and promotion ($\beta = 0.305$; $t =$

14.426; $p < 0.05$). These findings show that effective marketing mix strategies are crucial for maximizing bank profitability. Promotion turned out to be the dimension of the marketing mix that showed the highest impact on bank profitability. The role of technological integration cannot be underestimated as it had a robust positive effect on the profitability ($\beta = 0.752$; $t = 29.821$; $p < 0.05$). In other words, technological solutions like digital banking, automation, and technologies used in customer services positively influence financial performance. Moreover, technological integration acted as a moderator in the relationship between product, price, place, promotion, and profitability.

5. Discussion

The implications drawn from this research prove that marketing mix factors and technological integration have a substantial effect on boosting profitability in commercial banks operating in Bangladesh (Redwanuzzaman & Khan, 2021). It is proved that all the mentioned marketing mix components have a positive and statistically significant impact on profitability and, thus, show high effectiveness in the banking industry. Nonetheless, this research indicates that profitability is influenced not only by marketing actions. Instead, the efficiency of such actions depends heavily on their integration with technological solutions. This trend can be explained by a number of changes taking place in the modern world and, therefore, influencing the banking industry (Kakhniashvili, 2025). When compared with the other components of the marketing mix, promotion was seen to exert a more pronounced direct impact on profitability, after which came product, price and place. From this, it is apparent that communication, advertising, customer relationship efforts and online marketing activities should be given priority in order to capture and retain bank customers. As noted by Cavallone and Modina (2013), customers are more inclined to interact with banks that have effectively communicated to them the value of their products and services in a competitive banking landscape. The second component to show significance in its direct impact was product. It demonstrated that diverse and customer-focused financial services could contribute to profitability in the face of changes in individual, business and online banking customer needs. Price was also seen to exert a favorable impact, signifying that reasonable service charges and competitive interest rates can help promote performance and customer satisfaction.

The most critical outcome of the study is the significant impact of technological integration. There was a significant direct effect of technological integration on profitability, and it moderated the association between all the four marketing mix factors and profitability. The model had an R-square value of 91.4%, and all the five hypotheses proposed had a significant positive impact, including the direct effects of product, price, place, promotions, and technological integration, as well as the moderating effects of technological integration on the other four factors. It shows that digital banking services, automation, and technology-enabled customer solutions enhance the effectiveness of marketing activities.

The current research also represents a valuable theoretical contribution by expanding the scope of application of the classic 4Ps marketing mix approach into the domain of technologically-driven banking services. The concepts of product, price, place, and promotion are well-established in the field of marketing; however, this research proves that their influence on profitability becomes even more significant in case technological integration is considered as a moderating variable. In other words, the present study makes a contribution to marketing and banking studies in that it offers a more comprehensive conceptual model, where profitability is defined with respect to marketing strategies and digitalization.

In practical terms, the insights gained can be very helpful for managers of banks, policy makers, and marketers. The commercial banks operating in Bangladesh must concentrate on developing unique financial products, keeping their prices transparent and competitive, increasing accessibility both offline and online, and also conducting promotional activities using digital means. Given that the integration of technology enhances the performance of all aspects of the marketing mix, banks need to allocate more resources towards mobile banking services, internet banking services, digitization of account opening processes, loan application processes, customer service automation, transaction security, and digital marketing.

In summary, the research findings imply that for a commercial bank to sustain its profitability, there must be adequate integration between marketing strategy and technological capabilities. It is only when a commercial bank approaches its marketing and technology as interrelated strategies that it can enhance the performance of all four P's and ensure customers' satisfaction, operational efficiency, and increased market reach and profits. Commercial banks in Bangladesh need to integrate marketing and technology in their operations.

6. Conclusion and Scope of Further Research

From the results obtained from this study, it can be concluded that the marketing mix approach along with technological integration is quite critical in terms of increasing the profitability levels of commercial banks operating in Bangladesh. It has been confirmed that each one of the four components of the marketing mix including product, price, place, and promotion has positively impacted bank profitability. In this context, it can be highlighted that the component of promotion has shown to have

had the maximum impact among all four components. Nevertheless, the factor of technological integration has proved to be the most influential component out of all these factors.

In addition, it is clear from the results that the moderation indicates that the integration of technology improves the connection between the marketing mix variable and profitability. This shows that there is synergy between the integration of technology and marketing mix strategy that contributes more towards profit-making through marketing. Hence, the banks should not think of integrating technology in marketing separately from marketing activities. Technological integration should go hand in hand with the development of products, pricing decisions, delivery channels, and promotion in order for banks to earn higher profits. In terms of management implications, this paper recommends commercial banks in Bangladesh to concentrate on digital transformation along with the marketing orientation. The research can further be extended to include service industries along with other moderators like organizational agility, digital literacy, etc.

However, this study reveals a lot of important issues concerning the effects of marketing mix and technology integration for enhancing the performance of banks in the form of increased profits. There are still some directions that can be explored further as possible areas of research. First of all, the current study paid a lot of attention to the traditional aspects of marketing, including products, price, promotion, and place. In the future, other aspects of service marketing might also be taken into account, like people, process, and physical evidence since they play an important role for the performance of banks. Secondly, this study is limited to the banking industry in Bangladesh. It is worth considering some other service industries as well. Thirdly, even though technological integration was utilized as a moderating variable in this study, there is still room for other mediating or moderating variables that can be considered in future studies, including organizational agility, digital proficiency of the employees, digital proficiency of the customers, service innovation, and regulatory support. Additionally, it should be noted that the current study applied cross-sectional research design. As a result, no dynamics were observed throughout the research process, as it would have been possible in longitudinal research design. Hence, future research may focus on studying dynamics of the interplay between marketing strategy, technological integration, and profitability. Lastly, future research may use qualitative research methodologies to shed more light on this topic.

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