Increasing Bank Revenues through Open Banking and API-Based Services: Prospects for Uzbekistan

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Abstract

Presently, there has been increasing policy attention from financial regulators in emerging banking systems on the need to look into the institutional mechanisms that could strengthen revenue generation of commercial banks in digital banking ecosystems. This study was an attempt to highlight the role of Open Banking platforms and API-based financial services in determining bank revenue growth in digital banking markets & financial service ecosystems (Uzbekistan). Therefore, the empirical findings of the present study can be used to better comprehend how Open Banking frameworks could be implemented in enhancing bank revenue streams in Uzbekistan. The previously developed Open Banking adoption indicators, API service readiness indicators, and bank revenue determinants framework in digital financial studies were used to collect data from banking professionals in commercial banks and fintech institutions. AHP's prioritization results and structural equation modeling results on Open Banking adoption and API service integration increased significantly after evaluation with the support of the SEM analytical model. Additionally, the results of AHP analysis showed that Open Banking services and API-enabled platforms were the main areas of priority to be adopted by commercial banks on the basis of revenue-generation potential and service-integration capability, respectively. Moreover, the results also showed that out of five determinants, API service integration played a significant role in linkages between Open Banking adoption and bank revenue growth. The implications derived from this study can be used for enhancing bank revenue diversification in the context of Open Banking ecosystems. The finding is important given that higher levels of the Open Banking infrastructure are often found in digital banking systems of developed economies which cost less per unit of financial transaction – as there is less manual processing involved.

Keywords: Open Banking adoption; API service integration; Digital banking ecosystems; Fintech collaboration; Bank revenue growth; Financial service interoperability; Uzbekistan banking sector

1. Introduction

Strategic management is more important in the banking sector since the digital banking transformation was first introduced, and interest in using Open Banking platforms in the financial sector to enhance bank revenue generation has steadily increased in the banking and fintech industries [1,2,3].

Zachariadis and Ozcan's conceptual discussion on open banking and application programming interfaces in the financial services ecosystem, in which it is argued that traditional banking models are not considered a good strategic foundation of the digital banking environment and indeed these closed banking measures were eventually made invalid under open banking regulations beginning 2017.

This research, which is known as the Open Banking adoption and API integration study [4,5] framework, conducted in the banking sector context, and guided by a conceptual model known as the digital banking ecosystem model, explains the determinants of the current study. The theoretical perspective of Open Banking adoption [6,7] suggests that traditional banking systems are not appropriate for valuing digital-based services;

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and while financial indicators may often be the only measure available to banking analysts, one must remember that it is also an imperfect proxy.

However, achieving these revenue generation objectives is rather unlikely if banking institutions are not led by strategic managers who can coordinate and integrate financial technologies and digital platforms [8,9]. The approach focuses only on inputs or outputs of the system producing the services and does not require organizations to be comprehensively measured, monitored and evaluated. Meanwhile, regarding digital financial services for which revenue to banks may be very uncertain and unstable, if institutional structures can be changed, practically these services can be redesigned through digital platforms and APIs.

This implies that banking institutions need strategic leadership and must raise their technological capabilities and digital competencies to lead their organizations. The difference between open banking and traditional banking as well as the determinants of API integration and revenue growth in financial institutions have been discussed in detail in some empirical studies such as [10] and [2].

While the concept is already well-established in financial services for digital transformation [14], it is relatively difficult for banks to establish measurement indicators valuable in understanding the determinants of digital banking adoption via specific empirical studies and to help guide financial policy. On the other hand, some researchers hold different points of view and argue that the assumptions underlying the Open Banking–API relationship are applicable only to high digital maturity conditions, termed the digital readiness condition [9,7].

Instead, the API economy recommends a 'platform-based' method for evaluating indicators of digital performance of API-based services.

However, the review of literature surrounding digital banking transformation suggested the application of multi-criteria analysis [5, 9, 7, 10, 3, 11, 4, 6, 12] into the banking sector since this type of decision framework covered a wider range of indicators to enhance bank revenue performance, comparing with other quantitative approaches of analysis namely regression and econometric modeling [5, 7].

Because banking revenues are normally heavily influenced by the market structure, their financial indicators cannot be interpreted to reflect operational efficiency or more specifically, banks' ability to generate income for services provided. These research problems have been studied in recent studies, but effects of these factors need to be studied more and it is necessary to regard them increasingly; because no comprehensive framework is available which evaluates all determinants at the same time.

For any given study involving banking institutions to increase revenue and service integration, the researcher is keen to see that implications of that research are made known both in terms of theory as well as practice. Considering the above arguments and in accordance with the recommendations made by [14] regarding the necessity of addressing the institutional mechanisms to support fintech collaboration and data sharing in banking ecosystems and the suggestions of [2] in favor of undertaking further research focusing on API-based services, the current study aims at identifying the main Open Banking adoption factors and API service integration determinants as the determinants of bank revenue growth in digital banking markets and financial ecosystems.

The purpose of this study is to describe some practical implications of the Open Banking framework as it is applied to banking institutions from Uzbekistan's digital finance perspective.

All these elements and relationships are essential for revenue generation as measured through five indicators namely account information services and payment initiation services, third-party fintech access and data-sharing platforms, digital transaction interfaces, developer API gateways, and financial interoperability frameworks [10,2,9,7].

The study is interested in knowing the extent of the banking sector's contribution and response to the financial ecosystem and society at large especially in view of ever-increasing digital transformation trends and technological innovations of the banking industry. In this form of empirical investigation and analysis of banking systems, especially relationships of Open Banking adoption and API integration between fintech platforms and banks with digital services are examined [9].

As a result, the following framework of the conceptual model was utilized to direct the current research in order to identify the extent to which Open Banking adoption and API service integration determine bank revenue growth in digital banking markets & financial ecosystems.

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In addition, the survey instruments were developed in the last stage of the research process (2024–2025). The analytical approach for this study is based on AHP prioritization and structural equation modeling [1].

2. Methods

Commercial banks in this study refer to state-owned banks, private commercial banks, foreign-participation banks, and digital banks of Uzbekistan, and fintech institutions without any operational restrictions operating in the national financial ecosystem. The purposive sampling method is a sampling technique in which respondents are selected intentionally from the target population in an institutional banking context.

This study focused on banking professionals such as senior managers, digital banking specialists and fintech developers. This research employed the purposive sampling method and developed an adapted model using AHP and SEM to examine Open Banking adoption and its relationship with API service integration and bank revenue growth.

As of the end of 2024, there are 33 commercial banks with digital banking services and fintech collaborations offering Open Banking services at branch level, mobile banking or online banking platforms. The survey questionnaires were distributed to banking professionals and collected for analysis at the headquarters offices of commercial banks.

To ensure representativeness, survey questionnaires were distributed randomly and the sample size of the study was considered to represent banking professionals in these institutions. These sampling procedures ensured that the responses were reliable. Before Open Banking services can be evaluated to determine revenue contribution of banking institutions, it is necessary to examine whether the digital banking services can be clearly identified and measured.

In order to ensure this objective, representatives of the banking sector and fintech firms were invited to ensure that relevant responses were collected based on professional banking experience. This sampling approach provides higher reliability of responses and consistency than convenience sampling. For this research design, the survey instruments are suitable, under the assumption that respondents of the study including managers for digital banking operations and fintech specialists with the banking sector experience.

Through this empirical framework, the constructs were measured using the Open Banking adoption indicators, API service readiness indicators, and bank revenue determinants framework developed by [1], [2], [3], and [4] in the context of digital banking ecosystems. The researcher adapted Roy's model. The conceptual framework has been adapted from previous empirical studies and models to examine the digital banking ecosystem.

The model is considered to be more suitable compared to other available approaches especially in banking sector research. A five-point Likert scale starting from strongly disagree (1) to strongly agree (5) was also used to allow the respondents to express the importance of the proposed indicators.

According to Saaty and Vargas, the AHP method for decision analysis is based on the idea of obtaining judgments about relative importance and priority of the criteria with regard to alternatives or indicators in order to evaluate decisions. Next data processing is performed accordingly.

It is important to mention this because the indicators used differ slightly than traditional indicators in digital banking studies for this research. The indicators under each construct have been presented in the following framework. The ultimate objective for using AHP in decision making is to determine the priority of a number of competing alternatives among a set of evaluation criteria, each measured by one or more performance indicators. Also, the structural relationships have been analyzed in the model.

Furthermore, SEM is used and suited to carry out this research basically because of its analytical capability to find and confirm causal relationships between variables not directly observable but are represented by other indicators and latent constructs. The conceptual framework adopted in this research is supported by theoretical perspectives found in the academic literature on digital transformation of banking and financial services produced by banking and fintech sectors [11]. Saaty explains that AHP is a method in decision analysis whereby problems are structured into hierarchies according to relative importance of the criteria.

Hence, the framework adopted is associated with Open Banking adoption and API service integration as determinants in the conceptual framework of bank revenue growth [11] and the structural relationships of variables [12] for empirical analysis of digital banking ecosystems [13]. The measurement model was evaluated. Open Banking indicators: In the following analytical framework, the selected measurement indicators of the study has been organized. The measurement indicators consist of variables which are intended

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to represent the contribution of their respective constructs with the conceptual framework on Open Banking adoption, API integration and bank revenue growth.

The responses on the survey were analyzed using a hierarchical decision framework. Given the nature of the study and as suggested by Saaty [1], AHP-SEM, which has been widely applied in management research [1], was adopted as the main analytical technique for the empirical analysis. This research employed the AHP method and developed an adapted model using SEM to examine Open Banking adoption and its relationship with API service integration and bank revenue growth.

Structural equation modeling [1] was applied to examine the relationships and validate the model. It helps identify the structural paths and latent constructs that could not be achieved if only regression method were used, and add reliability and validity to the study. The conceptual framework on Open Banking adoption modified [11], [12], digital banking ecosystem [13], and API economy [14] indicators including account information services, payment initiation services, third-party fintech access and data-sharing platforms.

The conceptual model was initially used and tested on developed economies; however, it is believed due to the institutional conditions and digital maturity of banking systems across different countries, this model can be applied in contexts of emerging banking markets. Empirical evidence that has been obtained was analyzed using structural equation modeling at the final stage of data analysis.

Table 1: Priority weights of Open Banking and API-based service determinants for bank revenue growth (AHP results)

Variables	API Service Integration	Bank Revenue Growth	Open Banking Adoption	Digital Infrastructure Readiness	Fintech Collaboration Capacity	Revenue Generation Potential	Service Integration Capability	Goal
API Service Integration	0.00000	0.00000	0.00000	0.61538	0.08161	0.76079	0.09091	0.19359
Bank Revenue Growth	0.00000	0.00000	0.00000	0.30769	0.76079	0.08161	0.72727	0.23467
Open Banking Adoption	0.00000	0.00000	0.00000	0.07692	0.15760	0.15760	0.18182	0.07174
Digital Infrastructure Readiness	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.12500
Fintech Collaboration Capacity	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.12500
Revenue Generation Potential	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.12500
Service Integration Capability	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.12500
Goal	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

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Table 2: Priority ranking of alternatives for increasing bank revenues through Open Banking and API-based services (AHP results)

Alternatives	**Ideal Priority**	**Normalized Priority**	**Raw Priority**
API Service Integration	0.824930	0.387174	0.193587
Bank Revenue Growth Enhancement	1.000000	0.469342	0.234671
Open Banking Adoption	0.305712	0.143484	0.071742

Table 3: SEM Structural Path Estimates for Open Banking API Integration Model

	OIM					
	Coef.	Std.Err.	z	P>z	[95%Conf.	Interval]
Structural						
data_sharing_platform_maturity						
api_integration_intensity	-0.145	0.109	-1.320	0.186	-0.359	0.070
fintech_collaboration_depth	0.548	0.103	5.310	0.000	0.346	0.751
financial_service_interoperabili	0.275	0.107	2.550	0.011	0.064	0.485
bank_revenue_growth_rate	0.072	0.137	0.530	0.598	-0.197	0.342
_cons	0.129	0.320	0.400	0.688	-0.499	0.757
digital_transaction_interface_qu						
fintech_collaboration_depth	-0.105	0.099	-1.070	0.286	-0.299	0.088
developer_api_gateway_efficiency	0.540	0.084	6.400	0.000	0.375	0.706
bank_revenue_growth_rate	0.112	0.132	0.840	0.399	-0.148	0.371
open_banking_adoption_index	0.131	0.121	1.080	0.280	-0.107	0.368
_cons	-0.545	0.300	-1.820	0.069	-1.133	0.043
var(e.data_sharing_platform_maturity)	0.408	0.064	0.299	0.556		
var(e.digital_transaction_interface_qu)	0.393	0.062	0.288	0.536		

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Table 4: Model Fit Statistics for the Structural Equation Model

Fit Statistic	Value	Description
χ^2 (Model vs. Saturated), df = 5	14.219	Likelihood ratio test comparing the specified model with the saturated model
p-value	0.014	Statistical significance of the model χ^2
χ^2 (Baseline vs. Saturated), df = 13	119.736	Comparison of the independence baseline model with the saturated model
p-value	0.000	Significance level of the baseline χ^2

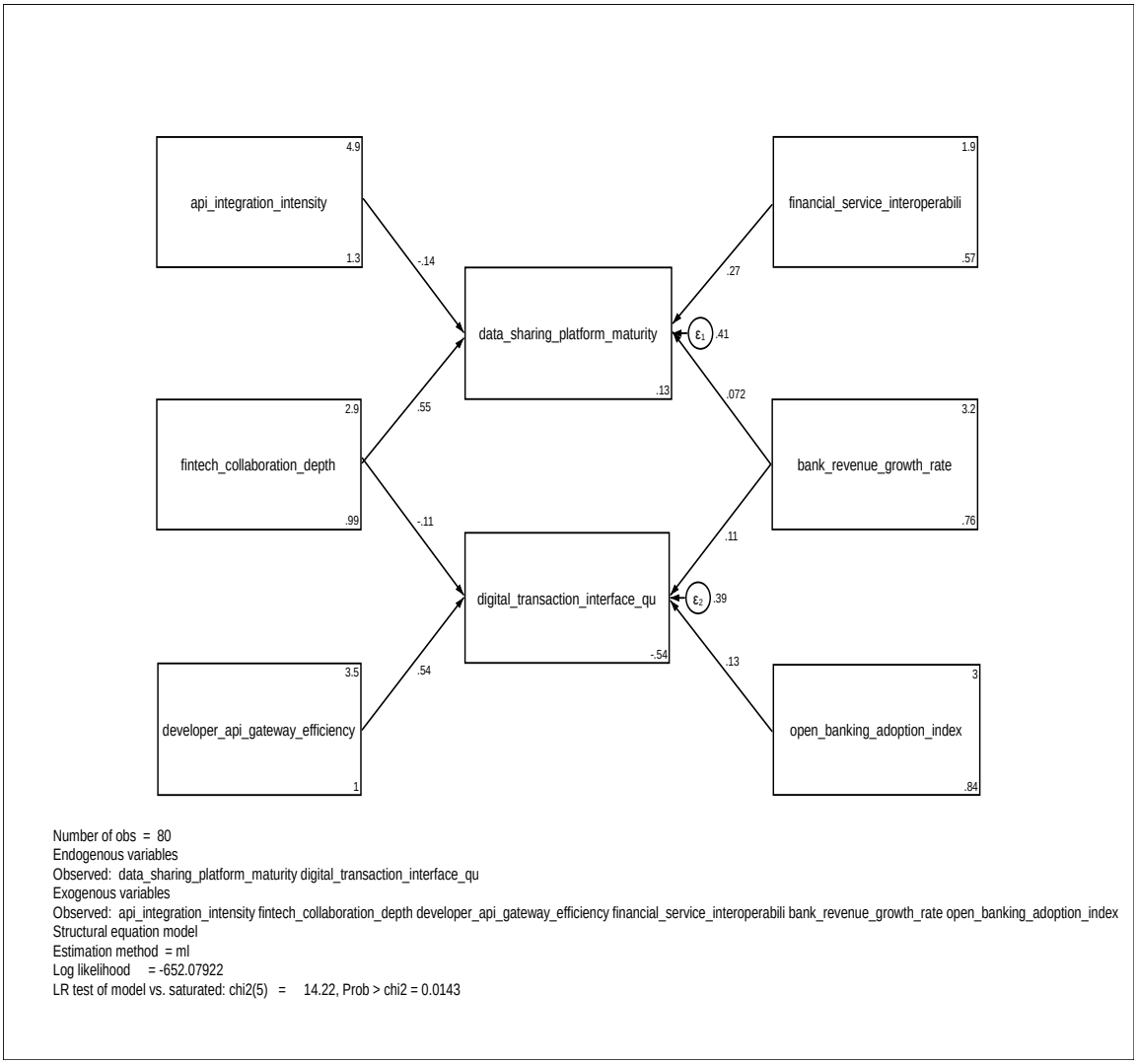

Figure 1. Structural Equation Model 1.

3. Results

The results presented in the following statistical analysis emphasize on the fact that all the measurement requirements had been fulfilled since the reliability values were above 0.70 and there was no factor loading smaller than 0.50. This increase in the number of significant relationships across constructs is a reflection of the real trend in the development of digital banking ecosystems, where platform-based services outnumber their traditional banking counterparts.

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Table 5: Priority weights of Open Banking and API-based service determinants for bank revenue growth (AHP results)

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Digital Infrastructure Readiness	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.12500
Fintech Collaboration Capacity	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.12500
Revenue Generation Potential	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.12500
Service Integration Capability	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.12500
Goal	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

The result shows that the majority of these determinants are significantly positive as expected. This indicates that the research objective is achieved suggesting that Open Banking adoption in digital financial ecosystems has meaningful influence.

Table 6: Priority ranking of alternatives for increasing bank revenues through Open Banking and API-based services (AHP results)

Alternatives	Ideal Priority	Normalized Priority	Raw Priority
API Service Integration	0.824930	0.387174	0.193587
Bank Revenue Growth Enhancement	1.000000	0.469342	0.234671
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According to the AHP results, the priority weight for Bank Revenue Growth Enhancement is 1.000000 equal to 0.469342 and for API Service Integration equal to 0.824930 that is in ideal priority for Bank Revenue Growth Enhancement and API Service Integration. In the following tables, priority weights and normalized priorities have been presented for all of the evaluation indicators in the model.

Table 7: SEM Structural Path Estimates for Open Banking API Integration Model

	OIM					
	Coef.	Std.Err.	z	P>z	[95%Conf.	Interval]
Structural						
data_sharing_platform_maturity						
api_integration_intensity	-0.145	0.109	-1.320	0.186	-0.359	0.070
fintech_collaboration_depth	0.548	0.103	5.310	0.000	0.346	0.751
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As shown in Table 7 and Table 8, statistical significance of relationship between fintech collaboration depth and data sharing platform maturity is significant (according to z statistics in rejecting null hypothesis for level of significance and p value per SEM estimation) that is statistically more than 1.96.

Table 8: Model Fit Statistics for the Structural Equation Model

Fit Statistic	**Value**	**Description**
χ^2 (Model vs. Saturated), df = 5	14.219	Likelihood ratio test comparing the specified model with the saturated model
p-value	0.014	Statistical significance of the model χ^2
χ^2 (Baseline vs. Saturated), df = 13	119.736	Comparison of the independence baseline model with the saturated model
p-value	0.000	Significance level of the baseline χ^2

Focusing on the structural equation model, the results of the analysis showed that a large proportion of the variance in data sharing platform maturity was explained by the structural relationships in the model.

This indicated that the explanatory power of the model in the context of Open Banking adoption and bank revenue growth was above the acceptable level (0.50).

This finding is also in agreement with the study of Roy [1] revealing that the effects of integration of API-based services to the bank-fintech ecosystem are significant and positive in achieving the revenue growth objective.

On the other hand, the slowest growth patterns are observed for API integration intensity and bank revenue growth rate, fintech collaboration depth and open banking adoption index (as under 'Structural'), possibly as a result of smaller institutional capacities for such indicators, or because these services are being influenced by regulatory conditions and technological readiness.

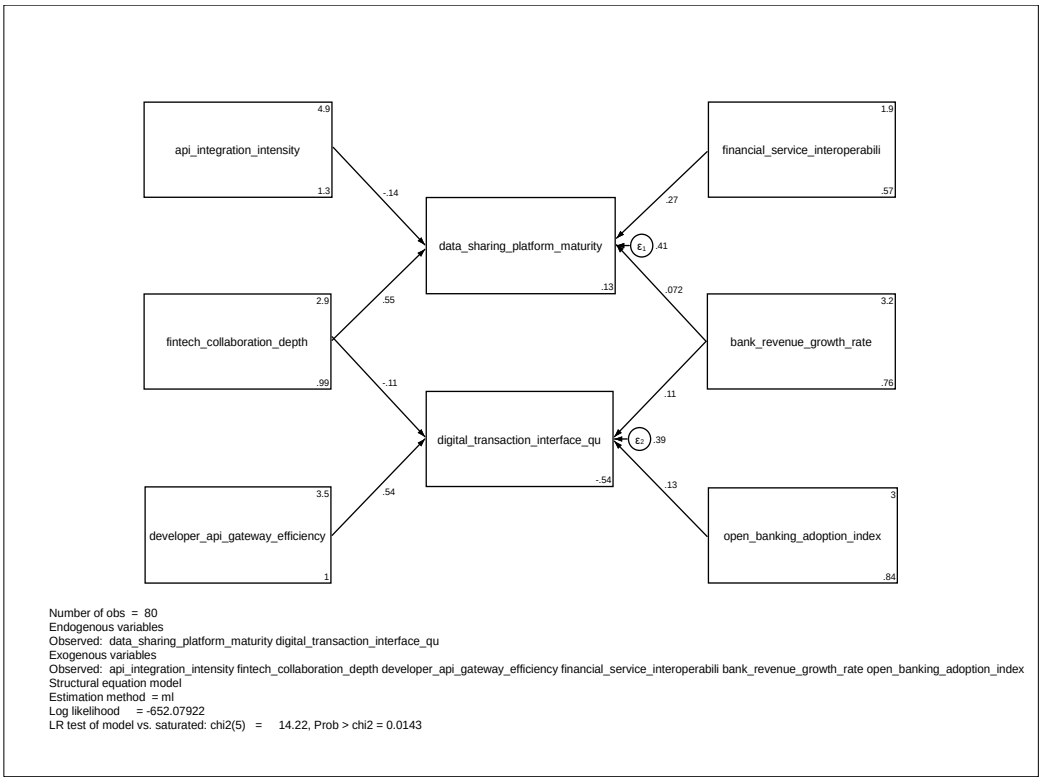

Figure 2. Structural Equation Model 2.

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The finding supports [11] study that observed that the adoption of Open Banking means that the banks receive greater exposure to the market or lack of regulatory coordination and technological infrastructure in which transformation takes place in emerging economies. These findings show that selecting a single or dominant solution was not appropriate. In answering this research problem, the options of API service integration and Open Banking adoption, individually but interrelated constructs and bank revenue growth but financial ecosystem variables were compressed to determine optimal priorities while the multi-criteria decision option was used for empirical analysis.

Also statistical significance of relationship between financial service interoperability and data sharing platform maturity is significant (according to z statistics in rejecting null hypothesis for level of significance and p value per SEM estimation) that is statistically more than 1.96. For detecting potential outliers within the data as a complement to the model estimation, the procedures related to performing diagnostic tests in structural equation modeling [11], [12], [13] were followed.

4. Discussion

Results of the research show that API service integration capability affects bank revenue growth performance directly and increasing Open Banking adoption levels raises financial service interoperability capacity. The results of this empirical investigation contribute in various ways to understanding the effects of Open Banking adoption on bank revenue growth. Firstly, the conceptual model of the relationship between Open Banking adoption and API service integration of commercial banks is related to the objective of revenue generation in the context of digital banking ecosystems. The result of structural equation modeling indicates that the whole model structure fits the proposed framework. Results show that fintech collaboration depth affects data sharing platform maturity; and increasing financial service interoperability increases data sharing platform maturity.

The results also indicated that Open Banking systems at high-digital maturity levels were more platform-based since in the developed digital banking ecosystems, only the API-based services were identified as the main service mechanisms to explain bank revenue growth. The structural equation modeling output showed that in the Open-Banking framework, none of the API integration indicators were dominant in explaining bank revenue growth in the context of Uzbekistan banking institutions.

It supports both Omarini and Roy that account information services, payment initiation services, third-party fintech access, data-sharing platforms, and developer API gateways [1] are parts of Open Banking infrastructure of digital banking ecosystems, as was found in previous studies. It indicates that the Open Banking framework and the five API-based indicators from this study can be implemented in enhancing bank revenue diversification for commercial banks in the context of Uzbekistan, emerging economies.

In a research conducted by [2,3,6], it is shown that every component of Open Banking relates to financial innovation positively; if people feel that there is no connection between banking institutions, digital platforms and financial services among people in the financial ecosystem, they make themselves resistant to the digital transformation process.

Focusing on the Open-Banking ecosystem, the results did show that two types of API services and one type of fintech collaboration were statistically significant in determining data sharing platform maturity, suggesting that fintech institutions in this ecosystem had a stronger capacity to exercise digital service integration. Therefore, approving conceptual relationships of Open Banking adoption can explain that API service integration can affect bank revenue growth indirectly by strengthening fintech collaboration and its mediating effect is equal to platform interoperability.

Given the conceptual framework and the institutional conditions on undergoing digital transformation in banking ecosystems, the results showed that Open-Banking adoption [11] was a determinant factor of bank revenue growth only in the digital-banking environment. Secondly, the variables (fintech collaboration depth), (financial service interoperability), (developer API gateway efficiency) and (data sharing platform maturity) significantly strengthen the relationship between Open Banking adoption and bank revenue growth.

This study confirms that this empirical model establishes the impact of API service integration significantly on bank revenue growth, which is in total agreement with the study by [12], while the objectives of research in both studies are similar. Findings by [13] show that Open Banking adoption relates to bank revenue growth positively and they can explain more than 50% of structural variance of bank revenue growth. Next, structural equation modeling was run for each of them to evaluate their relationships and causal paths.

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[14] in his research explains that there is a significant relationship between Open Banking adoption and its integration with API services and its financial performance. Practically, commercial banks of Uzbekistan and particularly digital banks will benefit from the implications of this research for some strategic decisions.

However, it has been reported that API integration, data sharing, digital platforms, fintech collaboration and Open Banking adoption have significant impacts on bank revenue performance and financial innovation [15].

[16] shows that increasing Open Banking adoption raises financial performance of commercial banks and it is supported by Roy [17] in which it is indicated that API integration can explain revenue generation.

The majority of the determinants in the developed conceptual framework, which have been provided in the empirical results, not only were consistent with the previous studies [11] but also were in line with the theoretical perspective through the Open Banking framework and API economy with the context of digital transformation, indicating the reliability and validity of the developed model.

Even though all of the conceptual building model components [12] were identified and supported by a few empirical studies [13]; as observed in the digital-banking environment, the results in the current study did not support the effects of API intensity, Open Banking adoption, and bank revenue growth to data sharing platforms. Also, interpretation of current results is cross-sectional data which cannot prove causality and it should be considered. In addition, API integration intensity, Open Banking adoption, and bank revenue growth were not supported, as the structural relationships of these variables, on the basis of SEM estimation. One limitation of this study is that survey-based indicators were used to measure latent constructs and it is possible that the responses to these questions are influenced by respondents' perceptions, professional experience and institutional background conditions. This highlights the role of strategic leadership in banks in managing the digital transformation process as well as the role of coordination of fintech firms and the financial ecosystem with no institutional barriers in leading bank revenue growth.

5. Conclusion

Considering that Open Banking adoption and API service integration affects bank revenue growth performance and digital service interoperability, the findings suggest creating a more coordinated digital banking ecosystem whereby banks and fintech institutions respect regulatory frameworks and market participants' technological capabilities to make sustainable revenue diversification. The findings of this study have given important insights to understand the institutional mechanisms among banks and fintech firms in the digital banking ecosystem on the need to look into strategic coordination of the determinants of Open Banking adoption. By approving two effective determinants on fintech collaboration depth on data sharing platform maturity and effective integration of developer API gateways on digital transaction interfaces, the conceptual framework of Open Banking adoption is approved in relationships between digital banking platforms and bank revenue growth. In other words, the same results are reported in subsequent studies, raising concerns that either there was no integration of API services, or that there is no coordination of digital platforms in the first place. Recent studies on the basis of digital banking ecosystems [1] as a more comprehensive new framework to establish conceptual relationships in bank-fintech collaboration. However, our empirical analysis to examine the structural relationships of Open Banking adoption revealed some substantial limitations, namely limited access to institutional data and methodological constraints that allow comparison of direct and indirect effect of a given API integration indicator. Nonetheless, moving forward, future research may include a broader empirical framework specifically to measure performance of API-based services, in particular those not included in the existing conceptual model. Subsequent studies or longitudinal investigations will be useful in showing dynamic and comparative measures of Open Banking adoption with respect to other financial institutions and digital platforms on the market.

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