

THE IMPACT OF FINTECH COMPANIES ON THE TRADITIONAL BANKING SECTOR: COMPETITIVE INTERACTIONS AND OPPORTUNITIES FOR COOPERATION

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Abstract

The rapid growth of fintech companies has significantly transformed the competitive dynamics within the financial sector. This study examines the impact of fintech activity on the performance of traditional banks, focusing on competitive interactions and potential opportunities for collaboration. Using a panel econometric analysis of data from 150 commercial banks across various countries from 2010 to 2022, we investigate how fintech innovation influences banks' return on assets (ROA). The results reveal that increased fintech activity exerts a statistically significant negative effect on the ROA of traditional banks, indicating heightened competitive pressure. However, this impact is moderated by bank-specific factors such as size and capital adequacy, as well as macroeconomic conditions. Larger banks and those with higher capital adequacy ratios are less adversely affected, suggesting that scale and financial stability provide resilience against fintech competition. The study also highlights that in economies with higher GDP growth, the negative influence of fintech on banks is diminished. These findings underscore the necessity for traditional banks to adapt by investing in technological innovations and exploring strategic partnerships with fintech firms. Such adaptations can mitigate competitive threats and harness potential synergies, contributing to sustained profitability and market position.

Keywords: Fintech; Traditional banks; Competitive dynamics; Econometric analysis; Return on assets; Financial innovation; Bank performance; Capital adequacy; Macroeconomic conditions; Strategic partnerships.

Introduction

Today's financial sector is undergoing an intense digital transformation driven by the rapid development of financial technology (fintech). Fintech companies, integrating innovative technological solutions into financial services, are radically changing the traditional methods of interaction between consumers and financial institutions. Significant growth of investments in the fintech sector, which, according to KPMG, will reach 105 billion dollars in 2022, indicates the high attractiveness and dynamism of this market at the global level.



Traditional banking institutions are facing serious challenges due to the active expansion of fintech companies. Among the main challenges is the increasing competition for the customer base, where fintech offers more convenient, responsive and personalized services, especially demanded by the younger generation. In addition, the technological lag of banks, reflected in the slow adoption of modern technologies, may lead to a loss of competitiveness. Changing consumer behavior, characterized by an increased expectation of accessibility and speed of financial services through mobile and online platforms, requires banks to adapt and modernize their business models.

The study of interaction between fintech companies and traditional banks is particularly relevant in the context of the need for strategic planning for financial institutions. Understanding current trends and market dynamics allows banks to develop effective strategies for adapting to new conditions, including integration of innovations and revision of organizational structures. Identifying successful models of cooperation with fintech companies helps to stimulate innovative development, create new products and services, and improve efficiency and competitiveness.

Regulatory aspects also play a key role in this context. The rapid development of the fintech sector is accompanied by the emergence of new risks related to data security, cyber threats and financial stability. This requires regulators to develop and implement adequate regulations that strike a balance between fostering innovation and protecting the interests of consumers and the financial system as a whole.

Global trends show the increasing integration of fintech solutions into the banking sector. According to Deloitte research, many banks are already actively investing in fintech startups, creating joint ventures and implementing advanced technologies such as artificial intelligence and blockchain. These processes indicate that traditional financial institutions recognize the inevitability of digital transformation and the need to cooperate with fintech companies to maintain and strengthen their market positions.

Socio-economic aspects also reinforce the significance of the study. Fintechs promote financial inclusion by providing access to financial services to previously unserved or underserved segments of the population. This has significant implications for reducing social inequality, stimulating entrepreneurial activity and economic growth.

With the rapid evolution of technology and the changing landscape of financial services, research on the impact of fintech companies on the traditional banking sector is timely and necessary. It provides valuable insights to understand current challenges and opportunities, and to formulate strategic decisions aimed at sustainable development and innovative renewal of the financial sector in the era of digitalization.

Research Methodology

This study uses econometric methods to quantify the impact of fintech companies on the performance of the traditional banking sector. The use of this approach allows us to identify statistically significant relationships and determine the degree of impact of fintech innovations on the financial performance of banking institutions.

The methodology is based on the construction of a panel regression model that takes into account time and individual effects. The **return on assets (ROA)** of traditional banks is chosen



as the dependent variable, as this indicator is widely used to assess the efficiency of bank asset management. The independent variables include indicators of fintech sector activity, as well as a number of control variables.

Variable selection and model justification

- **Indicators of fintech sector activity:** volume of investment in the fintech industry, number of registered fintech companies, penetration rate of fintech services among the population.
- **Control variables:** bank size (in terms of assets), capital adequacy ratio, loan-to-deposit ratio, macroeconomic indicators (GDP growth, inflation rate, refinancing rate).

The model has the following form:

$$ROA_{it} = \alpha + \beta_1 \text{FintechActivity}_{it} + \beta_2 \text{BankSize}_{it} + \beta_3 \text{CapitalAdequacy}_{it} + \beta_4 \text{GDPGrowth}_{it} + \beta_5 \text{Inflation}_{it} + \varepsilon_{it}$$

Where:

- i is the bank's index,
- t - time period,
- ε_{it} is an accidental mistake.

Data collection and processing

The data is collected for the period from 2010 to 2022 to cover the stages of active development of the fintech industry. Data sources include:

- **Bank financial performance:** International Monetary Fund (IMF), World Bank databases and bank financial reports.
- **Data on fintech sector:** reports of analytical companies (KPMG, Accenture), specialized fintech portals, investment funds statistics.
- **Macroeconomic indicators:** national statistical services, central bank reports.

Standardization of indicators and logarithmization of some variables were carried out to ensure comparability of data. The conditions of regression analysis application were checked, including tests for stationarity (Dickey-Fuller tests), multicollinearity (variance inflation factor) and heteroscedasticity (Breusch-Pagan test).

Econometric analysis

Panel regression with fixed effects was applied, taking into account individual bank characteristics that do not change over time but may affect the dependent variable. This approach allows controlling for unmeasured or omitted variables related to specific bank characteristics.



The following steps of the analysis have been carried out:

1. **Estimation of the baseline model:** main independent variables without interactions are included.
2. **Interaction analysis:** added interaction variables between measures of fintech sector activity and bank characteristics (e.g., interaction between FintechActivity and BankSize) to test the hypothesis that the impact of fintech companies may differ by bank size.
3. **Checking the robustness of the results:** a number of robust tests were performed, including changing the model specification and using alternative estimation techniques (e.g., the method of generalized moments).

Hypotheses of the study

- **H1:** Increased activity of fintech companies has a negative impact on the return on assets of traditional banks due to increased competitive pressures.
- **H2:** The impact of fintech companies on banks varies depending on the size and financial strength of banks; large banks may be less adversely affected due to resources for adaptation.
- **H3:** Macroeconomic conditions modify the relationship between fintech sector activity and bank performance; in an environment of economic growth, the impact of fintech may be less pronounced.

The study is based on available data, but there may be limitations due to incomplete or inaccurate information on private fintech companies, which are not required to disclose detailed financial statements. It is also assumed that the selected variables correctly capture the impact of the fintech sector and control for the main factors affecting bank efficiency. All data are used in accordance with the principles of academic honesty and open access. Information on specific banks and companies is anonymized to respect confidentiality. The results are presented in a generalized form without disclosing commercially sensitive information. The chosen econometric approach allows for a comprehensive analysis of the impact of fintech companies on the traditional banking sector, taking into account various factors and conditions. The use of panel data and appropriate estimation methods ensures the reliability and validity of the results obtained, which can be used to develop strategic decisions of banks and regulators in a rapidly changing financial landscape.

Results

The study conducted an econometric analysis of the impact of fintech companies' activity on the performance of traditional banks using panel data from 2010 to 2022. This section presents the findings including descriptive statistics, regression analysis results and hypothesis testing. Prior to the regression analysis, data preprocessing was performed and basic statistics were calculated for the included variables. The sample includes data on 150 commercial banks from different countries, as well as indicators of fintech sector activity in the respective regions.



Table 1: Descriptive statistics of the main variables

Variable	Average value	standard deviation	Minimum	Maximum
ROA (%)	1,05	0,85	-2,50	3,80
Fintech activity (\$ bln)	5,2	4,1	0,2	18,0
Bank size (logarithm of assets)	15,8	1,2	13,0	18,5
Capital adequacy (%)	12,0	2,5	8,0	18,0
GDP growth (%)	2,5	1,8	-3,0	6,0
Inflation (%)	2,1	1,5	0,1	5,0

Note: ROA - return on assets.

The table shows that the average return on assets (ROA) of banks is 1.05%, with a range of -2.50% to 3.80%. Fintech sector activity, as measured by investment volume, ranges from \$0.2 billion to \$18.0 billion, reflecting significant variation across regions and periods.

Correlation analysis was carried out to test the relationships between variables. Main observations:

- **There is a negative correlation between ROA and fintech activity** (-0.35), indicating a possible negative impact of fintech companies on bank efficiency.
- **There is a positive correlation between bank size and ROA** (0.22), which may indicate the benefits of scale.
- **Low correlation between independent variables**, which reduces the risk of multicollinearity.

Several regression model specifications were estimated. The main results are presented in Table 2.

Table 2. Fixed-effects regression results

Variable	Model 1	Model 2	Model 3
Constant	2,50*** (0,30)	2,20*** (0,35)	2,10*** (0,40)
Fintech activity	-0,08** (0,03)	-0,06** (0,03)	-0,05* (0,03)
Bank size	0,12** (0,05)	0,10* (0,05)	0,08 (0,05)
Capital adequacy	0,05* (0,02)	0,04* (0,02)	0,03 (0,02)
GDP growth	0,15*** (0,04)	0,14*** (0,04)	0,13*** (0,04)
Inflation	-0,10** (0,05)	-0,09* (0,05)	-0,08 (0,05)
Fintech activity × Bank size	-	-0,02* (0,01)	-0,01 (0,01)
Fintech Activity × Capital Endowment	-	-	-0,03* (0,01)
R ²	0,45	0,48	0,50
Number of observations	1800	1800	1800

Note: Significance of coefficients is indicated as $p < 0.01$, $p < 0.05$, $p < 0.1$; standard errors are indicated in parentheses.

Interpretation of results

- **Model 1:** The baseline model shows that fintech activity has a statistically significant negative impact on banks' ROA. The coefficient of -0.08 means that a \$1 billion increase in fintech activity is associated with a 0.08 percentage point decrease in ROA.
- **Model 2:** Adding the interaction variable between fintech activity and bank size shows that the negative impact of fintech is mitigated for larger banks. The interaction coefficient of -0.02 indicates that the negative impact of fintech decreases as bank size increases.
- **Model 3:** Including the interaction between fintech activity and capital adequacy shows that banks with higher capital levels are less adversely affected by fintech firms.

Hypothesis testing

- **Hypothesis H1** is confirmed: the increase in the activity of fintech companies has a negative impact on the return on assets of traditional banks.
- **Hypothesis H2** is partially confirmed: the impact of fintech companies depends on bank size and capital adequacy level; large banks and banks with high capital levels are less negatively affected.
- **Hypothesis H3:** Additional analysis considering the interaction of fintech activity with GDP growth showed that the negative impact of fintech companies on banks decreases in higher economic growth, which supports the hypothesis.

Additional tests were conducted to check the reliability of the results:

- **Model specification change:** Using a random effects model yielded similar results, confirming the robustness of the estimates.
- **Alternative dependent variables:** Replacing ROA with return on equity (ROE) led to similar findings.
- **Generalized Method of Moments (GMM):** The application of GMM to account for possible endogeneity of variables confirmed the main results.

Additional observations

- **Banks' investment in technology:** Banks that actively invest in their own technological developments show less negative impact from fintech companies.
- **Regional differences:** In countries with developed fintech infrastructure, the impact of fintech companies on banks is more pronounced.
- **The role of the regulatory environment:** The stringency of financial sector regulation affects the degree of exposure of fintech companies; banks are under less pressure in countries with stricter regulations.

The results of the study confirm that the activity of fintech companies has a statistically significant negative impact on the efficiency of traditional banks. However, the extent of this impact depends on the internal characteristics of banks and external economic conditions. Banks with greater resources and high capital levels are able to better adapt to competition with fintech companies.

The findings have practical implications for banks' strategic planning. It is recommended to strengthen investments in technological innovations and consider opportunities for cooperation with fintech companies to enhance competitiveness in the modern financial landscape.



Discussion

The results of the econometric analysis show a significant impact of fintech companies' activity on the efficiency indicators of traditional banks. The findings support the hypothesis that growth in fintech sector activity has a negative impact on return on assets (ROA) of banking institutions. This conclusion is in line with the trends observed in the modern financial sector, where fintech companies act as serious competitors for traditional banks.

The results of our study are in line with the findings of a number of authors studying the impact of fintech on the banking industry. It is noted that fintech companies, due to their innovation and flexibility, are able to quickly adapt to market needs, providing customers with more convenient and personalized services. This leads to a redistribution of market shares in favor of fintech players, which negatively affects the profitability of traditional banks.

The analysis of interactions showed that the negative impact of fintech firms' activity is mitigated for large banks and banks with high capital adequacy. This may be due to several factors:

1. **Economies of scale:** Large banks have the resources to invest in technological innovation, allowing them to compete effectively with fintech companies.
2. **Financial strength:** High capital levels provide banks with additional stability and the ability to absorb potential losses associated with increased competition.
3. **Diversification of services:** Large banks offer a wide range of products and services, which reduces dependence on individual market segments exposed to fintech competition.

Our results also suggest that macroeconomic conditions affect the extent to which fintech firms impact banks. Under conditions of economic growth, the negative impact of fintechs is reduced, possibly due to the general expansion of the financial market and increased demand for financial services.[6] This is consistent with theories suggesting that competition is mitigated during periods of economic recovery due to an increase in the size of the available market.

The regulatory environment plays a key role in shaping the competitive landscape. In countries with strict financial regulation, banks are shielded from some of the competition as fintech companies face higher barriers to entry. However, over-regulation can also hinder innovation within banks themselves, which can negatively impact their competitiveness in the long run.

The results obtained have significant implications for the strategic planning of banks:

- **Invest in technology:** Banks should actively invest in digital transformation by adopting advanced technologies to improve customer experience and operational efficiency.
- **Collaboration with fintech companies:** Partnerships with fintech players can provide access to innovative solutions and new market segments. This may include joint development, strategic investments or acquisitions.
- **Revise business models:** Existing business models need to be adapted to meet changing customer needs and new competitive conditions. This may include shifting to more flexible and customer-centric approaches.

Despite the significant results obtained, the study has a number of limitations:

1. **Data limitations:** The availability and quality of data on the activities of private fintech companies can be limited, which affects the accuracy of measuring fintech sector activity.



2. **Heterogeneity of the banking sector:** Differences in banks' strategies, structures and operating models can affect results, and not all factors have been accounted for in the model.
3. **Market dynamism:** The financial sector is changing rapidly and results based on historical data may not fully reflect current trends.

To deepen the understanding of the interaction between fintech companies and traditional banks, it is proposed:

- **Examining the impact of specific fintechs:** Analyzing the impact of technologies such as blockchain, artificial intelligence and machine learning on various aspects of banking.
- **Regional studies:** Comparative analysis of the impact of fintech in different countries and regions, taking into account the specifics of local markets and regulatory regimes.
- **Consumer Behavior Analysis:** Examining changes in customer preferences and expectations due to the proliferation of fintech services, which will help banks better adapt to market demands.

The study confirms that fintech companies are a significant factor in changing the competitive environment in the banking sector. Traditional banks, realizing the scale and nature of this influence, can take measures to adapt and strengthen their positions. A combination of internal reforms and external cooperation with fintech players seems to be the most promising approach to ensure sustainable development in the digital economy.

Conclusion

The study demonstrates that the activity of fintech companies has a significant impact on the efficiency of traditional banking institutions. The growth of the fintech sector correlates with a decrease in the return on assets of banks, which is confirmed by statistically significant results of econometric analysis. However, the extent of this impact depends on internal characteristics of banks, such as size and capital adequacy, as well as on external factors, including macroeconomic conditions and regulatory environment.

The **key findings** are that fintech companies are transforming the competitive dynamics in the financial sector by offering innovative products and services that attract customers through convenience, speed and personalization. Traditional banks, especially those that are less flexible and technologically advanced, are facing increased competitive pressures that are negatively impacting their financial performance.[3] The key findings of the study indicate that fintech companies are having a significant impact on transforming the competitive dynamics in the financial sector. They are adopting advanced technologies and innovative business models, offering products and services that differ significantly from traditional banking offerings. In particular, fintech companies provide customers with access to financial services through mobile apps and online platforms, offering a high degree of convenience and accessibility. They use big data analytics and artificial intelligence to personalize services to better meet individual customer needs. In addition, the speed of transaction processing and decision-making at fintech companies often surpasses that of traditional banks due to the automation of processes and minimization of bureaucratic hurdles. For example, online lending through fintech platforms allows a loan decision to be made within minutes, which is significantly faster than the processing time of traditional banks. As a result, such advantages



are attracting more and more customers, especially among the younger and tech-savvy generations who value mobility and speed. [1] This is leading to a redistribution of market shares in favor of fintech companies and increasing competitive pressure on traditional banks. Traditional banks, especially those that are less flexible and lagging behind in technological development, are facing serious challenges. Their infrastructure is often based on outdated technology, making it difficult to rapidly innovate and adapt to changing market demands. Lack of personalization and complex procedures can lead to lower customer satisfaction and an exodus to more advanced fintech solutions. The negative impact of competition from fintech companies on banks' financial performance is manifested in reduced profit margins, lower return on assets and lower return on capital. Banks are forced to invest heavily in digital transformation, which increases costs in the short term and may put pressure on financial strength. In addition, increased competition leads to the need to revise pricing policies and reduce fees, which also affects profitability. Thus, the study highlights that without timely adaptation and innovation, traditional banks risk losing competitiveness.[2] This requires them not only to modernize technologically, but also to change their corporate culture towards flexibility, customer-centricity and willingness to cooperate with fintech companies.

The practical implication of the study points to the need for banking institutions to rethink their strategic approaches. Investments in technological innovation and digital transformation are becoming critical to remain competitive. Collaboration with fintech companies, including partnerships and strategic alliances, can provide access to advanced technologies and new business models. In addition, strengthening customer focus and improving service quality are key factors in retaining and expanding the customer base.

Areas for future research include a more detailed analysis of the impact of specific technological innovations, such as artificial intelligence, blockchain and fintech platforms, on various aspects of banking. Also promising is the study of changes in consumer behavior and preferences in the context of digitalization of financial services. Additional attention should be paid to investigating regulatory and legal aspects that can both promote and hinder innovation and competition in the financial sector. Overall, the findings of the study emphasize the need for traditional banks to adapt to the rapidly changing technological and competitive landscape. Adopting innovation and strategic cooperation with fintech companies can be key factors for sustainable development and success of banking institutions in the era of digital economy.

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