

The Impact of the COVID Pandemic on Banking Digitalization: An Analysis of Digital Payments and Digital Bank Revenues

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Abstract. *This study examines the impact of COVID-19 on the banking industry with a particular focus on digital payments and digital banking. These comparisons are made regarding digital transactions and the interest income of digital banks, based on a review of 87 countries over seven years (2017-2023). After the COVID-19 pandemic, both digital transactions and revenues from digital banking have experienced moderate growth. It suggests that banks and customers alike are gradually adapting to the new normal. However, we do note vast discrepancies from country to country. These findings are very pertinent for the future of banking in the face of the growing necessity for digital transformation. We performed a clustering analysis wherein countries were classified as emerging economies, modest-growth economies, and digital leaders. We tracked distinct patterns for their adoption rates of digital banking services. These findings make us realize that it is crucial to develop financial strategies tailored to each market's economic and technological aspects. This study conducted statistical analyses comparing digital transactions and digital bank revenues before and after the pandemic, along with clustering analyses.*

Keywords: digital transformation, digital payments, digital banks, COVID-19 pandemic, technology adoption.

Introduction

The COVID-19 pandemic, besides spurring digital transformation in many other industries, highlights aspirations in the banking sector as well. (Fu & Mishra, 2022). With an increasing demand for remote contactless services and closures of physical bank branches, both financial institutions and customers had to accept digital channels at an unprecedented rate (Fu & Mishra, 2022). This can also be observed in two prominent developments: the growth in the adoption of digital payment platforms and the establishment of digital-only banks (Yunita, 2021). During the pandemic, global fintech grew by 21%-26%, as consumers and businesses prioritized these solutions for their ease and efficiency (Fu & Mishra, 2022). The pandemic has significantly accelerated the digital transformation of the banking sector. A growing number of customers have adopted digital payments, valuing their efficiency, ease of use, and enhanced security. Banks have adopted Enterprise Resource Planning systems to boost efficiency and competitiveness (Beheshti & Beheshti, 2010). These systems centralize data, make operations more comprehensive, and improve security (Mahato et al., 2006; Ahn & Ahn, 2020). Furthermore, digital-only banks have

made major headway into the market by appealing to customers with easy-to-use apps, high-interest rates, and a plethora of cutting-edge services (Saif et al., 2022; Taneja et al., 2024).

Ongoing research will help identify regional trends, allowing banking institutions to develop sustainable strategies and inform policies for digital economic development (Kingiri & Fu, 2020; Verma et al., 2024). Following statistical and cluster analysis, our research examines digital payment and transactions by digital banking and earnings from digital Banking, before and after the pandemic.

Literature review

Senior banking management supports this hypothesis: ERP is an appropriate system for the digital transformation of the banking sector. It centralizes data and automates services, enabling financial service organizations to tackle modern digital solutions, verifiable through improved customer service and internal processes (AlBar & Hoque, 2019; Gomber et al., 2017). ERP systems enable faster credit approval and seamless digital payments, maximizing economic efficiency and sustainability (Gomber et al., 2017; Matende & Ogao, 2013). Performance indicators, such as interest income, are directly related to the success of implementation of such systems in digital banks (AlBar & Hoque, 2019). Digital transformation was accelerated during the COVID-19 pandemic, spurring investments in digital technologies and cybersecurity solutions (Gomber et al., 2017; Yildirim and Erdil 2023). Also, the businesses became compelled to develop sustainable supply chain strategies to reduce business disruptions and improve resilience (Ahmed et al., 2022). During this time, ERP systems were essential in providing operational stability that allowed real-time processing of payables while managing privacy effectively (AlBar & Hoque, 2019). Their power enabled banks to respond promptly to customer needs, thus catalyzing the adoption rate of digital payments as clients preferred speed, security, and contactless transactions (Gomber et al., 2017; Kotkowski & Polasik, 2021). The effects of the COVID-19 pandemic were substantial on the market and on business models that emerged through digital platforms, with dramatically varying resilience across sectors. Gerwe and Silva Froján (2021) show that platforms without physical interactions (Amazon, Deliveroo) thrived, while others (Uber, Airbnb) were impacted by pandemic restrictions. These structural changes in the digital ecosystem also flowed into banking; how robustly banks adjusted to stark new economic realities ultimately determined their stability and facilitated digital growth.

Regional disparities in digital payment adoption are well-documented, with many European countries having integrated systems before the pandemic (Borowski-Beszta, 2021; Petrikova & Kocisova, 2024; Wisniewski et al., 2021). Emerging economies, such as India, exhibited remarkable growth in the adoption of digital payments, prompted by the fear attributed to the pandemic and the need for contactless payments (Parihar et al., 2021; Yildirim & Erdil, 2023). These contrasting factors highlight the role of contextual drivers in shaping digital transformation outcomes. The COVID-19 pandemic accelerated the digital revolution, significantly shaping companies' recovery strategies. According to Golik-Górecka (2022), consumer behavior influence on businesses to incorporate digital procedures and innovate their business models to remain competitive. Her case-based study illustrates many Polish and international companies successfully adapting to the new market conditions through digitalization and operational strategy optimization.

One additional important area where the pandemic had an impact was in enhancing bank strategies regarding digitalization, which led to changes in customer relationships and resource allocation (Yildirim & Erdil, 2023). Findings show that ERP software enhances operational

efficiency and financial inclusion by enabling banks to provide better services and maintain stability during economic uncertainty (AlBar & Hoque, 2019; Petrikova & Kocisova, 2024). In Central and Eastern Europe, Doran et al. (2022) observe that improvement in the online services provided by banks correlates to the implementation of these systems and improvement in server security. Modular organizational structures allow banks to react quickly to market changes, optimizing loan portfolios and improving risk management (Aloini et al., 2012; Caldarelli et al., 2016). Improvements in interest income indicate the financial performance of digital banks, as shown in further assessments (AlBar & Hoque, 2019; Matende & Ogao, 2013). For example, the impact of coronavirus on the banking industry in Indonesia further exemplified how digitalization can bring both challenges and opportunities, particularly for emerging markets (Putri & Kho, 2023). Changes in income revenue of digital banks have been observed across various financial markets from the post-pandemic. The trend shows how ERP functions in making a transition toward the new economy. Kraus et al. (2022) add in support of claims that ERP systems have the added benefit of being flexible and scalable enough to manage changes in the financial market. Also seen in this field are the works of Ahmad et al. (2022) and Putri & Kho (2023), stating that while digitalisation has worked well in improving operations, the effect on interest income may be put at variance according to the monetary policy, consumer behavior, as well as strategies adopted by digital banks.

While previous studies have explored the role of ERP in banking efficiency (AlBar & Hoque, 2019; Gomber et al., 2017), few have assessed its impact on digital payments before and after the pandemic. While there are regional disparities in the adoption of digital banking (Petrikova & Kocisova, 2024; Wisniewski et al., 2021), it is unclear how these disparities translated into subsequent variations in financial performance, especially with respect to revenue growth. Besides, still less is known about the theoretical relationship between ERP implementation and interest income with empirical tests being scanty in the digital banking context. Motivated by these gaps, this study intends to examine the positive contribution of ERP in sustenance of digital banking after the pandemic in relation to digital payments' acceptance, revenue growth, and overall performance.

Research Gaps and Hypotheses

Despite extensive research in banking digital transformation, the differentials still remain:

First, according to research in this field, minimal empirical evidence exists on how ERP systems influenced digital payment service adoption during the course of the pandemic, to shed light on the studies that spoke about the role of ERP systems in enhancing operational efficiency and financial performance. Earlier research suggested that ERP systems serve to enable automation and streamlining of financial services (AlBar & Hoque, 2019; Gomber et al., 2017); still, its very specific role in hastening the digital payment movement during economic turmoil is still yet to be remarkably explored.

Second, if widespread acknowledgment exists about the regional differences in digital payment adoption, no comparative study exists that quantifies the impact of the pandemic on digital payment utilization as well as the buttressing financial performance from both the emerging and mature markets. Studies indicate that developed economies already had a well-integrated digital banking infrastructure before the onset of the pandemic, ensuring financial stability (Borowski-Beszta, 2021; Petrikova & Kocisova, 2024), whereas the adoption of fast but rather reactive solutions by emerging markets was driven by necessity rather than pre-existing infrastructure

(Parihar et al., 2021; Yıldırım & Erdil, 2023). However, it has finally not been clarified how much these regional differences have led into post-pandemic financial performance differentials.

To address these two gaps, the study proposes to test the following hypotheses:

H1: The COVID-19 pandemic significantly accelerated the adoption of digital payment services.

Grounded in earlier research regarding digital transformation in banking (Gomber et al., 2017; Yıldırım & Erdil, 2023), it is hypothesized that the COVID-19 pandemic served as a catalyst for the rapid adoption of digital payment services, with ERP systems aiding assuring operational continuity and smooth transaction processing. With varying digital infrastructure at once, and considering regional disparity about these aspects (Petrikova & Kocisova, 2024), statistically significant differences are accordingly expected between pre-and post-pandemic in emerging markets, where accelerated digitalization was triggered by the COVID-19 crisis.

H2: The COVID-19 pandemic increased digital banking revenues.

Although earlier studies highlighted the connection between ERP implementation, operational efficiency, and customer service improvement (AlBar & Hoque, 2019; Matende & Ogao, 2013), few empirical studies have examined the direct impact of post-pandemic ERP adoption on digital banking revenues. The authors propose that ERP systems aided in financial performances owing to improved risk management, quality of customer service, and optimizing digital transactions taking cognizance of changing circumstances in finance.

However, it is expected that there will be a moderating regional effect in these relationships. Emerging markets, where the adoption of digital banking surged out of necessity, would have, therefore, seen a more dramatic revenue growth compared to those sectors in developed economies where there was already a foundation for digital banking operations long before the pandemic period.

Methodology

The research study navigates changes in the digital banking sector; post-pandemic context employs statistical and analytical methods for this purpose, including Shapiro-Wilk test and cluster analysis. It contains a dataset of 87 countries for 2017-2023. Data were collected and processed using the Statista platform.

The Shapiro-Wilk test was used to check whether digital payment usage and digital bank interest income followed a normal distribution. This ensures that the other analysis is valid. After that, cluster analysis was performed. In this case, K-means algorithm was used for clustering countries based on the growth of digital payments usage and the rise in interest income during the post-pandemic period. For each country, the pre-and post-Covid periods average was calculated for each indicator. For the purposes of this research, 2020 marks the beginning of the post-Covid period. Using the two computed averages for pre- and post-Covid periods, the following formula was employed in determining the ratio of the post-Covid average to that of the pre-Covid period.

$$Grow_{variable, country} = \frac{Mean_{variable, post-Covid, country}}{Mean_{variable, pre-Covid, country}}$$

Where $variable \in \{Digital Banks, Digital Payment\}$

$Mean_{variable, Group, country} = \frac{\sum_{year \in Group} variable_{country}}{number\ of\ year\ of\ Group}$ It represents the average value of the indicator

$$\begin{aligned} GroupPostCovid &\in \{Year \geq 2020\} \\ GroupPostCovid &\in \{Year < 2020\} \end{aligned}$$

The Digital Payment and Digital Banks variables discussed throughout this study were enclosed in Table 1.

Digital Payment encompasses online transactions, POS payments, and internet-based money transfers. Digital Banks are banks that conduct their business exclusively through digital platforms and mobile applications, providing financial services without any physical branch and depending entirely on technology.

Table 1. Variables

Variables	Description	Unit	Source
Digital payment	transaction value of digital payment	billion USD	Digital Payments - Worldwide. (n.d.). Retrieved January 04, 2025, from https://04116v2py-y-https-www-statista-com.z-e-nformation.ro/outlook/fmo/digital-payments/worldwide?currency=USD
Digital banks	net interest income of digital banks	billion USD	Digital Banks - Worldwide. (n.d.). Retrieved January 04, 2025, from https://04116v2py-y-https-www-statista-com.z-e-nformation.ro/outlook/fmo/banking/digital-banks/worldwide?currency=USD

Source: Authors' own research.

Results and discussions

Based on data gathered from 87 countries (Table A1) for the period 2017–2023, the average values for the DigitalPayment and DigitalBanks indicators were calculated for each country in both the post-Covid and pre-Covid periods. Using these averages, the growth of each indicator for every country was determined by taking the ratio of the average values between the two periods.

$Mean_{DigitalPayment,Post-Covid} = \frac{\sum_{year \geq 2020} DigitalPayment}{number\ of\ year \geq 2020}$ It represents the average of the Digital payment indicator for each country in the post-COVID period.

$Mean_{DigitalPayment,Pre-Covid} = \frac{\sum_{year < 2020} DigitalPayment}{number\ of\ year < 2020}$ It represents the average of the Digital payment indicator for each country in the pre-COVID period.

$Mean_{DigitalBanks,Post-Covid} = \frac{\sum_{year \geq 2020} DigitalBanks}{number\ of\ year \geq 2020}$ It represents the average of the Digital banks indicator for each country in the post-COVID period.

$Mean_{DigitalBanks,Pre-Covid} = \frac{\sum_{year < 2020} DigitalBanks}{number\ of\ year < 2020}$ It represents the average of the Digital banks indicator for each country in the pre-COVID period.

$$GrowDigitalPayment_{country} = \frac{Mean_{DigitalPayment,postCovid,country}}{Mean_{DigitalPayment,preCovid,country}}$$

$$GrowDigitalBank_{country} = \frac{Mean_{DigitalBanks,postCovid,country}}{Mean_{DigitalBanks,preCovid,country}}$$

The statistical analysis of the variables used in the study revealed the presence of significant extreme values, confirmed by both percentile analysis and coefficients of skewness and kurtosis. For digital payments (MeanDigitalPayment pre and post), a strongly asymmetric distribution was identified. Additionally, the high kurtosis coefficients confirm the presence of extreme outliers. A similar situation was observed for digital bank revenues (MeanDigitalBanks Pre and Post), where elevated kurtosis coefficients indicate an imbalanced distribution. The GrowDigitalPayment variable has a relatively balanced distribution, with slight symmetry (skewness: -0.31) and

moderate extreme values (kurtosis: 7.25). In contrast, GrowDigitalBanks is highly asymmetric (skewness: 6.39) with extreme values (kurtosis: 51.70). Taking the natural logarithm of the variables has produced a distribution closer to normal, shown by the need for smaller modifications in the Skewness, Kurtosis values, and a non-significant Shapiro-Wilk test value of the transformed variables (Rosner et al. (2006); Statology, n.d.).

Table 2. Descriptive Statistics for the Pre- and Post-COVID Periods

Variable	Mean	Std. Dev.	Min	Max	Skewness	Kurtosis	Shapiro-Wilk Test Statistic (p-value)
MeanDigitalPaymentPre	83.480	488.540	0.120	4469.333	8.523	76.510	0.147 (0.000)
MeanDigitalPaymentPre_LN	1.999	1.809	-2.120	8.405	0.561	4.110	0.979 (0.086*)
MeanDigitalPaymentPost	145.356	771.724	0.19	6986.25	8.252	72.836	0.165 (0.000)
MeanDigitalPaymentPost_LN	2.719	1.820	-1.661	8.852	0.463	3.784	0.975 (0.172*)
GrowDigitalPayment	2.093	0.377	0.686	3.393	-0.317	7.251	0.908 (0.000)
MeanDigitalBanksPre	10.644	33.374	0.0333	242.800	5.181	32.517	0.355 (0.000)
MeanDigitalBanksPre_LN	0.018	2.132	-3.401	5.492	0.603	2.449	0.950 (0.002)
MeanDigitalBanksPost	14.316	46.228	0.050	340.025	5.506	35.541	0.328 (0.000)
MeanDigitalBanksPost_LN	0.433	2.082	-2.996	5.829	0.495	2.524	0.968 (0.030)
GrowDigitalBanks	1.771	1.626	0.500	15.000	6.399	51.702	0.439 (0.000)

Note: LN represents the natural logarithm (*ln*).

* the null hypothesis (data is normally distributed) is not rejected

Source: Authors' data processing in Stata 14.2.

Germany topped the list of new openings in digital payment (3.394), while Egypt recorded significant growth in digital banking revenues (2.625). Bangladesh gained prominence through exceptional growth (15.000), indicating exponential advancement in digital banking on the part of an emerging market. Other players have also performed reasonably well, showing evidence of a steady uptake and integration of the digital financial system. Other countries showed mediocre growth, suggesting steady uptake of digital financial infrastructure.

Figure 1 shows post-COVID digital payment growth, with Central European and Latin American countries experiencing significant increases, while mature markets like China and North America exhibit slower growth, suggesting market saturation.

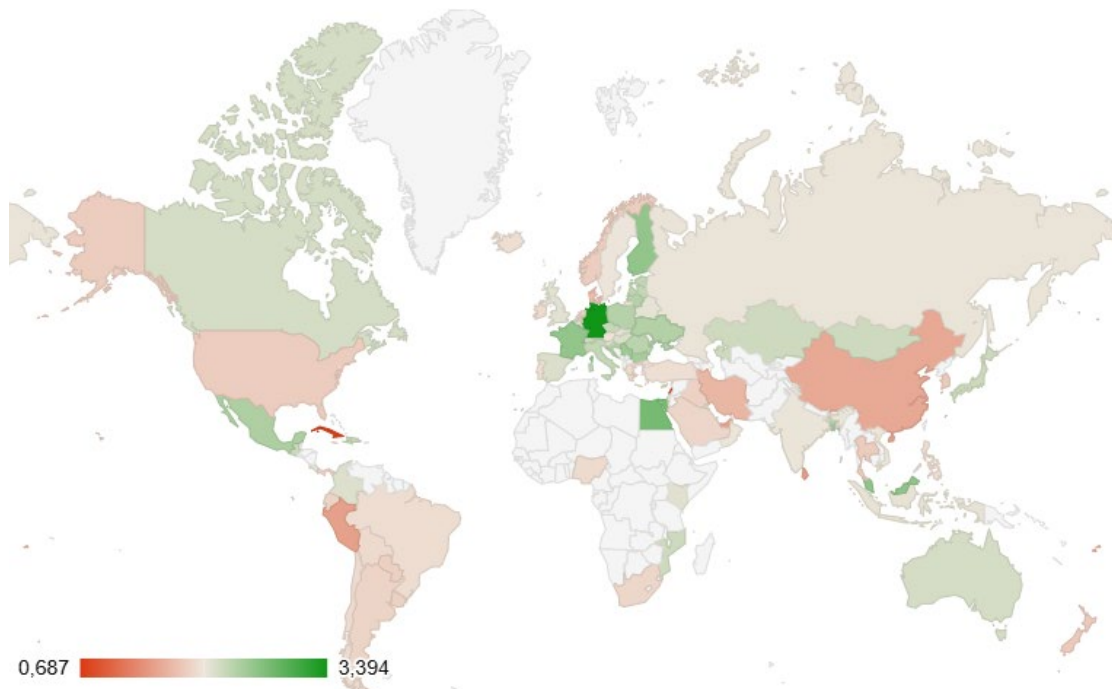


Figure 1. Growth in Digital Payment Transaction Volume During the Post-COVID Period

Source: Authors' data processing using EXCEL.

The differences between pre- and post-COVID-19 values for digital payments and banking revenues highlight the pandemic's major role in accelerating financial digitalization. The rise in online transactions reflects increased digital payment adoption due to physical restrictions, though country-level disparities reveal uneven adaptation influenced by infrastructure, regulations, and digital literacy. Despite the great extent of digital services, the technological growth in banking revenues has been variable across different countries, with some barely scratching 1 percent. In this regard, these findings strengthen the argument for adaptive and sustainable strategies that should be considered during the recovery period post-pandemic, as suggested by Ahmed et al. (2022). Figure 2 illustrates digital banking revenues within the post-COVID period featuring rather strong growth in North America, Western Europe, and Australia, whereas small increases have been registered in areas such as South-East Asia and Eastern Europe.

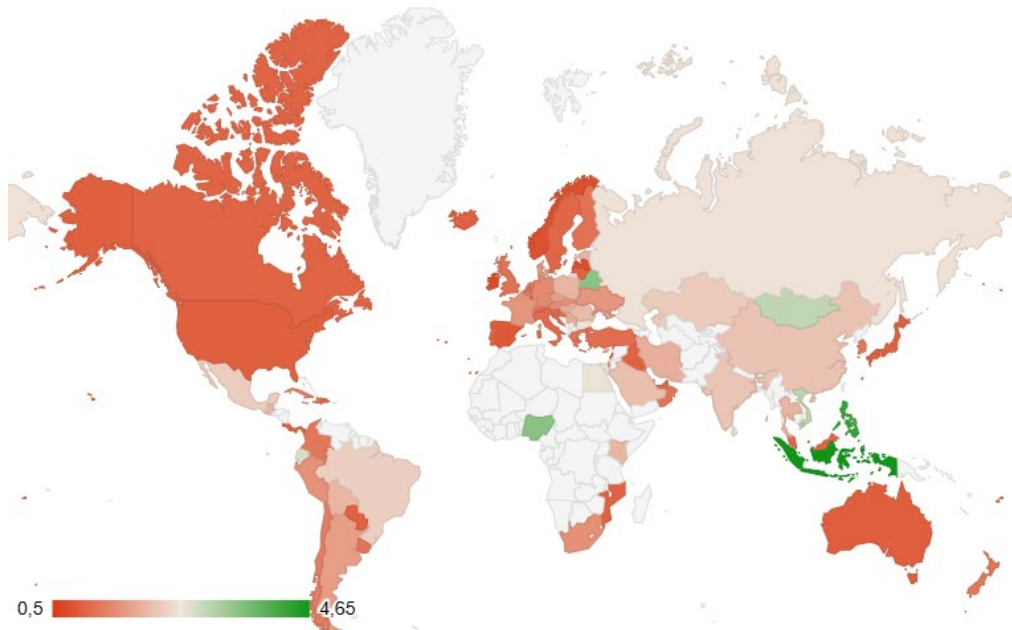


Figure 2. Increase in Digital Banking Revenues in the Post-COVID Period

Source: Authors' data processing using EXCEL.

The correlation coefficient value of 0.9987 indicates a very strong correlation between digital payment volumes before and after COVID-19. Such a high correlation may reflect stability in the trends in digital payments that developed as a result of existing financial infrastructure and consumer readiness to make transactions online. Countries with high levels of digital payments prior to the pandemic almost invariably continued afterward. While a strong correlation (0.9265) existed between revenues earned by digital banks before and after the pandemic, the correlation between the growth of digital payments and the revenues of digital banks is very weak (0.1058), stressing that an adoption of digital payments does not necessarily lead to a satisfactory increase in the revenue earned from such services.

Table 3. Correlation Coefficients

	Variable	1	2	3	4	5	6
1	MeanDigitalPaymentPre	1	0.9987	-0.1615	0.6312	0.8647	0.0203
2	MeanDigitalPaymentPost	0.9987	1	-0.1556	0.6568	0.8789	0.0201
3	GrowDigitalPayment	-0.1615	-0.1556	1	-0.0787	-0.1083	0.1058
4	MeanDigitalBanksPre	0.6312	0.6568	-0.0787	1	0.9265	-0.0845
5	MeanDigitalBanksPost	0.8647	0.8789	-0.1083	0.9265	1	-0.0449
6	GrowDigitalBanks	0.0203	0.0201	0.1058	-0.0845	-0.0449	1

Source: Authors' data processing in Stata 14.2.

For the pre- and post-COVID-19 comparisons, several comparative tests were employed. Natural logarithm (ln) values were used for both digital payments and digital banks. The Shapiro-Wilk test confirmed that the differences were normally distributed for digital payments, while for digital banks they were not. The Morgan-Pitman test for digital payments showed that the variance of differences is constant, thus satisfying the homoscedasticity assumption. Consequently, the paired t-test was used for digital payments. Since the differences in digital banks variable are symmetric, the Wilcoxon Signed Ranks Test was applied for digital banks.

Table 4. Comparison of pre and post Digital payment and digital bank

Paired t-test						
Variabile Comparete	No.	Mean Difference	Standard Error	Standard Deviation	t-statistic	p-value (two-tailed)
Digital Payment Post vs. pre	87	0.719	0.0223	0.214	31.397	0.0459
Wilcoxon Signed-Rank						
Variabile Comparete	No	z-statistic	Positive Differences	Negative Differences	Zero Differences	p-value
Digital Banks Post vs. Pre	87	6.914	69	9	9	0.0000

Note: The values of the variables used in the Paired t-test and Wilcoxon Signed-Rank test were calculated using the natural logarithm (*ln*).

Source: Authors' data processing in Stata 14.2.

The results of the paired t-test (Table 4) indicate a statistically significant difference at the 5% significance level ($p < 0.05$), suggesting a noteworthy shift in digital payments after the pandemic, thus supporting H1 hypothesis. These results are aligned with those of previous studies conducted by Wisniewski et al. (2021) and Yıldırım & Erdil (2023), which exhibited that digital payments accelerated the pace of acceptance after the pandemic. Besides, along with the rapid implementation of ERP systems to cope with the rising number of electronic transactions, AlBar & Hoque (2019) tried to mention for the sustained and secure digital infrastructures in respect of the expansion of digital transactions.

The Wilcoxon Signed-Rank Test results (Table 4) indicate a statistically significant increase in digital bank revenues post-pandemic, confirming Hypothesis H2. This trend is supported by Kraus et al. (2022), who highlight the flexibility and scalability of ERP platforms in adapting to financial market changes, as well as by Ahmad et al. (2022) and Putri & Kho (2023), who suggest that while digitalization has improved operational efficiency, its impact on interest income may vary depending on monetary policy, consumer behavior, and digital banking strategies.

The research, conducted on Stata 14.2, based on the banking data for which clustering of countries was achieved with K-means clustering, produced four clusters.

Cluster 1 (Belarus, Ecuador, Indonesia, Mongolia, Nigeria, Philippines, Sri Lanka, Vietnam): At low but steady digital payments adoption (1.97) and relatively high growth (3.42) rates for digital banking revenues focused on banking digitalization.

Cluster 2 (Australia, Austria, Bahrain, Belgium, Canada, Chile, Colombia, Costa Rica, Croatia, Cuba, Dominican Republic, Fiji, Finland, Greece, Haiti, Iceland, Iraq, Ireland, Israel, Italy, Jamaica, Japan, Kuwait, Latvia, Lebanon, Lithuania, Luxembourg, Malaysia, Malta, Mozambique, Netherlands, New Zealand, Norway, Oman, Panama, Paraguay, Peru, Portugal, Qatar, Slovenia, South Africa, South Korea, Spain, Sweden, Switzerland, Turkey, United Arab Emirates, United Kingdom, United States, Uruguay): 50 countries with moderate to low levels of digital payments growth (at 2.02) and low levels of digital banking revenue growth (at 1.12); this depending on stable digital adoption of very limited variation.

Cluster 3 (Argentina, Bolivia, Brazil, Bulgaria, China, Cyprus, Czechia, Denmark, Egypt, Estonia, France, Germany, Guatemala, Hungary, India, Iran, Kazakhstan, Kenya, Mexico, Poland, Romania, Russia, Saudi Arabia, Serbia, Singapore, Slovakia, Thailand, Ukraine): Out of 28 countries covered in the survey, in this cluster, high growth in digital payments at 2.25 was contrasted with relatively lower growth in banking revenues with a value of 1.97, meaning that this was high-speed digital development without a gain in bank revenues.

Cluster 4 (Bangladesh): A country remains as an outlier with very high digital payment growth (2.41) coupled with exceptionally high banking revenue growth (15), indicating aggressive digitalization and strong market integration.

Table 5 presents descriptive statistics for each cluster, emphasizing the substantial differences that characterize the digital-financial services landscape by region.

Table 5. Descriptive statistics for the growth of digital payments and digital bank revenues by clusters

Cluster	1	2	3	4
Obs	8	50	28	1
Mean_GrowDigitalPayment	1.97	2.02	2.25	2.42
Std_Dev_GrowDigitalPayment	0.23	0.35	0.41	
Min_GrowDigitalPayment	1.47	0.69	1.56	2.42
Max_GrowDigitalPayment	2.24	2.61	3.39	2.42
Mean_GrowDigitalBanks	3.43	1.13	1.98	15.00
Std_Dev_GrowDigitalBanks	0.72	0.22	0.32	
Min_GrowDigitalBanks	2.70	0.50	1.42	15.00
Max_GrowDigitalBanks	4.65	1.58	2.63	15.00

Source: Authors' data processing in Stata 14.2.

The clustering analyses agree with those of Gomber et al. (2018), according to which regional specificities and digital maturity shape ERP integration and banking evolution. The results also support the leapfrogging paradigm for emerging economies (Kraus et al., 2018): cluster 2 (Europe, North America, Central Asia) is stable, with limited adoption, while cluster 3 (South-East Asia, South America, parts of Eastern Europe) is expanding rapidly; cluster 1 includes advanced, niche cases of digitalization, while Cluster 4 represents a unique outlier in the global digital financial landscape.

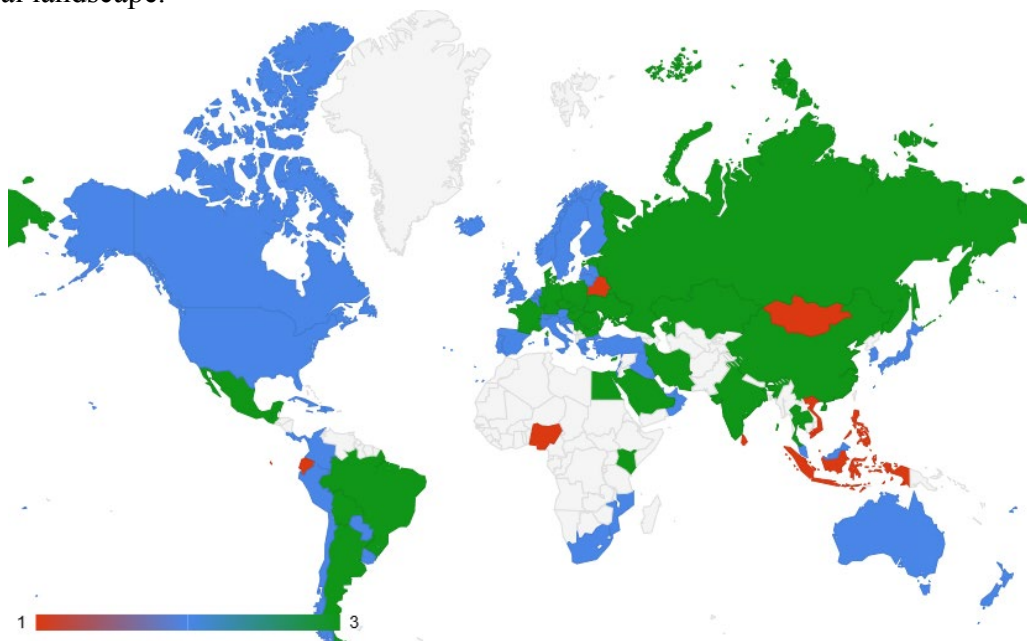


Figure 3. Distribution of countries by cluster based on digital payment growth and digital banking growth

Source: Authors' data processing using EXCEL.

Conclusion

The COVID-19 pandemic accelerated digital transformation within the banking industry and attested to the growing importance of online financial services. The continuous rise in digital payments demonstrates increasing preferences for cashless transactions, while the acceptance of ERP systems and digital banking infrastructure indicates a long-term shift in strategy among financial institutions. Digital payments are seeing an overall increase, though the stabilization in the growth of these slow-moving transactions suggests that many countries may have matured in the adoption of their use. The clustering analysis exhibits that digital banking has diverging paths of development, whereby some countries accompany moderate levels of digital payment use with higher banking revenues that are indicative of advanced digitalization of finance, while others show within flat growth of digital payments progressive growth of bank revenues associated with a mixed-but-cautious adoption pattern. Rapid digital-payments expansion, matching a weaker banking revenue growth, is observed for emerging markets, with 1 taking off on an exceptional path: a very proactive one toward digitization.

These findings have implications for how finance in its shovel will inform decisions in the digital banking space that would align with the regional context of the economy and technology. The authors contribute to the literature by undertaking a comparative pre-and post-COVID-19 analysis across 87 countries based on the revenues from digital banking and the ease of making electronic payments. Particularly, statistical and cluster analysis is used within the analysis to uncover regional disparities across market dynamics. The study echoes the growing calls for adaptive and sustainable digital strategies in the banking sector to support long-term resiliency and innovation.

Such information can be useful in helping financial institutions decide on their investment strategies, focusing on the critical need for adjustments to regional variations in the market and selecting appropriate technological solutions. These associations may indicate that developed economies are expected to experience sound financial performance in the post-COVID period, while the gap with respect to emerging markets still exists.

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