

CONSEQUENCES OF THE DISRUPTIVE TRANSFORMATIONS ON THE RESILIENCE OF THE NATIONAL FINANCIAL AND BANKING SECTOR

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Abstract: *In the knowledge-based economy, in order to be competitive in the business environment, many economic entities invest both in the modern technologies, which improve their main activity, and in those disruptive technologies that can generate new income streams and provide them with a competitive advantage. In this context, by investigating the interaction between the disruptive transformations (especially accelerated digitalization, artificial intelligence and cyber security regulations) and the resilience of the Romanian financial and banking sector, we aimed to identify the main effects that the disruptive transformations produce on the resilience of the national financial and banking system, while critically analyzing the risks, the opportunities and the strengthening trends.*

Keywords: disruptive transformations, financial disruption, systemic resilience, emerging digital technologies, SWOT analysis

1. Introduction:

During the last decade, the global financial and banking system has entered a process of profound technological disruption, determined by the convergence of the emerging digital technologies and the increasingly strict regulations. Romania, fully integrated into the European architecture of financial stability, is experiencing these changes in the form of a mix between a structural adaptation requirement and innovative pressure. The emerging digital technologies (artificial intelligence, machine learning, resilience and infrastructure technologies, blockchain, digital assets, digital currencies, open banking, quantum finance, etc.) have evolved from simple experimental tools to pillars of the financial and banking infrastructure, driven by the European regulations (DORA, MiCA) and the competition with the neobanks.

Specialists in the financial and banking system recognize that it is undergoing fundamental transformations, amplified by the increasing implementation and use of the artificial intelligence and the

reconfiguration of the relationship between institutions, regulators and customers.

Within this contextual framework, the present paper explores and highlights the impact of these disruptive transformations on the resilience of the banking system, critically analyzing the risks, the opportunities and the strengthening trends.

2. Theoretical Approaches to the Financial Disruption and the Systemic Resilience

The theoretical context of the financial disruption and the systemic resilience is based on the interaction between the radical technological innovation and the ability of the financial banking system to absorb shocks without collapsing. The concept of disruption comes from the theory of technological disruption (of the disruptive innovation), introduced by Harvard University professor Clayton Christensen. He describes the processes by which the innovations, initially marginal, become dominant, thus reshaping institutional structures and business models. In the financial context, the disruption results

from the use of specific technologies (such as: artificial intelligence, blockchain, cloud computing and big data), which reduce costs, on the one hand, but, on the other hand, generate new types of vulnerabilities. Therefore, in the financial field, this disruption does not mean just "a change", but it constitutes a specific process by which:

- the conventional intermediaries are eliminated (for example, the peer-to-peer - P2P -lending platforms eliminate the bank from its role as a credit arbitrator);
- the digital technologies (such as: artificial intelligence, blockchain or cloud) allow the new "financial actors" to scale exponentially, forcing the conventional institutions to fundamentally change their business model in order not to become irrelevant;
- the new companies (Fintech) enter the market targeting customer segments ignored by the conventional banks (for example: unbanked customers, low-income customers, etc.).

The concept of systemic resilience highlights the capacity of a financial and banking system to absorb economic, technological or operational shocks without losing its basic functionality. In the digital age, this definition expands to include dimensions such as: cybersecurity, infrastructure redundancy and decision-making agility. From a theoretical point of view, the systemic resilience has evolved due to the following considerations:

- if in the past resilience was measured by capital (Basel III), now it includes digital operational resilience (for example, a massive cyber attack on a Cloud provider can be as dangerous as a liquidity crisis);
- the network theory argues that the disruption increases the complexity (i.e., a failure at one point in the system can instantly propagate throughout the ecosystem);
- the financial homeostasis has increased (respectively, the system's self-regulating capacity has improved).

Also, the systemic resilience theories support the idea that sound financial and banking systems must have the following as fundamental characteristics: diversity, controlled interconnection and adaptive capacity. [1] In Romania, where the bank is the main interface of the economy with the financial market, the balance between stability and innovation becomes essential.

3. Disruptive Transformations - Between Technological Opportunity and Systemic Risk

In the knowledge-based economy, knowledge management is becoming more and more dynamic and complex, reflecting the interdisciplinarity of this field, and the creation, acquisition, analysis, transfer of knowledge, etc. depend on the digital technologies and the digitalization of the economic organizations.[2] In this context, the digital infrastructure and the digital technology are the means to connect to both the artificial intelligence and to the natural human one.

The theory of disruptive technologies, developed by Professor Clayton Christensen, initially claims that the term represents a business model designed to allow newcomers to surpass those already active in the respective field, resorting to markets they do not serve or to neglected consumers. Subsequently, this theory was extended to the term of "disruptive market", in the sense that companies use innovations that create completely new markets and no longer report only to the "low-end" area of an existing market, with inferior quality products. The updated theory of the disruptive technologies focuses on "the disruptive innovation", which acknowledges that the business model that the new technology enables is the one that disrupts the market.[3]

The effects of using the disruptive technologies change the fundamental expectations and behaviours of a certain culture, market, industry or process. This change is propagated through the digital techniques and technologies, specific to the

new challenges and opportunities in the field. These innovative technologies will change, in the digital age, the way the economic affairs work and will change the way the organizational strategy is designed.[4] Thus, customer expectations for lower-cost services, friendly mobile applications and more will be the result of the implementation of certain disruptive technological platforms.

In the financial and banking field, this disruption does not involve only modernization, but also redefining the boundaries of risk. Artificial intelligence, automation and advanced analytics can optimize the decisions, but can also generate algorithmic dependencies and ethical risks (such as decisional bias, limited transparency). Also, the extensive use of the cloud platforms and the interconnected infrastructures increases the vulnerability to cyber attacks, and those like ransomware and phishing, which are increasingly frequent, are becoming a systemic threat. On the other hand, the opportunities are substantial. Thus, by using these innovative technologies, the processing costs are considerably reduced, the personalization of the banking services is emphasized, and the financial inclusion is expanded. Consequently, the digital resilience becomes an essential strategic component of the competitiveness of the national financial and banking system.

Although the Romanian banking system is stable, the high operational and intermediation costs limit the access of many economic entities to financing. Since many of them prefer self-financing, the share of the bank credit in the GDP is among the lowest in the European Union. This imbalance reduces the economic elasticity of the national financial system, blocking the positive effects of the digital

technologies. In order to correct this asymmetry, we consider that it is necessary to combine public policies, smart regulations and technological innovation.

We believe that certain measures are required in order to transform the disruption into a vector of financial-banking consolidation, such as:

- integrating cyber resilience into the corporate governance strategy of the banks;
- making coordinated investments in the secure digital infrastructure, including redundant data centers and the resilient interbank networks;
- creating a regulated fintech ecosystem that stimulates innovation without affecting the stability of the system;
- training and developing the digital skills of our own human resources in order to reduce the reliance on external solutions.

4. SWOT Analysis of the Romanian Banking System in the Context of the Digital Transformation and Prospects for Evolution

Digital transformation is one of the most important factors of structural change in the contemporary financial and banking sector, influencing both the operational models and the customer relationships. In Romania, this process has considerably increased in the last decade, due to the technological progress, the European regulations and the changing consumer behavior. Currently, the digital transformation of the Romanian banking system has reached an advanced stage, but it is still evolving, characterized by the rapid assimilation of the digital technologies, the growth of fintechs and the pressures generated by regulations and security, as shown in the tables below.

Table 1 The use of digital technologies in the banks of Romania

No.	Technological category	Digital technology	No. of user banks	Degree of implementation	Remarks
1.	Digital channels	Internet&Mobile Banking	Most banks	Very high	Standard service Used weekly by over 70% of customers
2.	Cloud & infrastructure	Cloud computing/cloud banking	13 banks	High	Allowsscalability and quick digital services
3.	Automation & analysis	Machine Learning (ML)	13 banks	High	Used for scoring, anti-fraud, customization
4.	Artificial intelligence	AI (general)	9 banks	Average	Increasing, but still moderate implementation
		Chatbots	12 banks	High	Used for customer service
5.	Identification & security	Biometrics (digital KYC)	17 banks	Very high	Remote identification anddigital onboarding
		OCR(optical character recognition)	16 banks	Very high	Internal process automation
6.	Digital payments	Digital wallets (Apple Pay, Google Pay etc.)	Most banks	High	Accelerated increaseof usage
		Instant payments/ Mobile (RoPay,etc.)	Expanding	Average high	Progressive implementation at the level of the banking system
7.	Emerging technologies	Blockchain	0 banks	Nonexistent	No active implementations reported
8.	Client experience	Advancedmobile applications	Most banks	Very high	Strategic priority for UX

Source: Own processing

Table 2 Comparison between Romania and the European Union

No.	Indicator	Romania	EU Average	Difference
1.	Use of internet banking	70%	75-80%	Slightly below average
2.	Use of mobile banking	High	Very high	Almost equal
3.	Digital onboarding (online account)	Very common	Very common	Similar
4.	Use of AI in banks	Average	High	Behind
5.	Big Data	Low	High	Far behind
6.	Open Banking (APIs)	In development	Advanced	Behind
7.	Digital payments/ wallet	High	Very high	Almost equal
8.	Blockchain	Nonexistent	Limited (pilot)	Slightly behind

Source: Own processing

Practically, the Romanian banking sector has surpassed the simple phase of digitalization (basic online banking) and entered a stage of profound transformation, of changing the business model, characterized by:

- the transition to integrated digital ecosystems (banks+fintech+external services);
- the development of the concept of "invisible banking" (services integrated into other services);
- the emphasis on customer experience and personalized services.

In order to assess the current situation of the Romanian banking system in the context of the digital transformation, we will further on conduct a SWOT analysis, by means of which we will identify and highlight the main strengths, vulnerabilities, opportunities and threats.

4.1. Strengths

A first identified advantage of the Romanian banking system is *the accelerated pace of the implementation of the digital technologies*. Most banking companies have implemented mobile banking solutions, biometric authentication and integrated digital services, which has led to a significant increase of the accessibility and efficiency of the financial services.[5]

Secondly, *user experience* has become a central element of the banking strategies.

The intuitive interfaces, the 24/7 availability of services and the reduced physical interactions have increased customer satisfaction and loyalty.

Another strength is the *relatively flexible structure of the operational costs*. Compared to the mature banking systems in Western Europe, the Romanian banks have had the opportunity to directly adopt modern digital technologies, partially avoiding the constraints of the traditional infrastructures.

Last but not least, *the dynamic competitive environment*, characterized by the interaction between the traditional banking companies and the fintech companies, stimulates innovation and continuous adaptation.

4.2. Weaknesses

Even though it has made a significant progress as far as the digital transformations are concerned, the Romanian banking system faces certain structural limitations. One of the most important is *the existence of the heterogeneous IT infrastructures*, partly based on legacy systems, which hinder the integration and scaling of the modern digital solutions.

Also, *the use of the advanced analytics and the artificial intelligence remains limited* to certain operational segments, without being widely integrated into the strategic decision-making processes. This situation reflects both technological constraints and the shortage of specialized digital skills.

Another problematic issue is *the relatively low level of investment in digital transformation*, compared to the real needs of the financial and banking sector. This gap can slow down the pace of innovation and affect competitiveness in the long run.

In addition, *the digital inclusion is uneven*, and there are significant discrepancies between the urban and the rural areas, as well as between the different age groups. This situation limits the uniform expansion of the digital services.

4.3. Opportunities

The continuously increasing demand for digital financial services represents a major opportunity for the financial and banking institutions, which can capitalize on this trend by developing personalized products and innovative services. Customers are showing an increasing preference for fast, personalized and accessible solutions via mobile devices.

Also, *the development of the fintech ecosystem and the possibility of strategic partnerships* offer banks the opportunity to expand their service offer and to access new market segments.

The implementation of the open banking concept, in accordance with the European regulations, creates *the premises for the development of innovative services*, based on data sharing and the integration of APIs (Application Programming Interface).

At the same time, the access to European funds intended for the digitalization can accelerate *the modernization of the infrastructure and the adoption of the emerging technologies* (such as: artificial intelligence, cloud computing, etc.).

4.4. Threats

One of the main risks of the digital transformation is *the intensification of the cyber threats*, amid the increase in the volume of the digital transactions and the expansion of the attack surface. Since the increase of the cyber risks can affect customer confidence and the stability of the financial system, information security is thus becoming a strategic priority for all financial and banking institutions.

Another major challenge is *the competition from fintech companies and large actors in the technological field* (big tech), as these entities benefit from operational agility and high capacity for innovation.

Also, *the pressure of regulations*, both at national and European level, requires significant compliance costs and can limit the banks' operational flexibility.

In addition, the volatility of the macroeconomic environment (inflation, interest rate fluctuations) negatively influences the profitability and the capacity to invest in digital technologies.

4.5. Conclusions of the analysis

The results of the SWOT analysis reflect that the Romanian banking system is in a transitional phase between digitalization and complete digital transformation. Although progress is evident in the interfaces and the services offered to customers, significant limitations persist in the internal infrastructure and in the use of the advanced technologies.

Although there are significant vulnerabilities, the opportunities generated by the evolution of the digital technologies and the changes in consumer behavior create the premises for a sustainable development of the digital technologies, which will increase the resilience of the national financial and banking system.

In the future, we believe that the success of the financial and banking companies in Romania will depend on their ability to integrate these emerging technologies, to capitalize on data and to maintain a balance between the digital innovation and the cybersecurity, in a particularly versatile economic environment.

5. Predictions Regarding the Evolution of the Digital Transformations, in the Medium Term, in the Romanian Banking System

Based on the current trends, a series of relevant medium-term projections can be formulated. First, *the financial and banking companies will become "invisible" in daily life*, as the "mobile-first" model will

become dominant (over 80 to 90% of all interactions between the banking companies and the customers will be carried out through digital channels), and their physical branches will focus on advisory services and complex products.

Secondly, *the artificial intelligence will be increasingly integrated into the banking processes*, from the credit risk analysis to the customization of offers and the automation of the interactions with the customers. Actually, the artificial intelligence will completely redefine the banking operations (almost instant lending, automated scoring, virtual financial consultants), becoming a major differentiator between the banking companies.

Another major trend is *the development of the digital ecosystems*, in which banks function as integrated platforms, offering financial services within broader applications (embedded finance). Therefore, banks will become platforms, not just providers.

Additionally, it is likely *that the central bank will issue digital currencies which will be gradually adopted*, a fact that will have major implications for the payment system and for the structure of the bank deposits, generating faster payments, pressure on the bank deposits, and so on. Ultimately, we will witness a structural change in the national financial system.

Regarding the market structure, we anticipate *a process of consolidation of the banking sector*, characterized by mergers and acquisitions, which will lead to a reduction in the number of actors and an increase in the efficiency of the system.

Last but not least, *the importance of the cybersecurity will increase exponentially*,

and the investments in this area will become essential for maintaining customer confidence and complying with the regulatory requirements.

6. Conclusions

The disruptive transformations are redefining the nature of the banking resilience. In Romania, the digital transition has brought both obvious progress and emerging vulnerabilities. The national banking system, although stable, faces a structural dilemma, namely how to maintain its robustness and public confidence in a particularly versatile economic environment, governed by speed, data and algorithms.

Strengthening the resilience of the national financial and banking sector cannot be achieved only through inspired, intelligent regulations, but through a strategic transformation agreement between banks, customers and the state, where digitalization is approached not as an end in itself, but as a vital solution for a fair, secure and sustainable economy.

Currently, the Romanian banking system has considerable development potential, supported by the rapid implementation of the digital technologies and the market dynamics. However, in order to fully capitalize on its existing opportunities, it is necessary to overcome the structural limitations, especially in terms of IT infrastructure and data use.

In the future, the banking companies that will manage to effectively integrate the emerging technologies and meet the demands of a complex digital environment will have a significant competitive advantage.

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