

Original Article

Adapting Global Regulatory Models to Local Realities: Digital Banking Policy Development in Azerbaijan

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Abstract: This article examines how Azerbaijan can develop and strengthen its digital banking regulatory framework by drawing on global best practices while considering local conditions and constraints. Using a qualitative research design with comparative policy analysis, the study reviews international regulatory experiences from various regions, including the EU, UK, Singapore, Asia, North America, and Estonia, and evaluates their applicability to Azerbaijan. Key findings highlight the potential for phased open banking, the utility of regulatory sandboxes, adaptive digital bank licensing, enhanced cybersecurity, consumer education, and data protection measures. Empirical evidence indicates that Azerbaijan has made significant progress in digital finance, including the implementation of the instant payment system, the development of legal frameworks for payment services, and the adoption of a digital finance strategy. However, gaps remain in fintech oversight, financial inclusion, and the integration of systemic cybersecurity. The research concludes that adopting adaptive, customer-centric, and innovation-friendly regulations, informed by global models and tailored to local realities, will help Azerbaijan build a resilient, inclusive, and competitive digital banking ecosystem.

Keywords: Digital Banking, Regulatory Framework, Azerbaijan, Open Banking, Fintech, Cybersecurity, Consumer Protection, Regulatory Sandbox, Digital Finance, Financial Inclusion, GDPR, PSD2, Adaptive Regulation, Comparative Policy Analysis.
JEL. F47, G11, G18, C87

I. INTRODUCTION

Azerbaijan can gain significantly by examining and selectively implementing global best practices in the regulation of digital banking. Regulators all over the world have had to deal with the same problems: how to encourage innovation in banking while keeping consumers safe and the system stable. Many of them have come up with imaginative remedies and frameworks. In this section, we look at international examples that could help Azerbaijan make things better.

II. METHODOLOGY

This thesis employs a qualitative research design that incorporates aspects of comparative policy analysis. The primary objective is to determine how Azerbaijan can enhance its digital banking regulations by examining best practices worldwide and identifying the most effective approaches within the country. The study integrates an examination of international case studies with an analysis of Azerbaijan's existing regulatory framework.

1. Balancing Innovation and Consumer Protection The Case of the EU (PSD2 and Beyond): The European Union's Payment Services Directive 2 (PSD2) is one of the most important changes in the rules for digital banking. PSD2, which went into effect in 2018, changed the game by requiring banks to let third-party fintech companies (with the customer's permission) access their infrastructure through secure APIs [66]. This regulation was aimed at increasing competition and innovation (allowing fintechs to build on bank data or initiate payments) while also protecting consumers through strong security mandates (notably, PSD2 introduced strong customer authentication requiring multi-factor authentication for online payments). The result has been an explosion of new services (budgeting apps, multi-bank aggregators, etc.) in Europe and improved convenience for customers, without sacrificing security. In fact, fraud rates on payments have declined in many areas due to the stronger authentication rules. Azerbaijan can take inspiration here: introducing open banking principles in a controlled manner can spur local fintech growth and give consumers more choices, all under the umbrella of regulatory oversight. Additionally, PSD2's approach to security and liability could be emulated. For example, in the EU, if an unauthorized transaction occurs and the customer didn't deliberately compromise their credentials deliberately, the bank (or provider) must refund the money, usually within a day or two. These consumer-centric rules build trust and encourage usage.

Furthermore, the EU has recently passed the Digital Operational Resilience Act (DORA), which sets uniform requirements for financial entities to manage cyber risks. DORA will enforce things like regular cyber testing, oversight



of critical service providers (e.g., cloud services), and incident reporting across the EU from 2025 onwards. These kinds of all-encompassing plans show how regulators all over the world are working together to deal with cybersecurity in a more organized way. Azerbaijan might want to think about making it mandatory for banks to follow international cybersecurity regulations, not just voluntary best practices.

2. **Regulatory Sandboxes: The UK and Singapore Experience:** To encourage innovation while keeping a close eye on risk, regulatory sandboxes have been pioneered by countries like the United Kingdom (through the Financial Conduct Authority, FCA) and Singapore (Monetary Authority of Singapore, MAS). A sandbox lets banks or fintech companies test novel digital products or business models with real customers in a controlled setting, with regulators watching and some rules being temporarily relaxed [66]. The FCA's sandbox, launched in 2016, has been widely credited with helping the UK become a fintech hub. It's allowed things like app-only challenger banks and innovative payment solutions to come to market faster, while the regulator learned about these innovations and guided them on compliance. Importantly, many consumer safeguards remain in place (firms in the sandbox have limited customer numbers or transaction volumes to contain any failure, and must compensate customers if something goes wrong). Singapore similarly uses sandboxes to test things like blockchain-based payments and digital advisory services. For Azerbaijan, a sandbox could be very useful. It would send a signal that the country welcomes fintech innovation, potentially attracting investment or encouraging local startups (Azerbaijan has tech talent and entrepreneurial youth who might otherwise go abroad or operate in grey areas due to unclear regulations). By experimenting within a sandbox, Azerbaijan's regulators can get comfortable with new ideas (for instance, perhaps a fully digital bank with no branches wants to launch a sandbox could let it operate under monitoring before full licensing). As one fintech commentary notes, global regulatory frameworks are evolving rapidly to accommodate digital banking, and jurisdictions using sandboxes are learning how to calibrate rules optimally. Azerbaijan could join that learning curve in a low-risk way.
3. **Digital Bank Licensing Lessons from Asia:** Some countries have gone further to create special licensing categories for digital-only banks (sometimes called "challenger banks" or "neobanks"). For example:
 - Hong Kong and South Korea have, in recent years, issued virtual bank licenses. In 2019, Hong Kong gave licenses to a number of virtual banks. These banks didn't need to have physical branches, but they did have to meet certain capital and cybersecurity standards. The central bank has kept an eye on these new entrants, who have brought more competition (by offering higher deposit rates or new app features), which has pushed existing companies to get better.
 - Malaysia and Singapore also started accepting applications for digital bank licenses: This was partly to help people who don't have access to banking services, like small businesses or younger customers [66]. They often link these licenses to policy goals. For example, Malaysia encouraged applicants who could fill in the gaps in the current banking coverage. The main point for regulators to take away from this is that a flexible licensing system can be helpful. Instead of one-size-fits-all (where every institution must meet the exact same requirements), regulators can tailor requirements to the risk and scope of the business. A digital bank without branches might have lower overhead and potentially lower risk in some aspects (like robbery or cash handling risk is nil), but higher tech risk. So the regulator might mandate stronger IT capabilities but allow, say, a different distribution of capital since they might not engage in risky trading. Azerbaijan could watch how these digital banks perform abroad and consider if introducing a similar framework in a few years makes sense, especially to serve niches the big banks aren't covering. However, such a move should come after strengthening fundamentals (legal and supervisory capacity) as mentioned earlier, so the timing has to be right.
4. **Consumer Education and Awareness North American Approaches:** In countries like the United States and Canada, regulators and financial consumer protection agencies put significant effort into consumer education around digital finance. The US Consumer Financial Protection Bureau (CFPB), for example, often posts blog posts and guides like "Protect yourself when banking online/mobile" and runs campaigns to stop theft of identity, among other things. Regulators also push banks to add educational content to their apps and websites, like short reminders not to share OTPs and other important information. The world agrees that one of the best ways to fight fraud and mis-selling is to have a well-informed customer base. The experiences in these countries demonstrate that educational initiatives must be ongoing and adapt to emerging threats. A few years ago, phishing emails might have been the focus; now, it could be mobile app malware or social engineering scams. Azerbaijan can do this by setting up a separate unit within the Central Bank or Ministry of Finance to work with the media and community groups to help people learn more about money, especially how to use digital money. Partnering with global bodies like the World Bank's financial capability programs could also bring in expertise and funds for such initiatives.

5. **Data Protection and Privacy: GDPR as a Gold Standard:** The General Data Protection Regulation (GDPR) of the EU has set a high benchmark for data privacy. It gives individuals robust rights over their personal data and imposes heavy fines for data mishandling. While GDPR is broad and not finance-specific, banks have had to comply by strengthening how they gather consent, how they store data, and how they respond to customers wanting to see or delete their data. One result is that European consumers have clearer information about what data banks collect (privacy notices are more detailed) and more control (e.g., the right to opt out of certain data sharing). Additionally, GDPR's breach notification requirement (companies must notify authorities and users of serious data breaches within 72 hours) has improved transparency for consumers in Europe, who often hear directly from companies if their data might have been compromised, in a timely way. Azerbaijan has its own data protection law, but aligning more closely with GDPR principles could enhance user trust significantly. Notably, adopting clear consent practices and breach notifications in the financial sector would be wise. Also, exploring mechanisms like data portability (a GDPR concept) could complement open banking – it allows consumers to request their data in a machine-readable format to take to another provider [67]. That concept, applied to banking (as PSD2 does), fuels competition and innovation, giving consumers power to leverage their own financial data for better services.
6. **Collaborative Cybersecurity Frameworks: The ESTONIA example:** Estonia is a smaller country that is often cited for its advanced digital society and e-governance, including in banking. One thing Estonia has done well is establish a unified digital identity system (e-ID), which all banks use for authentication. This was a government-led initiative that greatly enhanced security and convenience for citizens to use one secure ID method to log into any bank. It lowers the risk of phishing because people don't have to remember a lot of passwords, and the ID is very secure because it is issued by the government and uses smart-card or mobile ID technology. Azerbaijan has Asan Imza, a mobile ID that could be used as the main way to log in to banking apps, based on how well it works in Estonia. Estonia's banks and government also work very closely together on cybersecurity. After cyberattacks in 2007, they famously built strong defenses. Their model shows how important it is to share information and work together with the government to protect digital finance. A lot of countries now have Financial ISACs (Information Sharing and Analysis Centers) where banks exchange threat information with each other and with the government. Establishing a formal information-sharing group, as suggested in 4.2's cyber recommendations, is supported by global practice. For example, the US has FS-ISAC, and Europe has comparable networks under the ECB. Knowing that "we're all in this together" when it comes to fighting cyber threats can make each bank and the system as a whole much more resilient.
7. **Adaptive Regulatory Approach: The Agile Regulation Trend:** A global observation is that regulators are moving towards more adaptive, outcomes-based regulation instead of rigid rule-based approaches for fintech. For instance, Australia's securities regulator published a guideline on "RegTech" encouraging firms to use AI for compliance and telling them the regulator is open to new compliance methods as long as outcomes are met. In the banking sphere, some regulators have started giving guidance that they care about results (e.g., low fraud rates, high availability) more than prescribing exactly how to achieve them, thus giving banks flexibility to innovate in achieving regulatory goals. This is often combined with active supervision the regulator is in dialogue with banks on what they're doing. For Azerbaijan, which is in a development phase for regulation, adopting an agile mindset could be beneficial. That means, for example, if a new mobile payment service doesn't fit neatly into old categories, instead of banning it or ignoring it, the Central Bank could issue a no-objection with conditions and closely watch it, tweaking rules as needed. This experimental but safe approach is being seen globally as the way to not stifle beneficial new tech while still guarding against risks.
8. **Importance of Policy Objectives Financial Inclusion and Competition:** Global experience shows that clear regulatory goals yield better frameworks. For instance, countries like India have explicitly regulated digital banking with financial inclusion in mind. India's central bank allowed "payments banks", a type of stripped-down bank that can't lend but can take deposits and offer payment services to foster inclusion for the unbanked via mobile. They also rolled out a Unified Payments Interface (UPI) that has revolutionized retail payments through a common platform accessible by all banks and fintechs, overseen by the regulator. The result is a highly competitive and innovative payment ecosystem that's also stable and widely used by all social strata. The lesson for Azerbaijan: identify what you want from digital banking (e.g., more people using cashless payments, more SME access to finance through digital platforms, etc.) and tailor regulations to achieve it. If financial inclusion is a goal, maybe allow non-bank entities like postal networks or telecoms (under appropriate oversight) to provide basic digital financial services to reach remote areas. If competition is a goal, ensure fair access to critical infrastructures (payment systems, card networks) for new entrants, as global best practice would advise. Conversely, if stability is the prime concern, impose prudential requirements on whoever holds customer funds digitally (e.g., require that e-money issuers keep 100% reserves to avoid any chance of collapse harming consumers).

In exploring these global practices, the key is that Azerbaijan should not copy-paste foreign models, but adapt them intelligently. Each country's context differs, for instance, the EU's regime works partly because there's a strong legal system and data protection ethos; a lighter-touch approach might be needed in a smaller system to avoid overburdening participants. However, certain principles seem universally beneficial:

- Customer-centric regulation (giving customers control, information, and protection) is always positive. It builds trust, which is the lifeblood of digital banking adoption.
- Encouraging innovation in a supervised way (through sandboxes, pilot programs, or phased licensing) helps the financial sector evolve without causing shocks.
- Strengthening systemic resilience (via cybersecurity cooperation, operational standards) prevents crises that could set the whole system back.

Azerbaijan is in a good position; it can leapfrog in some areas by leveraging tried-and-tested approaches. For example, learning from PSD2 and other jurisdictions, Azerbaijan could design its open banking regulations perhaps even more advanced from the start (including newer concepts like "open finance" which extends data sharing beyond banks to insurance, etc., something the EU is now looking at post-PSD2).

Finally, global experience also shows the need for continuous learning. Digital banking will keep changing (think of AI, digital currencies, etc.). Regulators globally convene through forums (like the BIS, IMF, etc.) to share knowledge. Azerbaijan should remain plugged into these networks. Already, as evidenced by collaboration on the SupTech roadmap with the World Bank [64], the country is open to international expertise. Continuing that openness, sending staff to trainings, participating in fintech conferences, and even aligning local regulations with global standards (like AML/CFT rules from FATF, etc.) will ensure Azerbaijan's regulatory regime stays modern.

In conclusion, by exploring and internalizing global experiences, Azerbaijan can avoid pitfalls and accelerate its regulatory improvements. The successes of others provide a menu of options: whether it's the EU's strong consumer rights and competition framework, the UK's collaborative sandbox model, Asia's innovative licensing, or Estonia's digital security solutions. Coupling these with the local insights from our research (what Azerbaijani users and banks specifically need) will allow the creation of a regulatory environment that is both world-class and home-grown, fostering a safe, transparent, and vibrant digital banking ecosystem in Azerbaijan for years to come.

The analysis of regulatory and institutional frameworks indicates that Azerbaijan has made notable progress in advancing digital finance:

- Implementation of the Instant Payment System (IPS) has significantly improved the accessibility of cashless transactions, integrating 19 commercial banks, the Ministry of Finance, and Azerpost.
- According to the Asian Development Bank (2025), around 3.85 million citizens now use digital payments, representing approximately one-third of the population.
- The adoption of Law No. 987-VIQ (2023) on payment services established legal foundations for digital money institutions, payment system operators, and electronic payment services, aligning with global regulatory trends.
- Progress on the Digital Finance Strategy (2024–2026) has reached nearly 90% implementation, including the development of fintech platforms, open banking initiatives, and enhanced cybersecurity standards.

These findings show that Azerbaijan is in a transition phase, moving from a cash-dominated system toward an increasingly digitalized financial ecosystem.

1. Comparative Findings from Global Best Practices

The cross-country analysis highlighted several regulatory strategies with potential applicability to Azerbaijan:

- EU (PSD2, GDPR, DORA): Demonstrated the importance of consumer protection, secure open banking, and cybersecurity resilience. Azerbaijan could benefit from adopting open banking standards with clear liability rules and mandatory breach notifications.
- UK and Singapore (Regulatory Sandboxes): Showed how controlled innovation environments can stimulate fintech growth. A sandbox in Azerbaijan could attract investment, reduce regulatory uncertainty, and help authorities learn from fintech experimentation.
- Asia (Hong Kong, Malaysia, South Korea): Their digital bank licensing regimes provide a model for Azerbaijan to diversify its banking sector, enhance financial inclusion, and introduce competitive digital-only institutions.
- North America (Consumer Education): Demonstrated the necessity of ongoing consumer awareness programs in combating fraud and mis-selling.
- Estonia (Cybersecurity & e-ID integration): Proved the effectiveness of public-private collaboration and a unified national digital identity system in enhancing trust and resilience.

2. Alignment with Azerbaijan's Context

When mapped against Azerbaijan's financial sector needs, the following results emerge:

- **High Potential for Open Banking:** With IPS and strong government-led digitalization efforts already in place, Azerbaijan is well-positioned to introduce open banking in a phased manner.
- **Regulatory Gaps in Fintech Oversight:** Despite recent reforms, there is no formal sandbox or tailored licensing for digital-only banks, creating barriers for startups.
- **Cybersecurity Readiness:** While Asan İmza (mobile ID) exists, integration across all financial services remains partial, leaving room for systemic improvement inspired by Estonia's model.
- **Financial Inclusion Objective:** Digital transformation is progressing, but rural populations and SMEs remain underbanked. Case studies (India's UPI and payments banks) show how tailored digital finance models could close these gaps.

Key Empirical Insights

- Digitalization has a stronger impact on banking system development than on GDP growth, consistent with earlier findings by Tagiyeva et al. (2023).
- Stakeholder feedback and secondary data confirm that trust and consumer confidence remain critical challenges for adoption. Regulatory clarity, consumer protection, and education are necessary to deepen digital finance penetration.
- Comparative evidence suggests that adaptive, agile regulation is more effective than rigid frameworks. Azerbaijan's ongoing reforms show movement in this direction but require further institutional strengthening.

III. LITERATURE REVIEW

1. **Fintech and Big Tech in Finance:** Cornelli et al. (2020) and Frost et al. (2019) examine the evolving function of fintech and big tech companies in financial intermediation, stressing the need for regulations to change to deal with new credit risks and systemic effects. Crisanto & Ehrentraud (2021) analyze policy strategies to reconcile innovation with financial stability, highlighting the difficulties in regulating substantial technology-driven financial institutions. Huang, Wang, and Zhang (2020) talk about big tech lending in China and how it could grow, but they also talk about the risks to consumer protection and financial oversight.
2. **Technology Adoption and Innovation in Financial Services:** Davis (1989) presents the Technology Acceptance Model (TAM), a fundamental framework for comprehending user adoption of digital banking services. Dwivedi et al. (2019) augment this discourse in the Unified Theory of Acceptance and Use of Technology (UTAUT), presenting a refined model for the analysis of fintech adoption trends. Dezem, Oliveira, and Fernandes (2023) analyze open banking APIs, evaluating the trade-offs between internal and external inventiveness in digital financial institutions.
3. **Regulatory Challenges and Compliance:** Eggert (2021) proposes a pattern-matching methodology for evaluating compliance in financial services, demonstrating techniques for overseeing fintech business operations. Kapeczynski (2020) looks at informational capitalism and the legal problems that come with data-driven financial systems. He also talks about how important data governance is becoming in digital banking. Infante (2021) examines central bank digital currencies and their macroeconomic implications, underscoring the necessity for regulatory readiness in the implementation of emerging financial technologies.
4. **Financial Crises and Systemic Risk:** Gorton (2010), Hellwig (2009), and Goetzmann (2016) examine historical financial crises, imparting lessons on systemic risk management that continue to be pertinent in the realm of fintech and online banking creativity.
5. **Global Open Finance and Sustainability:** Herrera et al. (2023) examine open finance initiatives in Latin America, highlighting possibilities for financial inclusion and obstacles to regulation. Delle Foglie and Keshminder (2021) examine sustainable finance instruments such as SRI sukuk, emphasizing the convergence of digital finance innovation and environmental concerns.
6. **Regional Financial Developments:** Huseynova (2023, 2024) and SM & SS (2025) execute cointegration and econometric examinations to look into the financial systems of Azerbaijan and its neighboring markets, focusing on how economic growth, banking sector stability, and the use of digital finance are changing in those areas.

All of these publications together give us a lot of information about digital banking regulation, fintech adoption, consumer protection, and cybersecurity risks. They also give us useful ideas for improving Azerbaijan's digital financial infrastructure.

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