CHAPTER 2. STUDY OF THE FUNCTIONING OF NEOBANKS IN THE GLOBAL FINANCIAL SERVICES MARKET

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2.1. Development of Neobanks in the Western European Financial Market

The emergence of neobanks is shaped by a number of key micro- and macro-level trends, with the process of globalisation representing a particularly salient influence. This is evidenced by an 8.4% increase in the volume of trade operations (exports and imports combined) globally between 1995 and 2020, with the highest growth rates observed in Belgium, the Czech Republic, Germany, Latvia, and Poland, which are all developed countries (Table 2.1).

Table 2.1

Trade dynamics (exports and imports) in different countries of the world, % of GDP

Country	1995	2005	2010	2018	2019	2020	Deviations, +/-
Austria	68,3	94,0	99,0	107,9	107,5	100,0	31,7
Belgium	116,4	144,5	150,0	166,3	163,7	158,6	42,2
Czech Republic	83,5	121,3	128,0	148,0	141,8	135,1	51,7
Germany	43,6	70,9	79,9	88,4	87,6	81,1	37,5
Spain	44,8	54,8	52,9	67,6	67,0	59,8	15,0
EU-27	57,1	74,3	79,7	92,2	92,2	85,6	28,5
Georgia	67,8	84,5	82,9	111,8	118,6	93,9	26,0
Croatia	62,6	81,5	73,3	99,9	101,8	90,8	28,2
Italy	45,7	49,3	52,0	60,3	60,0	55,1	9,4
Latvia	73,9	100,2	108,6	123,7	120,4	119,5	45,6
Poland	43,7	70,5	81,9	107,4	106,0	105,6	61,9
Romania	56,3	59,4	71,4	87,1	84,9	79,0	22,7
Ukraine	97,2	94,6	95,7	99,2	90,5	79,2	-18,1
USA	22,5	25,6	28,3	27,5	26,3	23,4	1,0
Worldwide	43,2	56,7	57,0	57,7	56,3	51,6	8,4

Source: [231]

Globally, exports and imports grew from 25% in 1970 to 60% of GDP in 2008, with a sharp drop after the 2008-2009 financial crisis to 52.42% of GDP, recovering in 2010, 2018-2019. The spread of the COVID-19 pandemic in 2020 had a positive impact on the functioning of the banking system, contributing to its active digitalisation due to the growing demand for remote banking services.

Conversely, global practice demonstrates that there is no straightforward correlation between GDP per capita and the optimal number of bank branches. While the number of commercial bank branches per 100,000 adults is increasing globally, there has been a decline in Europe, with an average of 22 branches in the EU over the 2010-2020 period (Table 2.2).

Table 2.2

Number of branches of commercial banks in different European countries, per 100 thousand adults in 2005-2020, units

Country	2005	2010	2016	2017	2018	2019	2020	Deviation (2020-2010), +/-
Austria	13,32	11,29	12,66	12,06	11,94	11,87	7,42	-3,87
Belgium	53,77	45,05	36,55	34,79	32,39	29,64	29,64	-15,41
Czech Republic	21,37	22,61	22,36	21,28	21,26	20,57	18,3	-4,31
Germany	20,21	15,71	13,55	12,95	11,17	10,97	9,37	-6,34
Spain	99,19	95,93	61,81	58,57	55,11	49,6	45,53	-50,4
EU-27	29,86	34,18	24,62	22,86	21,26	23,42	22,56	-11,62
Georgia	11,68	21,21	32,72	33,23	31,52	33,58	31,72	10,51
Croatia	31,66	36,18	32,73	32,25	30,05	28,36	27,09	-9,09
Italy	56,77	58,44	47,63	44,61	40,89	39,16	37,63	-20,81
Latvia	31,88	34,18	17,1	16,47	14,7	9,74	6,99	-27,19
Poland	26,59	32,19	31,01	29,31	29,73	28,95	25,73	-6,46
Romania	-	35,44	28,02	26,68	25,58	23,66	22,56	-12,88
Ukraine	3,86	2,33	0,5	0,45	0,43	0,42	0,41	-1,92
USA	33,28	35,42	32,1	31,21	30,88	30,46	29,69	-5,73
Worldwide world	10,59	10,98	12,35	11,86	11,53	11,51	14,14	3,17

Source: [111]

Conversely, this figure is considerably lower in Ukraine than in the EU, with less than one branch per 100,000 adults. For comparative purposes, the data indicate that Romania has 22 branches, Poland has 25 branches, and Latvia has 7 branches. Therefore, in general, there has been a notable decline in the number of branches per 100,000 individuals, largely attributed to the accelerated advancement of technology and the emergence of neobanks during this period.

Nevertheless, there is a notable correlation between the macroeconomic situation (Table 2.3) and the stability of the financial sector, which in turn affects the performance of banks' functions.

Table 2.3

Dynamics of GDP per capita at purchasing power parity, USD in 1990-2020

Country	1990	2005	2010	2018	2019	2020	Deviations, +/-
Austria	19425,4	35013,71	42041,49	57059,54	58641,3	55648,87	36223,47
Belgium	18642,89	33177,89	39870,49	52623,56	54918,17	52626,58	33983,69
Czech Republic	12772,95	22095,39	27903,26	41134,09	43316,33	42049,19	29276,24
Germany	19415,98	31794,1	38982,43	55142,32	56284,98	54263,65	34847,67
Spain	13652,55	27606,93	31706,88	40686,99	42172,13	38343,16	24690,6
EU	14784,62	26815,15	32890,77	44654,17	46659,08	44765,77	29981,15
Georgia	5727,257	5169,062	7564,063	14595,63	15623,15	14761,48	9034,22
Croatia	8060,558	15436,67	19982,5	28960,38	30989,58	29133,99	21073,43
Italy	18592,63	30130,64	35185,29	43119,35	44950,93	41890,21	23297,58
Latvia	5504,241	13913,79	17720,43	30811,07	32240,81	32212,39	26708,15
Poland	6170,249	13896,79	21088,62	31978,53	34233,32	34406,24	28235,99
Romania	5267,533	9602,149	16989,31	29248,81	32323,87	31945,75	26678,22
Ukraine	7305,143	6977,259	8245,375	12634,24	13350,48	13056,7	5751,559
USA	23888,6	44114,75	48466,66	63064,42	65279,53	63413,51	39524,91
World	5543,739	10162,13	12896,21	17008,32	17598,44	17082,79	11539,05

Source: [155]

The ratio of a bank's capital and provisions to total assets provides insight into the extent to which assets are not financed by own funds. This ratio is therefore an indicator of the capital adequacy of the deposit sector.

It serves to complement the capital adequacy ratios that are based on the methodology which has been agreed by the Basel Committee on Banking Supervision. Additionally, it gauges financial leverage, and is occasionally designated as the leverage ratio. The ratio of bank capital to total assets, which serves as an indicator of the solvency and resilience of a banking system, demonstrates the extent to which banks are capable of coping with unexpected losses. The term "capital" encompasses both tier 1 capital, which comprises paid-in capital and common stock, and total regulatory capital. The latter includes a range of subordinated debt instruments that are not required to be repaid if funds are needed to maintain minimum capital levels, namely tier 2 and tier 3 capital. These features are a common feature of banking systems across all countries. The term "total assets" encompasses all assets, both financial and non-financial.

The ratio of bank capital and provisions to total assets in Ukraine, Georgia, and Latvia is less resilient than in Austria, the Czech Republic, Germany, Spain, Croatia, and the United States (Table 2.4). It is noteworthy that the greatest instability is evident during periods of crisis, namely 2008, 2014-2015, and 2018-2019. During these periods, banks' capital was insufficient, resulting in an increased risk transfer to creditors and depositors. This, in turn, led to a rise in distrust in the banking sector as a whole [76].

The globalisation of the economy and the advent of the COVID-19 pandemic have had a profound impact on the global economy and the banking sector in particular, contributing to the rapid growth of neobanks. The growth in the volume of international trade transactions from 1995 to 2020, coupled with the expansion of exports and imports from 25% to 60% of GDP prior to the 2008 crisis, serves to illustrate the high level of integration that characterises the global economy. This trend, in conjunction with the necessity for remote banking during the pandemic, has prompted the active digitalisation of financial services. Concurrently, the reduction in the number of physical bank branches in Europe is indicative of the increasing prevalence of online banking and the transition away from conventional banking operations. The stability of the financial sector is inextricably linked to the prevailing macroeconomic situation, which necessitates that banks adapt to evolving circumstances in order to fulfil their functions effectively. This is particularly pertinent

with regard to the ratio of bank capital and reserves to total assets, which plays a crucial role in safeguarding the resilience of the banking system during periods of economic turbulence. The analysis indicates that in certain countries (Ukraine, Georgia, Latvia), the level of resilience of the banking system is inadequate in comparison to that of developed countries. This underscores the necessity to reinforce the financial sector. In consequence, these trends indicate both a rapid transition to digital financial services in response to external challenges and a requirement for financial institutions to be flexible and innovative in order to adapt to global macroeconomic changes.

Table 2.4

Dynamics of the ratio of bank capital and reserves to total assets in different countries of Europe and the USA in 2008-2020, %

Country	2008	2010	2014	2015	2016	2017	2018	2019	2020	Standard deviation, +/-
Austria	6,28	7,49	6,84	7,45	7,33	7,54	7,71	7,95	7,73	0,48
Belgium	3,28	4,97	6,63	6,78	7,05	7,55	7,61	7,45	7,06	1,37
Czech Republic	5,46	6,49	7,30	7,52	7,26	6,48	6,54	6,84	7,38	0,59
Germany	4,49	4,30	5,61	5,94	5,98	6,33	6,47	6,31	5,93	0,80
Spain	5,87	6,09	7,24	7,44	7,79	7,62	7,55	7,59	6,50	0,76
Georgia	17,11	16,92	17,40	13,96	13,20	12,82	12,64	11,92	9,94	2,63
Croatia	13,32	13,77	14,04	12,68	14,04	14,82	13,90	13,85	13,37	0,51
Italy	4,09	4,98	5,88	6,19	5,49	6,64	6,33	6,71	6,60	0,79
Latvia	7,75	9,27	10,07	10,06	10,08	11,13	12,80	9,70	10,02	1,36
Poland	7,54	8,20	8,94	9,37	9,51	10,02	9,77	9,56	9,49	0,80
Romania	9,05	8,88	7,38	8,18	8,92	8,89	9,34	10,20	9,99	0,82
Ukraine	12,86	14,63	11,23	8,02	9,78	11,90	10,77	13,51	11,66	2,18
USA	12,37	12,74	11,66	11,71	11,59	11,65	11,69	11,78	11,02	0,44

Source: [111]

Virtual banking institutions have rapidly gained popularity among the population due to the simplification of banking services. According to the Ipsos MORI survey of 1,778 respondents, as part of the regulatory

requirement of each of the 17 largest service providers that open personal current accounts, 78%-86% of respondents would recommend online services to friends and family. In terms of major online and mobile banking service providers, respondents give the greatest preference to the following: 86% of respondents recommend Starling Bank, Monzo – 85%, First Direct – 81%, Halifax – 79%, Metro Bank – 78% [154]. The popularity of online banking is increasing due to its ability to meet the fundamental requirements of customers. A survey conducted by GOBankingRates revealed that 33.63% of respondents require banks to set low fees, 21.65% – affordable tariffs and rates, 14.08% – low deposit fees, 12.06% – a variety of services and products offered, and 11.99% – availability of a round-the-clock customer support service [233]. As of 2021, the ten most prominent neobanks include the following: Revolut (established in 2015), N26, Monese (2015), Starling, Bunq (2012), MonzoBank, TinkoffBank (2006), Monobank, and Shime (2012) [220].

The growing popularity of mobile banking can be attributed to shifts in customer behaviour and the emergence of new financial needs, particularly in terms of speed, simplicity, convenience and the quality of service provided. At the time of writing, there are more than 150 neobanks in operation worldwide, with approximately one-third of these located in the UK. Notable examples include Monzo Bank, Revolut, Atom Bank, Number26, Fidor Bank, Saxo Bank, Solaris Bank, and others. The development of online banking varies considerably between European countries. In the Nordic countries, including Norway, Denmark, Finland, and Sweden, the penetration of online banking services reached over 80% of the population, in stark contrast to Albania, Montenegro, and Bosnia and Herzegovina, where penetration stood at approximately 15% in 2021 [190].

On December 3, 2020, the European Banking Federation published the report "Banking in Europe: Facts and Figures" [146], which shows a reduction in the number of staff and bank branches in the European banking sector. These trends are driven by the following factors: positive perception of electronic payments, online and mobile banking by bank customers due to their convenience, simplicity, and speed of operations. The 2019 review of banking activities in Europe shows that the total number of credit institutions in the EU decreased by 2544 units in 2008-2019 (-30%): from 8,525 in 2008 to 5,981 in 2019. The popularity of widespread

networks of bank branches is declining among the general population. The number of bank branches in the EU has decreased to 163,270, with approximately 10,000 branches closing in 2019 alone. In comparison to the total number of bank branches in 2008, there has been a 31% reduction, equating to almost 75,000 branches. This decline is indicative of the accelerated expansion of online and mobile banking services in recent years. In 2019, 58% of the EU population used internet banking, representing a significant increase from 25% in 2007. The number of individuals employed by EU credit institutions has reached its lowest point since the ECB initially estimated this figure in 1997, with a total of approximately 2.62 million individuals employed by such institutions by the end of 2019. For purposes of comparison, the figure for 2008 was 3.26 million people, while in 2018 it was 2.67 million people [107].

On average, the share of individual customers using internet banking in the 27 EU Member States (hereinafter referred to as the EU27) and in Europe was 58% in 2021 (Annex G). Grouping countries by the share of individuals using internet banking in European countries allows to identify the following groups of countries:

1) With a high share (75-100%) – Belgium 75%, Ireland 77%, Switzerland 77%, Latvia 80%, Great Britain 81%, Estonia 82%, Sweden 84%, the Netherlands 91%, Finland 93%, Denmark 95%, Iceland 95%, Norway 96%;

2) with an average share (50-75%) – Germany 50%, Poland 52%, Portugal 53%, Croatia 56%, Hungary 56%, Slovenia 57%, Slovakia 58%, Malta 63%, Spain 65%, Cyprus 65%, Austria 71%, France 72%, Lithuania 72%, Luxembourg 72%, Czech Republic 73%;

3) with a below average share (30-50%) – Italy 45%, Greece 42%;

4) with a low share (less than 30%) – Bulgaria 15%, Romania 15%.

One of the positive factors influencing the development of online banking in Europe is the growing number of employees working in the financial and technology sectors. To illustrate, the financial and technology industry in the United Kingdom (UK) is projected to employ approximately 44 thousand individuals in 2017, 52.5 thousand in 2021, and 60.5 thousand in 2030 [136]. In the European Economic Area, which encompasses the EU Member States, as well as Iceland, Liechtenstein, and Norway, the number of individuals employed in the financial and technology sectors reached

21.5 thousand in 2017, 25 thousand in 2021, and is projected to reach 29.5 thousand in 2030 [136].

Over the past decade, since the start of the tech boom in the financial services sector, more than a hundred standalone digital banks have emerged around the world. Using digital technologies, neobanks have changed the way consumers save, borrow, lend, make payments and invest. In 2022, TABInsights launched the world's first comprehensive assessment of global digital banks, which ranks them according to a balanced scorecard based on an objective and transparent set of evaluation criteria. This was done in order to track the growing number of mobile virtual banks. The scorecard encompasses five principal parameters: customers, market coverage/ products, profitability, asset and deposit growth, and funding. The scale and size of virtual banks are not the primary determinants of ranking; they are balanced with profitability, operational efficiency, the capacity of digital banks to grow and raise funds (balance sheet dynamics, lending). The TABInsights Global Top 100 Digital Banks ranking encompasses digital banks from 36 countries across the globe, representing the major regions of the world (see Annex B.1-B.3). Australia (5), China (5), the United States (6), Japan (6), Hong Kong (7), and the United Kingdom (11) are the countries with the highest number of digital banks. Additionally, the ranking encompasses online banks in various European countries, including Spain (1), Italy (1), the Czech Republic (1), Sweden (1), and Germany (2). In the period 1991-2014, 23 virtual banks were opened in the world, while in 2015-2021 there was a boom in their launch – 77 banks were opened, especially in 2015 (12 banks), 2017 (17 banks) and 2020 (15 banks). Given the dynamic development of internet banking in Europe and the growth of virtual banks at global level, it is advisable to examine more closely the peculiarities of their operation, the range of banking services they offer and their strategies, using the example of the most innovative financial institutions.

Atom is a challenger bank, one of the most innovative financial technology companies in the UK, investing "in building the world's best banking platform, powered by Google's cloud platform". The digital bank was founded in 2014 and offers customers a new, simpler and more efficient way of banking, accessible only through an app on a smartphone or tablet [101]. Atom Bank operates on an app basis, which eliminates the need

for physical branches, the completion of paperwork (e.g., hard copies of bank statements) and the use of inefficient websites. Instead, customers can access their personal banking information via a mobile application available for iOS and Android devices. By downloading the app, customers can access their accounts at any time and from any location. The digital bank provides the following benefits of banking services via the Atom app: the ability to make transfers, round-the-clock access to accounts, reports and information, security, simplicity and ease of use of the app. At the same time, the digital bank provides the same level of protection for clients' funds as traditional banks. Atom guarantees the protection of customers' financial resources up to 85 thousand GBP in accordance with the UK Financial Services Compensation Scheme (FSCS). Furthermore, the bank has devised a framework for remunerating clients in the event of an online banking failure, in alignment with the stipulations set forth by the UK Prudential Regulation Authority [102]. The framework for compensation pertaining to financial services rendered was established in the country in 2001, in accordance with the UK Financial Services and Markets Act 2000 [224]. The FSCS is an autonomous entity, separate from both the government and the financial services industry. It is financed through fees levied on authorised financial services firms. In the 2018-2019 period, the FSCS distributed 473 million GBP to 425,760 customers of bankrupt companies and provided 20 billion GBP in reimbursements following the 2008 banking crises.

According to the 2021-2022 annual report [97], Atom Bank has ensured profitability of its operating activities, which generally indicates the potential for growth and development. For example, profit before other expenses amounted to 1 million GBP in FY2022 (for comparison, in FY2021, the bank made a loss of 49 million GBP). The bank finances its activities through the issue of shares (117 million GBP in 2022), net interest income (47 million GBP in 2022), and lending to business clients (662 million GBP in 2021, 930 million GBP in 2022) [97]. Atom's banking activities, like those of traditional banks, include a diversified portfolio of business loans (secured and high-yield unsecured lending, housing lending). Among the innovative products of Atom Bank is housing lending in partnership with the Platform Co-operative Bank in the UK [97], which provides mortgages for renting out the acquired property (Buy to Let, BTL – mortgages are

intended for customers who want to buy property for rent and are provided only to business business partners [221]). In this manner, digital banks are broadening their range of banking products through collaboration with traditional banking institutions.

The business model of Atom Bank is designed in such a way as to guarantee the continuous scalability and automation of the company. This ensures that the growth in lending and deposits does not necessitate an equivalent scale-up of operational functions and the associated increase in costs. This illustrates the efficacy of digital business models employed by virtual banks, which facilitate the expansion of loans and deposits without necessitating a substantial increase in personnel and associated costs. To illustrate, in 2022, staffing and administrative costs increased by 3.4 million GBP to reach 50.7 million GBP, while the average number of employees increased by 22 to reach 424 full-time employees, in order to support operational and technological functions [97]. Furthermore, the rise in remuneration was partly counterbalanced by a decline in bonus expenditure. In FY2021, a one-off bonus of 2 million GBP was disbursed, whereas in FY2022, the bonus was distributed in the form of share options to all employees [97]. The cost of loan servicing increased by 3.2 million GBP, reaching 5 million GBP in 2022 [97].

Among the cases in online banking, it is worth noting the example of ING Bank N.V. (ING Bank), which is part of the public company ING Groep N.V. This is the parent company for Dutch and a number of foreign banks. ING Bank is directly supervised by the European Central Bank (ECB) in accordance with the provisions of the Single Supervisory Mechanism (SSM). The SSM is comprised of the ECB and the national competent authorities of its Member States. Its responsibilities include the supervision of financial institutions in accordance with the principles of prudential supervision and the maintenance of financial stability. The ECB is tasked with the supervision of financial institutions in accordance with the relevant prudential standards. The Dutch central bank (De Nederlandsche Bank, DNB) retains responsibility for prudential supervision in relation to those mandates that fall outside the remit of the ECB, including payment system supervision and financial crime supervision. The other Dutch financial sector supervisor, the Dutch Financial Markets Authority, retains responsibility for the supervision of market conduct, which

encompasses the assessment of the conduct of participants in the Dutch financial markets.

ING Bank, with its robust European foundation, engages in global operations, with 58,000 personnel serving approximately 38 million customers, corporate clients, and financial institutions across more than 40 countries. The bank's product range encompasses savings, payments, investments, loans and mortgages, which are available in the majority of retail markets. For clients engaged in wholesale banking, the bank offers a range of specialized financial services, including lending solutions tailored to specific client needs, corporate finance, bond and equity market solutions, sustainable finance solutions, payments and cash management, and trading and treasury services. Interaction with customers is one of the Bank's key competitive advantages. By working with partners, the Bank is able to implement ideas quickly and bring innovative products to the market. The bank implements its sustainability policy by financing society's transition to a low-carbon future and introducing innovative forms of financing to support this approach, which is an integral part of ING's strategy. The bank's key innovations include internal innovation through the bank's 25 million EUR Innovation Fund, investments and partnerships with financial technology companies through ING Ventures, and the development of its own unique innovation methodology, PACE, which has trained more than 10,000 employees [175].

In January 2021, ING received a score of 83 as a strong financial institution in terms of opportunities and risks in the environmental, social, governance and management (ESG) dimensions of strategy and governance from S&P Global Ratings. The Bank operates in the following key markets: 1) market leaders: The Netherlands, Belgium, Luxembourg, where the Group's leading retail and wholesale banks operate, and where the Group's mobile-first and cost-effective international customer interaction platform is available; 2) challenger markets: Australia, Germany, Italy, Spain, where the Group's wholesale banks and digital retail banks with "direct banking" operate, expanding the range of products and ensuring the implementation of the concept of mobile-first customer experience; 3) emerging markets: Poland, Romania, Turkey and some markets in Asia, where the group is developing retail and wholesale banking in economies with high growth potential, developing a differentiated customer experience based on a

mobile-first approach. ING's wholesale banking comprises an international network and global franchises, and a large international client base in all regions. The company is focused on the client business sector in lending, capital structuring and advisory, transaction services, sustainable financial solutions and financial markets [164].

It would be beneficial to conduct a more detailed examination of the ING Group's "Superior Customer Experience" approach. Both large and small customers anticipate an experience that is straightforward, tailored, immediate, and pertinent to their requirements. ING thus offers customer experiences tailored to the specific needs of each customer segment. For consumers and small businesses, the bank places a primary emphasis on mobile banking, while for corporate clients, it provides personalised relationships, industry and internet best practice, and seamless digital delivery. To ensure a positive customer experience, the bank is developing a robust technological and operational infrastructure that guarantees the continuity of digital services, the safety and security of funds, data, and privacy [216].

N26 is a mobile banking institution in Germany that was established in 2013. It provides users with the ability to manage their bank accounts remotely, track their expenses, and save money in real time. In 2016, the bank was granted a full German banking licence by the European Central Bank. Bank N26 operates in 24 markets, attracting more than 8 million users. Its services include personal and business accounts, as well as financial services such as insurance, e-insurance, travel insurance and property insurance. As a fully licensed German bank, N26 is bound by the same regulatory framework as traditional banking institutions, investing significantly in the security and integrity of online banking. N26 presents itself as a digital bank that offers customers security and transparency, as well as ease of service delivery. The security of customer funds is guaranteed by the German Deposit Protection Scheme [156], which is designed in accordance with EU standards and provides protection of up to 100,000 EUR. The statutory deposit guarantee scheme is established and regulated by the German Deposit Guarantee Act (EinSiG) and the Investor Compensation Act (AnlEntG). The German Deposit Guarantee Act (EinSiG) applies to all banking institutions incorporated in Germany, including those that are subsidiaries of foreign banks. In accordance

with this legislation, deposits held by retail customers, partnerships and corporations are guaranteed up to a maximum of 100,000 EUR per depositor. Furthermore, deposits in euros or other currencies are also protected by these guarantee schemes [156].

N26 has established new benchmarks in the EU's institutionally developed banking sector, particularly in terms of enhancing the scope and functionality of banking services. The digital bank standards posit a shift in the manner by which financial resources are managed through the utilisation of technology. Consequently, the transformational function of digital banks through technology has facilitated the acceleration of the mobilisation of free funds of certain business entities and their transfer to others, thereby significantly expanding the capacity to modify the timing and amount of cash capital and financial risks.

Revolut is a financial technology company that was established in London in 2015. It provides a range of financial services, including banking, currency exchange, payment cards, stock trading, and cryptocurrency transactions. In the year 2015, Revolut has introduced a money transfer and exchange service in the UK. In 2017, the company launched Revolut Business, which offers electronic money and payment services, currency exchange, acquiring, prepaid corporate cards and international and domestic wire transfers for small and medium-sized enterprises and freelancers. In July 2020, Revolut commenced the provision of consumer lending services, including unsecured loans and credit cards, in particular for customers in Lithuania through its Lithuanian subsidiary, Revolut Bank UAB. This entity is licensed and regulated by the Bank of Lithuania. By the conclusion of 2020, these services had been made available to customers in Poland [207].

Currently, customers in the retail and business sectors across the globe utilise Revolut's pioneering products, with over 150 million transactions conducted on a monthly basis. The company provides retail customers with a range of services, including e-money and prepaid card payments, offered under a free tiered subscription model. Additionally, customers have access to peer-to-peer payments, foreign exchange services, account opening, the ability to buy and sell public company shares, cryptocurrencies through the company's trading partners, and insurance intermediation services. Revolut offers a comprehensive range of retail products to its customers,

including interest-bearing savings vaults, open banking, gold and silver trading, junior accounts, cash gifts, rewards, e-wallets, account sharing, subscription management, web app, payroll, and four new cryptocurrencies. For business customers, Revolut offers nine business products, including debit cards, instant European payments, international transfers, direct transfers, expense management, open banking for business, rewards, and metal cards for business, as well as merchant acquiring. Revolut has launched an acquiring technology solution as part of its Revolut Business start-up package. This enables businesses in 13 European countries to accept online payments directly into their accounts, thereby offering a comprehensive cash management solution. In 2020, Revolut commenced operations under the auspices of the Revolut UAB banking licence, offering a range of banking services and credit products. In 2021, Revolut obtained certification for the provision of banking services and credit products throughout the European Union [207].

Since its initial release in 2015, Revolut has attracted a user base of over 25 million, 500 thousand business users, operates in 200 countries and regions, and offers more than 30 currencies. The company's mission is to "unleash the power of the borderless economy for everyone". Financial services are the foundation of modern society. The company's objective is to provide these services to users across the globe, thereby facilitating global economic growth by offering consumers affordable financial products and services in a seamless manner. In order to achieve this objective, the company has developed a customer-centric platform that is tailored to the specific needs of each user and serves as a dependable instrument for the management and expansion of financial resources. The company provides support to clients "throughout their lives", both individuals, groups and families. The company provides clients with digital tools for managing their own funds (loans, investments, expenses, etc.) through a personalised digital account. For business clients, the bank offers digital tools for starting and operating a business, scaling up, such as managing the company's balance sheet [208].

Revolut's focus on technology and innovation has driven revenue growth in 2019-2020. Adjusted profit for 2020 included statutory income of 222 million GBP and a fair value gain on cryptocurrency assets of 39 million GBP in other comprehensive income. The focus on innovation

and technology enabled Revolut to increase adjusted revenue by 57% from 166 million GBP in 2019 to 261 million GBP in 2020. Efficiency in cost control and increased gross margins allowed the company to reduce quarterly adjusted operating losses from 55 million GBP in Q1 2020 to 6 million GBP in Q4 2020, and to generate adjusted operating profit in November and December 2020 [207]. In 2020, the company saw a significant increase in the number of customers, in particular due to the spread of the COVID-19 pandemic. The number of retail customers grew by 45% to 14.5 million by the end of 2020, and the total number of business registrations increased by 127% to more than 500 thousand. Despite a decline in tourism activity and lower payment volumes, the level of customer activity remained consistent with previous years, largely due to the bank's diverse product range. The company observed an increase in the proportion of new customers opting for a paid subscription, from 11% to 14%, as a consequence of the expansion of its product range. In 2020, Revolut concentrated its efforts on enhancing the customer experience through a comprehensive programme encompassing all facets of the customer experience, from support satisfaction, defect resolution, to the reduction of response times to customer queries. During the course of 2020, Revolut achieved notable enhancements, markedly elevating the average level of satisfaction with customer service interactions and reducing the proportion of detractors among those utilising support services from 4% to 2%. In 2021, Revolut proceeded with further performance improvement projects. In order to safeguard its customers, the company regularly conducts special educational campaigns with the objective of deterring and preventing fraud, while also raising awareness of potential fraud schemes. For example, the bank has introduced payment recipient confirmation and security features for disposable and virtual cards, as well as the ability to freeze cards or disable contactless payments in the app. Revolut also actively uses social media and telecommunications companies to prevent fraudulent tools and ensure the safety of customer funds.

Fidor Bank is Germany's inaugural digital bank, headquartered in Munich and Berlin. Established in 2009, the bank's objective is to facilitate the provision of cutting-edge technology-driven banking services. Fidor's present business activities are concentrated on the delivery of a comprehensive digital banking experience to retail and SME customers

in Germany. Furthermore, the bank has a robust market presence in the provision of payment and transaction services to prominent payment service providers and digital asset market participants. Fidor has implemented the rules of the EU Payment Services Directive PSD2 (administered by the European Commission to regulate payment services and payment service providers throughout the European Union and the European Economic Area). In particular, the bank's implemented PSD2 XS2A API rules provide access to the account information service (AIS), payment initiation service (PIS) and payment instrument issuance service (PIIS) for licensed third-party providers (TPPs) [149]. Fidor Bank is positioned as a straightforward, adaptable, digital bank that offers pioneering financing services. Fidor Bank is a member of the BPCE group, which is the second largest banking group in France. The group employs a workforce of 100,000 individuals and serves a customer base of 36 million, comprising individuals, professionals, companies, investors and local governments, across the globe. The group operates in the retail banking and insurance sectors in France through two principal networks, Banque Populaire and Caisses d'Epargne, in addition to Banque Palatine and Oney. Additionally, the Group offers asset management services (Natixis Investment Managers) and provides expertise in wholesale banking (Natixis Corporate & Investment Banking). In 2021, the Group demonstrated robust performance, attributable to a favourable economic climate and an optimised organisational structure. The net profit was 4 billion EUR, with revenues increasing across all business lines to 25.7 billion EUR, representing a 14.1% growth compared to 2020 and a 5.8% growth compared to 2019. Operating expenses increased by 7.2% compared to 2020 and by 1.5% compared to 2019. The cost/income ratio was 66.1% in 2021, down 4.2% compared to 2020 and 2.9% compared to 2019. The cost of risk was 1.8 billion EUR, down 40.5% compared to 2020 and up 30.4% compared to 2019. In 2021, the Group simplified and unified its organisational structure. The transition to a more straightforward, adaptable and productive organisational structure enables Fidor Bank to retain its position as Europe's foremost unlisted banking collective, while reinforcing the universal cooperative banking model and facilitating greater strategic flexibility. The recently established Global Financial Services (GFS) division unites the group's two global business lines, namely asset management and corporate and investment

banking. In 2021, the insurance and payment activities of BPCE were transferred with the objective of uniting all business lines serving retail banking networks, namely insurance, payments, financial solutions, and expertise [205].

In 2004, an innovative online bank, Dukascopy Bank, was established in Switzerland. It provides online and mobile trading services, with a particular focus on foreign exchange, contracts for difference (CFDs), binary options, banking, and other financial services. These are delivered using patented technological solutions [55]. Dukascopy Bank, headquartered in Geneva, Switzerland, is subject to regulation by the Swiss Financial Market Supervisory Authority (FINMA) in both its capacity as a banking institution and a securities company. The bank is fully integrated into the country's financial market, as evidenced by its membership of the Swiss Association of Banks. The history of Dukascopy Bank commenced in 1998 as a tangible undertaking spearheaded by Andrei Duca in Geneva. The objective of the project was to provide the financial community with innovative solutions based on new mathematical and economophysical methods. The vision of the founders was realised in the form of an international financial and technology group (FinTech), with Dukascopy Bank at its core. As of 31 December 2022, the group is a fully digital Swiss bank and securities company operating on the Internet with 283 employees (full-time equivalent – 109.6 as of December 31, 2022). The Dukascopy Group is subject to regulatory oversight in Switzerland, Latvia, and Japan. The Latvian company Dukascopy Europe is duly licensed to operate within the European Union. The group offers a diverse range of financial products and services, including forex, precious metals, contracts for difference (CFDs), binary options, and a comprehensive suite of other financial instruments. These are accessible through online and mobile trading platforms. Additionally, the group provides a spectrum of banking services, such as current accounts, guarantees, traditional bank transfers, cutting-edge instant payments via smartphones, payment cards, and its own cryptocurrency. In accordance with Swiss law (Financial Market Infrastructure Act), the SWFX trading platforms operated by Dukascopy Bank qualify as a bilaterally organised trading facility (OTF). The motto of the Dukascopy Group is to offer easy-to-use financial services to every consumer at affordable terms in a friendly and modern environment. Since 2016, Dukascopy accounts can be opened

in one day, fully online (remotely), which has allowed the bank to open more than 260,000 accounts. In 2018, the Bank initiated its cryptocurrency activities with the creation of Dukascoins, tokens developed by the Bank using Ethereum-based blockchain technology as a means of payment and a method of rewarding customers who open a multicurrency MCA account [118]. By the conclusion of 2021, the number of Dukascoins in circulation had reached in excess of five million. In 2017, Dukascopy Bank has identified stable growth through technological solutions, simplification and rationalisation of the organisation of its activities as the key drivers of its strategic development. The primary strategic objectives of the bank's development are oriented towards the advancement of mobile retail banking and the expansion of its involvement in cryptocurrency-related activities [118]. In 2017, Dukascopy Bank adopted an online/digital banking model with a focus on technological solutions as a growth driver. This innovative and leading position contributed to the flexibility of operations, the rapid introduction of blockchain technology and the launch of specific financial programmes. During the 2020-2021 period, the digital banking model facilitated the sustainability, profitability and reliability of banking activities through the continuous development of technological solutions, ongoing optimisation and the automation/digitalisation of all processes. During 2017-2019, the Bank invested heavily in diversifying its product range. In addition to its traditional core business, trading, the Bank has developed an infrastructure for issuing, storing and exchanging cryptocurrencies, as well as retail mobile banking services, including instant payments and card transactions. For this purpose, the bank has made aggregate investments of approximately 6 million CHF per year without attracting external financing. In 2019, the Bank undertook a period of intensive investment in the rapid development of new products. This was combined with a controlled reduction in IT, personnel and other operating expenses, which ensured profitability in 2019. As of 2020, the Bank has diversified and sustainable operations, high liquidity, and low credit risks. The financial result for the first quarter of 2020 corroborates these optimistic expectations, with a profit of 2.2 million CHF, representing the highest quarterly profit in the Bank's historical record [120].

Table 2.5

Key operational and performance indicators of Dukascopy Bank's digital business model 2017-2022, million CHF or %

Indicator	2017	2018	2019	2020	2021	2022
Net profit	0,1	-1,1	2,2	20,4	2,1	6,4
Cost to income ratio	104,9%	100,6%	87,2%	52,5%	86,8%	75,7%
Comprehensive operating income	29,1	27,4	28,0	40,1	22,7	25,9
Total operating expenses	30,9	27,6	24,4	21,0	19,7	19,6
Total assets	144,0	153,0	142,6	162,7	184,5	196,3
Total customer deposits	105,5	113,9	102,1	105,3	125,9	124,0
Regulatory capital	35,4	34,4	36,6	50,4	51,1	-

Source: compiled by the author on the basis of [118]

The bank's net profit in 2021 was 2.1 million CHF, in 2022 – 6.4 million CHF (Table 2.5). Operating expenses were 6.5% lower in 2021 than in 2020, and 0.5% lower in 2022. Since the beginning of 2021, customer deposits have increased by 19.6%, while in 2022 they decreased by 12.6%. In 2021-2022, there was a significant increase in the number of mobile multicurrency accounts (MCAs), which demonstrates the effectiveness of the digital retail banking model. In addition, the Bank creates synergies by transferring some customers from MCAs to trading accounts. In the year 2021, a total of 51,935 new MCA accounts were opened. Since the beginning of the year, customer deposits in MCA accounts have increased by over 100% from 16.4 million CHF to 36.1 million CHF. In 2021, net income from MCA accounts reached 1.9 million CHF. The Bank's involvement and development in cryptocurrency-related activities represents a significant strategic priority, alongside the expansion of its retail banking operations. By the conclusion of 2021, the issuance of Dukascoin tokens had reached a total of over 5.3 million. It can be observed that trading accounts continue to represent the primary source of revenue. The bank is committed to the ongoing enhancement of its clients' experience through the provision of exemplary trading services [121]. The bank offers its clients the option of opening a multicurrency account

with a Swiss bank, which can be accessed via an Internet browser or mobile applications for iOS and Android devices. The account opening process is entirely digital and accessible from any location with an internet connection. Those utilising multicurrency accounts who seek to amass a sum in excess of 100,000 USD may submit an application for a Private Banking (Savings) Account, which will enable them to avail themselves of the services offered for the storage and accumulation of funds. The Multicurrency Account (MCA) is designed for retail customers with a net worth of less than 100,000 USD. It serves as a tool for facilitating daily transactions (see Table 2.6).

Table 2.6

Comparative table of Dukascopy Bank online banking services

Criteria for comparing account services	Multicurrency account	Standard current account
Remote account opening worldwide with video identification 24/7	+	+
Personal account manager	-	+
Round-the-clock multilingual support via chat, phone and email	+	+
Amounts over 100,000 USD	-	+
Security deposits up to 100,000 CHF	+	+
Accounts in 23 different currencies	+	+
No account maintenance fees	+	-
MasterCard and American Express credit cards	-	+
A wide range of available methods for depositing or withdrawing funds, including SWIFT/SEPA/SIX transfers, card payments, Skrill and Neteller transfers	+	-
Management of the account via an Internet browser, iOS or Android apps	+	+
Currency exchange at the interbank rate	+	+

Source: [58]

The account opening process is instantaneous and accessible from any location, due to the implementation of an innovative solution: online identification via video using a mobile phone. This online electronic identity

card enables clients to confirm their identity via the Internet by applying for an account and transmitting their identification data digitally [58]. It is important to acknowledge that, in general, electronic identification is actively employed by financial institutions in the context of digitalisation. This provides customers with the opportunity to open accounts at any time of the day or night. In particular, in Ukraine, e-identification is defined by law as "the procedure for using a person's identification data in electronic form that uniquely identifies an individual, legal entity or representative of a legal entity" [68].

The multicurrency account permits clients to undertake a variety of transactions. Clients are able to open accounts in 23 different currencies and in gold. Security deposits of up to 100 thousand CHF may be placed. A wide range of available methods for depositing or withdrawing funds is provided, including SWIFT/SEPA/SIX transfers, card payments, transfers via Skrill and Neteller. Clients are able to invest in a range of assets, including oil, gold, Bitcoin, Ethereum, and stock indices, without the use of leverage. They may also engage in other forms of investment. Account management is facilitated through the use of an Internet browser or mobile applications for iOS or Android devices. Clients may also utilise the platform to send and receive funds via a mobile number. Additionally, the platform offers currency exchange at the interbank rate and provides multilingual support, accessible via chat, phone, and email.

While the multicurrency account (MCA) is aimed at retail clients with funds below 100,000 USD, clients with funds above 100,000 USD can use the services of Private Banking (Savings). The principal function of this instrument is to serve as a repository for accumulated funds, whereas MCA is designed for the facilitation of routine retail transactions. The following benefits are available to clients of the Private Banking division: the storage of funds in a Swiss bank, the ability to deposit and store sums of at least 100 thousand USD, the provision of a personal account manager, the opportunity to invest in gold, silver, oil, gas, stocks, a multitude of indices and cryptocurrencies, and access to funds via premium credit cards from Visa, Mastercard or American Express [55].

Additionally, Dukascopy Bank SA provides the option of converting funds held in the current account at the exchange rates applicable to the SWFX platform. The client is afforded the option of instant currency

conversion at a time convenient to them. The Bank establishes a supplementary sub-account, free of charge, for each currency into which the client converts the funds held at Dukascopy Bank SA. It is possible for customers to convert foreign currencies to or from any sub-account by utilising their savings account.

Thus, in the most developed European countries, the development of neobanks is rapid, driven by several factors: changing customer behaviour and their transition to the digital financial environment due to the convenience, simplicity, and speed of using online bank services, and the positive perception of electronic transactions by the population; the dynamism of innovation and the rapid development of financial technology companies and the number of people employed in this sector; a favourable regulatory environment that is constantly evolving, assessed and reviewed within the EU and by national regulators; the coronavirus pandemic, which has increased the trend of consumers to use digital banking services, including digital currencies. Digitalisation and the introduction of technology are driving the development of online banking, and as a result, changing approaches to saving, borrowing, lending, transactions and investing by consumers and investors. An assessment of the practices of well-known online banks in Europe (Atom – a challenger bank, one of the most innovative financial and technology companies in the UK; ING Bank – a Dutch digital bank; N26 – a mobile online bank in Germany; Revolut – a financial and technology company providing banking services in the UK; Fidor Bank – a German digital bank; innovative online bank Dukascopy Bank in Switzerland) indicates the following features of their functioning: development of a clear strategy, tactics and positioning in the digital financial market; provision of simple, efficient, convenient and interconnected banking services to customers; change and optimisation of organisational structures, including the management structure of groups of companies to which the digital bank belongs, in order to improve internal business processes, reduce operating costs, increase profitability of operating activities, and ensure management flexibility; online banks are based on innovative business models that provide scalability and high automation, as well as change the approach to financial management; online banks are regulated by national regulators, subject to supervision and control by government agencies; constant expansion of the banking services

portfolio, including the issuance of digital currencies (cryptocurrencies); ensuring the innovation of banking services through cooperation with financial technology companies, the formation of powerful IT units in its own structure, the implementation of technological projects, the creation of investment funds and partnerships with other companies in the financial ecosystem.

2.2. International Regulation of Neobanking Institutions in the Global Financial Services Market

The advent of digitalisation is effecting a transformation in the boundaries between the various financial services sectors, as evidenced by the emergence of a novel combination of traditional, well-defined banking functions (payments, savings, borrowing). The advent of new market entrants, namely financial technology companies, has been pivotal in the creation and evolution of an innovative financial sector, particularly through the intensification of competition within the banking sector. According to Deloitte, the companies in the UK financial and technology sector that exhibited the greatest revenue growth in 2020 relative to 2019 were: DiveBuy 2073% growth in retail lending; Revolut: 6786% growth in online banking; Landbay: 5520% growth – investment and borrowing provider; Moneybox: 5270% growth – savings, cash and long-term investment products; FinTech London: 2200% growth – personal loan provider; Yoyo Wallet: 1291% growth – mobile payment platform. OakNorth, a provider of business and property loans, exhibited a 1261% growth rate. Divido, a retail financial platform for lenders and retailers, demonstrated a 1250% growth rate. ComplyAdvantage, a provider of financial crime data, exhibited a 1051% growth rate. CrowdProperty, a direct online lending company (peer-to-peer lending), exhibited a 1008% growth rate [95].

In order to maintain competitiveness, traditional banks must adopt practices that deviate from the norm, which in turn stimulates the emergence and development of challenger banks within their structures. Such institutions facilitate the personalisation of financial services at reduced costs. Such market developments are predicated on innovation, which facilitates financial inclusion and enables financial institutions to support market segments and rapidly expand their business on a global scale. This was previously challenging to implement in the absence of modern

mobile technologies. In order to optimise the benefits and advantages of innovative solutions, banking institutions operating on the Internet should ensure that they consistently apply the regulatory and supervisory requirements that are being introduced in connection with the active development of the financial technology sector and online banking. As Ralph Hamers, CEO of ING Group, has observed, businesses, banking institutions, and policymakers are employing new digital technologies that are transforming financial services at a fundamental level [166]. The EU institutions play a leading role in creating a stable regulatory environment for online banking, which allows for innovation in the financial sector regardless of the market. Banking institutions are also actively involved in discussing and providing recommendations on the legislative regulation of neobanks. An example of this is ING Bank's active engagement on specific regulatory and supervisory issues in the digital financial sector, in particular by providing recommendations in various areas of regulation of the financial and technology sector: 1) Open Finance: a project aimed at increasing customer control over financial data (September 2022); 2) Central bank digital currency (CBDC) in the European context (August 2020); 3) electronic identification (February 2020).); 4) financial innovation and licensing (July 2019); 5) cybersecurity (July 2019); 6) use of personal data (July 2018); 7) banks and financial technology: value added (June 2017); 8) European Digital Single Market (August 2016) [202].

The supervision of banking networks, payments and e-money institutions, and the manner in which licences are granted vary across Europe. The banking regime is determined at the EU level by the European Central Bank (ECB) as the single regulator. In contrast, payments and e-money operations require a national licence and are subject to supervision by national regulators. The ECB is vested with the authority to grant banking licences to all banks operating under the aegis of the Single Supervisory Mechanism (SSM) that seek to conduct business within the Eurozone. This encompasses financial technology banks, which are defined by the supranational regulator as institutions that employ a 'business model whereby the production and provision of banking products and services is based on technological innovation' [160]. Institution holders of national licences and supervision are permitted to offer their services in other

Member States via the EU passport system. This gives rise to the potential for supervisory fragmentation or even supervisory competition, which is intensifying as the FinTech sector narrows its focus to specific services and outsources non-core aspects of its business to third parties, including banks. This growing trend has resulted in the emergence of a complex network of interconnected financial institutions offering services across Europe, while the supervision of these institutions remains fragmented across EU countries. The fragmentation of supervision may have implications for the stability of the European financial system, compliance with regulations, and consumer protection as the FinTech and big tech sectors become increasingly important and expand rapidly. In light of the above, it is evident that there is a need for the harmonisation of the regulatory framework, as well as the supervision of payments and e-money institutions at the EU level. This is in order to ensure the accountability of all actors in the financial services value chain, the identification of systemic and non-financial risks, and their subsequent management and control.

The growth of technological innovations in the financial sector, the development of financial technology companies, and the active demand for financial technology services by users have led to the need to develop the legal framework for regulating these sectors and online banking in European countries. As a result, the EU seeks to create a single financial space that unites online banking providers and users, and therefore constantly improves its regulatory framework, in particular, to develop the financial and technology sector. The FinTech sector, comprising technological innovations in financial services, has developed at a rapid pace over the past five years, exerting a considerable influence on the development and delivery of financial services on a global scale. The financial technology industry finds itself at a pivotal juncture, where the domains of financial services and the digital single market converge. The financial sector is the primary adopter of digital technologies and a principal catalyst for the digital transformation of the economy and society.

Within the EU, strategic documents have been adopted for the development of the financial and technology sector, in particular, such as the European Commission's Digital Single Market Strategy [96], the EU Cybersecurity Strategy [96], Regulation (EU) No. 910/2014 of the European Parliament and of the Council of July 23, 2014 on electronic identification

and authentication and trust services for electronic transactions in the internal market and repealing Directive 1999/93/EC (hereinafter referred to as eIDAS Regulation 910/2014) [72; 204], financial services initiatives such as the Consumer Financial Services Action Plan [114], and the mid-term review of the Joint Capital Markets Action Plan [112; 153]. These strategic and regulatory documents exert a considerable influence on the evolution of online banking.

Regulation eIDAS 910/2014 came into force in 2014 [204], and in 2015 a number of amendments were introduced in 2015 concerning cooperation, insurance levels, interoperability frameworks within the EU, interoperability structure and electronic identification, and so forth (2015/296/EU eID Collaboration, 2015/1502/EU eID Assurance Levels, 2015/1501/EU eID Interoperability Framework and Voluntary Recognition of eID, 2015/806/EU Trust Mark, 2015/1505/EU Trusted List, 2015/1506/EU AdES Formats). In 2016, the eIDAS Regulation 2015/650/EU QSCD Security Assessment was formally adopted. In 2016, the eIDAS Regulation 910/2014 commenced its practical implementation [204].

Regulation eIDAS 910/2014 regulates electronic identification and trust services for electronic transactions in the internal market. It defines the protection and security standards for businesses, citizens and public authorities, in particular for secure electronic interaction (for citizens for the purposes of paying taxes, the "one-time only" principle, student mobility; for businesses for opening bank accounts; for small and medium-sized enterprises for the provision of professional services, in the transport sector, online retail, financial services). The eIDAS Regulation 910/2014 provides a framework for individuals and businesses to utilise their own national identity schemes (EIDS) to access public services available online in other EU countries. It establishes a European internal market for trust services, facilitating cooperation on electronic interactions between different entities within the EU. The European Commission conducts periodic assessments of the efficacy of the eIDAS Regulation. For instance, an open consultation was conducted from July 24 to October 2, 2020, to ascertain perspectives on the factors influencing the development and implementation of trust services and eIDAS in Europe. Furthermore, the European Commission assesses the compliance of the eIDAS structure with its core purpose and

anticipated outcomes. It also considers the merits of amending the eIDAS Regulation, taking into account the accumulated experience of its utilisation, technological, market and legal changes in the external environment [210].

Despite the intention of Regulation eIDAS 910/2014 to ensure mutual recognition of identification and authentication schemes within the EU, banking sector experts have identified a lack of operational identification standards, particularly in the private sector. This has resulted in significant barriers to the development of cross-border solutions for electronic identification, customer authorisation and other processes. The principal issue is the absence of interconnectivity between entities in disparate countries (cross-border digital interaction). Furthermore, experts posit that there is a necessity for the implementation of a comprehensive standardisation of electronic identification, with the objective of evaluating the proposed solution in terms of its security, convenience, general recognition and definition. It is therefore essential that these standards take into account data proportionality, data protection, security, authentication, and so forth [165].

The EU Directives on Payment Services and Cross-Border Payments play a pivotal role in regulating the activities of payment service providers and the operation of payment systems within the territory of the Member States. The following Directives are relevant to this discussion: Directive 2007/64/EC (PSD1) [127], Directive (EU) 2015/2366 (PSD2), and Directive (EU) 2021/1230 on cross-border payments in the EU [203]. The initial Directive 2007/64/EC, which was adopted in 2007, established a harmonised legal framework that facilitated the emergence of an integrated EU payment market. The Directive (EU) 2015/2366 removed barriers to the provision of new types of payment services and improved consumer protection and security by creating a level playing field for payment service providers and increasing the volume of payment services provided by non-banks. The objective of Directive (EU) 2021/1230 was to guarantee the optimal functioning of the internal market and to facilitate cross-border trade within the EU. To this end, the Directive sought to prevent the fragmentation of payment markets by applying the principle of equality of national payment fees [203].

Directive (EU) 2015/2366 on payment services in the internal market amended Directives 2002/65/EC and 2009/110/EC, Regulation (EU)

No 1093/2010 and repealed Directive 2007/64/EC [62]. Directive (EU) 2015/2366 updated the existing legal framework for payment services in the EU and introduced new requirements in order to: 1) increase efficiency, transparency and choice of payment instruments for payment service users (consumers and merchants); 2) provide card, internet and mobile payment services between EU Member States; 3) facilitate the entry of innovative payment services into a wider market; 4) ensure a high level of protection for payment service users in EU Member States [125].

From a legal standpoint, Directive (EU) 2015/2366 delineates a compendium of services, obligations, and definitions for market participants. The most pertinent provisions are as follows [191]:

1) Strong Customer Authentication (SCA). This is a type of advanced authentication based on two or more elements in the following categories: possession (requesting something that only the consumer possesses); knowledge (requesting something that only the user knows about); customer characteristic (requesting a characteristic or personal data of the customer).

2) Payment Initiation Service (PIS). A service that allows switching through a third-party payment service provider using a bank account held with another authorised banking service provider.

3) Confirmation of the Availability of Funds (COF). A service designed to ascertain the availability of the requisite funds for a payment transaction on the user's current account.

4) Account Information Service (AIS). A service that facilitates the transfer of data stored in at least one bank account managed by a specific service provider to another (or multiple) payment service provider.

5) Third Party Providers (TPP). A novel category of service providers has emerged. It is incumbent upon banking institutions to provide customers, businesses, and retailers with seamless access to their accounts via TPP, which should afford them the same level of functionality as if they were logged in directly to the bank's portal. This is made possible by the application programming interface (API). Third-party providers may include the following:

– Payment Initiation Service Providers (PISPs) are organisations that offer consumers the opportunity to perform a payment transaction on behalf of a buyer subject to authorisation without the need to visit the online

platform of the bank where the account is held, payment service providers that carry out business activities and provide payment initiation services.

– Account Information Service Providers (AISPs) are third-party companies, payment service providers that carry out commercial activities in the field of providing information services on account data.

Directive (EU) 2015/2366 permits users of online bank accounts to effect payments or gain access to their bank accounts and bank statements via software developed by authorised third parties (PISPs and AISPs). This openness to the market allows for the development of new services for customers through integration and cooperation with third-party financial ecosystem providers, thereby taking advantage of the interface that banks will have to provide to third-party providers. Consequently, the Directive has facilitated the advent of the concept of open banking, which entails the provision of open access to banking data to third parties, typically through the utilisation of APIs. In the context of financial services, the concept of open banking facilitates the exchange of financial data between banks and third-party service providers via APIs.

All third-party service providers are controlled by special financial supervisory authorities in all EU member states. It is worth noting that two years after Directive (EU) 2015/2366 came into force (on September 13, 2019), the European Commission decided to start working on its revision. In October 2021, the European Commission published a call for proposals addressed to the European Business Association (EBA), which outlined the areas to be improved: obligations and rights arising from the directive; customer authentication procedures; definitions and scope of the directive; transparency of information terms and conditions and requirements; payment institution licence and compliance with payment service provider requirements; ways to access payment systems; how to access accounts with a particular credit institution; how to use one's payment account details [191]. Because of the expansion of the payment services market and the emergence of new financial service providers, the European Commission has put forth a proposal to amend Directive (EU) 2015/2366, thereby introducing the third iteration of PSD3, and to approve the Payment Services Regulation (PSR). The legislative changes will include measures to combat payment fraud, facilitate the exchange of information between payment service providers, thereby increasing consumer awareness, reinforce authentication

rules, and expand consumer rights to a refund in the event of fraud. The new regulations will also improve consumer rights (transparency of account statements, temporary blocking of funds on accounts, information on bank fees, etc.), level the playing field between banks and non-banks by providing the latter with access to EU payment systems, improve the system of open banking by removing barriers to open banking services and strengthening customer control over their payment data, and so forth [179].

Under the second Directive (EU) 2015/2366, the European Banking Authority was given a number of mandates to draft Regulatory Technical Standards (RTS), including on strong customer authentication and general secure communications, which the Commission adopted on 27 November 2017 (Commission Delegated Regulation (EU) 2018/389, which entered into force on 14 September 2019) [140].

Given the increasing number of cyberattacks and fraud in the virtual banking space, it is also worth considering legislative norms in the field of cybersecurity. In 2016, the Directive (EU) on Security in Network and Information Systems 2016/1148 [137] (Network and Information Systems, NIS, Directive (EU) 2016/1148) is the first EU regulation in the field of cybersecurity, setting requirements for service providers to take appropriate security measures and report serious incidents related to cyber threats. Directive (EU) 2016/1148 gives the EU Cybersecurity Agency (ENISA [222]) a leading role in this area and establishes a cybersecurity certification scheme for digital products, processes and services. Directive (EU) 2016/1148 is complemented by recommendations from the European Supervisory Authorities (ESAs) to improve ICT risk management requirements, optimise incident reporting standards and create a framework for cyber resilience testing in the EU.

On 16 January 2023, the second directive on the security of network and information systems, Directive (EU) 2022/2555 (known as NIS2), came into force, replacing Directive (EU) 2016/1148 [125]. The leadership of the EU Cybersecurity Agency claims that Directive (EU) 2022/2555 will improve the cybersecurity situation by: establishing the necessary cyber crisis management structure; increasing the level of harmonisation of EU Member States' legislation establishing security requirements and reporting obligations; encouraging Member States to include new areas of regulation in their national cybersecurity strategies, such as supply chain, vulnerability

management, internet, and cyber hygiene; encouraging new ideas (e.g., expert assessments) to improve cooperation and knowledge sharing among Member States; encouraging other sectors of the economy and business entities to take measures to improve cybersecurity [222].

Despite these initiatives, the legal framework in the EU remains fragmented, depending on each Member State, which remains largely responsible for cybersecurity issues. In addition, different interpretations of EU standards by national authorities (e.g., General Data Protection Regulation, GDPR – General Data Protection Regulation within the framework of EU legislation for the protection of personal data of all individuals within the EU and the European Economic Area 2016/679/EU) lead to uncertainty and prevent a rapid response to cyberattacks and cyber incidents [228].

It is also worth considering the EU's instant payment architecture based on IP addresses (Internet Protocol Address) – network-level identifiers (unique numeric numbers) for addressing computers or devices in networks that offer instant payments, instant credit transfer schemes within the Single Settlement Network, SEPA (Single Euro Payments Area, SEPA – the only European payment network that completely eliminates the differences between domestic and international payments in euros to improve interstate payments and unite national markets into a single EU market), launched in November 2017 by the European Payments Council (EPC) [133]. Thanks to the SEPA project, European citizens can conduct transactions in euros in a simple and convenient way using the following payment instruments: credit transfers, direct debit transfers, card-to-card transfers, basic, corporate, and instant transfers [227].

Immediate transfers are a form of credit transfer in which funds are transferred from the payer's account to the recipient's account in a matter of seconds, at any time, day or night, on any day of the year. This distinguishes them from other credit transfers, which are processed by payment service providers (PSPs) only during business hours and are usually not credited to the recipient until the end of the next business day. The NBU defines instant payments as "electronic retail account-to-account payments that are processed in real time, 24 hours a day, 365 days a year, and where the funds are immediately available for use by the beneficiary" [75]. The use of IP addresses represents a significant technological advancement in the field

of payments, facilitating the immediate availability of funds to end users for both consumption and investment purposes. Furthermore, IP addresses present opportunities for banks and financial technology companies to develop novel payment solutions at the point of interaction (PoI), which represents the initial point of card read. This refers to an electronic transaction acceptance product comprising hardware and software installed in the acceptance equipment, enabling users to execute a transaction using a card. This may occur at physical points of sale or during e-commerce transactions (e.g., mobile phone apps).

In its Communication of December 5, 2018, entitled "Towards a stronger international role for the euro", the European Commission sets forth the proposition of a fully integrated EU instant transfer market, which it believes will serve to mitigate the risks and vulnerabilities inherent in retail payments, while concomitantly enhancing the autonomy of existing payment solutions. In its Communication of September 24, 2020, entitled "Retail Payments Strategy", the European Commission emphasised the necessity of proposing the development of legislation to regulate payment service providers in the EU offering instant payments in euros. In its conclusions of March 22, 2021, the European Commission underlined the importance of promoting greater use of instant transfers to achieve the objectives set out in the Retail Payments Strategy. In addition, the Communication of 20 January 2021 ‘The European Economic Financial System: fostering openness, strength and resilience’ reaffirmed the importance of the Retail Payments Strategy and digital innovation in finance as a way to strengthen the single market for financial services, which enhances the autonomy of the financial sector and its openness in the long term [197].

Among the regulations governing online banking in the EU, an important place is occupied by Directive 2014/65/EC on markets in financial instruments [18] (Markets in Financial Instruments Directive, MiFID II), which was officially adopted on April 29, 2015 [18]. The Markets in Financial Instruments Directive 2004/39/EC (MiFID I) has been in force in the European Union since November 2007 and is the basis for regulating financial markets, aimed at increasing their competitiveness by creating a single market for investment services, and ensuring investor protection when investing in financial instruments.

The provisions set forth in Directive 2014/65/EU are applicable to market operators, investment firms, data service providers, and third-country firms that provide investment services or engage in investment activities through the establishment of branches within the European Union. The Directive 2014/65/EU delineates the stipulations pertaining to the following actions: the authorisation and operational conditions of investment firms; the provision of investment services or investment activities by third-country firms through the establishment of branches; the authorisation and operation of regulated markets; the authorisation and operation of data communication providers; and the supervision, cooperation and enforcement by competent authorities.

It would be beneficial to conduct a thorough examination of the EU's strategic documents pertaining to the digitalisation of the financial sector. On September 24, 2020, the European Commission adopted a series of documents pertaining to the field of digital finance. These included a digital finance strategy and legislative proposals (draft regulations) on the cryptoasset market and digital resilience. The objective was to develop a competitive EU financial sector that provides consumers with access to innovative financial products, while ensuring consumer protection and financial stability. The package of documents demonstrates the EU's commitment to the recovery of the financial sector, which is to be achieved through embracing the digital transition. Digital financial services have the potential to modernise the European economy across multiple sectors and transform Europe into a global digital player. The Digital Finance Strategy sets out the general direction of Europe's digital transformation while managing potential risks. The key transformation priorities are as follows:

1) Elimination of fragmentation of the digital single market;

2) adaptation of the EU regulatory framework to promote digital innovation and data-driven finance;

3) addressing the challenges and risks of digital transformation, including enhancing the digital operational resilience of the financial system.

The implementation of the digital finance initiative thus provides support for Europe's economic recovery strategy and economic transformation, while simultaneously opening up new channels for the mobilisation of finance in order to provide support for the Green Deal and the New Industrial Strategy for Europe. The acceleration of cross-border

transactions within the context of the digitalisation of the EU financial sector has the potential to reinforce the integration of the financial market into the banking and capital markets union, thereby reinforcing Europe's economic and monetary union. The development of a robust and dynamic European digital financial sector will bolster Europe's capacity to cultivate an open and strategic autonomy in financial services. Consequently, it will enhance Europe's ability to regulate and supervise the financial system, thereby safeguarding Europe's financial stability [123].

Digitalisation and new technologies are transforming the European financial system and the way financial services are delivered to European businesses and citizens. Following the adoption of the FinTech Action plan [61], the European Commission has implemented all these measures to develop the digital financial space within the EU. The socio-economic consequences of the COVID-19 pandemic crisis have also increased the importance of digital finance development and the need for remote business using innovative digital technologies. In line with the European Commission's overarching objective of preparing Europe for the digital age, considerable effort has been dedicated to the domain of digital finance. This has entailed a concentration on the financing of digital transformation and the assurance that the financial sector is equipped to capitalise on digital opportunities, thereby sustaining its global competitiveness. In order to achieve this objective, the European Commission has adopted a Digital Finance Strategy which sets out the direction of its development. This strategy focuses, for example, on data access, artificial intelligence and digital identifiers. Furthermore, as part of its digital finance strategy, the European Commission publishes preliminary proposals for the cryptoasset market in the context of innovation, taking into account potential risks and strategies for their mitigation, while ensuring digital operational stability. Furthermore, the European Commission is engaged in the advancement and promotion of blockchain technology and distributed ledger technology[1] (DLT) across a range of sectors, including the financial sector [199].

It is appropriate to consider in detail the legislative regulation of cryptoassets in the EU. These are digital assets that are recorded in a distributed ledger, transferred and stored electronically [79]. A relatively

[1] Distributed ledger technology (DLT) is a protocol that ensures the secure operation of a decentralised digital database.

recent category of cryptoassets, known as stablecoins, has garnered significant attention from both the public and regulatory authorities globally. The market for cryptoassets remains relatively small in comparison to traditional financial markets and does not currently present a significant risk to financial stability. Nevertheless, the situation may undergo a significant transformation in the future, particularly with the advent of "global stablecoins" and the network effect associated with their distribution.

The market capitalisation of cryptoassets remains relatively insignificant in comparison to the market capitalisation of traditional financial assets. From a peak volume of approximately 760 billion EUR in January 2018, the total market capitalisation of cryptoassets declined to approximately 250 billion EUR by February 2020 [162]. The market has historically been characterised by considerable leverage, operational risks and high volatility. To illustrate, following the emergence of the COVID-19 pandemic, the price of Bitcoin exhibited a pronounced decline of 42%, in comparison to a 19% reduction observed in the S&P 500 stock index between March 1st and March 16th, 2020.

After a period of growth in the cryptocurrency market in 2018-2021, it declined in 2022. The growth factors were associated with rapidly growing public interest, which led to an increase in market demand. An examination of the price dynamics in the Bitcoin market [229] shows that the demand for cryptocurrency is formed not by its intrinsic value, but by market expectations, the level of interest and involvement of participants in this virtual network (through the network effect) [176]. In 2022, the bear cycle commenced, resulting in a loss of approximately 80-90% in the value of cryptocurrency assets. This decline in value subsequently led to a reduction in investment activity [229]. On November 11, 2022, one of the world's largest crypto exchanges, FTX, was forced to declare bankruptcy as a result of a liquidity crisis, subsequently commencing bankruptcy proceedings under the auspices of US law. In early 2022, FTX was valued at 32 billion USD. Nevertheless, subsequent to this, funds began to write off their investments in this particular crypto exchange. The Chief Executive Officer of the cryptocurrency exchange Binance has stated that the crisis in the cryptocurrency market has commenced [148].

The cryptocurrency market is currently confronted with a multitude of challenges and risks. Fraud, hacking, theft, money laundering and

cyber incidents are common occurrences in the context of cryptocurrency markets. This is due to the fact that a significant proportion of cryptocurrency trading platforms, exchanges/brokers/dealers and wallet services lack the requisite cybersecurity mechanisms [200]. Furthermore, almost all national authorities, as well as international standard-setting bodies, have issued warnings regarding the risks associated with specific cryptoassets. Conversely, some regulators have made favourable statements regarding the potential of the underlying blockchain technology (DLT). In particular, the European Commission itself has identified DLT as a transformative and fundamental technology, particularly in the financial sector. The cryptoasset market encompasses a number of activities and various market participants that provide trading and/or intermediary services. Many of these activities and service providers are not currently covered by any financial services regulatory framework, either at the EU level (except for AML/CFT purposes – Anti-Money Laundering/ Combating the Financing of Terrorism) or at the national level. An issuer or sponsor of cryptoassets is an organisation that usually develops the technical specifications of cryptoassets and determines their characteristics. In some cases, their identity is known, in others it is unknown. Some issuers are still involved in maintaining and improving the cryptoasset code and underlying algorithm, while others are not [116].

Cryptoasset trading platforms serve as a marketplace, facilitating interactions between disparate users of cryptoassets for the purpose of conducting buy and sell transactions. The function of trading platforms is to facilitate direct or indirect interactions between buyers and sellers. The business model, the range of services offered, and the number and type of trading pairs (e.g., cryptocurrency-fiat money or cryptocurrency-cryptocurrency) vary considerably between different trading platforms. The majority of currently operational trading platforms are of the "centralised platform" variety, which are overseen by a central operator. The concept of "decentralised platforms" are a recent phenomenon. They do not have a central operator and operate using smart contracts. Centralised platforms hold cryptoassets on behalf of their clients, while decentralised platforms do not. Another important difference is that trade settlements usually take place in the platform's ledgers ("off-chain") for centralised platforms [199] rather than during each transaction, compared to DLT processes for decentralised platforms.

Cryptocurrency asset brokers/dealers (or exchanges) are financial institutions that facilitate the exchange of cryptocurrency assets, typically charging a fee (commission) for their services. By providing brokerage and dealer services, they facilitate the sale of cryptoassets for fiat currency and the purchase of new cryptoassets for fiat currency. Some brokers/dealers specialise exclusively in cryptocurrency, accepting only payments in other cryptoassets (e.g., bitcoin). Unlike trading platforms, cryptocurrency exchanges themselves buy and sell cryptoassets on their own account and act as counterparties for users. Currently, there are approximately 200 to 500 trading platforms and exchanges in the world, although the bulk of trading is concentrated on a few of them [135]. The largest platforms in terms of transaction volume and value are currently located in Asia and the United States [159].

Cryptoasset wallets[2] are used to store public and private keys and to interact with DLTs to allow users to send and receive cryptoassets and control their balances. There are different types of cryptocurrency wallets. Some support multiple cryptoassets/DLTs, while others are designed for specific cryptoassets/DLTs only. DLT networks typically have their own wallet functions (e.g., Bitcoin). Some wallet providers not only provide their customers with wallets, but also store their private keys on their behalf. They may also provide an overview of customer transactions [198].

The total number of cryptoasset users is not readily ascertainable. Nevertheless, some projections indicate that the user base has grown from its initial cohort of tech-savvy individuals to encompass a broader demographic [134]. A survey of consumers conducted online by ING online bank [167] indicates that 9% of Europeans are willing to purchase cryptoassets, with this figure varying by country.

In its Proposal for a Regulation of the European Parliament and of the Council on markets in cryptoassets and amending Directive (EU) 2019/1937, the Commission has tasked the European Business Association (EBA) and the European Securities and Markets Authority (ESMA) to assess the applicability and suitability of the existing financial services regulatory framework for cryptoassets. In a report published in January 2019, the EBA observed that while certain cryptoassets may be subject to EU law,

[2] Cryptoasset wallets are digital storage devices that store the codes needed to securely access and exchange cryptoassets.

in some cases it is challenging to guarantee the effective implementation of the extant legal framework with respect to these assets. Furthermore, the report indicates that existing EU legislation may impede the utilisation of DLT. Concurrently, the EBA and ESMA underscored that, in addition to EU anti-money laundering and counter-terrorist financing legislation, the advancement of cryptoassets is not within the purview of EU financial services legislation. Consequently, these assets are not subject to consumer, investor, and market protection provisions. Furthermore, a number of Member States have recently enacted legislation pertaining to crypto-related matters, which is resulting in the fragmentation of the European market.

In December 2019, the European Commission and the Council jointly announced their intention to introduce a regulatory framework aimed at harnessing the potential of certain cryptoassets. The President of the European Commission, Ursula von der Leyen, emphasised the necessity for a unified approach amongst Member States with regard to cryptocurrencies, in order to fully comprehend the potential benefits and risks associated with their utilisation. In this regard, the European Parliament is working on a Digital Finance Regulation that pays special attention to cryptoassets to address a number of challenges related to cryptoassets and to create an EU framework that regulates and covers cryptoasset markets, as well as tokenisation of traditional financial assets and the wider use of DLT in financial services. The Regulation will be accompanied by other legislative proposals: the European Commission proposes to clarify the existing definition of "financial instruments" in the Markets in Financial Instruments Directive 2014/65/EU (MiFID II [129]) to include DLT-based financial instruments, a pilot regime for the operation of DLT market infrastructure for these instruments.

In the Proposal for a Regulation on Cryptoasset Markets and Amending Directive (EU) 2019/1937, the European Commission distinguishes between types of cryptoassets already regulated by EU law and other cryptoassets. The first type remains subject to the current legislation. For previously unregulated cryptoassets, including stablecoins, the European Commission proposes a special regime, setting strict requirements for issuers of cryptoassets in Europe and cryptoasset service providers wishing to apply for permission to provide their services in the single market. The safeguards in question encompass capital requirements, the

custody of assets, a mandatory complaints procedure that is available to investors, and investor rights against the issuer of the cryptoassets. Issuers of a substantial quantity of asset-backed cryptoassets will be obliged to comply with more rigorous capital, liquidity management and interoperability requirements [198].

The proposal for a Regulation on markets for cryptoassets not covered by current EU financial services legislation, as well as electronic money tokens, has four general and related objectives:

1. The first objective is to ensure legal certainty. In order to facilitate the development of cryptoasset markets within the European Union, it is essential to establish a robust legal framework that provides a clear definition of the regulatory regime applicable to all cryptoassets that are not already covered by existing financial services legislation.

2. The second objective is to support innovation to foster the development of cryptoassets and the wider use of DLT, so a safe and proportionate framework needs to be put in place to support innovation and fair competition.

3. The third objective is to ensure an adequate level of consumer and investor protection and market integrity, given that cryptoassets, which are not covered by existing financial services legislation, pose a number of risks.

4. The fourth objective is to ensure financial stability. Cryptoassets are constantly evolving, with some types of assets having a rather limited scope and use, while others, such as the new category of stablecoins, have the potential to become widely accepted and potentially systemic. Therefore, the proposal contains safeguards to address potential risks to financial stability and orderly monetary policy that may arise from stablecoins [200].

Among the examples of the implementation of the EU Directives on the regulation of online banking, the experience of the United Kingdom is illustrative. In August 2016. The UK Competition and Markets Authority (known as the CMA) issued an order covering the nine largest UK banks (Barclays, Santander, HSBC, RASS, Allied Irish Bank, Lloyds, Bank of Ireland, Danske Bank, NatWest) and providing licensed companies or start-ups with direct access to their data, including account transactions. In January 2018, a CMA Directive came into force that used standards developed by the Open Banking Limited, a non-profit organisation

established specifically to implement EU legislation in the area of online banking. This regulation applies exclusively to the nine banks mentioned above and is based on the general rules of Directive (EU) 2015/2366, which apply to all payment service providers. The application of Directive (EU) 2015/2366 in the UK is the responsibility of the Competition and Markets Authority. The protection of customers, their data and account information, and the execution of payment orders is overseen by the Information Commissioner's Office (ICO) and the Financial Conduct Authority (FCA). As of January 2020, there were 202 registered service providers in the UK regulated by the Financial Conduct Authority. As of May 2022, the number of regulated open banking providers in the UK was 339, comprising 249 third-party providers (TPPs) and 90 banks and co-operatives [188]. A significant proportion of these providers offer applications that provide online financial services, including financial management. Additionally, service providers include consumer credit companies that utilise open banking tools to provide access to information and bank accounts for verification purposes [191].

It is also worth considering the state of online banking regulation in Switzerland. The concept of open banking has been implemented in this country since 2018, and Directive (EU) 2015/2366 was the beginning of its integration into the financial sector. So far, Switzerland has followed a market-based approach to implementing the open banking approach, which creates simplified and efficient cooperation between banks and third-party providers through open and standardised interfaces. The concept is founded upon the primacy of the end customer, who is empowered to determine the manner in which their personal and banking data is processed. The advent of open banking has enabled financial institutions in Switzerland to not only develop their own business models but also to create cross-sectoral innovations in digital ecosystems [213].

The banking sector plays an indispensable role in the advancement of the Swiss economy and financial market, representing 9.7% of gross value added. The country is regarded as one of the foremost financial centres globally and is a pioneer in the field of cross-border wealth management. As of the conclusion of 2020, there were 243 banking institutions with 2,477 branches operating within Switzerland. Furthermore, Swiss banks operate 187 branches abroad. At the conclusion of 2021, there were

239 banking institutions operating within Switzerland. This number decreased to 235 in 2022, comprising four major banks, 25 branches of foreign banks, 24 cantonal banks, 61 foreign-controlled banks, 18 other banking institutions, five private banks, one Raiffeisen Bank, 59 regional and savings banks, and 38 stock exchange banks [226]. The banking sector is characterised by significant diversity, with banks exhibiting notable differences in terms of size, business model, ownership structure and regional specialisation. The remainder is distributed among private banks, foreign banks, and foreign branches in Switzerland. Banks ensure Switzerland's high international competitiveness by catalysing economic development, offering a large number of skilled jobs with above-average salaries and providing tax funding to the public sector. At the same time, the country's banks also face challenges: high regulatory costs; declining profitability; limited access to foreign markets; growing competition from both financial and non-financial entities; a long period of negative interest rates until June 2022 (discount rate -0.75%, since September 2022, the discount rate has been increased to 0.5%, as of June 2023 – 1.75% [168]).

The primary focus of Swiss banks is on digital innovation, with the objective of developing new business models and enhancing internal efficiency and cost structures. Furthermore, the Swiss FinTech landscape has undergone a notable expansion, with the presence of over 363 FinTech companies. Approximately one-third of these entities are engaged in the domain of distributed ledger technology (DLT). In August 2019, the first two blockchain service providers were granted licences for banking and securities trading. In 2021, the Swiss Financial Market Supervisory Authority (FINMA [217]) introduced the world's first independent digital asset market, the first Swiss stock exchange based on DLT, and the first Swiss crypto fund. With a market share of 24%, Switzerland is the world leader in cross-border private wealth management [105].

The Swiss Financial Market Supervisory Authority supervises financial technology institutions that hold a financial technology company licence or a DLT trading agent licence on a risk-based basis. The key rule is to comply with licence requirements at all times. FINMA's supervisory system distinguishes between direct supervision, where FINMA carries out supervisory work itself, and indirect supervision, where FINMA appoints

a licensed audit firm to extend the scope of regulation. For this purpose, the Financial Market Supervisory Authority relies on the work of audit firms that have been approved by the Federal Audit Supervisory Authority. The audit firms regularly receive requests from supervised institutions to conduct regulatory audits. When supervising institutions licensed as financial technology companies, FINMA takes into account the fact that deposits in such institutions are not subject to deposit protection under the Swiss Banking Act. The legal framework for the supervision of financial technology companies can be found in the Law on Banking, the Regulation on Banking, Directives and other regulatory acts of the regulator [215]. Among the exemplars of online banking regulation, the case of Dukascopy Bank, the previously discussed Swiss innovative online bank, is illustrative. Dukascopy Bank is subject to supervision by the Financial Market Supervisory Authority in its capacity as an online bank offering financial services [55].

Consequently, the primary objective of EU regulations in the digital banking sector is to guarantee the protection, security, simplicity, and cross-border digital interaction of the digital single market, particularly in the domain of online banking. The regulation of neobanks occurs at both the supranational and national levels. The principal institutions charged with the formulation of digital banking policy are those of the EU. The European Council, the European Commission, the European Central Bank (ECB), the European Banking Authority (EBA), and the European Securities and Markets Authority (ESMA) are the principal institutions responsible for the development of digital banking policy. Furthermore, banking institutions are actively engaged in the discourse surrounding the legislative regulation of neobanks, offering recommendations on the matter. The advent of new market participants, namely financial technology companies, has been pivotal in the creation and advancement of an innovative financial sector. Additionally, the regulation of their activities, particularly with regard to competition in the banking sector, has been a significant outcome. The principal areas of regulation for neobanks encompass electronic transactions and payments, digital financial data, digital currencies, electronic identification, financial innovation and licensing, cybersecurity, financial technology for banks, and technology projects.

The key issues in regulating the activities of neobanks are as follows:

1) Fragmentation of supervision at the EU level due to different levels of development of the financial and technology sector, digital banks, and the regulatory environment;

2) problems in regulating the institutional promotion of innovation by neobanks;

3) problems of pan-European systemic financial stability caused by the fragmentation of supervision.

The main EU documents on the development of neobanks are aimed at the following:

– development of strategies for the development of the EU's digital single market, which address the problems, challenges, barriers, and ways to overcome them in accordance with the specified objects of regulation;

– formulation of proposals for the development of the existing regulatory framework for the regulation and standardisation of online banking in the EU in order to create a level playing field for payment service providers, protect consumers, and increase the volume of payment services provided by non-bank institutions.

The digitalisation of the EU financial sector is a response to the needs of the digital economy within the Single Economic Area. This includes legislative proposals on cryptoassets and digital resilience, as well as the development of a competitive EU financial sector. This sector is designed to provide consumers with access to innovative financial products while ensuring consumer protection and financial stability. Concurrently, the regulatory framework is characterised by fragmentation due to the disparate levels of implementation of EU standards and the varying stages of development of the banking system.

2.3. Analysis of the Functioning and Development of Neobanks in Ukraine in the Context of European Integration

Modern Ukrainian banks offer a diverse array of services collectively referred to as "e-banking." This digital platform provides customers with convenient access to financial services through telecommunications, eliminating the need for direct visits to the bank. The implementation and development of e-banking services enables the bank to enhance operational efficiency and derive supplementary business benefits through the sale

of banking products and the acquisition of new customers. Conversely, the customer is able to access banking services in a prompt and efficient manner, which is sometimes instantaneous. Digital banking (or Internet banking) has become the main attribute for remote banking services [91]. The main operations related to the introduction of innovative solutions into Internet banking systems in modern conditions are based on software solutions to improve the customer service system through a simple and intuitive interface that can be used equally effectively in different applications and on different hardware. Furthermore, a significant aspect that necessitates novel enhancements is the assurance of confidentiality and security for online banking transactions conducted by Ukrainian bank customers. Consequently, the practical implementation of these innovative improvements contributes to the formation of a modern Internet banking system [32]. It would be beneficial to conduct a detailed examination of the practices pertaining to remote and online banking in Ukraine.

Privat24 represents the remote account servicing system of JSC CB PrivatBank (RASS). It serves as the official channel of communication (information exchange) between the Bank and the client. It is the most popular Internet banking system in Ukraine, facilitating the conduct of any financial transactions with funds and cards in real time, irrespective of time and location. Remote servicing is defined by the bank as a set of information services on the client's account and payment transactions on the account based on remote orders of the client using remote communication means, which include the bank's self-service devices, Privat24/Privat24 for business Internet banking system, including the mobile version, Mobile banking, the bank's contact centre, round-the-clock Concierge Service, LiqPay and Sendmoney services, ATMs (ATMs) self-service terminals (SSTs), instant messengers and any other client-bank, client-internet bank, telephone banking, instant contactless payment systems, if the bank provides technical capability for remote servicing with their help [73]. The Privat24 Internet Banking system enables clients to access a range of information services and perform account transactions based on remote orders from the Bank. These orders are transmitted by the client via the Internet, allowing for remote account management. The Privat24 service is utilised by over 6.3 million individuals, with the number of users continuing to expand on a daily basis. Clients are provided

with access to a 24/7 chat support service. The Privat24 remote banking system is accessible on all internet-connected devices, including those with the Privat24 Internet banking system, which can be accessed via a personal computer and any modern browser. The Bank-Client system is a Privat24 application that can be downloaded free of charge on a range of devices and is compatible with both Android and iOS operating systems. Among the most popular functions in Privat24 are viewing card and account balance and bank statements, replenishing mobile phones in 140 countries, transferring funds from a card or to a LiqPay account, paying any bills in Ukraine, and purchasing transport tickets. It is worthy of mention that the RASS of JSC CB PrivatBank was among the pioneers in developing a distinctive business model that integrates banking services with partner services, enabling users to make payments within the application. It is a simple and expedient process to discharge financial obligations, including taxation, fees, and utility bills, via the service provider's designated channels. Furthermore, customers are able to utilise payment templates and make payments for a range of services, including educational services, internet and television subscriptions, travel services, and insurance.

In its mobile application, JSC CB PrivatBank offers services for making transfers, payments using automated templates and automatically filled in details for various economic entities, the possibility of paying for transport services, entertainment services, insurance products, lending and leasing, and the possibility of ordering services at the client's address. In addition, JSC CB PrivatBank is engaged in the advancement of banking services for business, with a particular focus on electronic document management. It provides legal entities with internet banking, encompassing a range of supplementary business functions. These include accounting services, a platform for companies and entrepreneurs to create and submit electronic reports to regulatory authorities, and a tool for monitoring staff adherence to schedules. JSC CB PrivatBank also engages in collaborative endeavours with entities specialising in the provision of accounting, budget payment acceptance, online store creation and digital document exchange services.

Similar to PrivatBank's RASS, Oschadbank's RASS offers the following benefits: online money transfers, financial management, free utility bills, credit and deposit management, virtual cards, etc. Oschadbank's web

banking system is also available on all devices. The Oschad 24/7 application is available for download from Google Play or the App Store. The Oschad 24/7 RASS comprises two distinct versions: a mobile version, which enables users to perform banking transactions via their smartphones or tablets, and a web version, which allows users to access their accounts via a personal computer. Mobile banking Oschad 24/7 is defined by the bank as a set of software, hardware and organisational measures that allow the client to receive information remotely and perform account transactions on the basis of electronic documents, receive other services in the manner and under the conditions stipulated in the agreement with the bank, tariffs, and the system user manual [65].

The COVID-19 pandemic has significantly accelerated the use of digital banking, with mobile banking being the most popular and the most convenient to use, in particular, mobile online banking has become more active in Ukraine during the pandemic. According to the Mastercard Digital Trust Survey 2019, conducted among online bank account holders, Ukrainians are increasingly choosing digital devices and services for payments: 87% prefer to pay with a smartphone. According to the study, the most common five purposes for using digital services are Internet search (91% of users), access to social networks (89%), email (84%), tracking the weather forecast (83%) and online shopping (79%). Since 2016, there has been a notable increase in the use of mobile devices for a variety of purposes, including navigation (73%, +7%), photo and video sharing (66%, +8%), travel and public transport (55%, +9%) and sports (21%, +5%). In the context of online shopping, the preferred payment methods among consumers are online bank card payments (72%), payments by card during delivery (48%) and payments by mobile wallet (32%). One of the key priorities for users when making digital payments is maximum payment security. More than half of respondents said they use payment apps (58%), which is one of the highest rates among respondents in Europe. Only Austria (67%) has a higher rate of payment app use, with the closest figures in Poland (57%) and Serbia (52%) [20].

According to a study of Internet banking in Ukraine in 2021 (5 facts about user behaviour by Media Systems), the share of mobile banking users is growing in all age groups. In 2020, PrivatBank managed to attract older users, while Alfa-Bank, monobank, A-Bank, and Oschadbank gained

popularity among young people. Other trends include the growing level of loyalty to online banking, despite a decline in the level of knowledge about banks. The findings of the Media Systems research study indicated a consistent pattern: regardless of the level of tariffs, the domestic audience demonstrated a clear preference for the products of their own bank over those of competitors, even when the latter were more advantageous. This indicates a notable degree of conservatism among Ukrainian banking customers. Additionally, the study indicated a gradual rise in the proportion of individuals utilising online banking on a daily or four-to-six-day weekly basis. In particular, in 2021, 33% of customers used it daily at Alfa-Bank compared to 29% in 2020, and 30% at PUMB instead of 22%. The key trends in card usage are as follows: the number of customers using several cards from the same bank is growing significantly; those who also want to increase customer loyalty in this way should pay attention to Oschadbank's strategy (33% of users now have three or more cards, compared to 23% in 2020); for those who prefer to implement the strategy "One card for all expenses", the experience of PrivatBank may be useful (the number of cards per user, on the contrary, has significantly decreased); as for the types of cards, Media Systems noticed the following: cards for payments are leading in all banks, but it is noticeable that the number of people with credit cards of Oschadbank, PrivatBank and Alfa-Bank has significantly increased over the year; as for the types of expenses: both offline and online, people started paying more often with cards of Oschadbank and PrivatBank [31].

Consumer habits have changed during the COVID-19 pandemic as all businesses move to digital channels, which is one of the main risks for banks that did not have time for a gradual digital transformation: they had to transform their products and services immediately. The task of digitalisation proved to be easy only for those banks that had already introduced digital banking into their operations a long time ago. However, of the 74 banks operating in Ukraine, less than half had digitised their online banking services before the pandemic. In consequence of the implementation of restrictions on the movement of people, a number of banking institutions, including Credit Agricole, Alfa-Bank Ukraine, KredoBank, Pravex Bank, Bank Pivden-ny, Ukrgasbank, and others, have initiated the provision of online banking services (or undertaken a comprehensive rebranding of

their applications). Among the digital banking services of Ukrainian banks, the leaders in terms of the number of users are Privat24 by PrivatBank (12 million) [11], Oschad24/7 by Oschadbank (4 million) [12], and the monobank project by Universal Bank [13]. For more than 5 years, Privat24 Internet banking has been considered the most successful and best digital banking in Ukraine, receiving such prestigious awards as FinAwards, PSM Awards and the Ukrainian People's Award in the categories "Best Internet Bank of Ukraine" and "Internet Bank of the Year" [24].

The Ukrainian banking market has made some progress in digital technologies in recent years. Moreover, this progress is limited in comparison to that of EU countries, and is driven mainly by a few pioneering banks. Meanwhile, other banks are actively catching up by investing in online banking and mobile applications. The most pertinent area is that of mobile banking. It is notable that mobile traffic already accounts for more than half of all global internet traffic, a figure that continues to grow. Banks are modifying their services to align with the evolving expectations of internet users. Mobile applications now encompass the full range of services that a financial institution is legally permitted to provide remotely. The issue is that the functionality is constrained, and thus the sole means of developing mobile banking is to extend the array of services that can be remunerated via a mobile application. However, in Ukraine, this is subject to certain constraints due to the regulatory oversight of banking activities [5].

Among the Ukrainian online banks, it is worth noting the following: Izibank, monobank, O.Bank, Sport Bank, Todobank, and Neobank. A detailed examination of these online banks is now in order.

1. Izibank is a lightweight mobile bank, a financial and technology project created jointly with the TAS Group of companies, whose product is a convenient mobile application for effective financial management. Izibank operates under a licence issued by TASCOMBANK JSC (NBU licence No. 84 dated 25.10.2011, registered on 21.10.1991 by the NBU under No. 45). The bank offers a MasterCard World Contactless credit card with a credit limit of up to 200,000 UAH and a grace period of up to 72 days. Digital interaction takes place remotely, using a smartphone, without any visits to bank branches [169]. The bank is a member of the Deposit Guarantee Fund (Certificate of Participation in the DGF No. 028 dated 18.10.2012). Izibank offers its customers the following services: 1) payment transactions

(no fees for most transactions, transfers to cards of other banks, mobile top-ups, utility and budget payments, cash top-ups); deposits (remote opening, closing and management of deposits, early withdrawal, auto-renewal, possibility to replenish an existing deposit); 24/7 live support service in Telegram, Viber, Facebook Messenger; analytics that help to manage finances effectively.

2. The "monobank" is Ukraine's first mobile bank without branches, owned by JSC Universal Bank [180]. It is positioned as a "retail product of JSC Universal Bank", which was created in cooperation with the FinTech Band team. The bank offers credit cards, deposits and other services, and the best mobile application makes financial management as convenient as possible. The "monobank" application works only on mobile devices [66]. The monobank is positioned as a separate product that "provides customers with a progressive personal banking tool that is extremely profitable and competitive in the credit services market". This definition confirms the new technological format of interaction between the traditional bank JSC Universal Bank, the financial technology company FinTech Band and the neobank monobank as a digital financial services provider within the financial ecosystem they have created on the principles of transparency, ease of communication, customer focus and personalisation. Monobank's customer focus is defined as a prerequisite for competitiveness, as stated in the strategic objective of JSC Universal Bank "to constantly improve banking relations with customers at all levels of cooperation with them" [1]. The bank is licensed by Universal Bank, founded in 1994, which has been part of the TAS financial group since December 2016, and Universal Bank also develops online banking: Internet banking for individuals, Internet banking for legal entities, SMS banking. Within the framework of Internet banking for legal entities, automated services are provided through the Corporate Auto-client service to simplify work with documents and automate processes of legal entities (integration of the client's accounting system with the Internet banking system for legal entities, automation of the processes of electronic digital signature of payment documents uploaded from the accounting system and their sending to the bank without logging into Internet banking, convenient receipt of account statements in automatic mode without logging into the Internet banking system [42]). The Universal Bank also offers legal entities the Financial Control Centre, "a tool that

allows them to quickly and conveniently manage the company's structural units via Internet banking" [89]. The bank's products include: purchase by instalments, instalments, international transfers, individual entrepreneur account management, deposits, restaurant payments, register payments, bonds, investments, QR acquiring, Internet acquiring. The monobank develops digital lending for the population of Ukraine in order to provide high-quality digital banking services, improve the purchasing power of citizens, and develop small and medium-sized businesses in Ukraine. The monobank project operates on the basis of a progressive personal banking tool that is beneficial for customers and competitive in the credit services market. The mobile application, created specifically for monobank, offers a wide range of banking services, including free money transfers, convenient payment of utility bills, the opportunity to participate in promotional offers of the bank and receive cashback, control of financial transactions, and fast support via messengers (Viber, Facebook Messenger, Telegram) or by phone.

3. O.Bank is a new digital mobile bank with European capital in the Ukrainian banking market, operating on the basis of a new model of communication between the consumer and the bank using an application. O.Bank is owned by Idea Bank, which operates under NBU licence No. 96 of 04.11.2011 [189]. The functions available to the bank's customers include opening foreign currency accounts and cards, buying/selling currency, managing deposits and loans, transferring and recharging mobile phones, and blocking/unblocking cards.

4. Sportbank is a mobile bank with convenient banking functionality without branches, whose customer segment is the category of citizens who are "fond of sports and lead an active lifestyle". Sportbank is a joint project of IT company Dyvotech and the first specialised financial and technology fund N1. The bank issues cards under the licence of TASCOMBANK JSC. Card issuance and servicing are free of charge. Sportbank also offers its clients: a credit limit of up to 100,000 UAH for any needs with a grace period of up to 62 days; BOOOSTER deposit in hryvnia, up to 10% per annum with the possibility of early withdrawal; savings (5.55% on the ‘Backpack’ savings account) with interest paid weekly, the possibility of replenishment and withdrawal at any time; payment of traffic fines and utility bills in the application; payment with Apple Pay, Google

Pay, Garmin Pay and Swatch Pay; support team that is available 24/7 by phone or messengers (Viber, Telegram, Messenger); the ability to receive SWIFT currency transfers to a Sportbank card; the ability to issue a virtual eSupport card and receive assistance from the state [212]. As of 2022, Sportbank has attracted 486,999 customers who have been granted credit limits totalling 1,376,627,761 UAH, credited 23,880,717 UAH to cashback accounts, and paid for 24,700,050 items with Sportbank cards. It is worth noting that the issuer of the Sportbank payment card is TASCOMBANK JSC, which operates within the regulatory framework of the NBU and on the basis of its banking licence. Dyvotech is fully engaged in the development of the product – from analytics and technical documentation to software, integration of systems of project participants, and is responsible for marketing, promotion, application design and interface, operational support of all processes.

5. Todobank is a project of MEGABANK JSC that allows customers to make payments for utilities, transfers, manage their finances and perform many other operations in a convenient mobile application. More than 1500 service providers are available in the Todobank app for payment, setting card limits and blocking, phone number transfers, connecting other payment cards, and additional services. The bank's activities have been fully transferred to the online environment: courier delivery of the card, electronic card management and receipt of statements are available online as a support service. Cashback is accrued for card payments in the retail network and online stores, and the card can also be used to establish a credit line with a grace period of up to 62 days at a rate of 0.0001% for non-cash transactions. All operations are carried out by MEGABANK JSC, which has been operating in Ukraine since 1990 [230].

6. Neobank, which operates under the licence of ConcordBank (JSC JSCB CONCORD) and was created on the basis of the first open financial and technological ecosystem in Ukraine, Concord Fintech Solutions, founded in 2020. The unified infrastructure of the ecosystem is formed by ConcordBank, the independent processing centre ProCard, the payment service ConcordPay, the IT company MustPay, and the digital charity exchange DobroDiy [184].

Thus, the analysis of the activities of neobanks in Ukraine shows that they function as innovative financial institutions operating under a

traditional bank licence and are subsidiary financial service providers with a unique market positioning strategy and unique digital financial services in an online format (these include all neobanks in Ukraine that are positioned as digital mobile banks: monobank, Izibank, O.Bank, Sportbank, Todobank, Neobank).

The development of technology and its integration into banking activities required a review of national legislation in line with new market conditions and the needs of consumers who are increasingly using online banking services. The prerequisites for the transformation of payment legislation in Ukraine are as follows:

Precondition 1. Since the beginning of 2014, due to the signing of the Association Agreement with the EU and further active processes of European integration, Ukraine has been preparing for the implementation of Directive (EU) 2015/2366 [17].

Precondition 2. In 2017, the Ukrainian legislature adopted the Law of Ukraine "On Electronic Identification and Electronic Trust Services" (services provided to ensure electronic interaction between two or more entities that trust the provider of electronic trust services to provide such services) [68], which defines the organisational and legal framework for the provision of electronic trust services. Furthermore, the legislation addresses cross-border services, the rights and obligations of subjects of legal relations in the field of electronic trust services, the procedure for state supervision (control) over compliance with the requirements of legislation in the field of electronic trust services, as well as the legal and organisational framework for electronic identification.

Precondition 3. In 2019, the Regulation on the Integrated Electronic Identification System was adopted [63], which defines the procedure for its purpose, structure, functioning, creation and use.

Precondition 4. In 2019, the Draft Law "On Payment Services in Ukraine" was developed, which was discussed and adopted in 2021 [69; 71]. The Law defines the concept, the general procedure for performing payment transactions, establishes an exclusive list of payment services, the procedure for their provision, categories of payment service providers and conditions for authorising their activities. The Law determines the general principles of functioning of payment systems, issuance and use of electronic money and digital money of the National Bank of Ukraine in Ukraine,

establishes the duties, rights, and responsibilities of participants in the payment market of Ukraine, defines the general procedure for supervising the activities of payment service providers, providers of limited payment services, and the procedure for oversight of payment infrastructure [40].

Precondition 5. A number of the following measures and initiatives were implemented in 2020-2023:

– the project "Strengthening the Institutional and Regulatory Capacity of the National Bank of Ukraine for the Implementation of the EU-Ukraine Association Agreement", supported by the central banks of Poland, Hungary, and Lithuania, discusses and studies the most effective model of instant payment architecture for the domestic market of Ukraine [75];

– in 2021, the Cybersecurity Strategy of Ukraine was approved, according to which centres (units) for cybersecurity or cyber defence were established at the NBU [84];

– in 2022, the Law of Ukraine "On Financial Services and Financial Companies" was adopted [70], which establishes the general principles of the functioning of the financial services market, the activities of financial and/or support services providers, state regulation and supervision of such activities, and the protection of clients' rights;

– in pursuit of bringing the Ukrainian payment market closer to the European one, the concept of open banking was approved in 2023, defining the areas of development, roadmap and key requirements for its implementation in Ukraine [25].

Currently, according to the legislation, the payment infrastructure of Ukraine provides for the following: funds are transferred by banks and their agents NFIs subject to mandatory participation in the payment system; only banks issue electronic money; the NBU maintains two registers: a register of payment systems, settlement systems, participants in these systems and operators of payment infrastructure services, and a register of commercial agents of banks. The amendments to the legislation provide for the expansion of the payment infrastructure: inclusion of new payment service providers: payment institutions, payment institutions issuing electronic money, postal operators; introduction of the Unified Register of Payment Infrastructure.

The key changes in the payment market include: new business models, the NBU as a payment market regulator, issuance of e-money by non-financial institutions (NFIs), issuance of NFI cards, new payment services,

user protection, and an NFI payment account. The concept of reforming Ukraine's payment legislation affects both the payment market and banking institutions (Figure 2.1).

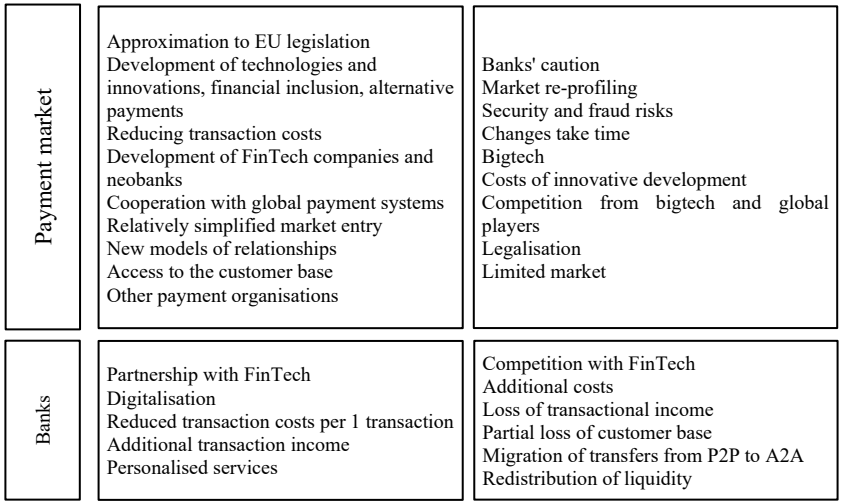

Figure 2.1. Impact of legislative changes on the Ukrainian payment market

Source: compiled by the author on the basis of [40]

As previously indicated, Ukraine has enacted Draft Law No. 4364, entitled "On Payment Services" [69]. This legislation is founded upon contemporary standards and incorporates the tenets of European regulatory frameworks, notably the Second Payment Directive (EU) 2015/2366 and the Electronic Money Directive 2009/110/EC (also known as the E-Money Directive or the Electronic Money Directive, EMD [128]). The legislation introduces the concept of open banking and facilitates the integration of the Ukrainian payment market with the European one, thereby modernising and further developing the Ukrainian payment services market [54].

The provisions of the Law of Ukraine "On Payment Services" have the effect of promoting innovation in the financial sector, establishing rules for the provision of payment services in Ukraine and setting out the

requirements for their providers. They also serve to improve the security and efficiency of these services, expand the range of payment service providers and streamline their activities, and change outdated approaches to the legal regulation of the payment market. The enactment of a contemporary legal framework for payment services paves the way for the advancement of payment products, services, and innovations. The advent of new market participants will serve to stimulate healthy competition. It is anticipated that customers will be able to access new, convenient payment services of a superior quality at a more competitive price. The concept of open banking will be introduced, which will facilitate the unification of diverse payment service providers and technology platforms into a unified payment ecosystem. This will serve as a significant motivator for the modernisation of existing payment solutions and a catalyst for the continued advancement of financial technology companies. This legislation provides a basis for banks to develop new services as an additional component of their existing banking services. The Law provides for the provision of nine payment services, of which seven are financial and two are non-financial (payment transaction initiation service and account information service). New market participants will be able to choose one payment service and focus on developing convenient services for it. This means developing a legal framework for the narrow specialisation of not only traditional and virtual banks, but also other new financial market operators. Therefore, non-bank payment service providers (payment institutions, electronic money institutions, postal operators, and some other payment service providers) will also be able to open payment accounts, issue payment cards, and electronic money. This means an expansion of traditional banking activities, as such banking services were provided exclusively by banks until 2021.

The new legislation will facilitate the digital transformation of the financial market, and non-bank institutions will be able to operate independently in the payment market, which will significantly simplify their functioning due to the absence of a requirement to participate in payment systems. The NBU is entitled to: 1) to establish interbank settlement systems, retail payment systems, and other types of payment systems for payment transactions; 2) to issue the "digital currency of the National Bank of Ukraine", and to create a regulatory digital environment – a platform for testing services, technologies, and instruments in the payment market

based on innovative technologies, the operation of which requires close interaction of the regulator with startups and understanding of their needs.

The Law of Ukraine "On Payment Services" also created conditions for the introduction of the open banking concept. This concept provides for payment service providers to open their own APIs (including those of banks) to other payment service providers and to provide any market participant that provides payment services and has the permission of the regulator with the ability to connect to and exchange data with the interfaces of banking services. In 2021, the NBU began working with Ukrainian payment market participants to develop common standards for open APIs that are convenient, understandable and acceptable for all. The NBU has announced its intention to implement the open banking concept in 2023. The benefits of this initiative include a change in the approach to banks' operations, the potential to outsource certain analytical and support functions, the creation of space for the development of new business models, marketplaces and ecosystems, increased competition among banks in traditional market segments, expansion of their access to previously inaccessible market segments, and enhancement of the ability to optimise banks' business processes through deep integration and distribution of functions among partners in the financial ecosystem.

It is noteworthy that, according to experts, particularly O. Korobkova, the Chairman of the Board of the Independent Association of Banks of Ukraine [41], the enacted Law of Ukraine "On Payment Services" presents a significant challenge for regulators and banks in practice, given the numerous obstacles created by the war in Ukraine to the systematic implementation of measures and work prior to the introduction of legislative changes in the payment services market. Concurrently, the Concept of the Open Banking Procedure remains under discussion as of 2022. The primary risks identified by banks in relation to the implementation of open banking services include the potential for competitors to gain access to their customer base. However, experts in the banking system have highlighted the possibility of developing open banking services in a way that makes them simple, convenient, affordable and diverse. The efficacy of open banking can be guaranteed if a greater number of stakeholders in the payment services sector are unified, in a manner analogous to the experience of Poland and the Netherlands.

The NBU continues to modernise the NBU's Electronic Payment System (hereinafter referred to as the EPS) and Ukraine's payment infrastructure in line with global trends, as well as the requirements of time and business. In particular, in 2021, the regulator actively worked on the transition of banks to the international standard ISO 20022 to modernise Ukraine's financial infrastructure, increase competitiveness, and integrate it with global markets. The transition to the international standard ISO 20022 will facilitate a qualitative leap in the automation of payment transactions, reducing the cost of transactions for banks and businesses, enhancing the security of transactions, and optimising transaction time. As part of the project, the NBU has developed models of the ISO 20022 standard for use in Ukraine's payment infrastructure in the following areas: credit transfer (initiated by the payer), debit transfer (initiated by the payee/ collector), account management, limits, special cases and investigations (including clarification of details, inability to execute a payment instruction, payment investigation, etc.). The standard has the potential to transform not only the banking sector but also to ensure the smooth functioning of enterprises, corporations, and trade, while also facilitating the processing of end-to-end payments for all financial market participants. The main advantages of using the international standard ISO 20022 in Ukraine's payment infrastructure include: harmonisation of the Ukrainian payment space with the global one; emergence and operation of new payment market players and payment instruments in accordance with the Second Payment Directive (EU) 2015/2366; introduction of new and expansion of the functionality of existing payment instruments for the benefit of banks and their customers; implementation of new automated processes covering the full payment life cycle; improvement of the level of service, efficiency, and effectiveness of payment services. The NBU is working to transition Ukraine's payment infrastructure to the international ISO 20022 standard in line with the NBU Strategy until 2025 and the EPS development roadmap, taking into account Ukraine's EU candidate status. Based on the international standard ISO 20022, the NBU has developed and is preparing to implement a new generation of the NBU's Electronic Payment System (EPS-4.0). Starting from 1 April 2023, all interbank payment transactions will be carried out exclusively through the new generation of EPS-4.0. The transition to the new generation of EPS has resulted in a formalised

model for financial services in Ukraine that is in line with the EU standard. This will improve the quality and efficiency of financial message exchange by making it more structured. The introduction of new tools and capabilities will help expand the functionality of the EPS and harmonise its operation with EU rules, in particular: to introduce an instant payment service for real-time payments to customers in Ukraine in the next versions of the EPS; and to provide the basis for the possibility of making cross-border transfers in euros with EU countries based on SEPA Instant Credit Transfer. Currently, all participants in the payment infrastructure are testing the functionality of the new generation of EPS. EPS participants can test the interaction of their automated banking systems with the new generation EPS testbed at any time convenient for them [86].

The recently established regulatory framework presents a distinctive chance to implement pioneering ideas for the advancement of Ukraine's banking sector. The introduction of a set of API requirements (in particular, those pertaining to payment initiation and account information services) in the context of banking activities presents a valuable opportunity for the implementation of innovative platform-based business models. The introduction of new legislative requirements has effectively established a framework within which banks may develop their own platform-based strategies, thereby altering the competitive landscape within the sector. At the same time, banks should reconsider their role as financial intermediaries, because now their activities include not only the provision of traditional banking services, but also the provision of Internet-based automated tools, services and systems that offer valuable new goods and services to participants of all parties to the platform [192, p. 71].

Thus, the analysis of the development of neobanks in Ukraine allows to identify the following main trends and features of online banking in Ukraine:

– The predominance of remote banking products provided and developed by the key systemic banks of Ukraine: PrivatBank, Oschadbank, Ukrgasbank, Ukreximbank, etc.

– Low level of competition in the mobile online banking sector, which is reflected in the active development and promotion of new projects and platforms targeting different consumer segments.

– Compared to EU online banking, Ukraine has a lower level of product innovation, a lower level of bundling of different banking products, and a

uniformity of online banking product offerings, which are mainly limited to transfers, deposits, lending, and remote electronic interaction. Only RASS of PrivatBank has a business model that combines different counterparties and allows consumers to pay for educational, insurance, travel services, utilities, and tax payments.

– Compared to online banking in the EU, digital banking in Ukraine is provided exclusively within the domestic market due to the gradual transformation of the digital payment infrastructure at the national level by the state regulator NBU and its slow connection to the EU payment infrastructure in accordance with EU legal requirements.

– Increased interest in and use of mobile online banking by Ukrainian consumers, with a preference for well-known bank products that users are used to using. This feature is partly explained by the historical distrust of the population in the banking sector and the financial market as a whole, and the lack of a sufficiently effective scheme for guaranteeing and protecting citizens' funds in Ukraine.

– Dynamic development of online banking during the pandemic, which is reflected in a sharp increase in the number of users of remote banking services.

– The largest players in the banking sector are attracting older consumers of online services, which makes it possible to scale digital banking within the domestic market.

Conclusions to Chapter 2

The research conducted in Chapter 2 led to the following conclusions:

– Neobanks are developing rapidly in Western Europe, leading to increased competition among them in the European financial market. The analysis of the leading European neobanks (the British challenger bank Atom, the Dutch digital bank ING Bank, the German neobank N26, the British neobank Revolut, the German Fidor Bank, and the innovative Swiss Dukascopy Bank) allowed to identify the following features of the functioning of neobanks in Western Europe, namely: a clear strategy, tactics and positioning of new banks; simple, efficient, convenient technologies for providing banking services; change and optimisation of organisational structures; innovative digital business models to ensure scalability and high automation of work; continuous expansion of the banking services

portfolio; active scaling of activities outside national markets; cooperation and competition with financial technology companies.

– A critical examination of the regulatory framework governing neobanks in Western Europe reveals that EU regulations in the digital banking sector are primarily designed to safeguard the protection, security, simplicity, and cross-border digital interactions of the subjects of the single digital market, particularly in the context of online banking. The digitalisation of the EU financial sector is a response to the needs of the development of the digital economy within the Single Economic Area. This includes legislative proposals on cryptoassets and digital resilience, as well as the development of a competitive EU financial sector. This sector is expected to provide customers with access to innovative financial products while ensuring consumer protection and financial stability.

– The regulation of neobanks in the European Union is a matter that is addressed at both the supranational and national levels. The analysis has led to the conclusion that the key problems in regulating the activities of neobanks at the supranational European level are: 1) fragmentation of supervision at the EU level due to different levels of development of the financial and technology sector, digital banks, and the regulatory environment; 2) complications due to the regulation of institutional support for innovation by neobanks; 3) challenges to pan-European systemic financial stability caused by fragmentation of supervision.

– Based on the analysis of the peculiarities of the functioning of neobanks in Ukraine, the author identifies the following main trends in the digitalisation of banking activities: prevalence of remote banking products; low level of competition in the online banking segment; low level of product innovation and combination of different banking products compared to the EU countries; uniformity of online banking product offers; gradual transformation of the digital infrastructure of banks, which limits their activities to the domestic market; a significant increase in the level of interest and use of mobile online banking by Ukrainian consumers, especially during the pandemic.

– In comparison to neobanks in the EU, digital banking in Ukraine is provided exclusively within the domestic market. This is due to the gradual transformation of the digital payment infrastructure at the national level by the state regulator NBU, which is occurring at a slower pace than the connection to the EU payment infrastructure in accordance with EU legal requirements.