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# Report on Cash Circulation in Poland in 2020



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# **Report on Cash Circulation in Poland in 2020**

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Chapter 1

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# Summary

## Summary

The central bank is an institution of major importance in the monetary system. As the central bank of the Republic of Poland, Narodowy Bank Polski (hereinafter referred to as NBP) fulfils tasks defined in the Constitution of the Republic of Poland, the Act on Narodowy Bank Polski and the Banking Law. Within its core functions, NBP also acts as the issuing bank and bank of banks. Holding the exclusive right to issue banknotes and coins, NBP ensures their adequate quality in circulation and liquidity of cash settlements, putting banknotes and coins in the full denomination structure in circulation.

Pursuant to Article 32 of the Act on Narodowy Bank Polski, banknotes and coins issued by NBP have the status of legal tender on the territory of the Republic of Poland, i.e. they are universally accepted as a form of cash settlements. The universal acceptance of cash and ensuring the availability of cash is fundamental to the smooth functioning of cash settlement in society, in particular for certain groups of consumers who perform settlements primarily with the use of banknotes and coins. This issue became particularly important in 2020.

NBP activity in the scope of cash cycle comprises the following: orders for the production of banknotes and coins placed at manufacturers, as well as the verification of the authenticity and fitness of banknotes and coins, and their storage and distribution. In practice, the area which NBP influences by means of regulations concerning the withdrawal and lodgement of Polish currency comprises mainly banks.<sup>1</sup> Besides the central bank and banks, domestic cash cycle participants also include manufacturers of banknotes and coins, CIT companies processing cash on behalf of banks, ATM deployers, retailers and consumers. Recently, especially in the era of the COVID-19 pandemic, the role of NBP has been increasing, not only as a market regulator, but also as a catalyst for change, taking actions of a systemic and strategic nature as well as initiating enhanced the cooperation between individual participants of cash circulation market. A similar trend is observed in other countries worldwide. Activities in this area are undertaken both by countries with a high share of cash payments (e.g. Germany and France) and in countries where the use of cash in transactions is low (e.g. Sweden, Norway, Denmark). The analysis of proposed solutions or the implementation of measures takes place on different levels: from legislative solutions (e.g. the amendment to the Act on Payment Services in Sweden) and recommendation activities (e.g. regarding the universal acceptance of cash in Canada) to the definition of strategic measures (e.g. “The Eurosystem Cash Strategy”). Such actions are often initiated by the regulator of the cash circulation market, including the central bank (e.g. in Australia), but also by government bodies (e.g. in the United Kingdom) or other cash circulation participants (e.g. in Finland and Sweden<sup>2</sup>).

In Poland, an increasing role of individual cash circulation market participants in providing citizens access to cash has also been observed. The availability and acceptance of cash during

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<sup>1</sup> For the needs of this Report, the term ‘banks’ also comprises entities other than banks with statutory authority to withdraw and lodge Polish currency from/in NBP.

<sup>2</sup> An example of such activities is the “ATM pooling”, which involves cooperation between banks and entities that offer ATM services to bank customers.

the pandemic became a priority. Like in many other countries, in Poland too, the function of cash as a store of value gained particular importance in 2020, while the role of cash in the execution of transactions decreased.

It should be emphasised that, on a global scale, the evolution of payment methods has been under way for many years. The increasing prevalence of credit and debit cards, technological innovations in banking, including online banking, new forms of payment such as contactless or mobile payments, and the development of e-commerce, including online platforms (Google, Facebook, Amazon), have now become an alternative to cash payments.<sup>3</sup> In retail, the already observed upward trend in sales via electronic channels has strengthened further in the era of the pandemic.<sup>4</sup>

In view of the developments observed, the discussion on the role of cash in the payment system as well as on the functioning and use of cashless payment instruments has already spread worldwide. Recently, as a result of the COVID-19 pandemic, the international debate has intensified and has shed light on additional aspects, taking into account the individual consumer and their needs in terms of solutions available in the payment market. Official communication and the relevant analyses performed by central banks and other institutions regulating the cash market very often refer to ensuring the freedom of consumers to choose their preferred means of payment, indicating their equivalence. At the same time, it is crucial to ensure that the adequate market infrastructure is in place to enable both the acquisition of cash and its widespread acceptance as well as the use of cashless forms of payment. The importance of cooperation of all cash circulation market participants, including the pooling of their activities and the development of streamlining solutions, involving market participants sectorally or cross-sectorally, has been growing. Recognising the role of cooperation of individual stakeholders of the cash circulation market in ensuring the availability of cash to the public and the efficient and safe and secure functioning of the infrastructure in this area, Narodowy Bank Polski initiated works aimed at developing the National Cash Security Strategy, which are a priority in 2021. Tasks in this area have been assigned to the Cash Circulation Council,<sup>5</sup> established in 2019 as the opinion-making and advisory body of the NBP Management Board. The composition of the Council was expanded to include institutional representatives of key importance to the issues under analysis.

Besides indicating the major factors influencing the cash cycle model operating in Poland, the relationships between the central bank and cash circulation market participants, and statistical data reflecting the trends in cash circulation observed in 2020, the “Report on Cash Circulation in Poland in 2020”, hereinafter referred to as the Report, presents information regarding the impact of the COVID-19 pandemic on the cash circulation market. The implementation of sanitary protection measures and the application of social distancing also extended to the sphere of payment transactions. In the early stages of the pandemic, in connection with massive withdrawals of funds by consumers, reports appeared in the global media concerning potential COVID-19 transmission following direct contact with banknotes and coins. The discussion on this issue intensified following the statement by a representative of the World Health Organisation (WHO) suggesting that banknotes could be a source

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<sup>3</sup> Andrea Nobili, Giorgia Rocco, *A game changer in payment habits: evidence from daily data during a pandemic*, Questioni di Economia e Finanza, Banca d’Italia, Guerino Ardizzi, No. 591, December 2020.

<sup>4</sup> Banca d’Italia, *The Governor’s Concluding Remarks*, Annual Report, 29 May 2020.

<sup>5</sup> Hereinafter referred to as the Cash Circulation Council or the Council.



of infection, and that therefore the use of electronic payments was recommended.<sup>6</sup> In the subsequent days, the statement was corrected several times, while the WHO explained that the information was misunderstood, as the intention was to indicate a possibility of coronavirus transmission following contact with the contaminated surface of, for example, a banknote, and then touching the person's mouth, eyes or nose.<sup>7</sup> In the public debate on the safety of using cash, publications have appeared providing information on the potential risk of coronavirus transmission. As an example, the findings highlighted by the Bank for International Settlements in April 2020 confirmed that scientific evidence suggests a low likelihood of COVID-19 transmission compared to exposure to other frequently touched surfaces, such as the keypad of a payment card terminal. On the other hand, in November 2020, the Bank of England published results of studies demonstrating that the number of coronavirus particles drops significantly as soon as one hour after they appear on a banknote, and drops to about 5% after 6 hours (in the case of paper banknotes it is around 2%).<sup>8</sup>

At the same time, during the period of uncertainty surrounding the COVID-19 pandemic, an unprecedented increase in the value of money in circulation was recorded in many countries around the world. The increased demand for banknotes, particularly of higher denominations, resulted mainly from precautionary hoarding.

In Poland, an increase in the value of money in circulation has been observed for years. In the last decade, i.e. in 2011–2020, the value of cash in circulation compared to December 2010 increased threefold, from PLN 102.7 billion to PLN 321.5 billion. In 2020 alone, a record annual increase in the value of cash in circulation of 34.8% was recorded, i.e. an increase of PLN 83.0 billion, compared to 2019 values. It is worth stressing that the annual increase in the value of cash in circulation in 2019 was four times lower compared to 2020. The phenomenon of the growth in the value of cash in circulation in 2020 resulted not only from an increase in the level of withdrawals of Polish currency from NBP but also from a significantly lower level of its lodgements in NBP. The value of banknotes and coins withdrawn from NBP in 2020 amounted to PLN 222.8 billion and increased by 9.5% compared to the previous year, while the value of banknotes and coins lodged in NBP in 2019 amounted to PLN 139.8 billion and decreased by 24.1% compared to the previous year. The increase in the value of withdrawals of the Polish currency from NBP was particularly visible in the period from March to April 2020 (it reached the record level of PLN 6 billion on 13 March 2020) and at the turn of October and November 2020. It is worth indicating that despite the increase in the value of withdrawals, the number of banknotes and coins withdrawn by banks from NBP in 2020 exceeded 3.3 billion pieces and fell by 11.5% compared to the previous year.<sup>9</sup> Likewise, the number of banknotes and coins lodged by banks in NBP in 2020 decreased by 25.5% compared to the previous year and amounted to 1.9 billion pieces. This is due to the fact that a significant part of the withdrawals was performed in higher banknote denominations – banknotes with the face value of 100 zł accounted for 47.9% of the value of withdrawals, while 38.4% of the withdrawals were performed in the 200 zł

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<sup>6</sup> The Telegraph, *Dirty banknotes may be spreading the coronavirus, WHO suggests*, 2 March 2020, [https://www.telegraph.co.uk/news/2020/03/02/exclusive-dirty-banknotes-may-spreading-coronavirus-world-health/?mod=article\\_inline](https://www.telegraph.co.uk/news/2020/03/02/exclusive-dirty-banknotes-may-spreading-coronavirus-world-health/?mod=article_inline).

<sup>7</sup> MarketWatch, World Health Organization: 'We did NOT say that cash was transmitting coronavirus', 9 March 2020, <https://www.marketwatch.com/story/who-we-did-not-say-that-cash-was-transmitting-coronavirus-2020-03-06>.

<sup>8</sup> Bank of England, *Cash in the time of Covid*, Quarterly Bulletin 2020 Q4, 24 November 2020, <https://www.bankofengland.co.uk/quarterly-bulletin/2020/2020-q4/cash-in-the-time-of-covid>.

<sup>9</sup> Full figures are used to calculate the changes.

denomination. Amid high demand for cash, the banks mainly withdrew banknotes with the face value of 100 zł from NBP, which reached 67.5% in the daily structure of withdrawals. Moreover, attention is drawn to the annual decline in the number of coins withdrawn from NBP (by 21.4%) as well as lodged in NBP (by 25.4%).

Recent years have seen a systematic decline in the frequency of banknotes and coins returned to NBP from the market, which is reflected in the decline in the recirculation rate in cycles. In 2020, this phenomenon intensified. At that time, a banknote was recirculated to the sorting room of the NBP regional branch, on average, after 21 months from the moment of its withdrawal by the bank (for comparison, in 2019, a banknote was recirculated to NBP, on average, after almost 12 months – almost twice as frequently). In the case of coins, the recirculation rate in 2020 reached approximately 17,386 days, which means that compared to 2019, a coin returned to NBP 5,025 days less frequently.

The developments in the value of cash in circulation resulting from fundamental factors (e.g. exchange rate, GDP, inflation, interest rates) or seasonal factors (i.e. public holidays, holidays, the beginning of the school year, etc.) identified so far, were significantly disrupted by the impact of the COVID-19 pandemic. At the same time, however, macroeconomic indicators show that:

- in 2020, the value of circulation in relation to GDP stood at 13.8% and reached a much higher level than in 2019 (10.4%), which is the largest increase in the last decade,
- in 2020, the value of M1 exceeded PLN 1.5 trillion and increased by PLN 376.8 billion compared to 2019, i.e. by 32.6%,
- the share of cash in M1 in 2020 amounted to 21.0% and increased by 1.6 percentage points compared to 2019.

At the same time, in 2020 Narodowy Bank Polski continued its work aimed at streamlining cash circulation, simplifying and reducing the labour intensity of cash processing on the part of both market participants and NBP. As part of these activities, amendments to Regulation No. 19/2016<sup>10</sup> were implemented regarding further steps of introducing the barcode marking of banknote and coin packages and preparation of cash circulation market participants to the pilot application of barcodes on banknote and coin packages. The amendment to Regulation No. 19/2016 also waived the need for separate lodging of banknotes unsuitable for machine sorting, so-called NS notes, by banks in NBP, which simplified and reduced labour-intensive cash processing on the part of both banks and NBP.

Faced with unprecedented demand for cash, NBP met market challenges by ensuring an efficient and uninterrupted supply of Polish currency to banks. The central bank strengthened its cooperation with banks, CIT companies and producers of banknotes and coins and successfully adjusted its work organisation, satisfying the demand for cash.

The subject matter of this Report covers cash circulation related to banknotes and coins of the Polish currency with the transaction (circulation) function as their major economic function. In connection with the foregoing, the data do not include so-called collector coins and banknotes, which play a payment function and have the status of legal tender, but are not treated as a universal means of payment.

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<sup>10</sup> Regulation No. 19/2016 of the Governor of Narodowy Bank Polski of 17 August 2016, hereinafter referred to as Regulation No. 19/2016.

The key statistical data regarding the cash circulation market in 2019 and 2020 are presented in Table 1, while the key terms included in this Report are explained in the Glossary.

**Table 1.** Key data for 2019 and 2020

	2019	2020	Change (2020/2019)
Value of cash in circulation (as at 31.12.2020)	PLN 238.5 bn	PLN 321.5 bn	increase of PLN 83.0 bn (+34.8%)
Number of banknotes in circulation (as at 31.12.2020)	2.3 bn pcs	2.8 bn pcs	increase of 0.5 bn pcs (+21.0%)
Number of coins in circulation (as at 31.12.2020)	19.4 bn pcs	20.2 bn pcs	increase of 0.8 bn pcs (+4.2%)
Value of Polish currency withdrawals from NBP	PLN 203.5 bn	PLN 222.8 bn	increase of PLN 19.3 billion (+9.5%)
Number of banknotes withdrawn from NBP <sup>1</sup>	2.2 bn pcs	2.1 bn pcs	decrease of 0.1 bn pcs (-4.1%)
Number of coins withdrawn from NBP <sup>2</sup>	1.6 bn pcs	1.3 bn pcs	decrease by 0.3 bn pcs (-21.4%)
Value of Polish currency lodgements in NBP	PLN 184.2 bn	PLN 139.8 bn	decrease of PLN 44.4 bn (-24.1%)
Number of banknotes lodged in NBP	2.0 bn pcs	1.5 bn pcs	decrease of PLN 0.5 bn (-25.5%)
Number of coins lodged in NBP	PLN 0.6 bn pcs	PLN 0.4 bn	decrease of PLN 0.1 bn (-25.4%)
Banknotes – frequency rate of return (as at 31.12.2020)	in cycles: 0.94 in days: 389	in cycles: 0.58 in days: 629	decrease in cycles: 0.36 increase in days: 240
Coins – frequency rate of return (as at 31.12.2020)	in cycles: 0.030 in days: 12,361	in cycles: 0.021 in days: 17,386	decrease in cycles: 0.009 increase in days: 5,025
GDP <sup>3</sup>	PLN 2,293.2 bn	PLN 2,323.9 bn	increase of PLN 30.7 bn (+1.3%) <sup>4</sup>
Value of circulation / GDP	10.4%	13.8%	increase of PLN 3.4 percentage points
Value of M1 aggregate	PLN 1,154.9 bn	PLN 1,531.6 bn	increase of PLN 376.8 bn (+32.6%)
Value of circulation/ M1 aggregate	19.4%	21.0%	increase of PLN 1.6 percentage points

<sup>1</sup> Number or value of Polish currency transferred to NBP by banks.

<sup>2</sup> See above.

<sup>3</sup> Nominal gross domestic product (current prices) according to GUS data for 2019 and 2020 (Statistics Poland No. 03/2021, publication date 26 April 2021).

<sup>4</sup> GDP growth in nominal terms; according to GUS data of 26 April 2021, in 2020, GDP decreased by 2.7% in real terms, against an increase of 4.7% in 2019.

Chapter 2

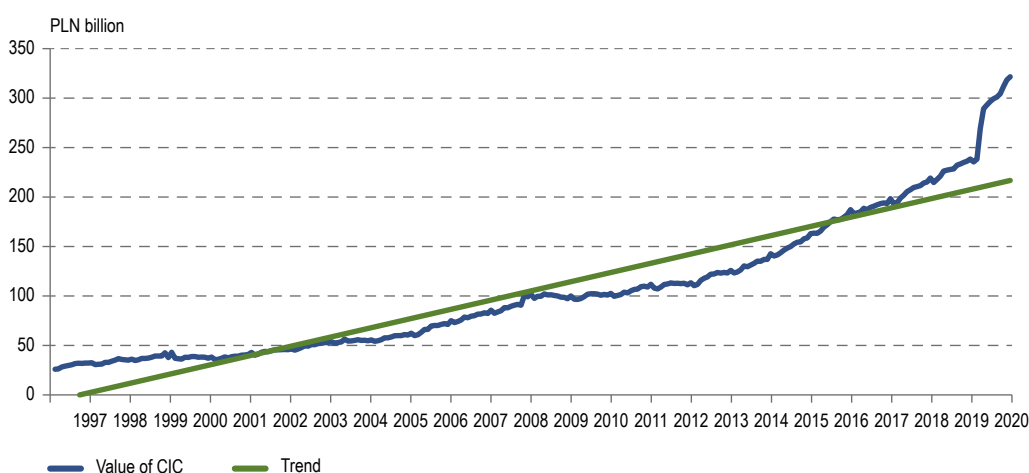
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# **Banknotes and coins in circulation**

## Banknotes and coins in circulation

The value of cash in circulation as at 31 December 2020 amounted to PLN 321.5 billion. An increase in the value of cash in circulation by 34.8%, i.e. PLN 83.0 billion, was recorded as compared to 31 December 2019.

**Figure 1.** Value of cash in circulation in monthly terms in 1997–2020



Source: study of NBP Cash and Issue Department.

Figure 1 illustrates the growth in value of cash in circulation. In Poland, in the years 1997–2020, the share of cash in the M1 aggregate decreased from approx. 36% to approx. 21%. It should be pointed out that trends change in emergency situations. This was the case in 2008 – at the beginning of the year, the share of cash in the M1 aggregate amounted to 23%, rising to 26% in December 2008 in connection with the financial crisis. Likewise, in 2020, the share of cash in the M1 aggregate increased to 21% from 19.4% in 2019.

### 2.1. Value and number of banknotes and coins in circulation<sup>11</sup>

Throughout 2020, the value of banknotes in circulation increased by over PLN 82.7 billion, i.e. by 35.4%. Compared to the state as at the end of 2019, an increase in the value of banknotes in circulation was noted in the case of banknotes with the following denominations: 500 zł, 200 zł, 100 zł, 50 zł, 10 zł, whereas a decline was noted in the case of the banknote with the face value of 20 zł.

<sup>11</sup> The value and number of banknotes and coins in circulation were presented as at the end of quarters of 2020.

**Table 2.** Value of banknotes in circulation by denomination in 2020 (in PLN)

As at end of quarter	500 zł	200 zł	100 zł	50 zł	20 zł	10 zł	Total
1	2	3	4	5	6	7	8
2019 Q4	10 423 225 500	71 749 478 000	137 386 957 400	9 444 906 100	2 533 335 480	1 818 200 750	233 356 103 230
2020 Q1	12 837 750 000	80 190 940 800	155 248 384 100	11 140 758 700	2 658 410 240	1 862 764 750	263 939 008 590
2020 Q2	15 656 737 000	98 260 929 400	161 849 435 400	11 146 562 700	2 531 761 120	1 864 971 990	291 310 397 610
2020 Q3	16 930 665 500	104 690 417 200	162 399 298 600	10 619 065 750	2 532 971 620	1 885 875 610	299 058 294 280
2020 Q4	19 253 421 000	114 919 731 600	166 593 990 000	10 847 698 550	2 523 530 960	1 906 072 610	316 044 444 720

Source: study of NBP Cash and Issue Department.

Taking into consideration the denomination structure of banknotes in circulation, the highest growth in value in this period was observed in the case of the highest denomination banknotes – 500 zł and 200 zł (by 84.7% and by 60.2%, respectively).

In the structure of banknotes by value, the share of 500 zł and 200 zł denominations increased by 1.6 percentage points and 5.7 percentage points, respectively. The share of the remaining denominations decreased: 100 zł by 6.2 percentage points, 50 zł by 0.6 percentage points, 20 zł by 0.3 percentage points and 10 zł by 0.2 percentage points. However, the banknote with the denomination of 100 zł continued to dominate the value structure of circulation in 2020.

Throughout 2020, the number of banknotes in circulation increased by 561.9 million pieces, i.e. by 25.0%. In the structure of banknotes by volume, an increase in share was recorded in the case of the highest value denominations, i.e. 500 zł (by 0.5 percentage points) and 200 zł (by as much as 4.5 percentage points). This growth was accompanied by a decline in the share of the following denominations: 100 zł by 1.8 percentage points, 50 zł by 0.7 percentage points, 20 zł by 1.1 percentage points and 10 zł by 1.3 percentage points. The changes in the share described above demonstrate an increase in demand for higher denomination banknotes.

At the end of 2020, banknotes with the face value of 100 zł had the highest share in circulation (59.2%). The second denomination in this respect was the 200 zł banknote (20.4%), while 50 zł banknotes accounted for 7.7% of the circulation. The increasing share of 500 zł banknotes is also noteworthy, from 0.9% in 2019 to 1.4% at the end of 2020 (Table 3).

**Table 3.** Volume of banknotes in circulation by denomination in 2020

As at end of quarter	500 zł	200 zł	100 zł	50 zł	20 zł	10 zł	Total
1	2	3	4	5	6	7	8
2019 Q4	20 846 451	358 747 390	1 373 869 574	188 898 122	126 666 774	181 820 075	2 250 848 386
2020 Q1	25 675 500	400 954 704	1 552 483 841	222 815 174	132 920 512	186 276 475	2 521 126 206
2020 Q2	31 313 474	491 304 647	1 618 494 354	222 931 254	126 588 056	186 497 199	2 677 128 984
2020 Q3	33 861 331	523 452 086	1 623 992 986	212 381 315	126 648 581	188 587 561	2 708 923 860
2020 Q4	38 506 842	574 598 658	1 665 939 900	216 953 971	126 176 548	190 607 261	2 812 783 180

Source: study of NBP Cash and Issue Department.

Throughout 2020, the value of coins in circulation increased by PLN 328.3 million, i.e. by 6.4%. In the denomination structure, in terms of value, the highest growth was recorded in the case of 5 zł, 2 zł (excluding 2 NG<sup>12</sup>) and 50 gr coins, respectively, by 8.7%, 7.4% and 6.0%. The share of 5 zł and 2 zł coins in the structure of coins in circulation by value increased by 0.8 percentage points and 0.2 percentage points, respectively. On the other hand, the share of 10 gr, 2 gr and 1 gr coins remained at the same level, while the share of 2 zł NG coins decreased by 0.5 percentage points and the share of 1 zł, 50 gr, 20 gr and 5 gr coins decreased for each of these denominations by 0.1 percentage points.

**Table 4.** Value of banknotes in circulation by denomination in 2020 (in PLN)

As at end of quarter	5 zł	2 zł	2 zł NG	1 zł	50 gr	20 gr	10 gr	5 gr	2 gr	1 gr	Total
1	2	3	4	5	6	7	8	9	10	11	12
2019 Q4	1 865 630 690	988 750 922	478 190 858	649 039 093	346 257 249	287 001 526	246 639 503	122 582 599	66 380 758	72 922 680	5 123 395 878
2020 Q1	1 886 245 775	990 968 686	478 116 646	649 067 087	348 730 001	288 943 604	249 067 863	123 235 264	66 593 659	73 439 386	5 154 407 971
2020 Q2	1 934 981 230	1 020 276 006	478 108 958	663 223 390	353 556 216	291 470 191	251 658 062	124 169 705	66 924 399	74 012 579	5 258 380 736
2020 Q3	1 982 987 245	1 042 193 870	478 049 748	676 534 099	360 524 130	296 089 266	255 851 660	125 830 123	67 566 559	74 950 867	5 360 577 567
2020 Q4	2 027 902 425	1 061 454 368	478 002 114	686 043 005	367 065 851	300 278 791	259 500 384	127 390 014	68 181 297	75 887 172	5 451 705 421

Source: study of NBP Cash and Issue Department.

**Table 5.** Volume of coins in circulation by denomination in 2020

As at end of quarter	5 zł	2 zł	2 zł NG	1 zł	50 gr	20 gr	10 gr	5 gr	2 gr	1 gr	Total
1	2	3	4	5	6	7	8	9	10	11	12
2019 Q4	373 126 138	494 375 461	239 095 429	649 039 093	692 514 498	1 435 007 628	2 466 395 027	2 451 651 972	3 319 037 907	7 292 267 974	19 412 511 127
2020 Q1	377 249 155	495 484 343	239 058 323	649 067 087	697 460 001	1 444 718 022	2 490 678 634	2 464 705 282	3 329 682 938	7 343 938 616	19 532 042 401
2020 Q2	386 996 246	510 138 003	239 054 479	663 223 390	707 112 432	1 457 350 953	2 516 580 621	2 483 394 099	3 346 219 944	7 401 257 944	19 711 328 111
2020 Q3	396 597 449	521 096 935	239 024 874	676 534 099	721 048 259	1 480 446 330	2 558 516 600	2 516 602 454	3 378 327 974	7 495 086 672	19 983 281 646
2020 Q4	405 580 485	530 727 184	239 001 057	686 043 005	734 131 701	1 501 393 957	2 595 003 843	2 547 800 286	3 409 064 849	7 588 717 180	20 237 463 547

Source: study of NBP Cash and Issue Department.

At the end of 2020, the number of coins in circulation increased by 825 million pieces, i.e. by 4.2% in relation to 2019. Growth was recorded for all coins (5 zł – 8.7%, 2 zł – 7.4%, 1 zł – 5.7%, 50 gr – 6.0%, 20 gr – 4.6%, 10 gr – 5.2%, 5 gr – 3.9%, 2 gr – 2.7% and 1 gr – 4.1%).

The data indicate that no significant changes were noted in the share of individual denominations in the structure of coins in circulation by volume. Coins of low denominations, i.e. from 1 gr to 5 gr, continued to have the highest share in the circulation – 66.9% collectively. In practice, however, these coins show the lowest frequency rate of return in cycles (see subsection “2.2. Frequency rate of return of banknotes and coins”).

<sup>12</sup> Commemorative 2 zł coins made of Nordic Gold alloy, being legal tender.

## 2.2. Frequency rate of return of banknotes and coins

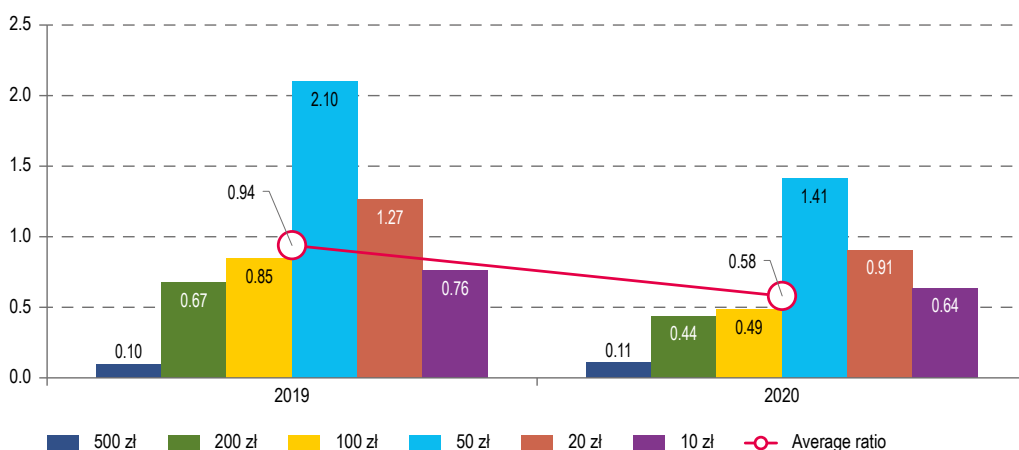
The frequency rate of return of banknotes and coins to NBP is expressed by means of recirculation rates in days and in cycles.

The frequency rate of return in cycles is the quotient of the volume of banknotes or coins lodged in NBP by banks in the adopted period and the average volume of banknotes or coins in circulation in the same period. On the other hand, the frequency rate of return in days is the quotient of the average volume of banknotes and coins in circulation in the adopted period and the volume of banknotes and coins lodged in NBP by banks in the same period, multiplied by the number of days (365).

In 2020, a significant decrease in the frequency rate of return in cycles was observed. The decline was much greater than in previous periods, which can be interpreted as a direct impact of the pandemic. On average, as at the end of 2020, a banknote was recirculated to the sorting room of the NBP regional branch after 629 days, calculated from the moment of its withdrawal from NBP by a bank. Compared to 2019, when the frequency rate of return of a banknote to NBP amounted to 389 days, 2020 saw an almost two-fold decline in the frequency rate of banknote return to NBP. In the case of coins, the estimated time of return to NBP as at the end of 2020 amounted to 17,386 days, i.e. approx. 48 years, increasing by 5,025 days, i.e. almost 14 years, compared to 2019.

The developments in banknote (Figure 2) and coin (Figure 3) recirculation rates by denomination are illustrated below.

**Figure 2.** Frequency rate of return of banknotes in cycles



Source: study of NBP Cash and Issue Department.

Note: for analytical purposes, source figures were rounded up to the nearest decimal place.

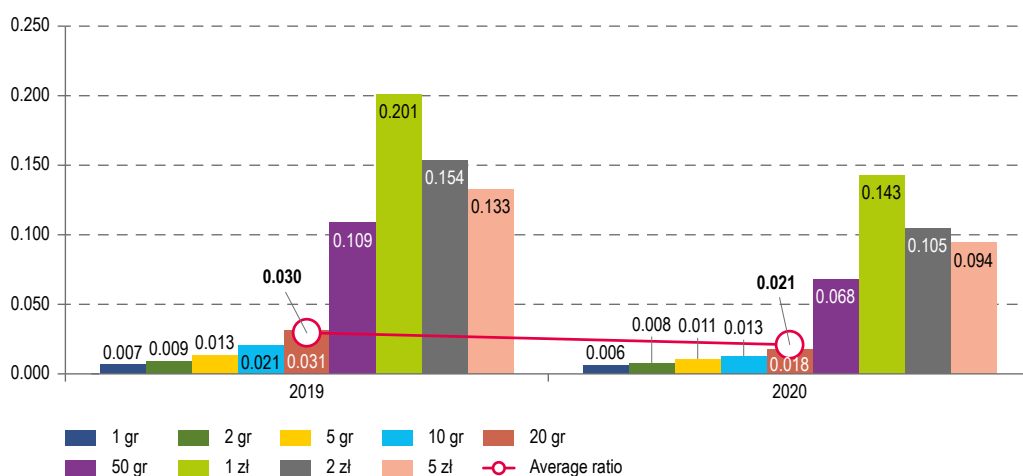
The frequency rate of return in cycles for all banknote denominations as at the end of 2020 was 0.58, which means a decrease of 0.36 compared to 2019 (in 2018, this rate amounted to 0.99). As at the end of 2020, the frequency rate of return for individual banknote denominations varied. The banknotes most frequently returned to NBP were the 50 zł and 20 zł denomination banknotes, while the 500 zł denomination banknote was recorded least frequently. In 2020, the frequency rate of return in cycles decreased compared to 2019 in the case of all banknote



denominations, except the 500 zł denomination banknote. The decrease in the frequency rate of return amounted to, respectively: 200 zł – 0.23 percentage points, 100 zł – 0.36 percentage points, 50 zł – 0.69 percentage points, 20 zł – 0.36 percentage points, 10 zł – 0.03 percentage points. In the case of the 500 zł denomination, the increase in the frequency rate of return amounted to 0.1 percentage points compared with the previous year (Figure 2).

The coin frequency rate of return has demonstrated a downward trend for many years. At the end of 2014, it amounted to 0.042 (i.e. on average coins returned to NBP almost every 24 years), and at the end of 2019, it amounted to 0.030 (34 years), whereas at the end of 2020, the frequency rate of return for all coin denominations amounted to 0.021 (i.e. on average, coins returned to NBP almost every 48 years) (Figure 3). Similar to banknotes, the frequency rate of return for individual coin denominations varied. As at the end of 2020, coins with the denomination of 1 zł most frequently returned to NBP (the rate reached almost 0.2, which means that a coin was recirculated to NBP more or less every 7 years) as well as 5 zł and 2 zł coins (a rate of approx. 0.1, i.e. the frequency of their return to NBP amounted to 10–11 years), whereas 1 gr, 2 gr and 5 gr denominations, in practice returned to NBP to a minor extent (according to calculations, approx. once in 161, 133, 94 years, respectively). It should be noted that in the case of coins with the face value of 10 gr and 20 gr, the value of the turnover ratio is more similar to the ratio of coins from the group of low denominations, i.e. 5 gr than to the turnover ratio of coins with a higher denomination, i.e. 50 gr.

**Figure 3.** Frequency rate of return of coins in cycles



Source: study of NBP Cash and Issue Department.

Note: for analytical purposes, source figures were rounded to the nearest decimal place.

Banknotes and coins processed by the commercial sector are also subject to analysis conducted based on quarterly reports submitted by banks to NBP. Details concerning this issue are presented in more detail in subsection “4.3. Reporting in the scope of cash circulation”. The data were used to calculate the frequency rate of return of banknotes in the market<sup>13</sup> in 2020, reflecting the frequency of their return to the sorting rooms of banks and CIT companies.

<sup>13</sup> The calculation was performed as in the case of the frequency of banknotes returning to NBP, replacing the volume of banknotes lodged in NBP by the volume of banknotes processed by banks and CIT companies in that period.

The denomination most frequently processed on the market was the 50 zł banknote which appeared in commercial sorting rooms more than 6 times during the year. The 50 zł banknotes also returned most frequently (every 258 days) to the sorting facilities of the NBP regional branches; however, it happened over four times less frequently than in the case of the commercial sector. Another denomination most frequently returned to the sorting facilities of banks and CIT companies was the 10 zł banknote. Low denomination banknotes were therefore commonly used in daily transactions, returning to the sorting rooms of banks and CIT companies with the highest frequency. It is also worth noting that the frequency rate of return of banknotes in cycles in the case of NBP is almost 4 times lower than in the case of the commercial sector (Table 6). Compared to the results of the 2019 calculation, a further increase in the frequency of banknote returns to the sorting facilities of banks and CIT companies was recorded, with its simultaneous decline in the case of NBP (in 2019, the frequency of banknote return amounted to 2.5 in cycles for the commercial sector and 0.94 for NBP).

**Table 6.** Frequency rate of return of banknotes in cycles and in days in 2020

Denomination	NBP		Cash market	
	Frequency rate of return (cycles)	Frequency rate of return (days)	Frequency rate of return (cycles)	Frequency rate of return (days)
500 zł	0.11	3 438	1.18	309
200 zł	0.44	832	1.91	191
100 zł	0.49	749	3.16	116
50 zł	1.41	258	6.47	56
20 zł	0.91	403	3.17	115
10 zł	0.64	573	3.21	114
<b>Total</b>	<b>0.58</b>	<b>629</b>	<b>3.18</b>	<b>115</b>

Source: study of NBP Cash and Issue Department.



Chapter 3

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# Cash and cashless means of payment

# Cash and cashless means of payment

## 3.1. Trends observed in Poland

The year 2020 featured an outperforming increase in the value of circulation as well as changes in consumer behaviour, triggered by, among others, factors related to the COVID-19 pandemic. Limited access to traditional retail outlets drove consumers towards online shopping. During the pandemic, 27% of consumers reported more frequent online shopping using a computer or a laptop, while 22% admitted that they used mobile devices to do shopping online more often than before. Interestingly, the pandemic simultaneously reinforced consumers' commitment to cash, since 64% of those surveyed were against the complete withdrawal of banknotes and coins from use. This percentage has been gradually increasing since 2017. It then reached 49% and, in addition, the number of consumers for whom the potential withdrawal of cash from circulation did not matter decreased during this period (from 43% in 2017 to 28% in 2020).<sup>14</sup>

As demonstrated by questionnaire and logbook surveys<sup>15</sup> conducted by NBP in 2020, cash remains the means of payment most commonly used by consumers. It was used by 97.8% of respondents over the last 12 months preceding the survey. 46.4% of transactions in terms of volume and 29.3% of transactions in terms of value were settled in cash. Cash prevailed only in the segment of payments up to 25 zł and from 25 zł to 50 zł (69.3% and 52.7% of these transactions, respectively). On the other hand, comparing the data from the pandemic period with the results of previous studies, it was noted that cash had lost its dominant position in daily transactions at retail outlets. At the turn of 2011 and 2012<sup>16</sup>, cash payments accounted for 81.8% of the volume of transactions and 63.7% of their value, while in 2016<sup>17</sup>, they accounted for 53.9% of the volume and 41.1% of the value of transactions. Figure 4 shows payment methods used by consumers in the last 12 months preceding the survey.

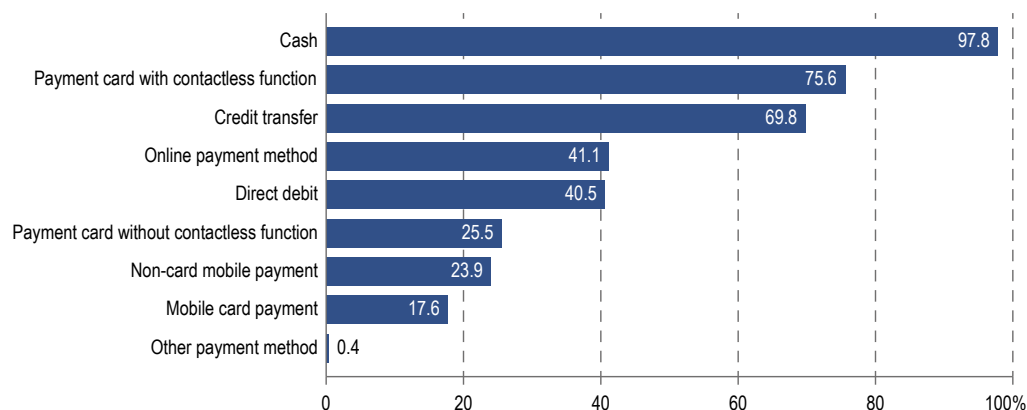
<sup>14</sup> *Digital Payments 2020*, Chamber of Electronic Economy.

<sup>15</sup> *Zwyczaje płatnicze w Polsce w 2020 r. Podstawowe wyniki badania* [Payment attitudes in Poland in 2020. Basic survey results], NBP Payment System Department, April 2021.

<sup>16</sup> Tomasz Koźliński, *Zwyczaje płatnicze Polaków* [Payment attitudes of Poles], Warsaw 2013, [https://www.nbp.pl/systemplatniczy/zwyczaje\\_platnicze/zwyczaje\\_platnicze\\_Polakow.pdf](https://www.nbp.pl/systemplatniczy/zwyczaje_platnicze/zwyczaje_platnicze_Polakow.pdf).

<sup>17</sup> A. Manikowski, *Raport z badania czynników oddziałujących na wielkość obrotu gotówkowego w Polsce* [Report of the study on factors affecting the volume of cash transactions in Poland], Warsaw 2017, <https://www.nbp.pl/systemplatniczy/obrot-gotowkowy/raport-gotowka-2016.pdf>.

**Figure 4.** Use of payment instruments by consumers in the last 12 months preceding the 2020 survey



Source: *Zwyczajne płatnicze w Polsce w 2020 r. Podstawowe wyniki badania* [Payment attitudes in Poland in 2020. Basic survey results], NBP Payment System Department, Warsaw 2021.

Notes: multiple choice question; the sum does not add up to 100%.

The choice of the payment method by consumers depends on a number of factors, including the availability of services and technological solutions, demographic characteristics and payment habits. In accordance with the surveys conducted, the use of individual payment instruments varies depending on age and education. Cashless forms of payment were most commonly used by consumers aged between 18 and 54. The share of these forms of payment also increased with the level of education. Furthermore, the type of point of sale significantly influenced the use of the payment instrument. The service sector was dominated by cash transactions which accounted for 57.4% of the number of all transactions and 57.2% of their value, while the retail sector demonstrated a greater share of cashless transactions (57.5% of the number and 77.1% of the value, respectively). The survey indicates that the pandemic had a significant impact on consumers' choice of payment instruments, while 8.3% experienced difficulties in making cash payments. At the same time, due to the lack of a payment terminal at the payment venue, 26.7% of consumers faced the impossibility of making payment with the use of cashless payment instruments. A significant part of cash transactions (48.8% of their number and 44.6% of their total value) were performed by people who could have paid with a payment card but opted out in favour of cash. About 35% of respondents indicated that the pandemic had an impact on the change of their payment behaviour, most often towards the use of cashless instruments. Such persons mostly (73.2%) indicated that in the future (after the pandemic has ceased) this change will continue.<sup>18</sup>

The surveys performed indicate that consumers do their shopping online more and more frequently. In the second half of 2020, the number of card payments for online purchases exceeded 80 million, while their value amounted to a total of PLN 11 billion, i.e. PLN 1.9 billion more than in the first half of 2020.<sup>19</sup> In 2020 Q4, the number of transactions carried out online increased by 28% compared to 2019 Q4, with the average transaction value

<sup>18</sup> *Zwyczajne płatnicze w Polsce w 2020 r. Podstawowe wyniki badania* [Payment attitudes in Poland in 2020. Basic survey results], NBP Payment System Department, April 2021.

<sup>19</sup> Assessment of the Polish payment system functioning in the second half of 2020, NBP Payment System Department, April 2021.

increasing by 12%. In the same period, a 1% increase in the number of transactions in points of sale was recorded, with a 5% increase in the average transaction value. The analysis of the data shows that the introduction of pandemic-related restrictions affected the behaviour of consumers, who abandoned transactions in the stationary points of sale in favour of the Internet. On the other hand, as a result of the temporary easing of the restrictions (2020 Q3), consumers were more willing to carry out transactions at the point of sale with the use of a payment card at that time.<sup>20</sup>

The results of the study on Internet payment methods show that credit transfers (especially pay-by-link payments) dominate, accounting for 64.8% of the number of transactions performed via the Internet and 69.4% of the value of these transactions.<sup>21</sup> It is worth emphasising that during the coronavirus pandemic the popularity of cashless payment instruments increased significantly, while 90% of consumers declared that they still intended to use this form of payment after the potential lifting of sanitary restrictions in Poland. At the same time, it should be stressed that the further use of cash was announced by as many as 80% of respondents.<sup>22</sup>

In accordance with the survey report<sup>23</sup> aimed at investigating the payment methods preferred by Polish women and men in 2021 Q1, more than 80% of respondents used payment cards while making payments in a brick-and-mortar shop. At the same time, every second participant in the survey was concerned that they might fall victim to fraud when paying by card. The most common reason for holding cash indicated by respondents was improved control over their spending (24%). Further factors included habits (19%) and the sense of independence (18%). When choosing a payment method, Poles were most often driven by convenience and quick availability of funds (68%). About a third of respondents agreed that paying in cash was safe, while nearly 70% of respondents believed that cash was needed for the economy. Almost 60% of survey participants noted that eliminating cash would be detrimental to the economy and consumer safety.

Additionally, as part of cyclical surveys commissioned by NBP,<sup>24</sup> taking into account the change in the socio-economic situation in the face of the pandemic, the interview questionnaire was extended to include questions on the perception of cash and cashless payment methods. A summary of these surveys shows that more than a half of respondents (57%) paid by debit card, 18% by cash, 11% with the use of a phone and 15% chose both cash and cashless forms. As a reason for choosing cash, consumers indicated that it was not possible to pay with another means of payment everywhere (25% of answers). The respondents also paid attention to the feeling of increased control over spending when using a means of payment in the form of physical money (22% of answers). On the other hand, respondents who used cashless payments during the pandemic indicated increased convenience and speed of transactions as the main reasons for choosing this type of payment instrument (36% of answers). Moreover,

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<sup>20</sup> Quarterly data on the payment system posted on the NBP website, [www.nbp.pl](http://www.nbp.pl).

<sup>21</sup> *Zwyczajne płatnicze w Polsce w 2020 r. Podstawowe wyniki badania* [Payment attitudes in Poland in 2020. Basic survey results], NBP Payment System Department, April 2021.

<sup>22</sup> *Payment methods survey: What do customers think*, Elavon, 28 June 2021.

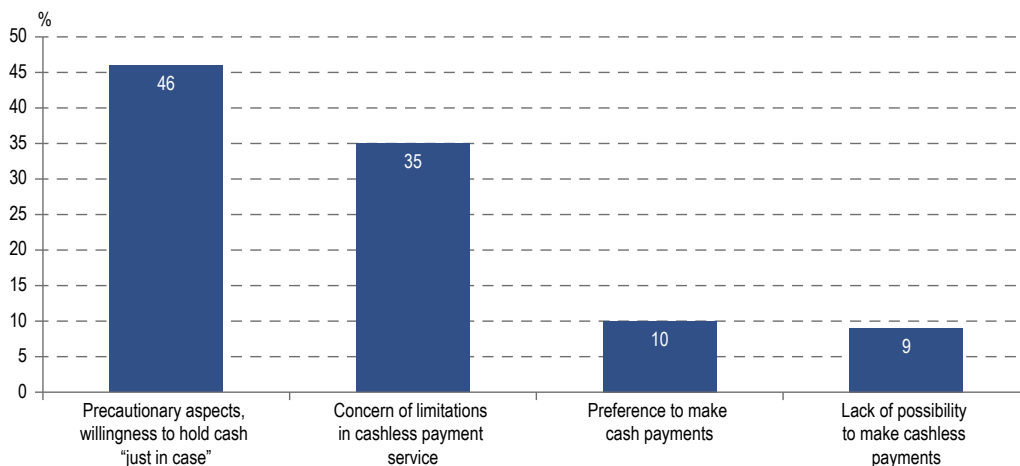
<sup>23</sup> *Metody płatności preferowane przez Polki i Polaków. Raport badawczy* [Payment methods preferred by Poles. Research report]. The survey was carried out on 7–8 April 2021 by SW RESEARCH agency using the online interview method (CAWI) on the SW Internet panel.

<sup>24</sup> *Public opinion survey on the quality of banknotes in general circulation in Poland*. Quantitative research report, Openfield, September 2020.

it was found that consumers withdrew more cash than usual during the pandemic, which was confirmed by 9% of respondents.

The reasons for withdrawing more cash during the COVID-19 pandemic are shown in Figure 5.

**Figure 5.** Reasons for withdrawing more cash during a pandemic



Source: *Public opinion survey on the quality of banknotes in general circulation in Poland*. Quantitative research report, Openfield, September 2020.

The results of the survey have shown that there is no single generally prevailing payment instrument in Poland. Poles, in accordance with their own preferences and the opportunities available on the market, use many payment methods, diversifying them depending on the amount spent, the category of expenditure, availability of the devices or the place where the transaction is performed.<sup>25</sup>

During the pandemic period, surveys concerning other participants of the cash circulation market, in addition to consumers, became particularly important. It is worth indicating that in addition to organising cyclical meetings, NBP's ongoing cooperation with stakeholders of the cash circulation market, also involves regular thematic questionnaire surveys conducted by NBP since 2018.<sup>26</sup>

The survey carried out in October 2020, covering banks and CIT companies also addressed issues related to the COVID-19 pandemic. The analysis of the aggregate results of the questionnaires showed that the pandemic did not significantly affect the change in the structure of customers and the change in the structure of the operations carried out for new customers. However, at the same time changes were noted in the use of customer-operated devices and in the operations carried out at bank outlets. In this area, the respondents paid

<sup>25</sup> *Zwyczaje płatnicze w Polsce w 2020 r. Podstawowe wyniki badania* [Payment attitudes in Poland in 2020. Basic survey results], NBP Payment System Department, April 2021.

<sup>26</sup> The questionnaire survey addressed to banks, CIT companies and other market participants concerning, among others, the monitoring of practical effects of changes resulting from regulations, phenomena occurring in the cash market and recorded trends in cash circulation, carried out by the NBP Cash and Issue Department. The first survey was conducted in August 2018.



attention, in particular, to the change in the volume of cash withdrawals made by customers in outlets, as well as to the change in the organisation of coin and banknote processing. Moreover, the following aspects were indicated:

- increased importance of cashless transactions,
- increased demand for cash in the initial period of the pandemic,
- fear of being infected by the COVID-19 virus, including in the context of media reports concerning the safety of using cash.

The highest number of respondents (78%) indicated that the ability to satisfy the demand for cash reported by customers proved to be important, explaining among others that:

- a higher than before average cash withdrawal amount and an increased volume of withdrawals were recorded,
- despite the hindrances, demand for cash was satisfied without delay,
- as a precautionary measure, the stock of domestic and foreign coins and banknotes was increased,
- with the outbreak of the pandemic, the amount of lodgements was increased.

Respondents emphasised the importance of information and communication activities during the pandemic, including in particular, of the ongoing cooperation with the central bank, customers and business partners. The processing and recirculation of cash originating from the market was also recognised as an important activity. According to the respondents, the decrease in the number of outlets offering cash services (77% of respondents) and changes in customers' payment behaviour and habits (89% of respondents) are most noticeable. Some respondents also indicated an increase in the number of self-service facilities.

### 3.2. Trends in selected countries

Recent years have been marked by new technological solutions emerging, both in the broad business sector and in the form of solutions addressed to individual consumers. The impact of global digitisation can also be observed in the area of payment products and services. The popularity of electronic solutions used to complete payments has increased particularly in 2020, i.e. during the period of the pandemic and the consequent restrictions introduced worldwide to contain the spread of COVID-19. The position of cash among other alternative payment instruments is subject to change; however, it is a permanent supplement to the variety of financial settlement forms.

The payment habits of consumers have become a reflection of the phenomena taking place in the payment market in 2020. Referring to the trends observed in Europe, the results of a survey conducted by the European Central Bank in the euro area countries should be quoted. In 2016, consumers made 163 billion payments amounting to approximately EUR 2,968 billion. Cash was used to complete 78.8% of payments, while in terms of value it was used in 53.8% of transactions.<sup>27</sup> The survey was repeated in 2019 while the results indicated a decline in the share of cash payments to 73% in terms of volume and to 48% in terms of value. It should be indicated that the total number of transactions fell to 160 billion,

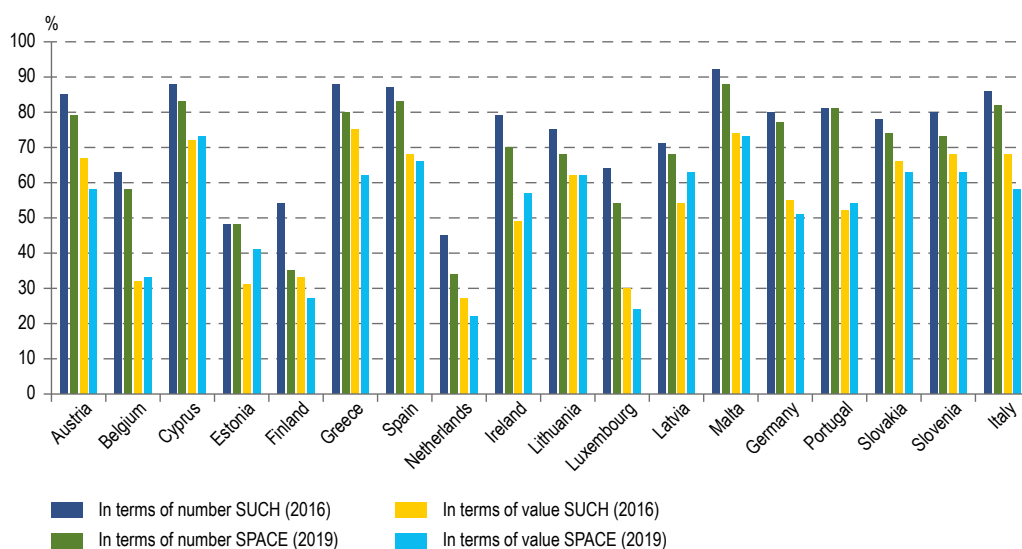
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<sup>27</sup> Henk Esselink, Lola Hernández, *The use of cash by households in the euro area*, Occasional Paper Series (SUCH 2016), November 2017, European Central Bank.

while the value of transactions increased to EUR 4,082 billion.<sup>28</sup> Furthermore, it should be noted that the aggregate statistics reveal an increase in the value of the share of other forms of payment by approx. 4 percentage points compared to an increase of 2 percentage points in the case of cash payments. This means that in 2019, the value of mobile payments, direct debits or credit transfers made by euro area residents was higher than in 2016.

The above surveys indicate that, in global terms, Europeans consumers are strongly dependent on cash. However, at the same time, payment habits in individual euro area member states vary. Cash is preferred by consumers in Malta, Greece, Cyprus, Spain and Italy – the 2016 survey recorded respectively: 92%, 88%, 88%, 87% and 86% share of cash payments. On the other hand, a preference for paying by card was declared particularly in the Netherlands, Estonia and Finland, where 45%, 48% and 54% of payments, respectively, were made by cash. In 2019, a similar survey showed a decline in the share of cash payments, in particular in Finland (by 19 percentage points), the Netherlands (by 11 percentage points) and Luxembourg (by 10 percentage points). In terms of value, a decline in the share of cash payments was also recorded in Greece (by 13 percentage points), Italy (by 10 percentage points) and Austria (by 9 percentage points). Interestingly, a comparison of the results of the cited surveys showed an increase in cash transactions in the case of Estonia (by 10 percentage points), Latvia (by 9 percentage points) and Ireland (by 8 percentage points).

**Figure 6.** Share of cash payments in transactions by volume and value



Source: study of the NBP Cash and Issue Department based on: Henk Esselink, Lola Hernández, *The use of cash by households in the euro area*, Occasional Paper Series (SUCH 2016), November 2017, European Central Bank and *Study on the payment attitudes of consumers in the euro area (SPACE 2019)*, December 2020, European Central Bank.

Data acquired in the European Central Bank survey may suggest that consumers are shifting towards cashless payment instruments. At the same time, the popularity of contactless payments is growing. Mastercard estimates that in February and March 2020, the number of contactless transactions increased twice as fast as the number of other point-of-sale

<sup>28</sup> *Study on the payment attitudes of consumers in the euro area (SPACE 2019)*, December 2020, European Central Bank.

card transactions. In 2020 Q1, a 40% increase in the number of contactless transactions was recorded on a global scale, compared to 2019 Q1. Of the total number of 17,000 respondents from 19 countries surveyed, nearly 9 out of every 10 respondents said they had used a contactless form of payment by card. In March 2020, Mastercard announced its commitment to increase the amount limit for these payments in more than 50 countries worldwide. However, it should be pointed out that the social distancing requirements have not only affected human interactions, but also the use of commonly and publicly available devices, such as payment terminals. Consequently, in the survey mentioned above, 79% of the respondents indicated that contactless payments are primarily used for precautionary reasons, based on personal safety and maintaining hygiene.<sup>29</sup>

It is also worth pointing out that in another European Central Bank survey conducted in July 2020, 4 out of 10 respondents admitted that they have used cash less frequently since the outbreak of the pandemic, which has proven to be a factor that strongly influences payment habits. In this context, it should also be pointed out that the long-term impact of the pandemic on consumer behaviour is not clear cut.<sup>30</sup>

The phenomena observed in 2020 included a significant increase in the value of cash circulation across continents. In the euro area, despite the observed decrease in the frequency of use of cash as a means of payment, the demand for euro banknotes increased by around 10% year-on-year.<sup>31</sup> For comparison, in September 2020 in Canada, the central bank reported a significant 16% increase in the value of circulation over the year. According to Bank of Canada estimates, under stable conditions this increment could have reached 4.7 billion Canadian dollars; however, during the pandemic it ultimately amounted to as much as 13.1 billion dollars.<sup>32</sup> A similar phenomenon was observed in the USA, where the circulation reached the value over USD 2 trillion by the end of 2020 and grew by as much as 16% during a year.<sup>33</sup> On the other hand, in autumn 2020 in Hungary, the number of low-value cash payments fell, while the number and value of transactions completed with the use of payment cards increased. However, at the same time, in 2020, the number of cash transactions accounted for 77% of payment transactions and their value – for 59% of transactions. In the same period, annual growth of circulation at a level of 10% was recorded, taking into account the introduction of a new series of circulation banknotes.<sup>34</sup> Meanwhile, in the United Kingdom, the value of circulation doubled from 2005 to 2017, reaching more than GBP 80 billion at the end of February 2021, reflecting unprecedented growth of 14% over a year.<sup>35</sup> New Zealand also saw a significant increase in the demand for cash, with the value of withdrawals reaching as much as 800 million New Zealand dollars in March 2020, i.e. 650 million New Zealand dollars more than in March 2019. As a consequence,

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<sup>29</sup> Mastercard study shows consumers globally make the move to contactless payments for everyday purchases, seeking touch-free payment experiences, 29 April 2020, Mastercard Newsroom, [www.mastercard.com](http://www.mastercard.com).

<sup>30</sup> Gradual change seen in the euro area payment behaviour, 2 December 2020, European Central Bank press release.

<sup>31</sup> *On the edge of a new frontier: European payments in the digital age*, speech by Fabio Panetta, 22 October 2020, European Central Bank.

<sup>32</sup> Heng Chen, Walter Engert, Kim P. Huynh, Gradon Nicholls, Julia Zhu, *Cash and Covid-19: the effects of lifting containment measures on cash demand and use*, Bank of Canada, 2 March 2021.

<sup>33</sup> *Currency in Circulation: Value*, 21 April 2021, Federal Reserve System.

<sup>34</sup> Vivien Deak, Istvan Nemečko, Tamas Vegso, Anniko Bodi-Schubert, *Impact of the coronavirus pandemic on Hungary's payment turnover in 2020*, Magyar Nemzeti Bank.

<sup>35</sup> *Banknote statistics*, 22 April 2021, Bank of England.

in 2020 Q2, a 15% increase in circulation value was recorded compared to the same period of the previous year.<sup>36</sup>

It is worth mentioning the measures taken to ensure the smooth supply of cash to the market in Sweden, a country with one of the lowest shares of payments made with the use of banknotes and coins. In 2016, the central bank, the Riksbank, in cooperation with the commission of the Swedish Parliament (Riksdag), examined proposals for changes in the area of cash management, costs associated with cash and the role of the central bank in cash management in terms of ensuring access to cash.<sup>37</sup> This work resulted in a report prepared in June 2018 containing a study of cash availability in the country. On the other hand, in November 2019, the Swedish Parliament adopted the Payment Services Act which came into force on 1 January 2021. The basic solution adopted is to obligate the 6 largest Swedish banks<sup>38</sup> to provide access to cash in the territory of Sweden in order to guarantee a fixed minimum access to cash services for consumers and institutional players.<sup>39</sup> It was also determined that no more than 0.3% of the population may reside at a distance greater than 25 km from a cash withdrawal facility, while no more than 1.22% of the population may reside at a distance greater than 25 km. The Act aims to counteract social exclusion and relates to facilities for all actors interested in further use of cash.

Significant growth in the value of circulation was also noted in Australia. It emerged in March 2020, i.e. during the introduction of the restrictions resulting from the pandemic, and by the end of February 2021 it had reached as much as 17.1%. In the last 10 years, average annual growth in circulation of 5% was noted in Australia; therefore, the phenomena occurring in the cash market during the pandemic significantly exceeded the norms applicable so far. Interestingly, in parallel, a significant increase in the share of high denomination banknotes (i.e. 50 and 100 Australian dollars) was observed in banknote withdrawals from the Reserve Bank of Australia.<sup>40</sup>

The above statistical data indicating a decline in the use of cash in transactions while the demand for banknotes and coins increases, causing a rise in the value of cash circulation, reveal the phenomenon of the so-called banknote paradox. As indicated by these publications concerning the euro area, the analysis of this phenomenon takes into account the demand for banknotes for precautionary reasons from both consumers living there and from consumers outside the euro area. Cash remains the dominant means of payment for transactions between consumers and at retail outlets in the euro area, although its share has been declining in the recent years. At the same time, however, an increase in the demand for cash is observed, which translates into an increase in the value of circulation through the following factors: the storage of banknotes for transaction purposes in the euro area (estimated to account for approx. 20–22% of circulation value), the demand for banknotes in the euro area due to prudent hoarding (estimated to correspond to about 28–50% of circulation value in 2019) and the demand for banknotes from outside the euro area (estimated to correspond to about

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<sup>36</sup> Christian Hawkesby, *Working together to be 'on the money'*, Reserve Bank of New Zealand, speech to The Royal Numismatic Society of New Zealand, 19 October 2020.

<sup>37</sup> *Secure Access to Cash* – report from the Riksbank Committee, Sveriges Riksbank, 16 April 2020.

<sup>38</sup> The Act covers financial institutions and branches which act as depositories of funds over SEK 70 billion (upon drafting the legislation, 6 entities fulfilled this condition).

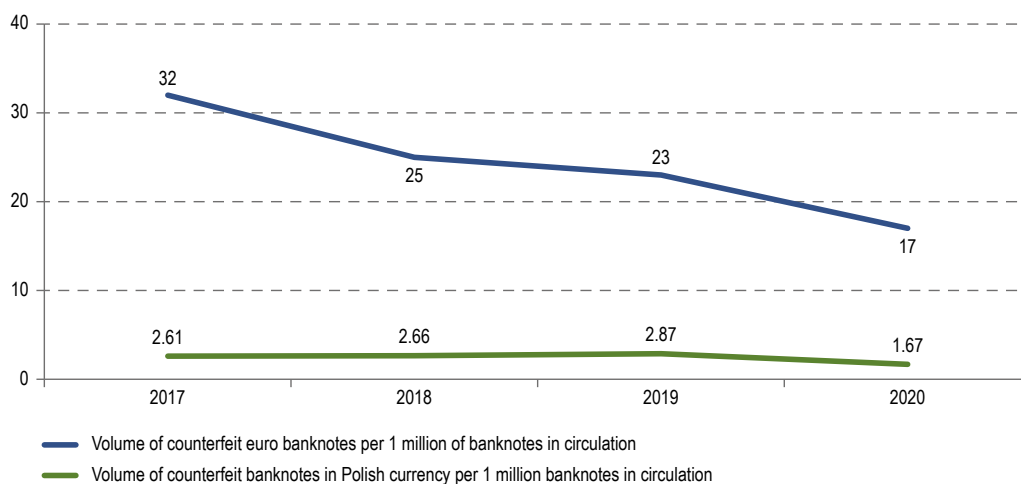
<sup>39</sup> *Secure Access to Cash* – report from the Riksbank Committee, Sveriges Riksbank, 16 April 2020.

<sup>40</sup> Rochelle Guttmann, Charissa Pavlik, Benjamin Ung, Gary Wang, *Cash Demand during COVID-19*, Reserve Bank of Australia, 18 March 2021.

30–50% of circulation value in 2019). The ranges indicated should, however, be treated with some degree of caution in view of the limited possibility to obtain information on the actual use of cash by all consumers.<sup>41</sup> The Bank of England also indicates that the banknote paradox results from the increased importance of the function of cash as a store of value which, in turn, is affected by a number of factors. This phenomenon partially results from historically low interest rates, accompanied by low levels of inflation since the early 1990s. It can also be associated with the level of the exchange rate and consumer concerns regarding the standing of the banking sector or the domestic economy.<sup>42</sup>

In the context of the above considerations, the information provided by the European Central Bank on the historically low level of counterfeit banknotes withdrawn from circulation in 2020 should also be mentioned. Statistics show that approx. 460,000 counterfeit euro banknotes were detected, which translates into a PPM (pieces per million) ratio of 17. By comparison, a year earlier, the European Central Bank reported 23 PPM and in 2015 – 48 PPM.<sup>43</sup> At this point, it is worth highlighting that in the case of the Polish cash market, despite a significant increase in the value of circulation in 2020, the PPM ratio amounted to 1.67. The persistently low level of counterfeiting results, among others, from the high quality of security features of Polish banknotes and coins. Increased public awareness in terms of recognition of these security features is also extremely important, which results, among others, from the educational activities of Narodowy Bank Polski.

**Figure 7.** Value of PPM in the years 2017–2020 for euro banknotes and Polish banknotes for general circulation



Source: study of the NBP Cash and Issue Department and the European Central Bank statistics *Euro banknote counterfeiting at historically low level in 2020* (europa.eu).

The impact of the COVID-19 pandemic on the trends observed in the cash market, occurring on different continents, has become a driver of changes in consumer habits, particularly

<sup>41</sup> Alejandro Zamora-Pérez, *The paradox of banknotes: understanding the demand for cash beyond transactional use*, ECB Economic Bulletin 2/2021, European Central Bank.

<sup>42</sup> *Cash in the time of Covid*, Quarterly Bulletin 2020 Q4, 18 December 2020, Bank of England.

<sup>43</sup> *Euro banknote counterfeiting at historically low level in 2020*, 22 January 2021, European Central Bank press release.

in terms of payment preferences, but also in relation to channels used for acquiring goods and services. However, it should be borne in mind that the conclusions concerning the sustainability or direction of these changes should be treated with caution in view of the potential variability of payment habits and the possibility of occurrence of unpredictable phenomena, which include the pandemic.



Chapter 4

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# Cash circulation market characteristics



# Cash circulation market characteristics

## 4.1. The cash circulation cycle and its participants

Cash circulation takes place within a cycle where participants are the entities representing individual sectors, from the regulatory to the commercial sector. The participants of cash circulation in Poland include the central bank, banks, producers of banknotes and coins, CIT companies processing cash on behalf of banks, operators of ATM networks, retail chains and consumers.

The activity of NBP in the scope of cash circulation covers, in particular:

- putting banknotes or coins into circulation, which is performed on the basis of the Regulation of the Governor of Narodowy Bank Polski announced in Monitor Polski (the Regulation sets the date of putting into circulation, the volume of issue as well as the design and the face value of banknotes or coins and in the case of coins, also the alloy, the purity and the weight); on 2 January 2020, NBP put into circulation 10 gr, 20 gr, 50 gr and 1 zł coins made of copper and nickel coated steel;<sup>44</sup>
- withdrawal of banknotes or coins from circulation; this is performed on the basis of the Regulation of the Governor of Narodowy Bank Polski announced in Monitor Polski, which specifies the coin or the banknote, the date of its withdrawal from circulation and the banks which carry out the exchange;
- orders for the production of banknotes and coins with manufacturers;
- verification of the authenticity and fitness for circulation of coins and banknotes;
- replacement of coins and banknotes which, due to wear and tear or damage, cease to operate as legal tender in the territory of the Republic of Poland;
- storage of banknotes and coins;
- distribution of banknotes and coins;
- destroying banknotes and coins unfit for circulation.

Both banks and CIT companies and NBP are responsible for the verification of the authenticity and fitness of recirculated banknotes and coins. On the other hand, the NBP and banks are responsible for the storage and distribution of Polish currency, while CIT companies deal with cash distribution and its storage on behalf of banks.

16 regional branches supplying Polish currency to banks operate within the organisational structure of NBP, supplying banks with Polish currency under the agreements.<sup>45</sup> As at 31 December 2020, 18 agreements were concluded, regulating the cooperation of the NBP Regional Branches with over 300 organisational units of banks operating under the basic system and with over 40 organisational units operating under the depository system.

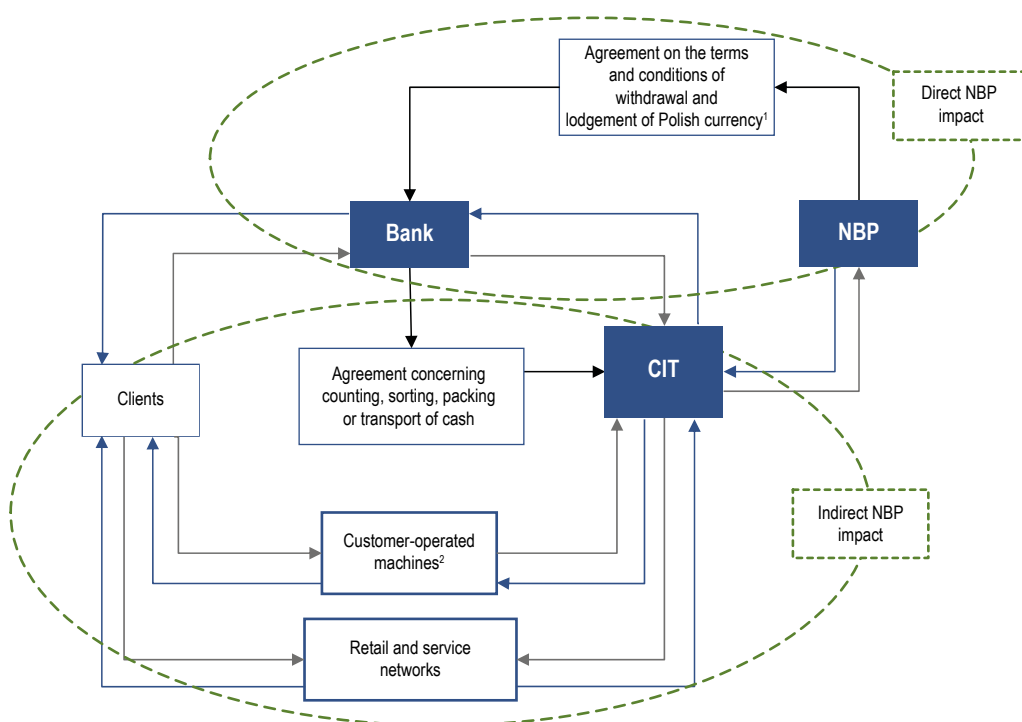
<sup>44</sup> The image, the side, the diameter and the weight of the coins have not changed, while the coins currently in circulation remain legal tender and will circulate in parallel with the new coins.

<sup>45</sup> Agreement on the terms and conditions of withdrawal and lodgement of Polish currency and related activities.

Within the cash cycle, NBP performs several significant functions, i.e. the issuer of banknotes and coins of the Republic of Poland, the legislator issuing legal acts addressed to banks,<sup>46</sup> an active participant in the cash cycle in terms of supplying the market with banknotes and coins<sup>47</sup> and an entity stimulating systemic activities as well as integrating market participants.

The cash cycle illustrated in Diagram 1 shows the route covered by banknotes and coins.

**Diagram 1.** Cash cycle in Poland



<sup>1</sup> Basic and deposit system.

<sup>2</sup> Devices for withdrawal and depositing of cash.

Source: study of the NBP Cash and Issue Department.

Banknotes and coins withdrawn from one of the NBP regional branches by banks or CIT companies operating on behalf of banks are transferred to cash centres of banks or CIT companies dealing with cash processing on behalf of banks and subsequently to customers via bank branches, ATM networks and retail chains. Cash covers the opposite route, returning to the central bank. Banknotes and coins from customers reach the cash centres of banks or CIT companies dealing with cash processing on behalf of banks via large retailers and self-service machines. There, they are divided into banknotes and coins fit for circulation and unfit for

<sup>46</sup> The Banking Law Act and the Act on Narodowy Bank Polski contain authorisations for the Governor of NBP to issue regulations whose provisions relate to cash transactions.

<sup>47</sup> The supply of banks with Polish currency by NBP stems from Article 68(2) of the Act of 29 August 1997 – Banking Law and it implements Article 37 of the Act of 29 August 1997 on Narodowy Bank Polski, pursuant to which NBP organises the management of coins and banknotes of the Republic of Poland. Pursuant to § 4 of Regulation No. 19/2016 of the Governor of NBP of 17 August 2016 on the method and procedure to be used in counting, sorting, packaging and labelling packages of banknotes and coins, and in conducting activities related to the supply of banknotes and coins to the banks (Official Journal of NBP of 2020 item 28), NBP concludes with banks and implements agreements defining the terms and conditions of withdrawal and lodging of the Polish currency.

circulation. Some banknotes and coins fit for circulation are recirculated in accordance with the needs reported by banks and their customers while the surplus banknotes and coins are lodged in NBP.

At the same time, as part of the measures to improve the functioning of cash circulation, in 2020, work on the implementation of GS1 standards in Polish cash circulation was continued. Since January 2020, GS1-standard barcodes have been incorporated for use at NBP and at the banknote manufacturer, and since January 2021 – at the coin manufacturer. The next implementation stage conducted by NBP is the pilot project on GS1 standards, which is joined by the banks declaring their readiness to undertake the work.

The phenomena occurring in the cash market in 2020 required the central bank to take decisive action, often conducted under time pressure and involving, directly or indirectly, all market participants. The intensified integration activities carried out by NBP were of particular importance at that time. The current exchange of information, dialogue and close cooperation of cash stakeholders translated into smooth operation of the procurement process in times of unprecedented demand for cash. These activities were carried out, among others, through the Cash Circulation Council, established in February 2019 at the NBP Management Board. This body brings together market participants representing various sectors, i.e. representatives of banks, the Polish Bank Association, Poczta Polska SA, organisations associating the retail sector,<sup>48</sup> representatives of the Polish Organisation of Cash Handling Companies and CIT companies and representatives of NBP. Subsequently, with a view to developing solutions to improve and standardise the operation of the cash circulation market, it was decided to establish advisory and opinion-making working groups at the Council. The activities of the groups focus on the development of recommendations and proposals of good practices, which are subject to regular reporting to the Council in the area of:

- functioning of the information system used in the procurement process,
- continuity of the cash circulation market operation,
- cash processing in the commercial sector,
- change of equipment tests.

At the end of 2020 and following the commencement of the work on the National Strategy for Cash Circulation Security, described in more detail in Box A, the decision was taken to expand the composition of the Council and to undertake additional cooperation with the major public institutions competent for the areas covered by the Strategy, as well as with representatives of further areas of the cash circulation market. As a result, contact was established with the Ministry of Finance, the Ministry of the Interior and Administration, the Ministry of Justice, the National Police Headquarters, the Polish Financial Supervision Authority, the National Association of Cooperative Banks as well as representatives of the market of ATM network operators.

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<sup>48</sup> Polish Chamber of Commerce, Polish Chamber of Liquid Fuels, Polish Organisation of Oil Industry and Trade, Polish Organisation of Commerce and Distribution.

### **Box A. National Strategy for Cash Circulation Security**

In 2020, the Governor of Narodowy Bank Polski, Professor Adam Glapiński announced measures aimed at developing the National Strategy for Cash Circulation Security, aimed at drafting proposals of legislative changes to strengthen the security of cash circulation in Poland, to prevent the elimination of cash from economic transactions and to defend the freedom to choose payment instruments.

The work on the National Strategy for Cash Circulation Security focuses on key aspects of cash circulation security which include universal acceptance of cash and its availability, physical security of cash, cyber security of systems critical to the functioning of cash circulation, continuity of cash supply to the market, counteracting counterfeiting, and ensuring an adequate stock of banknotes and coins in terms of value and denomination structure. In each of these areas, projects aimed at enhancing cash security are already in progress. The aim of the National Strategy is to streamline these activities, coordinate them and provide them with a common operational framework.

In order to streamline and coordinate the activities, the tasks related to the National Strategy for Cash Circulation Security were entrusted to the Cash Circulation Council, a consultative and advisory body established by the Management Board of Narodowy Bank Polski in February 2019. The previous tasks of the Council comprised, among others, analysing cash circulation in Poland and recommending proposals to mitigate systemic risk associated with cash circulation. They have been extended to include preparation of the draft National Strategy for submission to the NBP Management Board and an analysis of the effects of its implementation. The composition of the Council has also been expanded. The existing members, i.e. representatives of Poczta Polska S.A. and banks playing a key role in the withdrawal and lodging of Polish currency, representatives of organisations associating the retail sector, companies commissioned by banks to perform the activities of converting and sorting banknotes and coins as well as representatives of NBP, were joined by representatives of the major public institutions competent in the areas covered by the National Strategy and other key stakeholders of the cash circulation market, i.e. the representatives of: the Ministry of Finance, the Ministry of the Interior and Administration, the Ministry of Justice, the National Police Headquarters, the Office of the Polish Financial Supervision Authority, the National Association of Cooperative Banks and representatives of ATM network operators (IT Card and Euronet).

Support for the activities of Narodowy Bank Polski aimed at developing the National Strategy for Cash Circulation Security was expressed by the Monetary Policy Council in the resolution adopted at its meeting on 3 March 2021, in which it indicated, among others, that “cash circulation facilitates the conduct of the Polish monetary policy and allows citizens to use domestic money in a convenient manner” and that banknotes and coins issued by NBP “fulfil an important economic function, commonly ensuring physical access to money of the highest liquidity, providing a guarantee of security and continuity of economic transactions and strengthening the culturally established level of individual freedom in Poland.”

In March 2021, as part of the launch of the works related to the preparation of the National Strategy for Cash Circulation Security, the Cash Circulation Council established the following task forces, responsible for the preparation of the draft National Strategy:

- 1) acceptance and availability of cash,
- 2) cash logistics,
- 3) cyber security,
- 4) physical security of cash,
- 5) communication.

The task forces adopted the objectives and priorities of their activities and defined specific tasks, including their schedule, with a view to developing a draft the National Strategy for Cash Circulation Security, which will then be presented to the Management Board of the Narodowy Bank Polski for approval. In 2021, works in this area are treated as a priority.

#### **4.2. Changes in cash circulation introduced pursuant to amended provisions of Regulation No. 19/2016 and Regulation No. 31/2013**

With a view to a process-oriented approach to the issue of cash management, increasing the efficiency, security of cash processes and their standardisation, in 2020 NBP introduced further amendments to the provisions of Regulation No. 19/2016 of the Governor of Narodowy Bank Polski of 17 August 2016 on the method and procedure to be used in counting, sorting, packaging and labelling packages of banknotes and coins, and in conducting activities related to the supply of banknotes and coins to the banks as well as Regulation No. 31/2013 of the Governor of Narodowy Bank Polski of 17 December 2013 on the detailed principles and procedure for replacing coins and banknotes which, due to wear or damage, cease to act as the legal tender on the territory of the Republic of Poland.<sup>49</sup>

The amendment of Regulation No. 19/2016 included, in particular, changes regarding the waiver of the need for banks to lodge in NBP a separated category of banknotes unsuitable for machine sorting, the so-called NS. The waiver of the need for the banks to lodge in NBP with a separate stream of NS banknotes enabled the transfer of fit and unfit banknotes to NBP jointly, which simplified and reduced the labour intensity of cash processing both at banks and at NBP. In addition, it has contributed to increasing the degree of automation of the sorting process at cash market participants carrying out banknote sorting and conversion activities in the context of cash transactions.

Cash processes with the use of GS1-standard barcodes on the packaging of Polish currency banknotes and coins at NBP and on banknote packaging at the banknote manufacturer were implemented as part of the first stage of work, i.e. from January 2020. Subsequently, in connection with the launch of the next stage of implementation of barcodes in the GS1 standard on the packaging of coins formed by the manufacturer, further amendments to the regulations were introduced. Regulation No. 19/2016 has been adapted with

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<sup>49</sup> Hereinafter referred to as Regulation No. 31/2013.

regard to the barcode marking activities associated with the packaging of coins formed by the manufacturer. The introduction of GS1 standards in the circulation processes of manufacturer-formed coins as of January 2021 enables the standardisation and improvement of the coin transfer processes through:

- automatic entry of information on the supplied packages of banknotes and coins into the IT system and updating the data in the IT system,
- limiting manual activities and elimination of most of the paper documentation currently transferred between NBP and the manufacturer.

Works on the introduction of barcodes by banks and other cash circulation market participants are carried out successively, among others, within subsequent pilot stages.

In addition, the entry into force of the provision limiting manual banknote counting and sorting by banks has been postponed from January 2021 to January 2022 – the share of manually counted and sorted banknotes must not exceed 10% in any given quarter.<sup>50</sup> This change was the result of the implementation of the proposal of the Cash Circulation Group operating at the Polish Bank Association.

Moreover, Regulation No. 31/2013, provides for the possibility to exchange banknotes sent by individuals by post or courier service to the NBP Head Office, provided that the total value of these banknotes does not exceed PLN 2,000. This solution was introduced to enable the exchange of worn or damaged banknotes by individuals with difficult access to bank branches.

### 4.3. Reporting in the scope of cash circulation

Since 1 July 2018, banks which signed an agreement with NBP, specifying the terms and conditions for withdrawal and lodging of the Polish currency, pursuant to Regulation No. 19/2016, have been obliged to provide NBP with quarterly reports containing information on the number of customer-operated devices (e.g. cash deposit machines, recyclers) and devices operated by the bank's staff or by the staff of an undertaking to whom the bank has entrusted the processing of banknotes (e.g. sorters), as well as the conversion and sorting of banknotes and coins, and their subsequent recirculation.

#### 4.3.1. Legal conditions

As part of the guidelines defining the rules for accurate filing of reports, the “Guidelines concerning quarterly reporting related to the number of devices, counting and sorting of banknotes and coins and their recirculation” are available on the NBP website.

In accordance with the aforementioned instructions, banks:

- since 1 July 2018, have been obliged to include in their reports information on banknotes and coins:

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<sup>50</sup> Amendment to Regulation No. 14/2018 of the Governor of Narodowy Bank Polski of 7 June 2018 amending the regulation on the method and procedure to be used in counting, sorting, packaging and labelling packages of banknotes and coins and in conducting activities related to the supply of banknotes and coins to the banks.

- put into circulation,
  - processed: by devices, in a bank's sorting rooms, in sorting rooms of the undertakings commissioned by the bank for processing of banknotes or coins,
  - held on the last day of a given quarter: in the bank's cash desks, in the vaults of a bank and undertakings (including those received from another bank or from NBP) commissioned by the bank for processing of banknotes or coins as well as in the bank's devices and equipment of independent operators;
- since 1 January 2020, in addition to the above information, banks have been obliged to include in the reports data on banknotes and coins processed at the bank's cash desks and subsequently put into circulation.<sup>51</sup>

The reports are submitted to NBP on a quarterly basis, by electronic means, via the Reporting Information System (SIS) Internet portal. The first report was submitted by the banks for 2018 Q3.

NBP uses the quarterly reporting, among others, to monitor market trends in the area of putting banknotes and coins into circulation by banks without the participation of NBP and to analyse cash flows in banks. The interpretation of data received within the reporting framework allows, among others, to assess the scale of recirculation of banknotes and coins, i.e. putting them back into circulation by banks without the participation of NBP. At the same time, the scale of processing of banknotes and coins by market participants and the use of specialised equipment for this purpose is subject to analysis.

#### 4.3.2. Statistical data

Analysis of data reported by banks in 2020<sup>52</sup> shows a significant increase in the value of the cash stream of banknotes processed and recirculated compared to the values recorded in 2019. The phenomena triggered by the COVID-19 pandemic increased the demand for cash, which consequently resulted in increased withdrawals of funds by consumers, often accompanied by the accumulation of savings.

In 2020, the banks counted, sorted and checked for authenticity 8.3 billion banknotes, as much as 53.2% more than in 2019. The data show a clear increase in these values from 2020 Q1 onwards, i.e. from the outbreak of the pandemic. In 2019, banks processed, on average, 1.4 billion banknotes per quarter, while in 2020 this figure rose to approx. 2 billion banknotes (Table 7).

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<sup>51</sup> The exceptions include the operations of the records of denomination of suspected counterfeit banknotes, exchanges and replacements carried out at partner establishments. Data on operations carried out at banks' partner establishments are reported in value terms, according to a separate procedure.

<sup>52</sup> The Bank may at any time adjust its report for the selected quarter.

**Table 7.** Volume of banknotes processed and recirculated in 2019 and 2020 in quarterly terms

Denomination	2019				2020			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
1	2	3	4	5	6	7	8	9
500 zł	2 016 446	2 212 170	2 693 585	2 130 528	6 110 968	8 612 707	8 934 304	12 639 760
200 zł	93 203 174	101 332 956	106 328 629	112 912 589	172 293 334	212 793 277	260 302 779	270 485 773
100 zł	751 611 610	816 925 492	813 255 115	878 476 060	1 327 778 859	1 118 300 722	1 331 573 852	1 218 803 815
50 zł	233 277 647	244 569 838	243 566 152	271 499 106	353 684 183	337 455 208	358 589 044	335 843 270
20 zł	79 141 795	80 658 764	90 649 539	80 300 106	121 208 198	92 877 282	104 973 917	84 366 094
10 zł	105 634 532	102 031 764	106 210 005	118 903 271	152 783 356	143 879 675	164 834 929	136 647 423
<b>Total</b>	<b>1 264 885 204</b>	<b>1 347 730 984</b>	<b>1 362 703 025</b>	<b>1 464 221 660</b>	<b>2 133 858 898</b>	<b>1 913 918 871</b>	<b>2 229 208 825</b>	<b>2 058 786 135</b>
	<b>5 439 540 873</b>				<b>8 335 772 729</b>			

Source: study of the NBP Cash and Issue Department.

At the same time, an increase in the number of banknotes recirculated by banks was recorded. In 2020, this figure amounted to almost 6 billion units and increased by 46.8% compared to the previous year. It should be underlined that in 2019, banks recirculated, on average, 1 billion banknotes per quarter, while in 2020 this figure rose to approx. 1.5 billion banknotes. The share of banknotes recirculated in the number of banknotes processed by banks in 2020 amounted to 71.9% (Table 8). In annual terms, a slight decline in this share of around 3 percentage points was noted. It is also worth underlining that in the initial phase of the pandemic, falling in the first half of 2020, the percentage of banknotes recirculated by banks remained at a level of approx. 75%, whereas in the second half of 2020 it fell slightly below 70%.

**Table 8.** Volume and share of banknotes recirculated in 2019 and 2020 in quarterly terms

Denomination	2019		2020	
	Volume of banknotes recirculated	Ratio of the volume of banknotes recirculated to the volume of banknotes processed	Volume of banknotes recirculated	Ratio of the volume of banknotes recirculated to the volume of banknotes processed
1	2	3	4	5
500 zł	4 903 213	54.16%	26 359 897	72.62%
200 zł	199 883 259	48.31%	625 715 089	68.32%
100 zł	2 606 525 047	79.95%	3 952 155 967	79.10%
50 zł	815 249 460	82.11%	879 027 338	63.44%
20 zł	211 781 631	64.03%	240 612 310	59.64%
10 zł	245 193 957	56.66%	270 742 224	45.26%
<b>Total</b>	<b>4 083 536 567</b>	<b>75.07%</b>	<b>5 994 612 825</b>	<b>71.91%</b>

Source: study of NBP Cash and Issue Department.

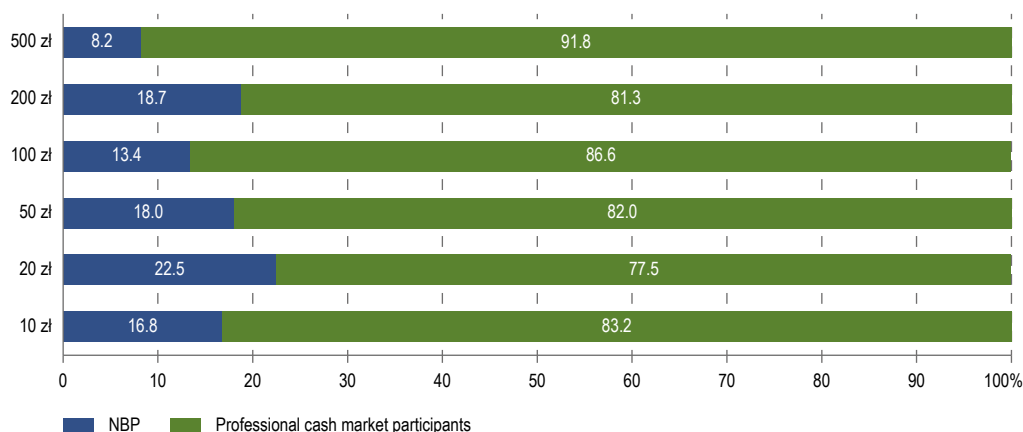
In 2020, 100 zł banknotes accounted for the highest volume of processed and recirculated banknotes (respectively, 59.9% and 65.9%). The second most frequently processed and recirculated denomination was the 50 zł banknote (respectively, 16.6% and 14.7%). In the case of 100 zł banknotes, similar results were obtained in 2019, i.e. 59.9% of processed banknotes and 63.8% of banknotes recirculated. This means that 100 zł and 50 zł denominations circulate, to a major extent, among market participants and are used for trading purposes. At the same time, the 100 zł banknote fulfils a function as a store of value.



Aggregate figures indicate that the processing of banknotes is largely carried out by the commercial sector. In 2019, the commercial sector's share in banknote processing reached 72.7%, rising to 84.5% in 2020. The increased market demand for banknotes in this case also intensified the counting and sorting process in banks and CIT companies (Figure 8).

In 2020, the banks counted, sorted and checked for authenticity 2.6 billion banknotes, i.e. 14.8% more than in 2019 (Table 9).

**Figure 8.** Processing of banknotes in 2020 by denomination structure broken down into NBP and other market participants



Source: study of NBP Cash and Issue Department.

**Table 9.** Volume of coins processed in 2019 and 2020 in quarterly terms

Denomination	2019				2020			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
1	2	3	4	5	6	7	8	9
5 zł	43 941 259	43 183 301	51 995 109	48 899 874	68 802 823	46 341 934	62 879 329	54 087 752
2 zł	82 307 138	73 339 441	86 380 667	90 144 772	115 583 511	73 699 258	102 523 859	93 075 271
1 zł	103 528 459	94 949 212	101 882 260	107 096 188	161 155 202	94 895 471	116 552 042	107 872 285
50 gr	59 976 096	58 122 922	68 112 761	68 683 364	77 155 451	52 344 079	65 332 349	59 549 296
20 gr	40 819 352	38 887 123	46 476 743	45 847 364	59 361 110	39 055 097	47 238 428	42 095 095
10 gr	59 701 818	58 617 835	69 721 686	69 160 949	86 398 384	59 581 011	69 927 429	62 893 210
5 gr	39 059 099	36 324 989	47 098 536	41 267 871	61 002 170	40 864 857	45 623 984	41 719 102
2 gr	37 931 902	34 830 472	59 571 371	54 024 664	72 551 193	49 046 893	53 672 295	49 591 174
1 gr	79 842 687	79 158 144	95 734 076	99 377 718	149 257 919	88 899 039	93 332 943	95 498 730
<b>Total</b>	<b>547 107 810</b>	<b>517 413 439</b>	<b>626 973 209</b>	<b>624 502 764</b>	<b>851 267 763</b>	<b>544 727 639</b>	<b>657 082 658</b>	<b>606 381 915</b>
	<b>2 315 997 222</b>				<b>2 659 459 975</b>			

Source: study of the NBP Cash and Issue Department.

At the same time, an upward trend in the number of coins recirculated was recorded. In 2020, this number amounted to 1.4 million pieces and increased by 7.7% compared to

2019. The reports submitted show that at the end of 2020, 53.1% of processed coins were recirculated by banks, compared to 56.6% in the previous year (Table 10).

**Table 10.** Volume and share of coins recirculated in 2019 and 2020 in quarterly terms

Denomination	2019		2020	
	Volume of coins recirculated	Ratio of the volume of coins recirculated to the volume of coins processed	Volume of coins recirculated	Ratio of the volume of coins recirculated to the volume of coins processed
1	2	3	4	5
5 zł	103 691 132	55.15%	123 241 240	53.10%
2 zł	187 587 745	56.47%	206 041 120	53.53%
1 zł	243 933 202	59.87%	275 756 713	57.39%
50 gr	134 972 561	52.95%	131 229 207	51.59%
20 gr	94 744 516	55.07%	97 498 194	51.93%
10 gr	179 869 409	69.93%	170 842 448	61.28%
5 gr	92 531 680	56.51%	95 725 895	50.59%
2 gr	81 017 026	43.47%	95 752 345	42.58%
1 gr	192 709 366	54.42%	216 551 634	50.72%
<b>Total</b>	<b>1 311 056 637</b>	<b>56.61%</b>	<b>1 412 638 796</b>	<b>53.12%</b>

Source: study of the NBP Cash and Issue Department.

Out of all coin denominations in 2020, the volume of one-zloty coins processed was the highest, at 18.1%. The second most frequently processed denomination was 1 gr (16.1%). Coins of these denominations also dominated in 2019 (at that time, 1 zł coins accounted for 17.6% while 1 gr coins accounted for 15.3% of the coins processed).

In the case of coins recirculated in 2020, like in the case of coins processed, the one-zloty coins had the highest share, which accounted for 19.5%. The second most frequently recirculated denomination was the 1 gr coin (15.3%). In 2019, 1 zł (18.6%) and 1 gr (14.7%) coins also prevailed among the coins recirculated.

The above figures indicate a slight upward trend in the number of coins processed and recirculated. At the same time, however, no significant impact of the pandemic has been observed in the case of coins in terms of value, which in turn is clearly noticeable with regard to banknote circulation.



Chapter 5

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# **Cooperation with banks in the scope of Polish currency supply**

# Cooperation with banks in the scope of Polish currency supply

## 5.1. Withdrawing Polish currency from NBP by banks

Under the agreements, banks may withdraw Polish currency from NBP. They are supplied with cash via:

- the basic system,<sup>53</sup>
- the deposit system.<sup>54</sup>

The value of banknotes and coins withdrawn by banks in 2020 was 9.5% higher than in 2019, while the number of banknotes and coins withdrawn by banks in 2020 was 11.5% lower than in 2019 (Table 11).

**Table 11.** Total value (PLN million) and volume (million pcs) of banknotes and coins withdrawn from NBP

Value or volume	2019	2020	Change (col. 3 – col. 2)
1	2	3	4
Value	203 528.1	222 818.3	19 290.2
Volume	3 770.9	3 339.1	-431.8

Source: study of the NBP Cash and Issue Department.

Note: for analytical purposes, source figures were rounded to the nearest decimal place.

**Table 12.** Total number of banks that have withdrawn at least 80% of the value or volume of banknotes or coins from NBP

Value or volume	Banknotes, coins	2019		2020	
		Total share	Number of banks	Total share	Number of banks
1	2	3	4	5	6
Value	banknotes and coins	83.3%	5	87.4%	6
	banknotes	83.6%	5	87.6%	6
	coins	82.8%	5	82.1%	5
Volume	banknotes and coins	82.0%	7	81.9%	7
	banknotes	80.6%	5	86.4%	6
	coins	83.3%	5	81.7%	5

Source: study of the NBP Cash and Issue Department.

Note: for analytical purposes, source figures were rounded to the nearest decimal place.

Among all banks supplied with cash by NBP, a group of so-called key banks can be distinguished, consisting of 5–7 banks generating over 80% of banknote and coin withdrawals in terms of their value and volume (Table 12).

<sup>53</sup> Withdrawal and lodging of the Polish currency by banks under the agreement concluded on the terms and conditions of withdrawal and lodging of the Polish currency.

<sup>54</sup> Polish currency lodged as an NBP deposit is the property of NBP and is stored in vault rooms of the bank's organisational unit, subject to the condition that the NBP deposit is adequately secured and separated from banknotes and coins owned by this bank. Some banks use the deposit system. Limits of amounts related to storage of NBP deposits are set out with banks on a case by case basis in agreements.

## 5.1.1. Banknotes

The value of banknotes withdrawn by banks in 2020, compared to 2019, was 9.6% higher, while the number of banknotes withdrawn by banks in 2020 was 4.1% lower than in 2019 (Table 13).

**Table 13.** Total value (PLN million) and volume (million) of banknotes withdrawn from NBP

Value or volume	2019	2020	Change (col. 3 – col. 2)
1	2	3	4
Value	202 577.8	222 017.5	19 439.7
Volume	2 169.9	2 080.4	-89.5

Source: study of the NBP Cash and Issue Department.

Note: for analytical purposes, source figures were rounded to the nearest decimal place.

The highest share in banknote withdrawals in 2020, both in terms of value and volume, was recorded in the case of the 100 zł denomination. In 2019, it was also the banknote most frequently withdrawn from NBP. In 2020, in numerical terms, banknotes with the denomination of 500 zł and 20 zł were withdrawn least frequently (Table 14).

**Table 14.** Value (PLN million) and volume (million) of banknotes withdrawn from NBP by banks

Denomination	Value		Volume		Structure by value		Structure by volume	
	2019	20120	2019	20120	2019	20120	2019	20120
1	2	3	4	5	6	7	8	9
500 zł	4 021.0	10 314.5	8.1	20.6	2.0%	4.6%	0.4%	1.0%
200 zł	53 961.0	85 259.8	269.8	426.3	26.6%	38.4%	12.4%	20.5%
100 zł	120 562.3	106 387.0	1 205.6	1 063.9	59.5%	47.9%	55.6%	51.1%
50 zł	19 485.8	16 531.8	389.7	330.6	9.6%	7.4%	18.0%	15.9%
20 zł	3 160.4	2 270.5	158.0	113.5	1.6%	1.0%	7.3%	5.5%
10 zł	1 387.3	1 254.0	138.7	125.4	0.7%	0.6%	6.4%	6.0%
<b>Total</b>	<b>202 577.8</b>	<b>222 017.5</b>	<b>2 169.9</b>	<b>2 080.4</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>

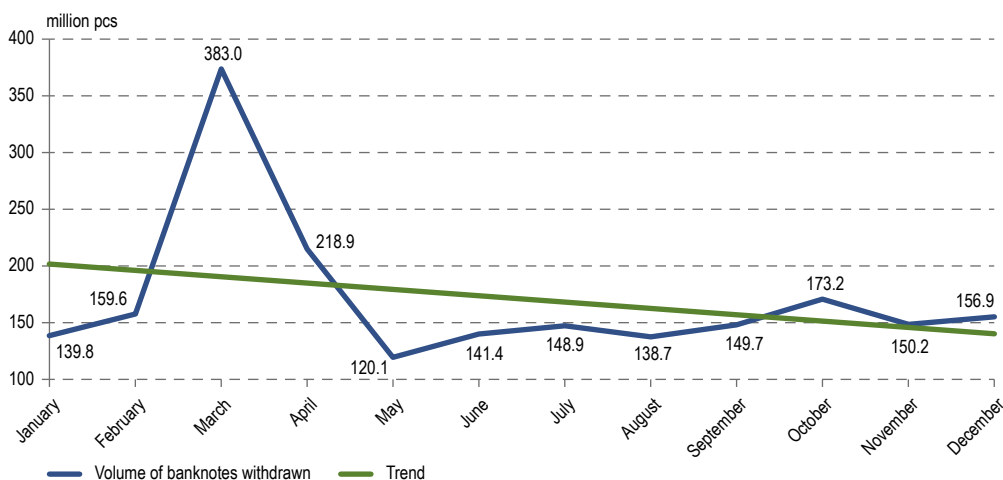
Source: study of the NBP Cash and Issue Department.

Note: for analytical purposes, source figures were rounded to the nearest decimal place.

In 2020, as compared to 2019, both the value and the volume of withdrawals increased for 500 zł and 200 zł denominations (in the case of value of withdrawals, respectively by PLN 6,293.5 million, PLN 31,298.8 million and in the case of the volume of withdrawals, respectively by 12.5 million pieces and 156.5 million pieces). On the other hand, in 2020, the value and the number of withdrawals for banknotes of 50 zł, 20 zł and 10 zł denomination decreased compared to 2019 (in the case of the value of withdrawals, respectively, by PLN 14,175.3 million, PLN 2,954.1 million, PLN 889.9 million, PLN 133.4 million, and in the case of the number of withdrawals, respectively by 141.7 million pieces, 59.1 million pieces, 44.5 million pieces, 13.3 million pieces).

In 2020, the lowest volume of banknotes was withdrawn by banks in May: 120.1 million pcs, and the highest in March: 383.0 million pcs and in October: 173.2 million pcs, i.e. during the months when the COVID-19 pandemic intensified (Figure 9). At the same time, the scale of withdrawals in 2020 was less affected by seasonal factors.

**Figure 9.** Number of banknotes withdrawn from NBP by banks in 2020



Source: study of the NBP Cash and Issue Department.

Note: for analytical purposes, source figures were rounded to the nearest decimal place.

### 5.1.2. Coins

The value of coins withdrawn by banks in 2020 was 15.7% lower than in 2019, whereas the volume of coins withdrawn was 21.4% lower (Table 15).

While analysing the denomination structure of coin withdrawals in 2020, it should be pointed out that the highest share of withdrawals, in terms of number, was recorded in the case of the 1 gr denomination. In 2019, 1 gr denomination coins were also most frequently withdrawn from NBP. In terms of volume, both in 2020 and in 2019, coins with the denomination of 5 zł were withdrawn least frequently (Table 16).

**Table 15.** Value (PLN million) and volume (million) of coins withdrawn from NBP

Value or volume	2019	2020	Change (col. 3 – col. 2)
1	2	3	4
Value	950.4	800.8	-149.6
Volume	1 601.0	1 258.7	-342.3

Source: study of the NBP Cash and Issue Department.

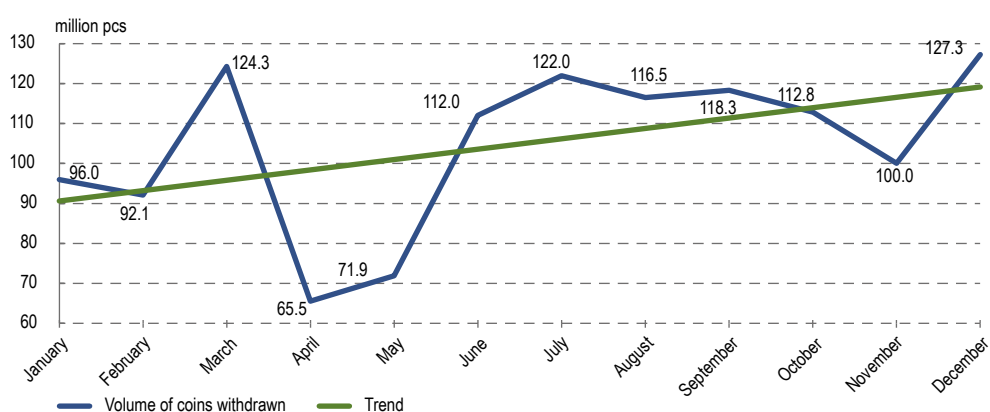
Note: for analytical purposes, source figures were rounded to the nearest decimal place.

**Table 16.** Value (PLN million), volume (million) and structure (%) of coins withdrawn from NBP

Denomination	Value		Volume		Structure by value		Structure by volume	
	2019	2020	2019	2020	2019	2020	2019	2020
1	2	3	4	5	6	7	8	9
5 zł	384.1	341.9	76.8	68.4	40.4%	42.7%	4.8%	5.4%
2 zł	279.4	232.1	139.7	116.0	29.4%	29.0%	8.7%	9.2%
1 zł	169.0	134.0	168.9	134.0	17.8%	16.7%	10.5%	10.6%
50 gr	58.4	45.7	116.9	91.3	6.1%	5.7%	7.3%	7.3%
20 gr	23.0	18.8	114.8	93.9	2.4%	2.3%	7.2%	7.5%
10 gr	20.6	16.3	206.0	163.4	2.2%	2.0%	12.9%	13.0%
5 gr	8.1	6.3	162.0	125.5	0.9%	0.8%	10.1%	10.0%
2 gr	3.3	2.4	163.9	118.2	0.3%	0.3%	10.2%	9.4%
1 gr	4.5	3.5	452.0	348.1	0.5%	0.4%	28.2%	27.7%
<b>Total</b>	<b>950.4</b>	<b>800.8</b>	<b>1 601.0</b>	<b>1 258.7</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>

Source: study of the NBP Cash and Issue Department.

Note: for analytical purposes, source figures were rounded to the nearest decimal place.

**Figure 10.** Volume of coins withdrawn from NBP by banks in 2020


Source: study of the NBP Cash and Issue Department.

Note: for analytical purposes, source figures were rounded to the nearest decimal place.

In 2020, compared to 2019, the value and the number of withdrawals of all coins decreased, respectively by PLN 149.6 million and 342.3 million pieces. The volume of coins withdrawn from NBP by banks showed an upward trend in consecutive months in 2020. The lowest volume of coins was withdrawn by banks in April: 65.5 million pieces, and the highest in December: 127.3 million pieces (Figure 10).

## 5.2. Lodging Polish currency in NBP by banks

In 2020,<sup>55</sup> the value of banknotes and coins lodged by banks in NBP was 24.1% lower compared to 2019. On the other hand, the volume of banknotes and coins lodged by banks in NBP was 25.5% lower than in the previous year (Table 17).

<sup>55</sup> In accordance with the provisions of Regulation No. 19/2016, as of 1 October 2020, non-machine sortable (NS) banknotes have been incorporated into a single stream of banknote lodgements in NBP (ON banknotes).



**Table 17.** Value (PLN million) and volume (million pcs) of coins withdrawn from NBP

Value or volume	2019	2020	Change (col. 3 – col. 2)
1	2	3	4
Value	184 210.3	139 844.1	-44 366.2
Volume	2 599.6	1 936.3	-663.3

Source: study of the NBP Cash and Issue Department.

Note: for analytical purposes, source figures were rounded to the nearest decimal place.

**Table 18.** Number of banks whose total share in the value or volume of banknotes or coins lodged in NBP reached at least 80%

Value or volume	Banknotes, coins	2019		2020	
		Total share	Number of banks	Total share	Number of banks
1	2	3	4	5	6
Value	banknotes and coins	81.2%	5	83.5%	5
	banknotes	81.3%	5	83.7%	6
	coins	81.0%	6	83.3%	7
Volume	banknotes and coins	81.2%	6	82.9%	6
	banknotes	80.5%	5	82.0%	5
	coins	81.4%	6	83.3%	7

Source: study of the NBP Cash and Issue Department.

Note: for analytical purposes, source figures were rounded to the nearest decimal place.

In 2020, a group of 5–7 banks lodged over 80% of banknotes and coins in NBP – both in terms of value and volume. The composition of this group did not change during the year (Table 18).

### 5.2.1. Banknotes<sup>56</sup>

In 2020, banks lodged in NBP banknotes with a total value of PLN 139,373.8 million, of which non-machine sortable banknotes (NS) accounted for 0.2%, i.e. PLN 305.8 million (Table 19).

**Table 19.** Value of banknotes lodged by banks in NBP in 2020 (PLN million)

Denomination	ON banknotes	NS banknotes	Total banknotes lodged in NBP (col. 2 + 3)
1	2	3	4
500 zł	1 630 500 000	2 192 000	1 632 692 000
200 zł	42 011 000 000	41 698 000	42 052 698 000
100 zł	76 954 000 000	119 543 600	77 073 543 600
50 zł	15 055 250 000	64 365 200	15 119 615 200
20 zł	2 262 400 000	43 797 260	2 306 197 260
10 zł	1 154 850 000	34 195 350	1 189 045 350
<b>Total</b>	<b>139 068 000 000</b>	<b>305 791 410</b>	<b>139 373 791 410</b>

Source: study of the NBP Cash and Issue Department.

In 2020, banks lodged 1,520.9 in NBP, of which non-machine sortable banknotes (NS) accounted for 0.5%, i.e. PLN 8.3 million (Table 20).

<sup>56</sup> Non-machine sortable banknotes, so-called NS, as a separate category of cash were lodged by banks in NBP until 30 September 2020. Since 1 October 2020, banks have lodged these banknotes together with so-called ON banknotes, i.e. as banknotes fit and unfit for circulation.

**Table 20.** Volume of banknotes lodged in NBP by banks in 2020 (million pcs)

Denomination	ON banknotes	NS banknotes	Total banknotes lodged in NBP (col. 2 + 3)
1	2	3	4
500 zł	3 261 000	4 384	3 265 384
200 zł	210 055 000	208 490	210 263 490
100 zł	769 540 000	1 195 436	770 735 436
50 zł	301 105 000	1 287 304	302 392 304
20 zł	113 120 000	2 189 863	115 309 863
10 zł	115 485 000	3 419 535	118 904 535
<b>Total</b>	<b>1 512 566 000</b>	<b>8 305 012</b>	<b>1 520 871 012</b>

Source: study of the NBP Cash and Issue Department.

**Table 21.** Total value (PLN million) and volume (million pcs) of banknotes lodged in NBP

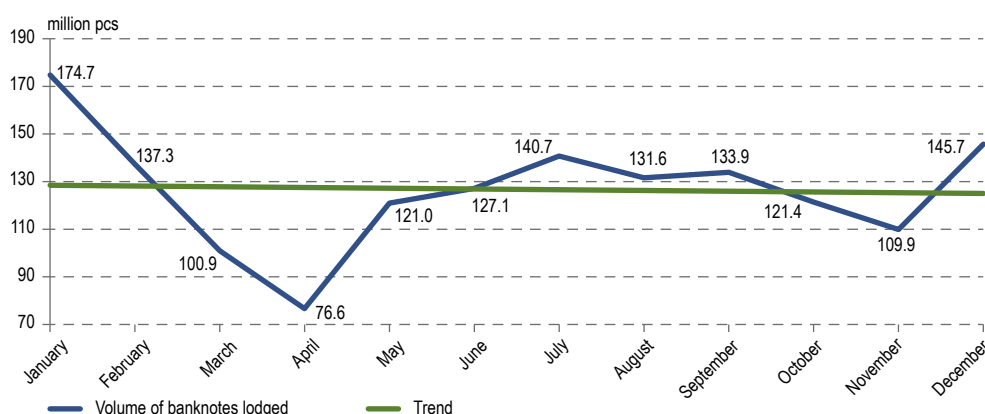
Value or volume	2019	2020	Change (col. 4 – 3)
1	3	4	5
Value	183 575.2	139 373.8	-44 201.4
Volume	2 042.4	1 520.9	-521.5

Source: study of the NBP Cash and Issue Department.

Note: for analytical purposes, source figures were rounded to the nearest decimal place.

In terms of value and number, in 2020, banks lodged more banknotes than in the previous year, by 24.1% and 25.5%, respectively (Table 21).

While analysing the volume of banknotes lodged in NBP by banks in the consecutive months of 2020, a slight downward tendency was observed. Banks lodged the lowest volume of banknotes in April – 76.6 million pieces and the highest volume in January – 174.7 million pieces (Figure 11).

**Figure 11.** Volume of banknotes lodged in NBP by banks in 2020

Source: study of the NBP Cash and Issue Department.

Note: for analytical purposes, source figures were rounded to the nearest decimal place.

Banknotes with 100 zł denomination represent the highest volume of banknotes lodged in NBP, whereas the volume of lodged banknotes with the denomination of 500 zł, 20 zł and 10 zł was the lowest (Table 22).

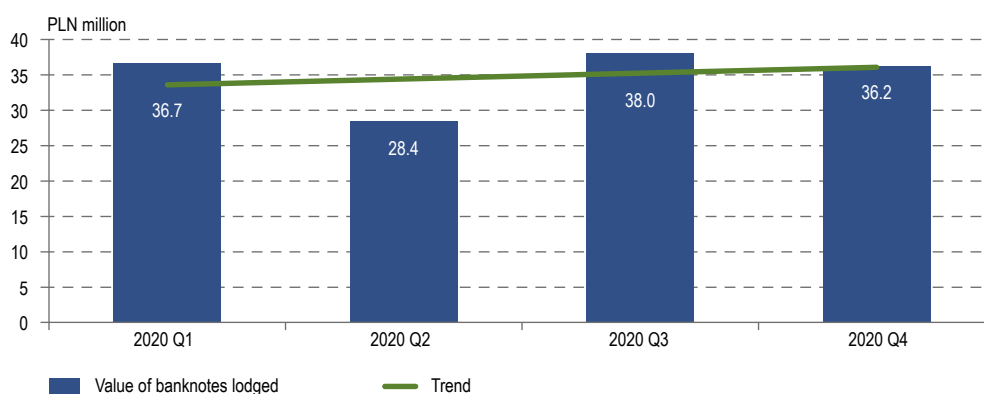
**Table 22.** Value (PLN million), volume (million pcs) and structure (%) of banknotes lodged in NBP in 2019 and 2020 by denomination

Denomination	Value		Volume		Structure by value		Structure by volume	
	2019	2020	2019	2020	2019	2020	2019	2020
1	2	3	4	5	6	7	8	9
500 zł	870.4	1 632.7	1.7	3.3	0.5%	1.2%	0.1%	0.2%
200 zł	45 548.0	42 052.7	227.7	210.3	24.8%	30.2%	11.1%	13.8%
100 zł	113 148.2	77 073.5	1 131.5	770.7	61.6%	55.3%	55.4%	50.7%
50 zł	19 532.5	15 119.6	390.7	302.4	10.7%	10.8%	19.1%	19.9%
20 zł	3 135.8	2 306.2	156.8	115.3	1.7%	1.6%	7.7%	7.6%
10 zł	1 340.3	1 189.0	134.0	118.9	0.7%	0.9%	6.6%	7.8%
<b>Total</b>	<b>183 575.2</b>	<b>139 373.7</b>	<b>2 042.4</b>	<b>1 520.9</b>	<b>100.1%</b>	<b>99.9%</b>	<b>100.0%</b>	<b>100.0%</b>

Source: study of the NBP Cash and Issue Department.

Note: for analytical purposes, source figures were rounded to the nearest decimal place.

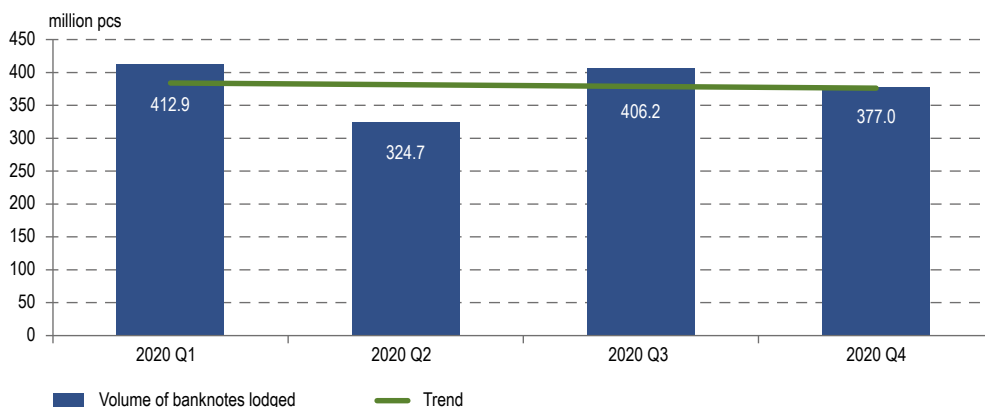
While analysing the value of banknotes lodged in NBP, it should be pointed out that the lowest value of lodgements was recorded in 2020 Q2. In 2020 Q4, the value of banknotes lodged in NBP was comparable to the data for 2020 Q1 and compared to 2020 Q2, it increased by 27.6% (Figure 12).

**Figure 12.** Value of banknotes lodged in NBP

Source: study of the NBP Cash and Issue Department.

Note: for analytical purposes, source figures were rounded to the nearest decimal place.

While examining the volume of banknotes lodged in NBP, it should be pointed out that, as in terms of value, banks discharged the lowest number of banknotes in 2020 Q2. In 2020 Q4, the volume of banknotes lodged in NBP was 7.8% lower than the figures for 2020 Q1; however, compared to 2020 Q2, it increased by 16.1% (Figure 13).

**Figure 13.** Volume of banknotes lodged in NBP

Source: study of the NBP Cash and Issue Department.

Note: for analytical purposes, source figures were rounded to the nearest decimal place.

### 5.2.2. Coins

The value and volume of coins lodged by banks in NBP in 2020 decreased, respectively, by PLN 164.8 million, or 25.9% and 141.7 million pieces, or 25.4%, compared to 2019 (Table 23).

**Table 23.** Value (PLN million) and volume (million pcs) of coins lodged in NBP in 2019–2020

Value or volume	2019	2020	Change (col. 3 – col. 2)
1	2	3	4
Value	635.1	470.3	-164.8
Volume	557.2	415.5	-141.7

Source: study of the NBP Cash and Issue Department.

Note: for analytical purposes, source figures were rounded to the nearest decimal place.

As of 2019, the denominations of 5 zł, 2 zł and 1 zł had the largest share in the value structure of the coins lodged (92.6% of all coins lodged).

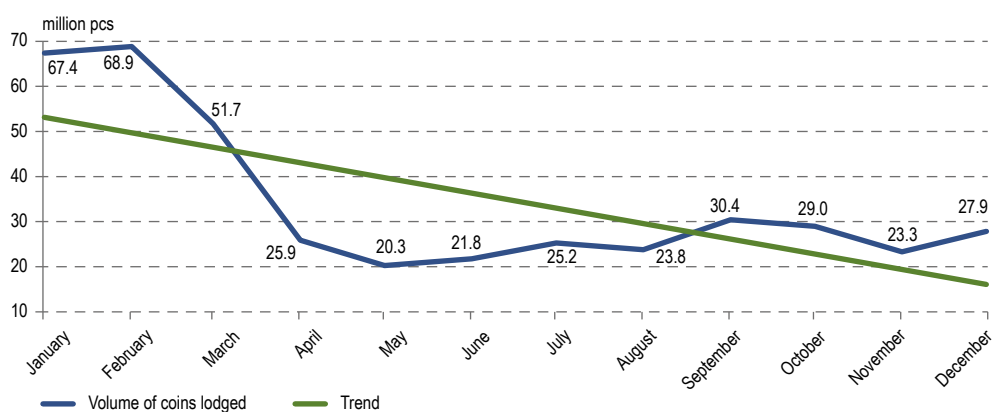
In terms of the volume of coins lodged in NBP, the following denominations prevailed: 2 zł, 1 zł, 50 gr and 1 gr (64.6% of all coins lodged). In terms of value, in 2020 the lowest value of coins lodged was recorded for low denominations, i.e. 5 gr, 2 gr and 1 gr; they accounted for 0.5% of all coins lodged. In numerical terms, the lowest volume of coins lodged was recorded for coins with the face value of 20 gr, 5 gr and 2 gr – 18.7% of all coins lodged (Table 24).

**Table 24.** Value (PLN million) and volume (million pcs) of coins lodged in NBP in 2019–2020

Denomination	Value		Volume		Structure by value		Structure by volume	
	2019	2020	2019	2020	2019	2020	2019	2020
1	2	3	4	5	6	7	8	9
5 zł	237.3	183.1	47.5	36.6	37.4%	38.9%	8.5%	8.8%
2 zł	219.9	157.1	109.9	78.6	34.6%	33.4%	19.7%	18.9%
1 zł	125.4	95.1	125.4	95.1	19.7%	20.2%	22.5%	22.9%
50 gr	36.3	24.2	72.6	48.5	5.7%	5.2%	13.0%	11.7%
20 gr	8.6	5.2	43.2	26.1	1.4%	1.1%	7.8%	6.3%
10 gr	4.9	3.3	49.5	32.6	0.8%	0.7%	8.9%	7.8%
5 gr	1.6	1.3	31.8	26.5	0.2%	0.3%	5.7%	6.4%
2 gr	0.6	0.5	29.3	25.3	0.1%	0.1%	5.3%	6.1%
1 gr	0.5	0.5	48.0	46.1	0.1%	0.1%	8.6%	11.1%
<b>Total</b>	<b>635.1</b>	<b>470.3</b>	<b>557.2</b>	<b>415.5</b>	<b>99.9%</b>	<b>100.1%</b>	<b>100.0%</b>	<b>100.0%</b>

Source: study of the NBP Cash and Issue Department.

Note: for analytical purposes, source figures were rounded to the nearest decimal place.

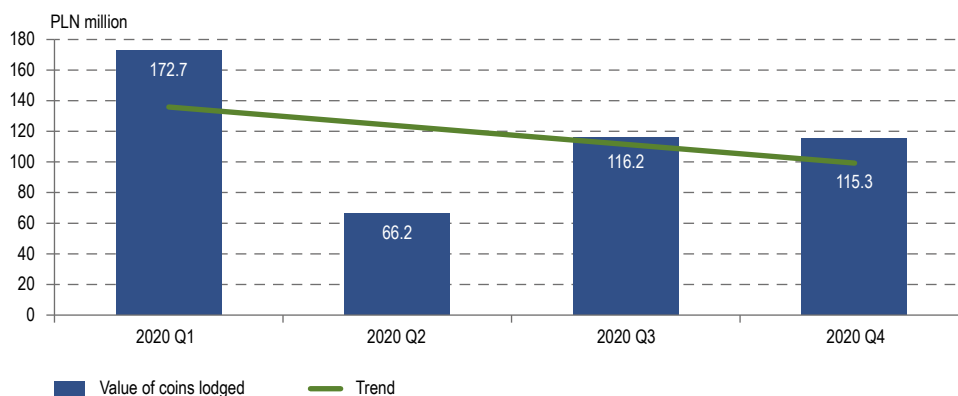
**Figure 14.** Volume of coins lodged in NBP by banks in 2020

Source: study of the NBP Cash and Issue Department.

Note: for analytical purposes, source figures were rounded to the nearest decimal place.

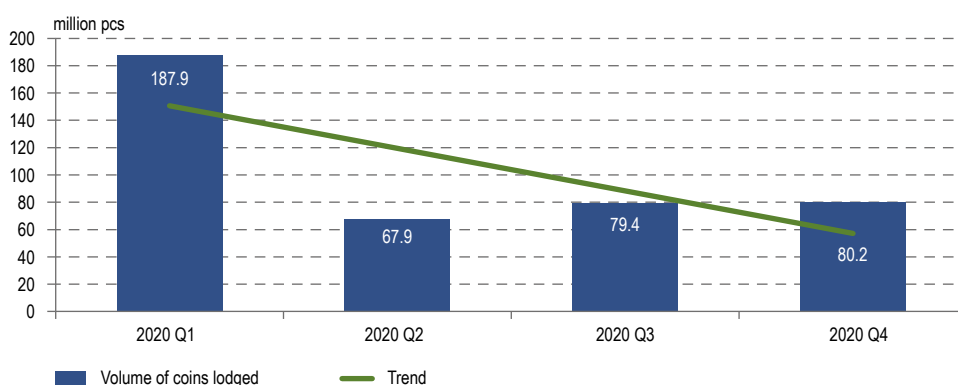
In the case of coins lodged in NBP by banks in individual months of 2020, a downward trend was observed. Banks lodged the lowest volume of coins in May (20.3 million pieces) and the highest volume in February (68.9 million pieces) (Figure 14).

While analysing the value of coins lodged in NBP, it should be indicated that, as in the case of banknotes, it reached the lowest level in 2020 Q2. In 2020 Q4, the value of coins lodged in NBP was comparable to the data for 2020 Q3 and in relation to 2020 Q2, it increased by 74.2% (Figure 15).

**Figure 15.** Value of coins lodged in NBP

Source: study of the NBP Cash and Issue Department.

Note: for analytical purposes, source figures were rounded to the nearest decimal place.

**Figure 16.** Volume of coins lodged in NBP

Source: study of the NBP Cash and Issue Department.

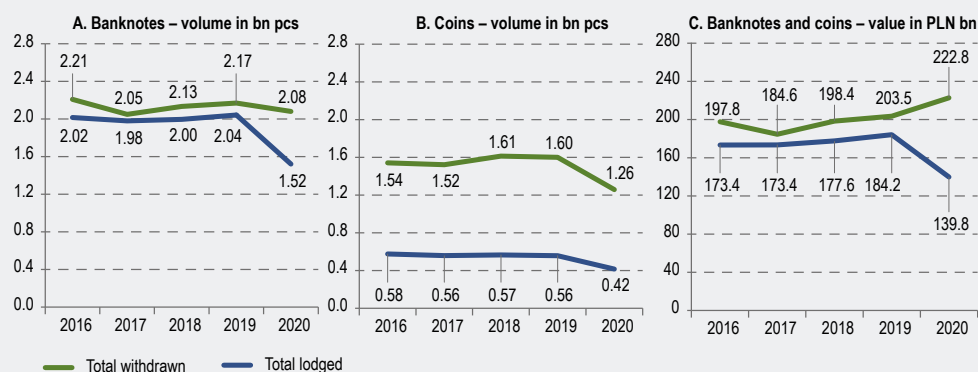
Note: for analytical purposes, source figures were rounded to the nearest decimal place.

In the case of the volume of coins lodged in NBP, as in terms of value, the lowest number of coins was discharged by banks in 2020 Q2. In 2020 Q4, the volume of coins lodged in NBP was 57.3% lower than in 2020 Q1; however, compared to 2020 Q2, it increased by 18.0%.

## Box B. Trends in supplying Polish currency to banks in 2016–2020

### 1. Withdrawal of banknotes from NBP and lodging of banknotes in NBP

In 2017–2019, the number of banknotes withdrawn from NBP was increasing, while a weak decline was recorded in 2020. In terms of value, however, an upward trend was observed in 2019–2020. Polish currency withdrawals are dominated by banknotes, accounting for 99.5–99.6% of the value of withdrawals. The same tendency occurs in the case of Polish currency lodgement; banknotes account for 99.6–99.7% of the value of banknotes and coins lodged in NBP (Figure B1).

**Figure B1.** Withdrawal and lodging of banknotes and coins from/in NBP in 2016–2020

Source: study of NBP Cash and Issue Department.

Note: for analytical purposes, source figures were rounded to the nearest decimal place.

The aforementioned phenomenon may be associated with an increase in the share of the highest denominations, i.e. 200 zł and 500 zł, in the structure of collected banknotes, related to an increase in the demand for cash.

In 2020, the number of banknotes withdrawn fell by 4.1% compared to the previous year, while the value of Polish currency withdrawn increased by as much as 9.5%.

**Table B1.** Volume of banknotes withdrawn from NBP and lodged in NBP in 2016–2020

Specification	2016	2017	2018	2019	2020
1	2	3	4	5	6
Withdrawals from NBP	2 208 782 500	2 049 518 500	2 133 613 000	2 169 935 000	2 080 353 000
Change: year / previous year	x	-7.2%	4.1%	1.7%	-4.1%
Lodgements in NBP	2 015 759 117	1 979 899 584	1 996 009 377	2 042 436 123	1 520 871 012
Change: year / previous year	x	-1.8%	0.8%	2.3%	-25.5%

Source: study of the NBP Cash and Issue Department.

It should also be noted that in 2016–2020, a prevalence of banknotes withdrawn over banknotes lodged was observed, as well as a surplus of the value of Polish currency withdrawn over the value of Polish currency lodged (Figure B1.A, Table B1, Table B2).

**Table B2.** Value of banknotes and coins withdrawn and lodged from/in NBP in 2016–2020

Specification	2016	2017	2018	2019	2020
1	2	3	4	5	6
Withdrawals from NBP	197 763 189 790	184 581 129 320	198 381 706 720	203 528 114 400	222 818 279 080
Change: year / previous year	x	-6.7%	7.5%	2.6%	9.5%
Lodgements in NBP	173 379 354 184	173 401 331 515	177 607 793 970	184 210 333 785	139 844 134 040
Change: year / previous year	x	0.0%	2.4%	3.7%	-24.1%

Source: study of the NBP Cash and Issue Department.

Compared to 2019, the COVID-19 pandemic saw a significant decline in the number of lodged banknotes (by 25.5%) and a decrease in the value of Polish currency lodged (by 24.1%). At the same time, due to the specific nature of the phenomena occurring in 2020, resulting from the COVID-19 pandemic, a change in trends in banknote lodgement in NBP cannot be excluded in a longer term.

## 2. Withdrawal and lodging of coins from/in NBP

In terms of the volume of coins withdrawn from NBP, an upward trend was observed in 2018–2019 (Figure B1.B, Table B3).

**Table B3.** Volume of coins withdrawn and lodged from/in NBP in 2016–2019

Specification	2016	2017	2018	2019	2020
1	2	3	4	5	6
Withdrawals from NBP	1 541 346 500	1 521 794 500	1 613 644 500	1 601 009 500	1 258 730 500
Change: year / previous year	x	-1.3%	6.0%	-0.8%	-21.4%
Lodgements in NBP	575 967 355	559 062 118	565 864 753	557 193 000	415 456 550
Change: year / previous year	x	-2.9%	1.2%	-1.5%	-25.4%

Source: study of the NBP Cash and Issue Department.

In 2020, the situation changed significantly, since the volume of coins withdrawn dropped by as much as 21.4% compared to the previous year. Such a considerable decline is closely related to the COVID-19 pandemic, which contributed to the reduction in cash transactions at retail outlets and the preference of some customers for contactless payments for sanitary reasons. The volume of coins lodged also dropped strongly, by 25.4%. It should be noted that in 2016–2019, a weak downward trend in coin lodgement occurred, which particularly intensified in 2020. At the same time, the volume of coins withdrawn remains at a level much higher than the number of coins lodged.





# **The supply process in 2020, taking into account the impact of the COVID-19 pandemic**

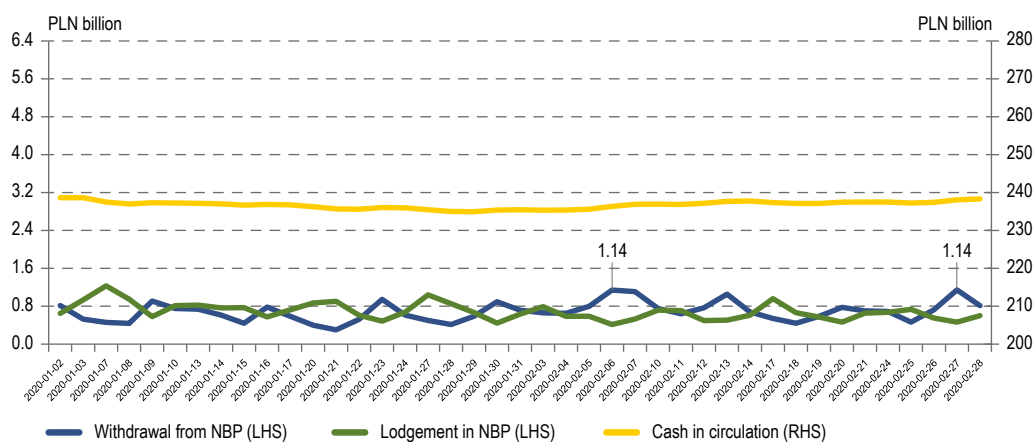
## The supply process in 2020, taking into account the impact of the COVID-19 pandemic

The significant increase in demand for cash in the period of the COVID-19 pandemic that was observed globally was also recorded in Poland. In order to analyse the case and indicate the trends observed in the supply of Polish currency to banks in 2020, the results are presented with the breakdown into two-month periods.

### 6.1. Analysis in bimonthly terms

The period of **January-February 2020**, i.e. just before the increase in demand for cash, demonstrated a stable level of withdrawals from NBP and lodgements in NBP (Figure 17).

**Figure 17.** Value of banknotes and coins withdrawn and lodged from/in NBP, value of banknote and coin circulation in January-February 2020

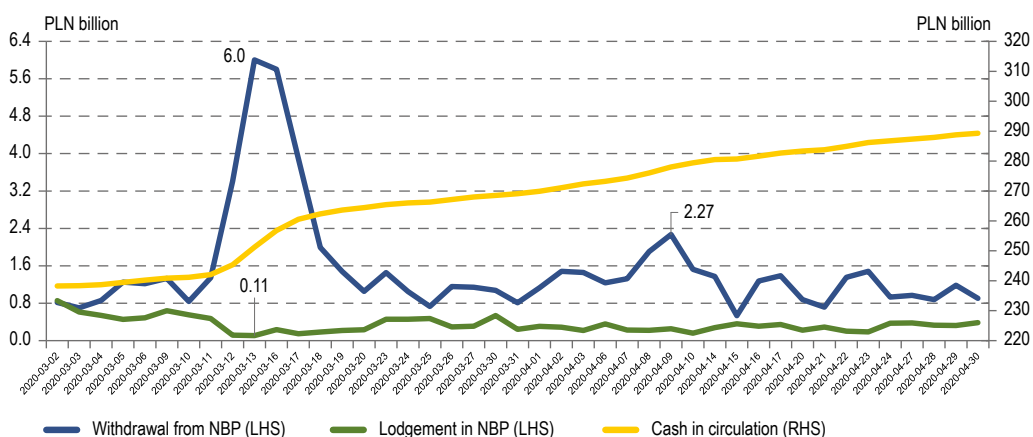


Source: study of the NBP Cash and Issue Department.

In this period, the average daily value of withdrawals amounted to PLN 684.7 million and was 3.2% higher than the average daily value in the corresponding period of the previous year. At the same time, the average daily value of lodgements in NBP amounted to PLN 689.3 million and was 0.9% lower than in the corresponding period of the previous year. As in previous years, the value of lodgements in NBP was higher than the value of withdrawals from NBP. The reason for this tendency was the cyclical return of cash to NBP after the Christmas period. As a consequence, at the end of February 2020, the value of cash in circulation dropped by 0.1% to the level of PLN 238 billion, compared to the end of 2020.

In the period of **March-April 2020**, significant changes in demand for cash occurred (Figure 18).

**Figure 18.** Value of banknotes and coins withdrawn and lodged from/in NBP, value of banknote and coin circulation in the period of March-April 2020



Source: study of the NBP Cash and Issue Department.

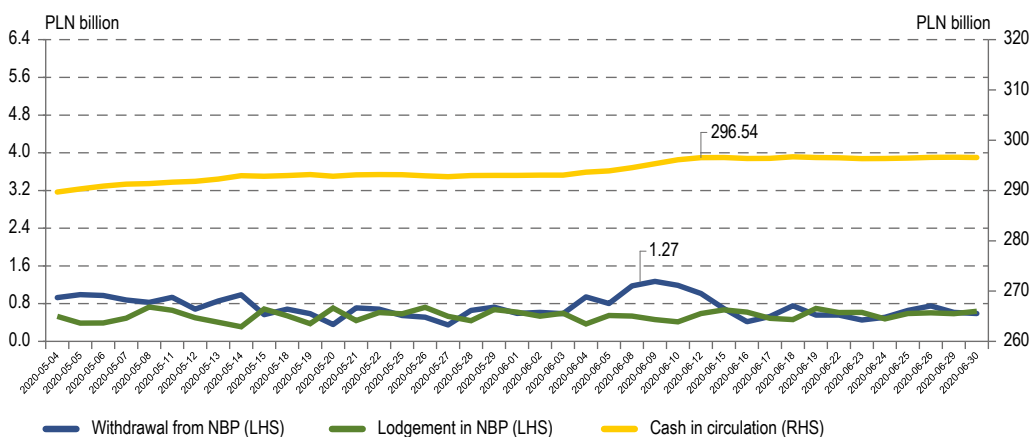
The turning point was 11 March 2020 when the WHO declared the COVID-19 pandemic<sup>57</sup> (the first case of COVID-19 infection in Poland was confirmed on 4 March 2020<sup>58</sup>). The first few days of March saw an increase in withdrawals of Polish currency from NBP, with the peak in daily cash demand recorded on 13 March 2021, when the value of daily withdrawals from NBP hit a record of PLN 6 billion. This value represented nearly 9 times the average daily value of withdrawals from NBP recorded in January-February 2020. On consecutive days, the value of daily withdrawals from NBP repeatedly exceeded PLN 1 billion, while a significant decline in daily lodgements in NBP was recorded. The lowest level of lodgements, i.e. PLN 107.8 million, was observed on 13 March 2021. The high level of withdrawals from NBP and the low level of lodgements in NBP continued on consecutive days. The average daily value of withdrawals from NBP amounted to PLN 1,526.6 million, and increased by 71.3% compared to the corresponding period of the previous year. At the same time, the average daily value of lodgements in NBP amounted to PLN 340.0 million and dropped by as much as 50.6% compared to the corresponding period of the previous year. As a consequence, in the period of March-April 2020, compared to the end of February 2020, the value of cash in circulation increased by as much as 21.4% to the level of PLN 289 billion.

In the subsequent period, i.e. **May-June 2020**, a stabilisation of withdrawals from NBP was recorded (Figure 19).

<sup>57</sup> <https://www.pap.pl/aktualnosci/news%2C603137%2Cwho-oglasza-pandemie-koronawirusa-covid-19.html>.

<sup>58</sup> <https://www.gov.pl/web/zdrowie/pierwszy-przypadek-koronawirusa-w-polsce>.

**Figure 19.** Value of banknotes and coins withdrawn and lodged from/in NBP, value of banknote and coin circulation in the period of May–June 2020

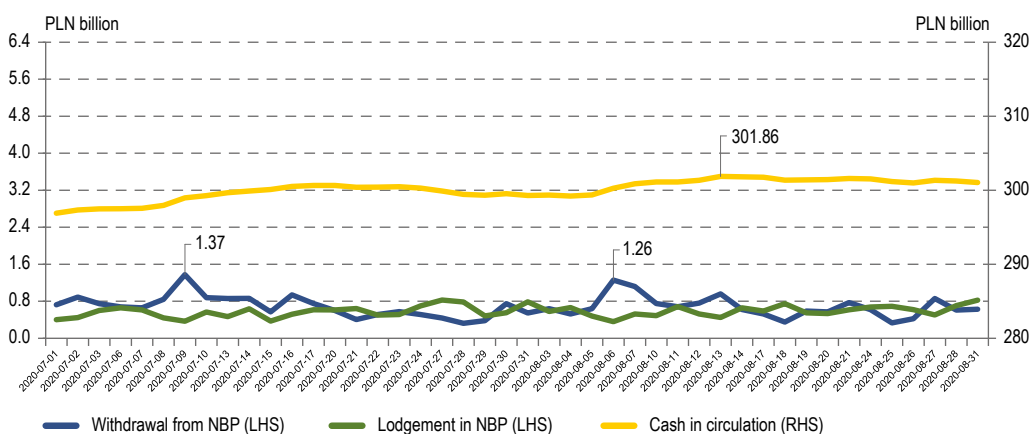


Source: study of the NBP Cash and Issue Department.

It is worth mentioning that in this period the value of withdrawals from NBP exceeded PLN 1 billion on only 4 working days. At the same time, however, withdrawals from NBP continued to decline. Compared to the corresponding period of the previous year, this decline amounted to 11.8%, while the average daily value of withdrawals amounted to PLN 724.9 million. In the case of the value of lodgements in NBP, the decline recorded was even higher than the decline in withdrawals. The average daily value of lodgements in NBP in this period amounted to PLN 547.7 million and was 30.1% lower than in the corresponding period of the previous year. As a consequence, in the period May–June 2020, the value of cash in circulation compared to the status as at the end of April 2020 increased by 2.5%, to PLN 297 billion.

The trends in the levels of withdrawals and lodgements observed in May and June 2020 continued in the period of **July–August 2020** (Figure 20).

**Figure 20.** Value of banknotes and coins withdrawn and lodged from/in NBP, value of banknote and coin circulation in the period of July–August 2020

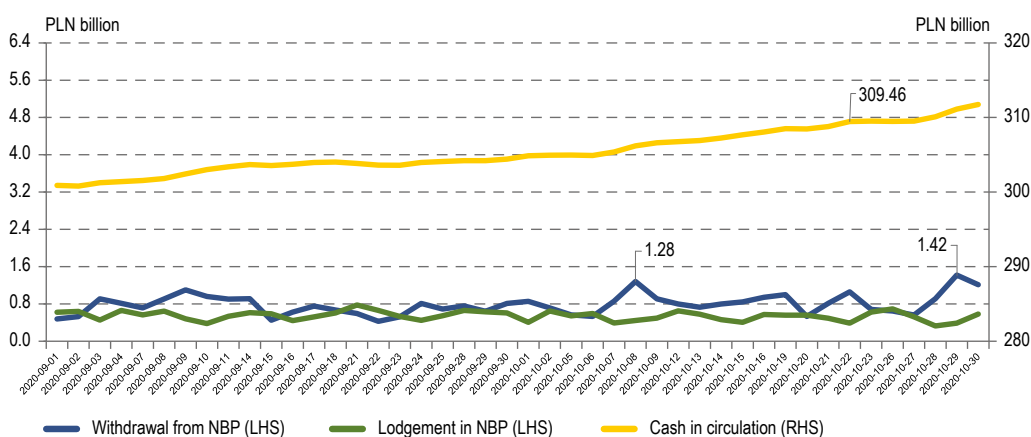


Source: study of the NBP Cash and Issue Department.

Withdrawals and lodgements from/in NBP remained relatively stable. In this period, the value of withdrawals from NBP exceeded PLN 1 billion on only 3 working days. At the same time, a decline in withdrawals from NBP by 18.9% was recorded in relation to the corresponding period of the previous year while their average daily value reached the level of PLN 682.6 million. The downward trend also continued in the case of lodgements in NBP, as their value was 21.9% lower than in the corresponding period of the previous year, with an average daily value of PLN 581.0 million. As in the previous two months, the scale of the decline in lodgements was greater than the decline in withdrawals from NBP. As a consequence, the value of cash in circulation compared to the level as at the end of June 2021 increased by 1.5%, to PLN 301 billion.

In the period of **September-October 2020**, the process of supplying banks with currency was generally stable (Figure 21).

**Figure 21.** Value of banknotes and coins withdrawn and lodged from/in NBP, value of banknote and coin circulation in the period of September-October 2020



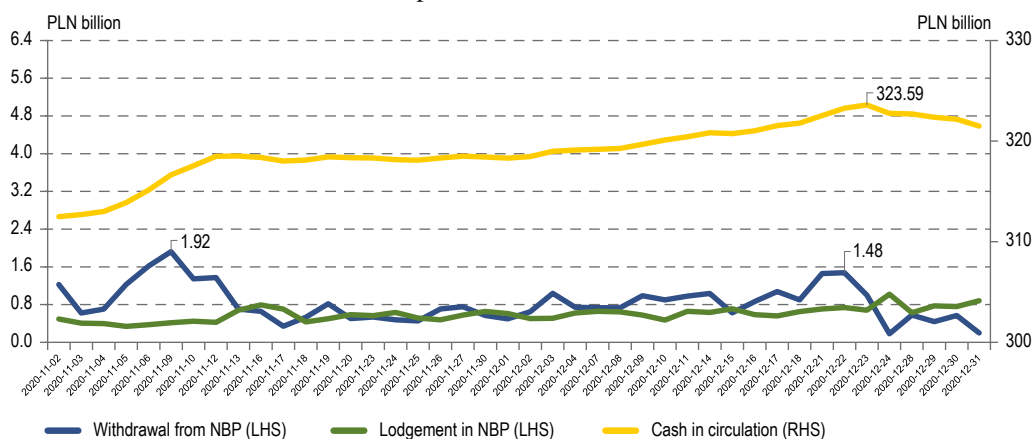
Source: study of the NBP Cash and Issue Department.

It should be mentioned that in this period the value of withdrawals from NBP exceeded PLN 1 billion on 5 working days, 3 of which fell on the last days of October. This rise was related to the occurrence of an increased demand for cash at the turn of October and November 2020 in connection with the Christmas season, and also probably due to precautionary hoarding by consumers following the announcement of new sanitary restrictions.

As a consequence, the average daily value of withdrawals from NBP increased by 1.7% to PLN 786.9 million in September-October 2020 compared to the corresponding period of the previous year. At the same time, a low level of lodgements in NBP continued, the average daily value of which fell to PLN 543.5 million, i.e. by 23.2%, compared with the corresponding period of the previous year. Finally, in the period of September-October 2020, the value of cash in circulation increased by 3.6% to PLN 312 billion compared to the end of August 2020.

In **November-December 2020**, the level of withdrawals from NBP increased compared to the previous two-month period (Figure 22).

**Figure 22.** Value of banknotes and coins withdrawn and lodged from/in NBP, value of banknote and coin circulation in the period of November-December 2020



Source: study of the NBP Cash and Issue Department.

The highest daily value of withdrawals – PLN 1.9 billion – was recorded on 9 November 2020. A repeated increase in the value of withdrawals from NBP occurred at the end of December 2020 and was seasonal in nature, related to the Christmas period. This was followed by an increase in withdrawals to PLN 1.5 billion on 22 December 2020. The aforementioned periodic increases did not significantly affect the average daily value of withdrawals from NBP; in relation to the corresponding period of the previous year, it was 6.0% lower and amounted to PLN 827.7 million. However, at the same time, the low level of lodgements in NBP was recorded, which amounted to PLN 595.9 million and dropped by as much as 24.6% compared to the corresponding period of the previous year. As a consequence, in the period of November-December 2020, the value of cash in circulation compared to the end of October 2020 increased by 3.1%, to PLN 321.5 billion.

Summarising the supply process in 2020, it should be mentioned that the increase in the demand for cash during the COVID-19 pandemic in the longer term was also satisfied by cash collected by market participants, which may also have contributed to a significant reduction in the scale of lodgements in NBP (Table 25).

**Table 25.** Value of average daily withdrawals and lodgements and value of circulation in 2019 and 2020 (in PLN million)

Period	Daily average						Change (withdrawal from NBP – lodgement in NBP)			Cash in circulation	
	Withdrawal from NBP			Lodgement in NBP			2019	2020	change	2020	change
	2019	2020	change	2019	2020	change					
1	2	3	4	5	6	7	8	9	10	11	12
January-February	663.2	684.7	3.2%	695.3	689.3	-0.9%	-1 347.7	-186.8	-86.1%	238 299.8	-0.1%
March-April	890.4	1 525.6	71.3%	688.9	340.0	-50.6%	8 463.5	50 979.8	502.4%	289 300.1	21.4%
May-June	822.3	724.9	-11.8%	783.9	547.7	-30.1%	1 539.6	7 264.8	371.9%	296 568.8	2.5%
July-August	841.4	682.6	-18.9%	744.4	581.0	-21.9%	4 270.0	4 472.0	4.7%	301 040.3	1.5%
September-October	773.6	786.9	1.7%	707.5	543.5	-23.2%	2 905.4	10 710.5	268.6%	311 748.9	3.6%
November-December	880.1	827.7	-6.0%	790.7	595.9	-24.6%	3 487.1	9 733.9	179.1%	321 496.2	3.1%
<b>January-December</b>	<b>810.9</b>	<b>873.8</b>	<b>7.8%</b>	<b>733.9</b>	<b>548.4</b>	<b>-25.3%</b>	<b>19 317.8</b>	<b>82 974.1</b>	<b>329.5%</b>	<b>321 496.2</b>	<b>34.8%</b>

Source: study of the NBP Cash and Issue Department.

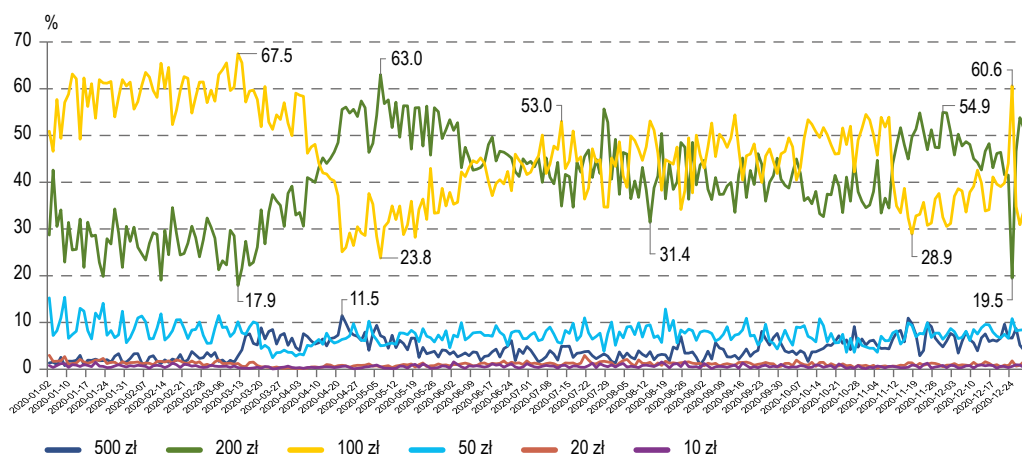
Note: the calculation of changes was performed on full figures.

High daily increases in the value of withdrawals from NBP occurring periodically, which reached PLN 6 billion at its peak on 13 March 2020, did not have such an impact on the increase in the value of circulation as the scale of the decrease in lodgements in NBP. It should be noted that on the same day a significantly low value of lodgements in NBP was recorded, which amounted to only PLN 0.1 billion. As a consequence, in 2020, as a result of an increase in the average daily value of withdrawals by 7.8% and a decrease in the average daily value of lodgements by 25.3%, the value of the Polish currency in circulation increased by as much as 34.8% compared to 2019 and reached PLN 321.5 billion.

## 6.2. Change in the denomination structure of withdrawals of Polish currency from NBP by banks

The surge in demand for cash in 2020 significantly affected the denomination structure of banknotes withdrawn by banks from NBP. In the early days, due to high cash withdrawals at ATMs, the demand for 100 zł banknotes increased. It should also be noted that most ATMs were not adapted to withdraw 200 zł and 500 zł banknotes. On 12 March 2020, the banknote with the nominal value of 100 zł reached a 67.5% share in the nominal structure of the value of withdrawals from NBP. Subsequently, as a result of the cooperation between NBP and banks aimed at ensuring the sustainable access to the full denomination structure of banknotes for all market participants, on 6 May 2020 the share of the 100 zł denomination in the value of banknotes withdrawn decreased to 23.8%. At the same time, as a result of joint activities, apart from a decrease in the share of the 100 zł denomination in withdrawals from NBP, an increase in this share was recorded for the 200 zł denomination. It is worth noting that as recently as 17 March 2020 the share of the 200 zł banknote in the value of banknote withdrawals from NBP amounted to 17.9%, after which it gradually increased, to reach 63.0% on 6 May 2020 (Figure 23).

**Figure 23.** Denomination structure of the value of banknotes withdrawn from NBP in the period from January to December 2020



Source: study of the NBP Cash and Issue Department.



An increase in demand for the 100 zł banknote, although not as high as in the spring, was also recorded in late October and early November 2020. Then, on 30 October 2020, the 100 zł banknote reached a 54.5% share in the denomination structure of banknotes withdrawn from NBP; however, on 18 November 2020 this share fell to 28.9%. At the same time, on 30 November 2020, the share of the 200 zł banknote increased to 54.9%.

**Table 26.** Change in the denomination structure of the value of banknotes withdrawn from NBP and in the denomination structure of banknotes in circulation in 2020, compared with 2019 (in percentage points)

	500 zł	200 zł	100 zł	50 zł	20 zł	10 zł
1	2	3	4	5	6	7
Withdrawal from NBP	2.7	11.8	-11.6	-2.2	-0.5	-0.1
Cash in circulation	1.6	5.6	-6.2	-0.6	-0.3	-0.2

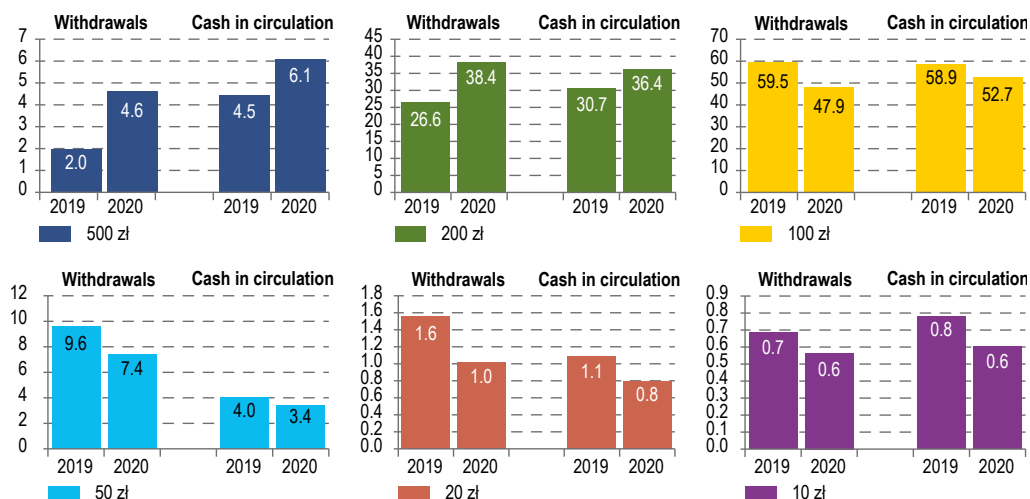
Source: study of the NBP Cash and Issue Department.

Note: the calculation was performed on full figures.

The COVID-19 pandemic period significantly affected the denomination structure of the value of banknotes withdrawn from NBP. The most significant changes were noted in the case of banknotes with the face value of 100 zł. In the structure of withdrawals from NBP, the share of this banknote fell by 11.6 percentage points, which translated into a 6.2 percentage point drop in its share in the denomination structure of banknotes in circulation. At the same time, the opposite trend was observed for the 200 zł banknote, whose share in the structure of withdrawals from NBP increased by 11.8 percentage points and in the circulation structure by 5.6 percentage points. Banknotes with the denomination of 10 zł, 20 zł and 50 zł recorded declines both in the structure of the value of withdrawals from NBP and in the structure of banknotes in circulation. At the same time, an increase in the importance of the 500 zł banknote was observed, since its share in withdrawals increased by 2.7 percentage points and in the value structure of banknotes in circulation by 1.6 percentage points.

It should be indicated that the 100 zł banknote played a prevailing role in the structure of withdrawals in 2020 (Figure 24); its share in the structure of banknotes in circulation was also dominant. At the same time, it is worth noting that the role of the banknote with the face value of 200 zł increased significantly during this period. The share of this denomination in the structure of withdrawals from NBP in 2020 amounted to 38.4%, resulting in its significant share in the structure of the value of banknotes in circulation at the end of 2020 at a level of 36.4%. It should also be noted that the banknote with the denomination of 500 zł increased its share in the value structure of circulation to 6.1%.

**Figure 24.** Denomination structure of the value of banknotes withdrawn from NBP and denomination structure of banknotes in circulation in the period 2019–2020 (in %)



Source: study of the NBP Cash and Issue Department.

Summarising the foregoing, it can be concluded that in 2020:

- an unprecedented annual increase in the value of circulation was recorded, amounting to PLN 83.0 billion, i.e. 34.8%; as a consequence, the value of cash in circulation as at the end of 2020 amounted to PLN 321.5 billion;
- high daily increases in the value of withdrawals from NBP occurring periodically (PLN 6 billion at its peak in March 2020), did not have such an impact on the increase in the value of circulation as the scale of the decrease in lodgements in NBP;
- compared to 2019, the average daily value of lodgements increased by 7.8%, while the average daily value of lodgements decreased by 25.3%;
- after a period of a rapid growth in withdrawals from NBP (March-April 2020 and at the turn of October-November 2020), they stabilised at a level lower than before the COVID-19 pandemic;
- the period of March-April 2020 saw a particularly low level of lodgements in NBP, with an exceptionally low value of lodgements in NBP of only 0.1 billion recorded on 13 March 2020;
- in the structure of withdrawals in 2020, the 100 zł denomination banknote prevailed (47.9%) while its share in the structure of banknotes in circulation was also the highest (52.7%);
- the role of the 200 zł banknote whose share in the structure of withdrawals from NBP amounted to 38.4%, increased significantly in its share in circulation (36.4%);
- the banknote with the denomination of 500 zł increased its share in the value structure of circulation to 6.1%.

### Box C. Self-service coin exchange machine

In recent years, a significant decrease in the coin recirculation rate in days has been recorded. According to the NBP analysis, in 2020 a coin could have returned to the sorting office of the NBP regional branch after an average of more than 17 thousand days (i.e. after about 47 years), counted from the moment of its withdrawal by the bank from NBP.

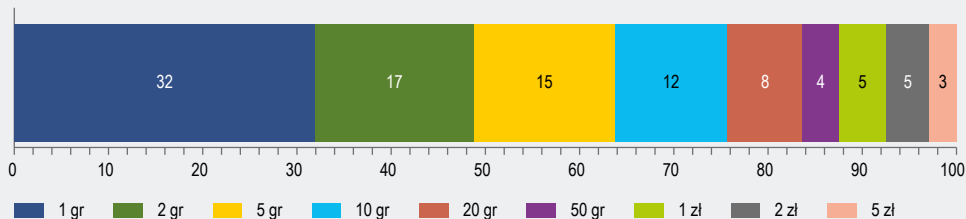


In view of the foregoing and based on a review of the market conducted earlier, it was decided to test a new possibility of acquiring coins held by households by NBP. To this end, in March 2019, a self-service coin exchange machine was made available to customers on a pilot basis at the NBP Regional Branch in Warsaw. The machine allowed customers to exchange a considerable number of general circulation coins from 1 gr to 5 zł without the need of their prior sorting by denomination and to collect their equivalent value in correspondingly higher denominations at the cash desk of the central bank branch. The possibility to exchange coins through the self-service device was received positively by customers and led to an increase in the number of coins returning to NBP regional branches. The installation of the device also contributed to an improvement in the quality of cashier service at the branch

owing to the possibility to redirect people who were previously changing coins at the cash desk to the self-service device. After obtaining positive results of the pilot project at the turn of 2020 and 2021, self-service coin exchange machines were successively installed in the remaining 15 NBP regional branches.

Since the launch of the devices, to the end of May 2021 a total of 44,713 coin exchange transactions were conducted, during which customers exchanged 79.3 million coins with a total value of PLN 27.5 million. In this period, the average transaction value amounted to PLN 615. Coins with a denomination of 1 zł, 2 zł and 5 zł accounted for 12% of all coins exchanged, while the denominations from 1 gr to 5 gr prevailed, reaching 64%.

**Figure C1.** Denomination structure of coins exchanged in the devices as at 31 May 2020



Source: study of the NBP Cash and Issue Department.

Considering the results of the introduction of the coin exchange machines achieved so far as well as the high level of their use, the decision was taken to install another four coin exchange machines in selected NBP regional branches in the second half of 2021. In addition, in order to further improve customer service, analytical work was initiated on expanding the functionality of the machines by crediting the customer's account with the equivalent of the exchanged coins via the BLIK system, without the need to collect their equivalent at the cash desk of the NBP regional branch.



Chapter 7

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# Glossary of terms

## Glossary of terms

**NS banknotes** – banknotes unfit for automated sorting, i.e. banknotes fixed with tape, glue or otherwise, torn, stapled or broken.

**ON banknotes** – total fit and unfit banknotes.

**CIT companies** (cash-in-transit) – undertakings commissioned by banks to perform activities related to counting and sorting of banknotes and coins (entrusting actual activities in accordance with Article 6a(1)(2) of the Act of 29 August 1997 – Banking Law) and transporting cash.

**ON coins** – total fit and unfit coins.

**Circulation** – the volume (or value) of general circulation coins remaining in cash circulation, less the volume (or value) of banknotes and coins at NBP cash desks and vaults, deposited by NBP in vaults of other banks, and withdrawn from circulation by NBP due to being worn out or damaged.

**Processing of banknotes and coins** – counting, sorting and checking banknotes or coins in terms of authenticity.

**Recirculation** (also referred to as turnover or recycling) – means putting into circulation banknotes fit for circulation via banks' cash points, devices operated by their clients (i.e. ATMs) formerly processed by the bank or on its behalf by an undertaking. This process takes place without the participation of NBP. Coins undergo a similar process.

**Polish currency** – banknotes and coins within the meaning of Article 2(1)(7) of the Act of 27 July 2002 – Foreign Exchange Law.

**Collector coins and banknotes** – gold and silver collector coins, collector banknotes, numismatic items (i.e. banknotes and coins which were not put into circulation as well as banknotes and coins withdrawn from circulation) as well as gold ounce coins issued by NBP.

**Supply** – number (or value) of banknotes or coins which were lodged in NBP or were withdrawn from NBP by banks. Supply of banks by NBP stems from Article 68(2) of the Act of 29 August 1997 – Banking Law and it implements Article 37 of the Act of 29 August 1997 on Narodowy Bank Polski.







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