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Report on Cash Circulation in Poland in 2017



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Chapter 1

Summary

Republic of Poland, Narodowy Bank Polski 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, Narodowy Bank Polski also acts as the issuing bank and the bank of banks. Holding the exclusive right to issue banknotes and coins, Narodowy Bank Polski ensures their adequate quality in circulation and the liquidity of cash settlements, putting banknotes and coins in the full denomination structure in circulation.

Narodowy Bank Polski activity in the scope of cash cycle comprises: orders for production of banknotes and coins placed at manufacturers, verification of authenticity and fitness of banknotes and coins, as well as their storage and distribution. In practice, the area which Narodowy Bank Polski influences by means of regulations concerning the withdrawal and lodgement of Polish currency¹ comprises mainly banks². Besides the central bank and banks, domestic cash cycle participants also include manufacturers of banknotes and coins, CIT companies³ processing cash on behalf of banks, ATM deployers, retailers and consumers.

Depending on the activity and role of individual commercial cash cycle participants, central banks adopt various cash cycle models.

In the literature of the subject, four main cash cycle models are distinguished: from the centralised model where the central bank acts as the basic institution storing, issuing and accepting cash and processing cash⁴ (e.g. as in Germany, France, Portugal, Romania and Slovakia), to the model based on delegation of tasks, where the central bank assigns a certain part of the tasks in the scope of cash handling to the commercial sector (among others, in Spain, Finland, the Netherlands and the United Kingdom). In an extreme case, the role of the central bank is limited to issuing new banknotes and coins and destroying unfit banknotes and coins. Norway and Sweden are countries where the central bank is not involved in cash supply. Taking into account the activity of Narodowy Bank Polski, in accordance with the report⁵ published in December 2013 by the European Payments Council, the cash cycle in Poland was classified as a centralised model in which the central bank plays a key role in the cash distribution process.

The “Report on Cash Circulation in Poland in 2017”, hereinafter referred to as the Report, is the first material prepared by Narodowy Bank Polski representing the set of information on the functioning of the domestic cash cycle.

¹ Currency (banknotes and coins) within the meaning of Article 2(1)(7) of the Act of 27 July 2002 – Foreign Exchange Law (Journal of Laws of 2017 item 679 and of 2018 item 650).

² 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.

³ CIT (cash-in-transit) companies are entrepreneurs to whom banks entrusted 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.

⁴ Processing construed as counting, sorting and checking banknotes or coins for authenticity.

⁵ Improving the efficiency of the handling of cash – Cash Cycle Model, version 2.0 – European Payments Council, 13 December 2013.

The Report presents major factors influencing the cash cycle model operating in Poland, the relationships between the central bank and other cash cycle participants as well as statistical data reflecting the trends in cash circulation observed in 2017 and in the years 2013–2017 in the area of supplying⁶ banks. 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 banknotes⁷, which play the payment function and have the status of a legal tender, but are not treated as an universal mean of payment.

In the case of the value of cash in circulation⁸ an upward trend has been observed for several years. In the years 2013-2016, the average growth in the value of cash in circulation amounted to 14.1%, y/y. The value of cash in circulation (excluding collector coins and notes) as at 31 December 2017 amounted to PLN 198.4 billion. This represents an increase in the value of cash in circulation of PLN 11.1 billion, i.e. 5.9%, in relation to the status as at 31 December 2016.

At the end of 2017, the highest share in circulation was recorded for the 100 zł banknote: 61.6% (in 2016 – 62.6%) and the 200 zł banknote: 13.9% (in 2016 – 13.2%). With regard to coins, the following coins had a significant share in circulation: 1 gr – 37.5% (in 2016 – 37.5%) and 2 gr – 17.5% (in 2016 – 17.6%).

The number of banknotes and coins withdrawn by banks from Narodowy Bank Polski in 2017 exceeded 3.5 billion pieces and dropped by 4.8% in relation to the previous year. On the other hand, the number of banknotes and coins lodged in Narodowy Bank Polski by banks reached over 2.5 billion pieces and was 2.0% lower than in 2016. This shows the tendency of diminishing frequency rate of return (FRoR) of banknotes and coins and, at the same time, the growth of so-called banknote recirculation⁹ performed by banks. This means that a banknote came back to the regional cash centre of Narodowy Bank Polski, on average, after 352 days from the moment of its withdrawal by a bank (for comparison: in 2013, a banknote was noted at Narodowy Bank Polski, on average, almost twice a year). In the case of coins, the recirculation ratio reached almost 11,000 days. This implies that a coin comes back to Narodowy Bank Polski, on average, 30 years after the moment of its withdrawal by a bank from Narodowy Bank Polski Regional Branch.

As demonstrated by questionnaire and logbook surveys conducted by Narodowy Bank Polski in 2016, cash remains the commonly used means of payment. In the case of 53.92% of transactions, consumers selected cash as a method of payment. Cash is also perceived as an

⁶ The number (or value) of banknotes or coins which were lodged in Narodowy Bank Polski or were withdrawn from Narodowy Bank Polski by banks. Supply of banks by Narodowy Bank Polski 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.

⁷ Collector coins and notes include 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 one ounce gold coins.

⁸ Circulation construed as the number (or value) of general circulation coins remaining in cash circulation, less the number (or value) of banknotes and coins at Narodowy Bank Polski cash desks and vaults, deposited by Narodowy Bank Polski in vaults of other banks, withdrawn from circulation by Narodowy Bank Polski due to being worn out or damaged.

⁹ Recirculation (also referred to as return rate or recycling) shall mean putting into circulation of banknotes fit for circulation via banks' cash desks or branches, clients of banks, customer operated machines (i.e. ATMs) formerly processed by the bank or on its behalf by an entrepreneur (CIT). This process takes place without the involvement of Narodowy Bank Polski. A similar phenomenon is observed in the case of coins.

easy-to-use means of payment, enabling expenditure control. On the other hand, the share of cash in payment transactions in terms of value was lower than the share of payment cards, amounting to 40.66%. Thus, the popularity of cash is particularly visible in the case of low value transactions, since in 80% of this type of payments banknotes or coins are used.¹⁰

The value of cash circulation in Poland as well as mechanisms and tendencies observed in this area are directly related to measures of the domestic economy. It should be noted that:

- in 2017, the value of circulation in relation to GDP amounted to 10.0% and reached a similar level as in 2016,
- in 2017, the value of M1 approached the level of PLN 1 trillion and, compared to 2016, increased by PLN 91.1 billion, i.e. by 11.2%,
- in 2017, the share of cash in M1 amounted to 20.4% in terms of the value and was similar to 2016.

In the light of the foregoing, the activities of Narodowy Bank Polski focused on the strengthening of security of the cash cycle and its participants, ensuring the adequate fitness of banknotes and coins in circulation, and increasing the effectiveness of processes functioning within the cash cycle. As a regulator of the cash cycle market and catalyst of changes, Narodowy Bank Polski accomplishes these objectives through the following:

1. Reducing issue costs of banknotes and coins achieved as a result of:
 - changing the alloy for 1 grosz, 2 grosz and 5 grosz denomination coins and putting them into circulation (March 2014),
 - successive modernisation of security features of banknotes, starting from denominations in the range of 10-100 zł (April 2014), up to the denomination of 200 zł (February 2016),
 - putting banknotes with the face value of 500 zł into circulation (February 2017), which contributes to efficient management of the strategic stock of banknotes stored by Narodowy Bank Polski,
 - extending the lifespan of Polish banknotes by almost 50% owing to putting into circulation coated banknotes with the face value of 20 zł (January 2017), 10 zł (February 2017) and 50 zł (July 2018).
2. Preparation of amendments to the ordinance on the method and procedure to be used in counting, sorting, packing and labelling packages of banknotes and coins, and in

¹⁰ Manikowski A., *Powody częstego wyboru gotówki przez Polaków – analiza wyników badań ankietowych i dziennikowych z 2016 r.* [Reasons for frequent selection of cash by Poles – analysis of questionnaire and logbook surveys of 2016], Narodowy Bank Polski; article originating from the scientific seminar held at Narodowy Bank Polski entitled “Research on factors influencing the level of cash circulation in Poland”, 13 December 2017.

conducting activities related to the supply of banknotes and coins to the banks¹¹; they entered into force on 1 July 2018 and, among others, referred to:

- fitness criteria for banknotes (for automated and manual sorting),
- tests of banknote handling machines,
- requirements to be met by devices and methods they use for banknote,
- classification quarterly reporting,
- multi-orientation sorting of banknotes,
- lodging banknotes in Narodowy Bank Polski in one stream, with a separated stream of banknotes unfit for automated fitness sorting,
- lodging coins in Narodowy Bank Polski in loose form in collective packaging, in one stream (i.e. fit and unfit coins jointly)¹²,
- standardization of banknote packaging content.

These amendments were consulted at each stage with representatives of the cash cycle market and discussed in detail during dedicated meetings held at Narodowy Bank Polski.

3. Increasing social responsibility for the cash cycle owing to the activation and inclusion of commercial cash cycle participants into the process of drafting amendments, i.e. banks, CIT companies, manufacturers and service providers for cash handling equipment, ATM deployers, and associations representing individual shareholders, including retailers.

The aforementioned measures are described in detail in subsequent parts of the Report.

Key statistical data regarding cash circulation in 2017 and 2016 are presented in Table 1.

¹¹ Ordinance No. 19/2016 of the President of Narodowy Bank Polski of 17 August 2016, hereinafter referred to as Ordinance No 19/2016.

¹² Until 30 June 2018, packets or unit bags containing coin rolls were packed in collective packaging.

Table 1. Key data for 2016 and 2017

	2016	2017	Change (2017/2016)
Value of circulation	PLN 187,294,980,796.07	PLN 198,429,472,531.19	Increase by PLN 11,134,491,735.12 (+5.9%)
Number of banknotes in circulation	1,906,234,190 pcs	1,978,722,833 pcs	Increase by 72,488,643 pcs (+3.8%)
Number of coins in circulation	16,377,838,886 pcs	17,339,082,820 pcs	Increase by 961,243,934 pcs (+5.9%)
Number of banknotes withdrawn from Narodowy Bank Polski	2,208,782,500 pcs	2,049,518,500 pcs	Decrease by 159,264,000 pcs (-7.2%)
Number of coins withdrawn from Narodowy Bank Polski	1,541,346,500 pcs	1,521,794,500 pcs	Decrease by 19,552,000 pcs (-1.3%)
Number of banknotes lodged in Narodowy Bank Polski ¹	2,015,759,117 pcs	1,979,899,584 pcs	Decrease by 35,859,533 pcs (-1.8%)
Number of coins lodged in Narodowy Bank Polski ²	575,967,355 pcs	559,062,118 pcs	Decrease by 16,905,237 pcs (-2.9%)
Banknotes – frequency rate of return	In cycles: 1.12 In days: 325	In cycles: 1.04 In days: 352	Decrease in cycles: 0.08 Increase in days : 27
Coins – frequency rate of return	In cycles: 0.036 In days: 10,056	In cycles: 0.033 In days: 10,983	Decrease in cycles: 0.003 Increase in days : 927
GDP ³	PLN 1,861.1 billion	PLN 1,988.7 billion	Increase by PLN 127.6 billion (+6.9%) ⁴
Value of circulation/GDP	10.1%	10.0%	Decrease by 0.1 percentage point
Value of M1 aggregate	PLN 815.3 billion	PLN 906.4 billion	Increase by PLN 91.1 billion (+11.2%)
Value of circulation ⁵ /M1 aggregate	21.4%	20.4%	Decrease by 1.0 percentage point

¹ Number or value of Polish currency transferred to Narodowy Bank Polski by banks.

² See above.

³ Nominal gross domestic product (current prices) according to GUS (Statistics Poland) data of 3 October 2018.

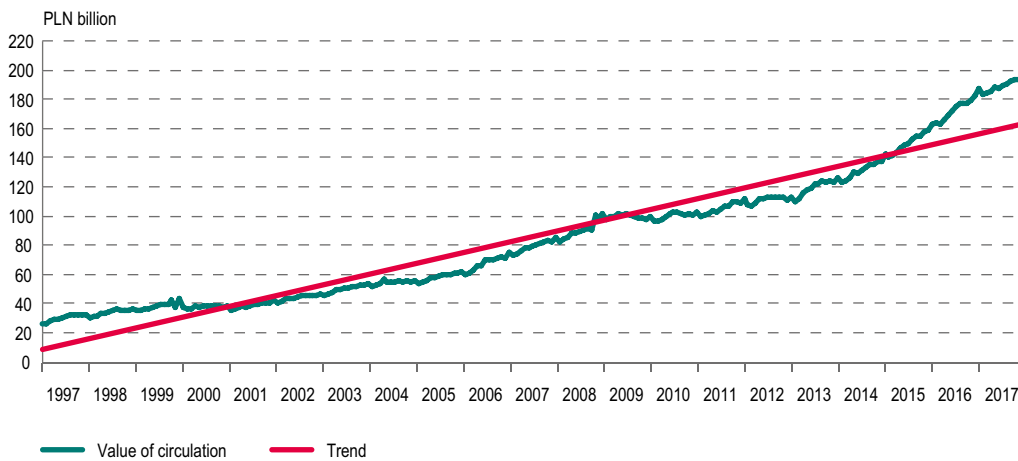
⁴ GDP growth in nominal terms; according to GUS (Statistics Poland) data of 3 October 2018, GDP in 2017 in relation to 2016 increased by 4.6% in real terms.

⁵ For the needs of calculation of the circulation value share, the stream of cash from branches of banks is not taken into account. The M1 aggregate does not comprise cash within branches of banks and collector coins and notes.

Banknotes and coins in circulation

The value of cash in circulation as at 31 December 2017 amounted to PLN 198.4 billion. An increase in the value of circulation by 5.9%, i.e. PLN 11.1 billion, was recorded as compared to 31 December 2016.

Figure 1. Value of cash in circulation in monthly terms in 1997-2017 (in PLN billion)



Source: study of the Narodowy Bank Polski Cash and Issue Department.

Figure 1 illustrates the growth in value of cash in circulation. Factors influencing changes in the value of cash in circulation can be divided into:

- fundamental (including currency exchange rate, GDP, inflation, interest rates), e.g.:
 - growth in economic activity in 2006-2007; GDP growth at that time reached the highest rate since 2004 Q2;
- seasonal (i.e. occurring cyclically due to feasts, holidays, beginning of school year, etc.), affecting the growth in cash circulation value in April, July, August and December and its decline in January, February and November, e.g.:
 - in December 2009 – growth in the value of cash circulation by approximately 3% in relation to November 2009,
 - in December 2010 – growth in the value of cash circulation by approximately 2% in relation to November 2010,
 - in December 2011 – growth in the value of cash circulation by approximately 3% in relation to November 2011;

- one-off (e.g. financial crisis):
 - effect of the year 2000 related to the expected growth of cash withdrawals by natural persons and introduction of a new instrument by Narodowy Bank Polski, so-called Narodowy Bank Polski deposit (in December 1999, the value of cash circulation increased by 14% in relation to the previous month),
 - as a result of the global financial crisis, in September 2008 increased demand for cash in October 2008 was recorded (the value of cash circulation increased by 11%).

In the years 1997-2017, the share of cash in the M1 aggregate in Poland fell from approximately 34% to approximately 20%. However, during financial crises a demand for cash increases, as observed in 2008. At that time, the share of cash in the M1 aggregate increased; in December 2008 it rose to 26%, i.e. by 3 percentage points in relation to the level recorded at the beginning of 2008.

2.1. Value and number of banknotes and coins in circulation¹³

Throughout 2017, the value of banknotes in circulation increased by almost PLN 13.3 billion, i.e. by 7.3%. Growth was recorded in relation to all banknote denominations.

In this period, the highest growth in value was observed in the case of 100 zł and 200 zł denomination banknotes (by 4.4% and by 8.8%, respectively).

Table 2. Value of banknotes in circulation by denomination in 2017 (in PLN)

Closing quarterly balance	500 zł	200 zł	100 zł	50 zł	20 zł	10 zł	Total
1	2	3	4	5	6	7	8
Q1	685,524,000	50,459,355,400	116,804,937,000	8,956,975,500	2,188,019,440	1,589,925,000	180,684,736,340
Q2	1,717,690,500	51,689,581,600	118,504,272,900	9,234,884,500	2,383,309,120	1,617,813,030	185,147,551,650
Q3	2,625,582,500	53,134,691,000	119,990,677,700	9,199,087,650	2,420,149,820	1,616,812,760	188,987,001,430
Q4	3,613,786,000	54,914,968,800	121,885,001,400	9,398,445,350	2,473,894,680	1,664,067,620	193,950,163,850

Source: study of Narodowy Bank Polski Cash and Issue Department.

In the banknote structure by value, the share of 500 zł, 200 zł and 20 zł denominations increased, respectively, by 1.5 percentage points, 0.4 percentage points, and 0.1 percentage points, whereas the share of 100 zł and 50 zł denominations decreased, respectively, by 1.8 percentage points and 0.1 percentage points. In the case of 10 zł denomination, no changes were observed.

¹³ The value and volume of banknotes and coins in circulation were presented as at the end of quarters of 2017.

Throughout 2017, the number of banknotes in circulation increased by 109.5 million pcs, i.e. by 5.9%. In terms of volume, an increase in 20 zł, 200 zł and 500 zł denominations was recorded, respectively, by 0.4 percentage points, 0.4 percentage points and 0.3 percentage points. On the other hand, the share of banknotes of 10 zł, 50 zł and 100 zł denominations decreased, respectively, by 0.1 percentage points, 0.1 percentage points and 0.9 percentage points.

Table 3. Volume of banknotes in circulation by denomination in 2017

Closing quarterly balance	500 zł	200 zł	100 zł	50 zł	20 zł	10 zł	Total
1	2	3	4	5	6	7	8
Q1	1,371,048	252,296,777	1,168,049,370	179,139,510	109,400,972	158,992,500	1,869,250,177
Q2	3,435,381	258,447,908	1,185,042,729	184,697,690	119,165,456	161,781,303	1,912,570,467
Q3	5,251,165	265,673,455	1,199,906,777	183,981,753	121,007,491	161,681,276	1,937,501,917
Q4	7,227,572	274,574,844	1,218,850,014	187,968,907	123,694,734	166,406,762	1,978,722,833

Source: study of Narodowy Bank Polski Cash and Issue Department.

Throughout 2017, the value of coins in circulation increased by PLN 154.1 million, i.e. by 3.6%. The highest growth was recorded in the case of 1 zł and 2 zł coins (excluding 2 NG¹⁴), respectively, by 7.7% and by 7.9%. The share of 1 gr, 2 gr, 5 gr, 10 gr, 20 gr and 50 gr coins increased, whereas the share of 2 NG and 5 zł coins decreased, respectively, by 0.4 percentage points and 1.3 percentage points.

Table 4. Value of coins in circulation by denomination in 2017 (in PLN)

Closing quarterly balance	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
Q1	1,575,098,920	793,619,782	478,462,970	520,220,250	283,963,084	243,888,176	205,252,957	104,666,137	58,104,294	61,962,614	4,325,239,184
Q2	1,549,964,365	815,429,082	478,497,698	534,014,733	289,653,630	247,793,104	208,898,757	106,105,157	58,761,509	62,834,876	4,351,952,911
Q3	1,544,445,810	841,856,584	478,556,236	549,291,144	296,464,483	252,502,173	213,002,575	107,805,760	59,641,317	63,893,335	4,407,459,417
Q4	1,572,369,410	856,781,830	478,533,802	559,553,030	302,185,681	257,230,135	217,029,024	109,933,139	60,626,801	65,065,830	4,479,308,682

Source: study of Narodowy Bank Polski Cash and Issue Department.

Throughout 2017, the number of coins in circulation increased by 833.1 million pcs, i.e. by 5.0%. The highest growth was recorded in the case of 2 zł, 1 zł, 50 gr, 20 gr, 10 gr, 5 gr, 2 gr and 1 gr denomination coins (respectively, by 8.0%, 7.6%, 6.4%, 5.5%, 5.7%, 5.0%, 4.3%, and 5.0%). In the case of 5 zł denomination coins, a decline by 0.2% was recorded, while the share of 2 NG denomination coins did not change.

¹⁴ Commemorative 2 zł coins made of Nordic Gold alloy, being legal tender.

Table 5. Volume of coins in circulation by denomination in 2017

Closing quarterly balance	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
Q1	315,019,784	396,809,891	239,231,485	520,220,250	567,926,168	1,219,440,879	2,052,529,573	2,093,322,739	2,905,214,721	6,196,261,360	16,505,976,850
Q2	309,992,873	407,714,541	239,248,849	534,014,733	579,307,260	1,238,965,518	2,088,987,573	2,122,103,137	2,938,075,454	6,283,487,597	16,741,897,535
Q3	308,889,162	420,928,292	239,278,118	549,291,144	592,928,966	1,262,510,864	2,130,025,749	2,156,115,194	2,982,065,843	6,389,333,548	17,031,366,880
Q4	314,473,882	428,390,915	239,266,901	559,553,030	604,371,361	1,286,150,673	2,170,290,244	2,198,662,778	3,031,340,043	6,506,582,993	17,339,082,820

Source: study of Narodowy Bank Polski Cash and Issue Department.

Box 1. Modernisation of banknotes and coins and change of denomination structure

1. Modernisation of banknotes and coins

The process of modernisation of banknotes or coins comprises, among others, the introduction of improved security features protecting against counterfeiting and modification of the material from which banknotes or coins are manufactured. These measures are mainly aimed at ensuring the security of the cash cycle, optimisation of broadly understood cash processing or limitation of associated costs.

In the framework of the aforementioned measures, on 3 March 2014, Narodowy Bank Polski put into circulation 1 gr, 2 gr and 5 gr denomination coins, made of brass plated steel with a slightly changed image of the obverse. At the same time, 1 gr, 2 gr and 5 gr coins put into circulation in 1995 remained legal tender and function jointly with the new coins. The introduction of new coins into circulation was preceded by information activities addressed to the commercial cash cycle participants.

Modernised banknotes with the face value of 10 zł, 20 zł, 50 zł and 100 zł were put into circulation on 7 April 2014. However, the banknote modernisation process was completed upon putting into circulation modernised banknotes with the face value of 200 zł on 12 February 2016.

The introduction into circulation of modernised banknotes with the face values of 10-200 zł was preceded by Narodowy Bank Polski activities thanks to which commercial cash cycle participants became acquainted with the security features of new banknotes. To that end, cooperation was established with entities dealing with the adjustment of banknote handling machines as well as with banks and other commercial cash cycle.

The aforementioned adjustment of banknote handling machines and, at the same time, recognition of the security features of banknotes, was performed at the turn of 2013 and 2014 in the case of 10-100 zł denominations and at the turn of 2015 and 2016 in connection with putting into circulation modernised 200 zł denomination banknotes. These activities covered, in each case, approximately 100 thousand devices across the country and proceeded with no major disruptions, which resulted in the smooth introduction of modernised banknotes into circulation.

Parallel to the adjustment of banknote handling machines, Narodowy Bank Polski conducted trainings in regional branches concerning the security features of 10-100 zł and 200 zł denomination banknotes, addressed to all commercial cash cycle participants, among others, banks, CIT companies, retailers and ATM deployers. In the case of the issue related to 10-100 zł denominations, 7,772 people participated in 407 training courses, whereas 5,135 people took part in 365 training courses concerning security features of modernised 200 zł denomination banknotes.

At the end of 2017, the estimated share of modernised banknotes in circulation reached 46.1%.

Apart from modernisation of banknotes, in December 2016 Narodowy Bank Polski initiated research work related to strengthening the resistance of banknotes to damage by applying a coating, which should extend the life cycle of the banknotes. As a result, in 2017 banknotes covered with a transparent protective coating on the front and reverse side were put into circulation. In the first instance, coated banknotes with the face value of 20 zł were put into circulation on 20 January 2017, followed by coated banknotes with the face value of 10 zł introduced on 27 February 2017. Subsequent banknotes covered with a protective coating with the face value of 50 zł were put into circulation on 16 July 2018.

Tests have shown that the coating of banknotes extends their life cycle by approximately 50%. In the case of 10 zł banknotes, the life cycle measured by a direct method (i.e. with the use of serial number readings) extended as a result of the coating from 1.9 to almost 2.9 years.

2. Change in denomination structure

Continuing activities aimed at reducing issue costs and in order to facilitate efficient management of the strategic stock of banknotes stored by Narodowy Bank Polski, on 10 February 2017 a new banknote with the face value of 500 zł, from the “Rulers of Poland” series, featuring a portrait of John III Sobieski, was put into circulation.

Prior to putting into circulation banknotes with the face value of 500 zł, Narodowy Bank Polski conducted information activities in order to introduce the banknote to commercial cash cycle participants. As in the case of modernisation of 10-200 zł banknotes, these activities consisted in cooperation with banks, CIT companies and entities dealing with adjustment of cash handling machines, the organisation of trainings in the scope of banknote security features and conducting information and education campaign.

Depending on technological conditions, cash handling machines were adjusted once or in stages. Overall, at Narodowy Bank Polski and in places indicated by entities, 112 processes of equipment adjustment were carried out with the participation of Narodowy Bank Polski employees. Over 120 thousand different banknote handling machines were adapted across the country, amongst which the most were module devices, such as customer-operated machines and control devices used for verification of banknote authenticity.



Additionally, in the scope of adjustment of banknote handling devices for banknotes with the face value of 500 zł, some entities performed their re-calibration, i.e. they were re-adjusted or the adopted settings were verified in relation to banknotes remaining in circulation for a certain time and bearing traces of wear and tear. In this process, modernised banknotes with the face value of 10-100 zł (2012 issue) and 200 zł (2015 issue) fit for circulation and banknotes with the face value of 10-200 zł (1994 issue) were used.

From November 2016 to April 2017, 960 training sessions were held in Narodowy Bank Polski regional branches, the subject of which was the recognition of security features of banknotes with the face value of 500 zł as well as modernised issue and 1994 issue. In total, 15,440 persons participated in the training programme. Training courses were attended, among others by representatives of banks, retailers, budgetary units, manufacturers and service providers of cash handling devices, and CIT companies.

In total, 28,347 people participated in three editions of training courses devoted to modernisation of 10-100 zł, 200 zł banknotes and putting a new 500 zł banknote into circulation.

It should be emphasised that, besides the adequate use of available technological means, the security of the cash cycle and its participants is also affected by the skill of identifying authentic banknotes and coins, both by professional cash handlers as well as by consumers.

2.2. Frequency rate of return of banknotes and coins

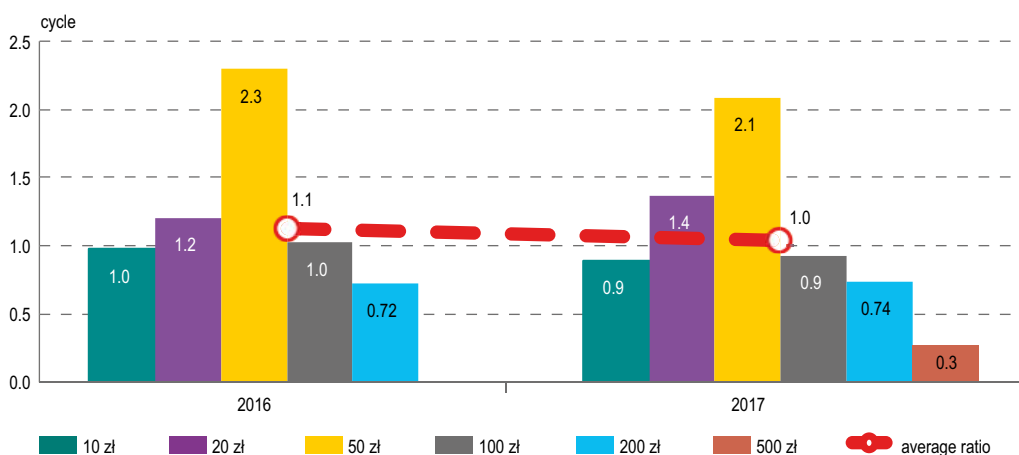
The frequency rate of return of banknotes and coins to NBP is expressed by means of recirculation rates in days and in cycles.

The frequency rate of return in cycles is the quotient of the number of banknotes or coins lodged in Narodowy Bank Polski by banks in the adopted period and the average number of banknotes or coins in circulation in the same period. The frequency rate of return in days is the quotient of the average number of banknotes or coins in circulation in the adopted period and the number of banknotes or coins lodged in Narodowy Bank Polski by banks in the same period, multiplied by the number of days (365).

On average, a banknote is recorded at the Narodowy Bank Polski regional branch after 352 days, calculated from the moment of its withdrawal from Narodowy Bank Polski by a bank. In the case of coins, the estimated frequency rate of return to Narodowy Bank Polski is approximately 30 years.

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

Figure 2. Frequency rate of return of banknotes in cycles



Source: study of Narodowy Bank Polski Cash and Issue Department.

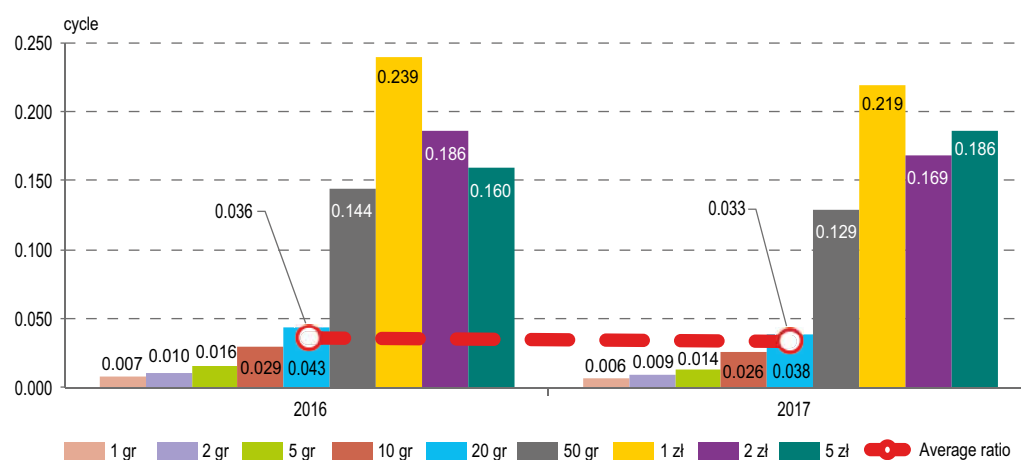
Note: for analytical purposes, source figures were rounded to one decimal place.

At the end of 2017, the frequency rate of return in cycles for all banknote denominations reached 1.0 (1.1 in 2016). As at the end of 2017, the frequency rate of return for individual banknote denominations varied. 50 zł and 20 zł denomination banknotes were recirculated to Narodowy Bank Polski most frequently. In 2016-2017, the frequency rate of return for the banknote with the face value of 50 zł significantly decreased – by 0.2. In the case of 20 zł denomination banknotes, in 2017 this ratio increased by 0.2 in relation to the previous year (Figure 2).

At the end of 2017, the frequency rate of return for all coin denominations amounted to 0.033 (Figure 3). The coin frequency rate of return in cycles maintained the downward tendency

(it amounted to 0.036 in 2016). Similar to banknotes, the frequency rate of return for individual coin denominations varied. As at the end of 2017, the following coins were most frequently recirculated to Narodowy Bank Polski: a coin with the face value of 1 zł (a ratio exceeded 0.2, which means that the coin was recirculated to Narodowy Bank Polski more or less every 5 years) and 5 zł and 2 zł coins (a ratio of almost 0.2, which means that the coin was recirculated to Narodowy Bank Polski more or less every 6 years). The overall coin recirculation rate was affected by low denomination coins, i.e. 1 gr, 2 gr and

Figure 3. Frequency rate of return of coins in cycles



Source: study of Narodowy Bank Polski Cash and Issue Department.

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

5 gr, which in practice were recirculated to Narodowy Bank Polski to a minor extent (according to calculations, approximately once every 113 years). It should be noted that in the case of coins with the face value of 10 gr and 20 gr, the value of the recirculation rate is more similar to the rate of coins from the group of low denominations, i.e. 5 gr rather than to the rate of coins with a higher denomination, i.e. 50 gr.

2.3. Cash and cashless means of payment

Cash and cashless means of payment parallel to the growth in the value of cash in circulation, the development of both cashless payment instruments and payment services is noted. Use of proximity cards and mobile payments is gaining popularity. In 2017, proximity cards were used in 69% of transactions performed with the use of payment cards, the number of which is growing systematically and in accordance with Narodowy Bank Polski estimates, in December 2017 it reached 31.1 million¹⁵. At the end of 2017, the number of transactions performed via the BLIK system¹⁶ amounted to 20.3 million and increased by 60% in relation to the first half of 2017.¹⁷

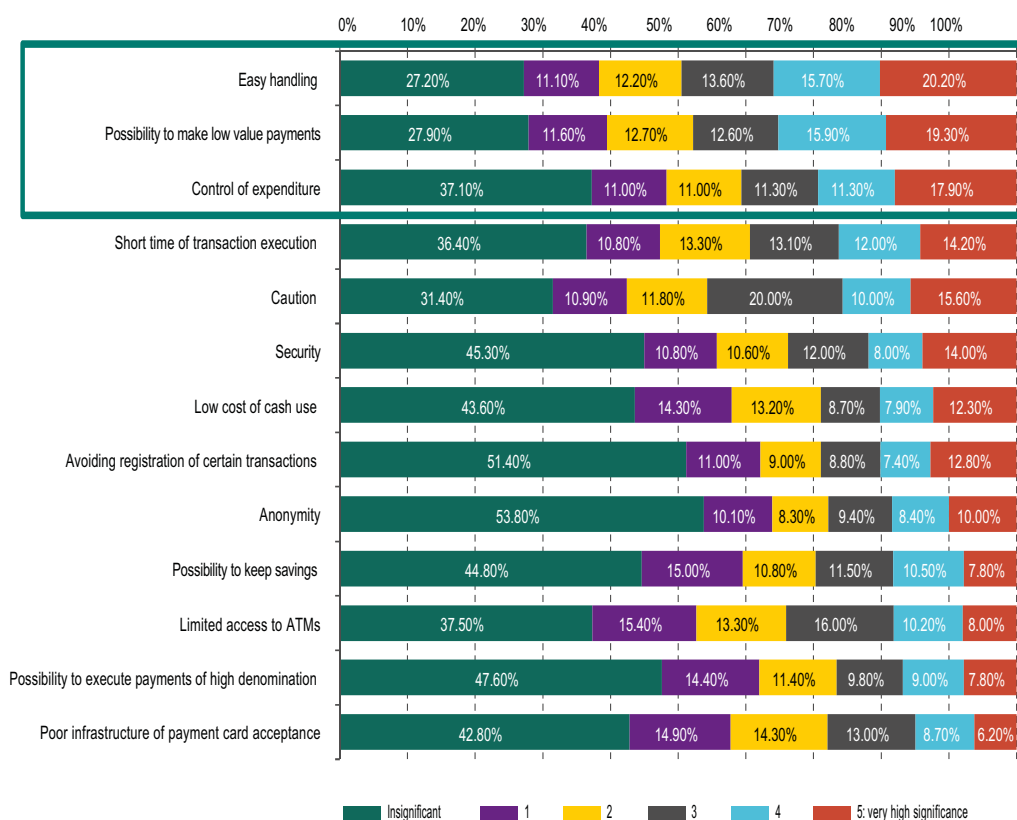
¹⁵ Assessment of the Polish payment system functioning in the second half of 2017, Narodowy Bank Polski Payment System Department, May 2018.

¹⁶ A system of mobile payments launched on the initiative of several banks, enabling smart phone owners to execute payments, transfers as well as cash contributions and withdrawals.

¹⁷ Assessment of the Polish payment system functioning in the second half of 2017, Narodowy Bank Polski Payment System Department, May 2018.

As demonstrated by questionnaire and logbook surveys conducted by Narodowy Bank Polski in 2016, cash remains a commonly used means of payment. The share of cash in the total value of transactions decreased in favour of payment cards and amounted to almost 41%.

Figure 4. Importance (significance) of reasons to use cash instead of other forms of payment



Source: Manikowski A., *Powody częstego wyboru gotówki przez Polaków – analiza wyników badań ankietowych i dziennikowych z 2016 r.* [Reasons for frequent selection of cash by Poles – analysis of questionnaire and logbook surveys of 2016], Narodowy Bank Polski; article originating from the scientific seminar held at Narodowy Bank Polski entitled “Research on factors influencing the cash circulation in Poland”, 13 December 2017.

However, it is still used for the execution of over a half of all transactions¹⁸. The following reasons justifying the selection of cash were indicated by respondents as most significant ones: easiness of handling such means of payment, possibility to perform low value transactions and easiness to control expenditure (see Figure 4).

The choice between cash and cashless forms of payment is associated with the age of consumers, education and access to various payment services. An example of a service gaining popularity over recent years, allowing payment card holders to acquire cash, is so-called cash back. In the second half of 2017, 7.7 million transactions of this type were

¹⁸ Manikowski A., *Powody częstego wyboru gotówki przez Polaków* [Reasons of frequent selection of cash by Poles – analysis of questionnaire and logbook surveys of 2016] op. cit.

recorded for the total amount of PLN 868.3 million. Compared to the second half of 2015, the number of such transactions increased by 76% and their value by as much as 80%.¹⁹

Common use of cash and confidence in Polish currency is associated with the limited scale of counterfeiting in Poland. The number of counterfeit Polish currency notes and coins disclosed in 2017 amounted to:

- 5,156 pieces of banknotes,
- 1,273 pieces of coins.

In 2017, the number of disclosed counterfeit Polish currency notes and coins decreased by 23.55%, as compared to 2016. The number of counterfeit banknotes and coins per million of currency pieces in circulation amounted to 1.91 pieces, having decreased by 0.77 pieces as compared to the previous year.

¹⁹Cash back is the service consisting in cash withdrawal while paying for shopping in a retail establishment by payment card, cf. Narodowy Bank Polski, *Assessment of the Polish payment system functioning in the second half of 2017*, op. cit.

Cash cycle models²⁰

Over recent decades, the role of central banks in the cash cycle has changed significantly. Traditionally, cash supply to the market, ensuring authenticity of coins and notes in circulation as well as withdrawing banknotes unfit for circulation from the market remain among the diverse tasks assigned to the central bank.

Throughout a long period of time, cash processing in central banks was performed manually. In the 1980s, central banks shifted to a semi-automatic system of cash processing and at the end of the 1990s, higher performance automatic devices were introduced. The growth in automation and reduction in the number of stages in cash processing also resulted in process optimisation.

Over recent years, central banks started to change their role in cash handling and re-define the scope of their involvement in the cash cycle. Some central banks decided to assign certain tasks and responsibilities to banks and external companies, i.e. to outsource cash-related activities. Such activities, in turn, affected the distribution of roles, tasks and responsibilities of cash cycle participants.

Organisations associated with the cash market in the country and worldwide undertook efforts aimed at classification of cash cycle models taking into consideration the premises mentioned above. In its document of 2013, the European Payments Council indicated four cash cycle models, depending on the scope of services in the cash cycle performed by the central bank and third parties, i.e.:

A. Centralised model. In this model, the central bank plays the main role in cash distribution in the country. Through its branches, it acts as the basic institution storing, issuing and accepting cash as well as processing cash. Examples of this model include solutions used in Germany, France, Portugal, Romania and Italy.

B. Joint-venture model. The central bank establishes a company, jointly with other entities, to deal with all aspects of the wholesale cash circulation. An example of the joint-venture model is Austria, where a dedicated solution based on public-private partnership was adopted. The partnership was established owing to the founding of an organisation responsible for the overall cash circulation in Austria. The central bank and Austrian banks cooperate as shareholders of Geldservice Austria (GSA) company founded in the mid-1990s. The main task of GSA is to process notes and coins. GSA also controls banknote stocks and manages them; moreover, it lodges surplus banknotes in the central bank. Banknotes are sorted in GSA. Those which are fit are recirculated whereas the remaining banknotes are destroyed by GSA under controlled conditions and the supervision of the central bank.

²⁰ Source: *Improving the efficiency of handling of cash – Cash Cycle Models*, 13 December 2013, European Payments Council.

C. Delegation model. The central bank delegates part of the tasks in the scope of cash handling to the commercial sector (banks, CIT companies), such as verification of authenticity, banknote and coin counting and sorting as well as their packaging. It also enables recirculation of such cash without the participation of the central bank. Solutions used, among others, in the United Kingdom, Finland, the Netherlands, Ireland and Hungary, are examples of such a model.

In the United Kingdom, a model of delegating tasks operates, which means that the central bank (Bank of England, BoE) assigned a part of its tasks to the commercial sector. In 1982, BoE introduced the notes held to order (NHTO) mechanism to enhance the effectiveness of banknote distribution management. The NHTO system enabled banks to sell banknote surpluses to the central bank with no need to transport them. In 2001, the role of BoE was limited as a result of delegating a greater scope of tasks to the commercial sector, i.e. the new Note Circulation Scheme (NCS) was introduced. In connection with the above, the number of cash centres and the number of cash transports was reduced. BoE only supplies new banknotes from the manufacturer to the market and destroys banknotes unfit for circulation. It practically does not participate in counting and sorting of cash. Distribution as well as sorting and storage of cash surpluses is handled by entities included in the NCS group, i.e. banks and CIT companies. Banks, ATM deployers and larger retailers are supplied with banknotes by one or more of the NCS members and among each other.

D. Transfer model. This model is based on an even greater delegation of tasks. In this model, providers of payment services are held accountable and are responsible for the costs of all tasks related to cash. The central bank is not involved in supplying cash. Banknotes and coins flow through the vaults of private companies, omitting the central bank. Norway and Sweden are examples of countries where the transfer model operates.

The cash cycle models defined by the European Payments Council are the most commonly encountered schemes of relations between cash market participants in Europe and worldwide. The choice and attempts to optimise the operation of the model depend largely on the particular country, in particular, on the organisation of the central bank, the number of market participants, legal regulations, and investment in the development of the cash cycle of the specific country. Consequently, a mixed model can be also found, as a combination of solutions derived from the above-mentioned models.

The European Payments Council classified the cash cycle in Poland as a centralised cash cycle model, where Narodowy Bank Polski plays the major role in the cash distribution process. However, taking into account the characteristics presented above as well as the fact that a part of cash is currently recirculated by banks or CIT companies acting on their behalf, the current cash cycle model in Poland can be defined as partially centralised.

Cash circulation market characteristics

4.1. Role of Narodowy Bank Polski in the cash cycle

The role of Narodowy Bank Polski in the cash cycle in Poland is defined in the Constitution of the Republic of Poland, the Banking Law Act and the Act on Narodowy Bank Polski. Pursuant to Article 227 of the Constitution, Narodowy Bank Polski is the central bank of the state and it has the exclusive right to issue banknotes and coins. Narodowy Bank Polski is also responsible for the value of Polish currency, its adequate quality in circulation and liquidity of cash settlements, putting banknotes and coins in the full denomination structure in circulation.

Narodowy Bank Polski activity in the scope of the cash cycle comprises orders for production of banknotes and coins placed at manufacturers, verification of authenticity and quality of banknotes and coins in circulation, their storage and distribution as well as destroying banknotes and notes unfit for circulation.

Supply of Polish currency to banks by Narodowy Bank Polski 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.

In accordance with Article 37 of the Act of 29 August 1997 on Narodowy Bank Polski, Narodowy Bank Polski arranges the management of banknotes and coins of the Republic of Poland. Narodowy Bank Polski performs its main tasks related to assuring the functioning of cash circulation in cooperation with banks. Pursuant to § 4 of Regulation No. 19/2016 of the President of Narodowy Bank Polski 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 Narodowy Bank Polski of 2018 item 14), Narodowy Bank Polski concludes and implements agreements defining the conditions of withdrawal and lodgement of banknotes and coins.

Banknotes and coins are put into circulation by Narodowy Bank Polski under standard, free-of-charge operations of supplying banks, pursuant to agreements:

- in the basic system used by all banks which concluded the agreement with Narodowy Bank Polski,
- in the deposit system used by some banks. Limits of amounts related to the storage of Narodowy Bank Polski deposits are set out with banks on an individual basis in agreements. Polish currency lodged as an Narodowy Bank Polski deposit is the property of Narodowy Bank Polski and it is stored in vault rooms of the bank's organisational unit, subject to the condition that the Narodowy Bank Polski deposit is adequately secured and separated from banknotes and coins owned by this bank.

Besides its operational function in the scope of supplying banknotes and coins to banks, Narodowy Bank Polski also fulfils regulatory functions and monitors the cash circulation market and acts as a catalyst of changes in the market. It is associated with the developments on the cash circulation market in Poland, expressed, among others, by a decline in the banknote recirculation rate, decrease in the number of banknotes lodged in Narodowy Bank Polski and the outsourcing of counting, sorting, packaging and labelling of banknote and coin packages by banks to CIT companies. This makes it difficult for the central bank to ensure adequate quality of banknotes on the cash circulation market. For those reasons, Narodowy Bank Polski introduced regulations defining the fitness criteria for banknotes as well as the requirements related to devices verifying the authenticity and fitness quality of banknotes.

Narodowy Bank Polski is also an active cash circulation participant. This engagement takes the form of a dialogue with market participants carried out by means of meetings and questionnaire surveys, consulting draft regulations and solutions and discussing developments in the cash cycle and related challenges for all its participants. Narodowy Bank Polski takes part in national and international conferences as well as meetings of working parties of the European Central Bank addressing the cash cycle.

4.2. Role of other participants in the cash cycle

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.

Narodowy Bank Polski, as the issuer of Polish currency, places orders with manufacturers for the production of banknotes and coins. Both Narodowy Bank Polski as well as banks and CIT companies are responsible for checking the authenticity and fitness quality of banknotes and coins for recirculation. Narodowy Bank Polski 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 (excluding cash stored as Narodowy Bank Polski deposit).

The outsourcing of activities associated with cash counting, sorting and packaging is a trend in the cash cycle market. Pursuant to Article 6a(1)(2) of the Act of 29 August 1997 – Banking Law, a bank may outsource the performance of activities related to, among others, counting, sorting, packaging and labelling of banknote and coin packages to an entrepreneur under an agreement concluded in writing.

Agreements with CIT companies concerning counting, sorting, packaging or the transport of cash are also concluded by other trading entities executing multiple cash payments, e.g. retailers or petrol stations. Tasks performed by key cash cycle participants are illustrated in table 6.

Retailers also play a significant role in the cash cycle market. The way they handle banknotes and coins at the stage of their packaging and lodging in banks or CIT companies affects the level of coin and banknote destruction and, consequently, their lifespan.

Table 6. Roles of individual cash cycle participants

	Manufacturers	Narodowy Bank Polski	Banks	CIT
Manufacture of banknotes and coins	X			
Cash storage		X	X	X*
Cash distribution		X	X	X**
Verification of authenticity and quality		X	X	X
Destruction of banknotes unfit for circulation		X		

Source: study of Narodowy Bank Polski Cash and Issue Department.

* Excluding Narodowy Bank Polski deposit.

** Cash distribution on behalf of banks.

4.3. Cash cycle scheme

The cash cycle scheme in Poland is presented in Chart 1. Banknotes and coins withdrawn from Narodowy Bank Polski regional branches by banks or CIT companies operating on behalf of banks go to cash centres of banks or CIT companies dealing with cash processing on behalf of banks, and subsequently to consumers via bank branches, ATM networks and retailers. Cash covers the opposite route, lodged in the central bank. The stream of banknotes and coins from consumers, via large retailers and customer-operated machines reaches banks' cash centres or CIT companies dealing with cash processing on behalf of banks. There it is divided into banknotes and coins fit for circulation and unfit for circulation. A part of the banknotes and coins deemed fit for circulation is used by cash centres to satisfy the needs reported by banks and their customers. The surplus of banknotes and coins fit for circulation and the banknotes and coins unfit for circulation are lodged in Narodowy Bank Polski.

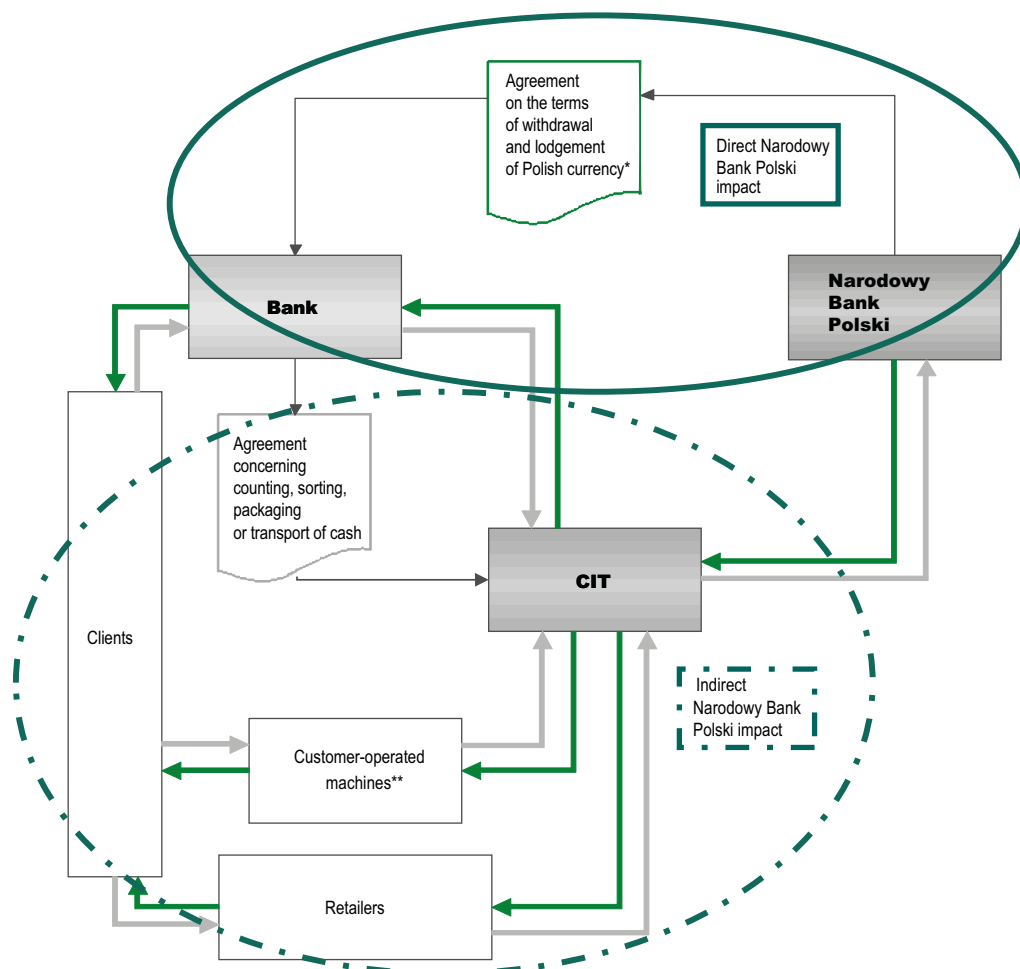
16 regional branches supplying Polish currency to banks operate within the organisational structure of Narodowy Bank Polski. Four of them act as supply centres for other regional branches of the central bank.

In agreements concluded by Narodowy Bank Polski with banks, the following terms are determined: security requirements, rules of participation in the SESCO system²¹ as well as the withdrawal and lodgement of Polish currency in the basic and deposit system and the method of settlement of cash discrepancies.

At the end of 2017, the number of concluded agreements was 35. As a result, Narodowy Bank Polski regional branches cooperated with approximately 400 organisational units of banks.

²¹The IT system administered by Narodowy Bank Polski, allowing the bank's organisational unit and Narodowy Bank Polski regional branch and the Cash and Issue Department to transfer or to receive messages. Its aim is to support the process of Polish currency supply to banks in the basic and deposit system and to ensure service of associated activities performed under agreements on the terms and conditions of the withdrawal and lodgement of Polish currency and the associated activities, concluded between Narodowy Bank Polski and banks.

Chart 1. Cash cycle in Poland



Source: study of Narodowy Bank Polski Cash and Issue Department.

* Basic and deposit system.

** Devices for withdrawal and depositing of cash.

Box 2. Changes in the cash cycle introduced pursuant to amended provisions of Regulation No 19/2016

Taking into account the optimisation and standardisation of cash processes, care for quality of banknotes and coins in circulation as well as ensuring the security of cash market participants, under the provisions of Regulation No 19/2016, Narodowy Bank Polski introduced systemic and technical changes, on the basis of a phased approach.

As of 1 July 2018, the following systemic changes apply:

- the obligation to verify the quality of banknotes recirculated by banks in accordance with specified criteria;

- banks' obligation to conduct tests of banknote processing machines at least once a year;
- banks' obligation to submit to Narodowy Bank Polski quarterly reporting of information containing, in particular, data concerning the following: types of devices, number of banknotes or coins counted, sorted and checked in terms of authenticity, number of banknotes recirculated, lodged in Narodowy Bank Polski and held in bank's (entrepreneur's) stocks; the reporting will enable verification of the scale of banknote and coin recycling and allow to identify the reasons of phenomena occurring on the cash cycle market, consequently enhancing the security of all its participants;
- enabling banknote multi-orientation sorting, i.e. piling of banknotes in a package¹ in any direction;
- enabling lodging of banknotes in Narodowy Bank Polski in one stream, i.e. collectively fit and unfit for circulation, with the obligation to separate banknotes unfit for automated sorting;
- enabling lodging of coins in Narodowy Bank Polski in bulk in bags, in one stream, i.e. collectively fit and unfit for circulation;
- standardisation of banknote packaging content (packages containing 20 thousand, 10 thousand or 5 thousand pcs of banknotes).

In the subsequent years, the following systemic requirements will apply:

- the necessity of counting, sorting and checking the authenticity of banknotes by means of devices (e.g. sorting machines) in the case of their assignment to customer operated machines (e.g. ATMs) – from 1 January 2020;
- the introduction of a 10-per cent limit for manual sorting of banknotes, their counting and checking in terms of authenticity – from 1 January 2021.

The form of implementation of the above-mentioned systemic requirements (i.e. adoption of technological solutions or change in processes) depends on commercial cash cycle participants.

In addition, in the provisions of Regulation No 19/2016, technical changes facilitating cash processes both on the part of Narodowy Bank Polski and other market participants were introduced.

In order to ensure smooth implementation of the mechanisms stipulated in the regulations by the market and prepare commercial cash cycle participants, a total of

¹ 100 pcs of banknotes of one denomination, arranged in any direction, on which a paper band is placed.

20 meetings with cash cycle participants were held in 2017 and in the first half of 2018. In parallel, besides group meetings with commercial cash cycle participants, Narodowy Bank Polski organised individual meetings, among others with representatives of banks and CIT companies.

In the framework of preparation for the implementation of the provisions of Regulation No 19/2016, in 2017 Q4 the central bank prepared and made available to commercial cash cycle participants the instructions concerning quarterly reporting and equipment tests and posted them on the Narodowy Bank Polsk website.

Cooperation with banks in the scope of supply of Polish currency

5.1. Withdrawing Polish currency from Narodowy Bank Polski by banks

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

- the basic system,
- the deposit system.

The value of banknotes and coins withdrawn by banks in 2017 was 6.7% lower than in 2016, whereas their number fell by 4.8% (Table 7).

Table 7. Value (PLN million) and number (million) of banknotes and coins withdrawn from Narodowy Bank Polski

Value or number	2016	2017	Change in numbers (col. 3 - col. 2)
1	2	3	4
Value	197,763.2	184,581.1	-13,182.1
Number	3,750.1	3,571.3	-178.8

Source: study of Narodowy Bank Polski Cash and Issue Department.

Note: for analytical purposes, figures were rounded to one decimal place.

Table 8. Number of banks whose total share in the value or number of banknotes or coins withdrawn from Narodowy Bank Polski reached at least 80%

Value or number	Banknotes, coins	2016		2017	
		Total share	Number of banks	Total share	Number of banks
1	2	3	4	5	6
Value	banknotes and coins	83.2%	5	83.7%	5
	banknotes	83.4%	5	83.9%	5
	coins	86.8%	7	84.2%	6
Number	banknotes and coins	89.0%	8	82.8%	7
	banknotes	80.4%	5	81.0%	5
	coins	89.8%	7	86.1%	6

Source: study of Narodowy Bank Polski Cash and Issue Department.

Note: for analytical purposes, figures were rounded to one decimal place.

Among all banks supplied with cash by Narodowy Bank Polski, a group of so-called key banks can be distinguished, consisting of 5-8 banks generating over 80% of banknote and coin withdrawals in terms of their value and number (Table 8).

5.1.1. Banknotes

The value of banknotes withdrawn by banks in 2017 was 6.7% lower than in 2016, whereas their number fell by 7.2% (Table 9).

Table 9. Value (PLN million) and number (million) of banknotes withdrawn from Narodowy Bank Polski

Value or number	2016	2017	Change in numbers (col. 3 - col. 2)
1	2	3	4
Value	196,854.5	183,763.4	-13,091.1
Number	2,208.8	2,049.5	-159.2

Source: study of Narodowy Bank Polski Cash and Issue Department.

Note: for analytical purposes, figures were rounded to one decimal place.

While analysing the denomination structure of banknote withdrawals in 2017, it should be pointed out that the highest share in banknote withdrawals, both in terms of value and number, was recorded in the case of the 100 zł denomination banknote. In 2016, it was also the banknote most frequently withdrawn from Narodowy Bank Polski. In 2017, in numerical terms, banknotes with the face value of 10 zł and 500 zł were withdrawn least frequently (Table 10).

Table 10. Value (PLN million) and number (million) of banknotes withdrawn from Narodowy Bank Polski by banks in 2017

Denomination	Value		Number		Structure by value		Structure by number	
	2016	2017	2016	2017	2016	2017	2016	2017
1	2	3	4	5	6	7	8	9
500 zł	0.0	3,897.0	0.0	7.8	0.0%	2.1%	0.0%	0.4%
200 zł	43,440.3	43,038.3	217.2	215.2	22.1%	23.4%	9.8%	10.5%
100 zł	128,372.6	112,836.4	1,283.7	1,128.3	65.2%	61.4%	58.1%	55.1%
50 zł	20,729.8	19,133.9	414.6	382.7	10.5%	10.4%	18.8%	18.7%
20 zł	2,758.4	3,405.9	137.9	170.3	1.4%	1.9%	6.2%	8.3%
10 zł	1,553.4	1,451.9	155.4	145.2	0.8%	0.8%	7.0%	7.1%
Total	196,854.5	183,763.4	2,208.8	2,049.5	100.0%	100.0%	100.0%	100.0%

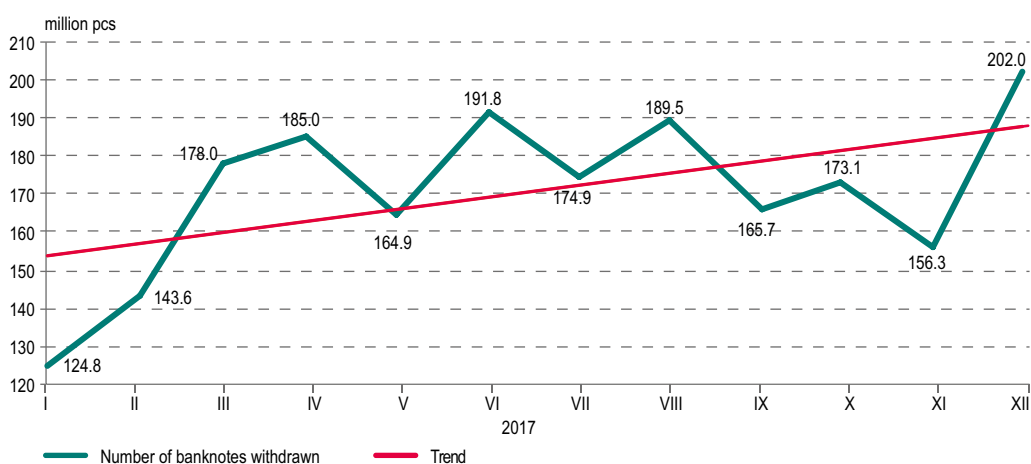
Source: study of Narodowy Bank Polski Cash and Issue Department.

Note: for analytical purposes, figures were rounded to one decimal place.

In 2017, both the value and the number of withdrawals decreased compared to 2016 for the following denominations: 200 zł, 100 zł, 50 zł, 10 zł (in the case of the value of withdrawals, respectively by PLN 402.0 million, PLN 15,536.2 million, PLN 1,595.9 million, and PLN 101.5 million, and in the case of the number of withdrawals, respectively by 2.0 million pcs, 155.4 million pcs, 31.9 million pcs, and 10.2 million pcs). The value and the number of withdrawals for 20 zł denomination banknotes increased by PLN 647.5 million and 32.4 million pcs, respectively, compared to 2016.

The number of banknotes withdrawn from Narodowy Bank Polski by banks grew in consecutive months of 2017. The lowest number of banknotes was withdrawn in January (124.8 million pcs), and the highest in December (202.0 million pcs) (Figure 5).

Figure 5. Number of banknotes withdrawn from Narodowy Bank Polski by banks in 2017 (million pcs)



Source: study of Narodowy Bank Polski Cash and Issue Department.

Note: for analytical purposes, figures were rounded to one decimal place.

5.1.2. Coins

The value of coins withdrawn by banks in 2017 was 10.0% lower than in 2016, whereas their number fell by 1.3% (Table 11).

Table 11. Value (PLN million) and number (million) of coins withdrawn from Narodowy Bank Polski, including withdrawal systems

Value or number	2016	2017	Change in numbers (col. 3 - col. 2)
1	2	3	4
Value	908.7	817.7	-91.0
Number	1,541.3	1,521.8	-19.5

Source: study of Narodowy Bank Polski Cash and Issue Department.

Note: for analytical purposes, figures were rounded to one decimal place.

While analysing the denomination structure of coin withdrawals in 2017, it should be pointed out that the highest share in coin withdrawals, in terms of number, was recorded in the case of 1 gr denomination coins. In 2016, 1 gr denomination coins were also most frequently withdrawn from Narodowy Bank Polski. In numerical terms, both in 2017 and in 2016, 5 zł denomination coins were withdrawn least frequently (Table 12).

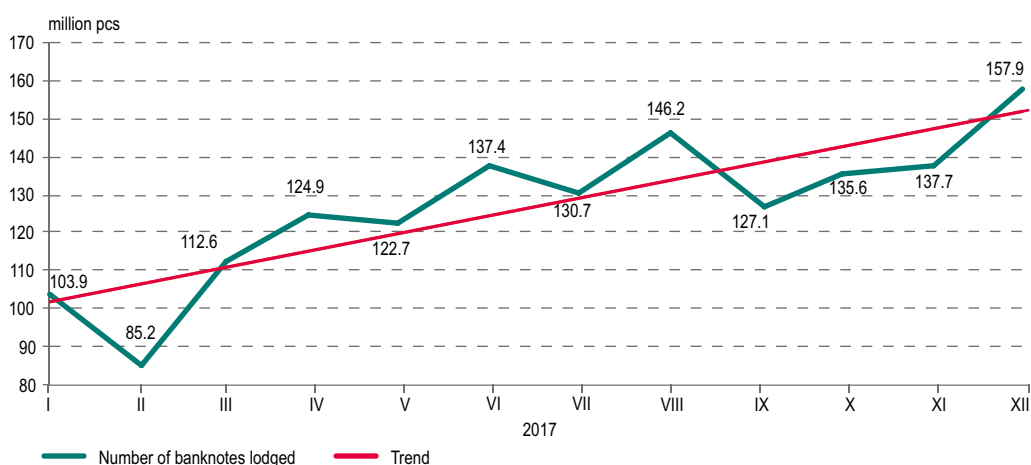
Table 12. Value, number and structure of coins withdrawn from Narodowy Bank Polski (in million)

Denomination	Value		Number		Structure by value		Structure by number	
	2016	2017	2016	2017	2016	2017	2016	2017
1	2	3	4	5	6	7	8	9
5 zł	358.4	279.2	71.7	55.8	39.4%	34.1%	4.7%	3.7%
2 zł	285.4	272.3	142.7	136.1	31.4%	33.3%	9.3%	8.9%
1 zł	148.3	150.7	148.3	150.7	16.3%	18.4%	9.6%	9.9%
50 gr	56.9	55.9	113.8	111.8	6.3%	6.8%	7.4%	7.3%
20 gr	25.3	24.7	126.3	123.6	2.8%	3.0%	8.2%	8.1%
10 gr	18.8	19.4	187.7	193.9	2.1%	2.4%	12.2%	12.7%
5 gr	8.0	7.8	159.3	156.6	0.9%	1.0%	10.3%	10.3%
2 gr	3.6	3.5	180.5	176.1	0.4%	0.4%	11.7%	11.6%
1 gr	4.1	4.2	411.0	417.0	0.5%	0.5%	26.7%	27.4%
Total	908.7	817.7	1 541.3	1 521.8	100.00%	100.00%	100.00%	100.00%

Source: study of Narodowy Bank Polski Cash and Issue Department.

Note: for analytical purposes, figures were rounded to one decimal place.

Figure 6. Number of coins withdrawn from Narodowy Bank Polski by banks in 2017 (million pcs)



Source: study of Narodowy Bank Polski Cash and Issue Department.

Note: for analytical purposes, figures were rounded to one decimal place.

In 2017, both the value and the number of withdrawals increased compared to 2016 for the following coin denominations: 1 zł, 10 gr and 1 gr. The value of withdrawals increased, respectively, by PLN 2.4 million, PLN 0.6 million, and PLN 0.1 million, and their number, respectively, by 2.4 million pcs, 6.2 million pcs, and 6.0 million pcs. On the other hand, in the case of other denominations, a decline in the value and number of withdrawals was recorded. The highest decline was in the case of 5 zł denomination coins; the value of their withdrawals decreased by PLN 79.2 million, i.e. by 15.9 million pcs.

The number of coins withdrawn from Narodowy Bank Polski by banks increased in the consecutive months of 2017. The lowest number of coins was withdrawn by banks in February (85.2 million pcs) and the highest in December (157.9 million pcs) (Figure 6).

5.2. Lodging Polish currency in Narodowy Bank Polski by banks

In accordance with the provisions of Regulation No 19/2016, until 30 June 2018, banks lodged in Narodowy Bank Polski:

- banknotes in three streams as:
 - banknotes fit for circulation (circulation banknotes),
 - banknotes unfit for circulation (non-circulation banknotes), i.e. banknotes which were not eligible as banknotes fit for circulation due to the level of wear and tear (e.g. stains, discolouring, tears),
 - banknotes unfit for automated sorting, i.e. banknotes fixed with tape, glue or otherwise, torn, stapled or broken;
- coins in two streams as:
 - fit for circulation (circulation coins),
 - unfit for circulation (non-circulation coins), i.e. coins with mechanical type of damage, worn, with changed colour, corroded, or damaged due to fixing a permanent label, drawing or other sign thereon.

Since 1 July 2018, banks have been lodging in Narodowy Bank Polski:

- Banknotes in one stream (without classification into fit and unfit for circulation), whereas banknotes unfit for automated sorting are separated.

The fitness criteria for banknotes, contained in Regulation No 19/2016 define the detailed method of their verification during counting and sorting manually or by means of devices, by indicating measurable parameters of damage, including the description. This allows to assess whether a banknote is damaged or fit for circulation.

- Coins in one stream (without classification into fit and unfit for circulation), with the same face value, in bulk, in bags.

Table 13. Total value and number of banknotes and coins lodged in Narodowy Bank Polski – with breakdown into fit and unfit for circulation (in million)

Value or number	Type	2016	2017	Change in numbers (col. 4 - col. 3)
1	2	3	4	5
Value	fit for circulation	169,213.3	168,783.1	-430.3
	unfit for circulation	4,166.0	4,618.2	452.2
	total	173,379.4	173,401.3	22.0
Number	fit for circulation	2,474.3	2,412.3	-62.0
	unfit for circulation	117.4	126.7	9.3
	total	2,591.7	2,539.0	-52.8

Source: study of Narodowy Bank Polski Cash and Issue Department.

Note: for analytical purposes, figures were rounded to one decimal place.

In terms of value, the share of banknotes and coins fit for circulations lodged in Narodowy Bank Polski in 2017 amounted to 97.3% and was 0.3 percentage points lower than in 2016 (Table 13).

The number of banknotes and coins fit for circulation and unfit for circulation lodged by banks in Narodowy Bank Polski in 2017 was 2.0% lower than in 2016. In numerical terms, in 2017, the share of banknotes and coins fit for circulation amounted to 95.0% and was 0.5 percentage points lower than in 2016.

In 2017, a group of 7-9 banks lodged over 80% of banknotes and coins in Narodowy Bank Polski – both in terms of number and value. The composition of this group did not change during the year (Table 14).

Table 14. Number of banks whose total share in the value or number of banknotes or coins lodged in Narodowy Bank Polski reached at least 80%

Value or number	Banknotes, coins	2016		2017	
		Total share	Number of banks	Total share	Number of banks
1	2	3	4	5	6
Value	banknotes and coins	87.2%	8	85.8%	7
	banknotes	87.3%	8	86.0%	7
	coins	86.4%	9	86.6%	8
Number	banknotes and coins	87.3%	10	86.1%	9
	banknotes	85.8%	8	84.4%	7
	coins	90.5%	9	86.6%	8

Source: study of Narodowy Bank Polski Cash and Issue Department.

Note: for analytical purposes, figures were rounded to one decimal place.

5.2.1. Banknotes

In terms of value, the share of banknotes lodged in Narodowy Bank Polski in 2017 was as follows:

- banknotes fit for circulation made up 97.3% of all banknotes lodged,
- banknotes unfit for circulation made Narodowy Bank Polski up 2.7% of all banknotes lodged, including banknotes unfit for automated sorting, which constituted 0.1% of all banknotes lodged (Table 15).

Table 15. Value of banknotes lodged in Narodowy Bank Polski by banks in 2017

Denomination	Fit for circulation	Unfit for circulation	Unfit for automated sorting	col. 3+4	Total banknotes lodged in Narodowy Bank Polski col. 2+5
1	2	3	4	5	6
500 zł	521,250,000	0	105,500	105,500	521,355,500
200 zł	38,302,000,000	186,200,000	34,697,200	220,897,200	38,522,897,200
100 zł	107,889,250,000	1,913,500,000	110,161,800	2,023,661,800	109,912,911,800
50 zł	17,859,125,000	1,185,700,000	57,905,450	1,243,605,450	19,102,730,450
20 zł	2,544,560,000	659,200,000	12,171,320	671,371,320	3,215,931,320
10 zł	985,320,000	446,870,000	10,430,940	457,300,940	1,442,620,940
Total	168,101,505,000	4,391,470,000	225,472,210	4,616,942,210	172,718,447,210

Source: study of Narodowy Bank Polski Cash and Issue Department.

Table 16. Number of banknotes lodged in Narodowy Bank Polski by banks in 2017

Denomination	Fit for circulation	Unfit for circulation	Unfit for automated sorting	col. 3+4	Total banknotes lodged in Narodowy Bank Polski col. 2+5
1	2	3	4	5	6
500 zł	1,042,500	0	211	211	1,042,711
200 zł	191,510,000	931,000	173,486	1,104,486	192,614,486
100 zł	1,078,892,500	19,135,000	1,101,618	20,236,618	1,099,129,118
50 zł	357,182,500	23,714,000	1,158,109	24,872,109	382,054,609
20 zł	127,228,000	32,960,000	608,566	33,568,566	160,796,566
10 zł	98,532,000	44,687,000	1,043,094	45,730,094	144,262,094
Total	1,854,387,500	121,427,000	4,085,084	125,512,084	1,979,899,584

Source: study of Narodowy Bank Polski Cash and Issue Department.

In terms of number, the share of banknotes lodged in Narodowy Bank Polski in 2017 was as follows:

- banknotes fit for circulation – 93.7% of all banknotes lodged,
- banknotes unfit for circulation – 6.3% of all banknotes lodged, including 0.2% of banknotes unfit for automated sorting (Table 16).

In terms of value, in 2017 banks lodged a lower amount of banknotes fit for circulation than in the previous year (by 0.3%) and more banknotes unfit for circulation (by 10.9%) (Table 17).

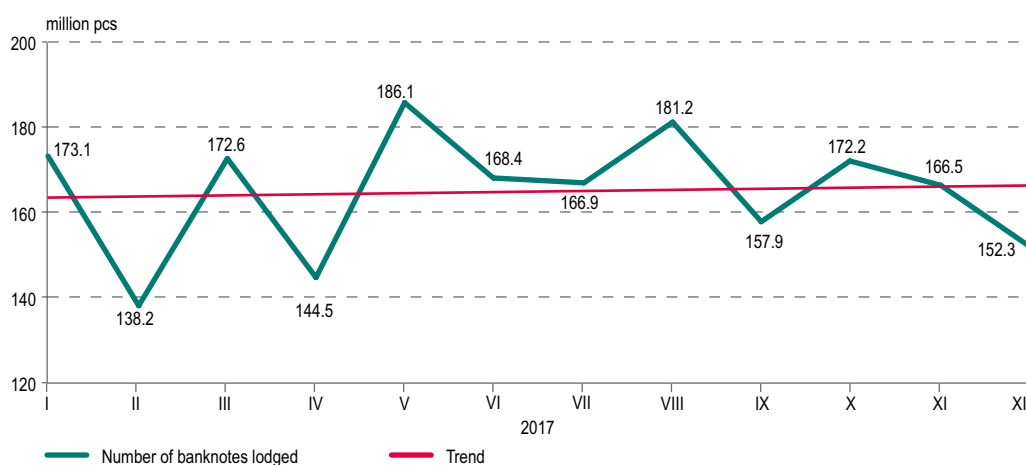
Table 17. Value and number of banknotes lodged in Narodowy Bank Polski, taking into account banknotes fit and unfit for circulation (in million)

Value or number	Type	2016	2017	Change in numbers (col. 4 - col. 3)
1	2	3	4	5
Value	fit for circulation	168,564.1	168,101.5	-462.6
	unfit for circulation	4,164.1	4,616.9	452.8
	total	172,728.2	172,718.4	-9.8
Number	fit for circulation	1,900.0	1,854.4	-45.6
	unfit for circulation	115.8	125.5	9.7
	total	2,015.8	1,979.9	-35.9

Source: study of Narodowy Bank Polski Cash and Issue Department.

Note: for analytical purposes, figures were rounded to one decimal place.

Figure 7. Number of banknotes lodged in Narodowy Bank Polski by banks in 2017 (million pcs)



Source: study of Narodowy Bank Polski Cash and Issue Department.

Note: for analytical purposes, figures were rounded to one decimal place.

Table 18. Value and number and structure of banknotes lodged in Narodowy Bank Polski in 2016 and 2017 – by denomination (in million)

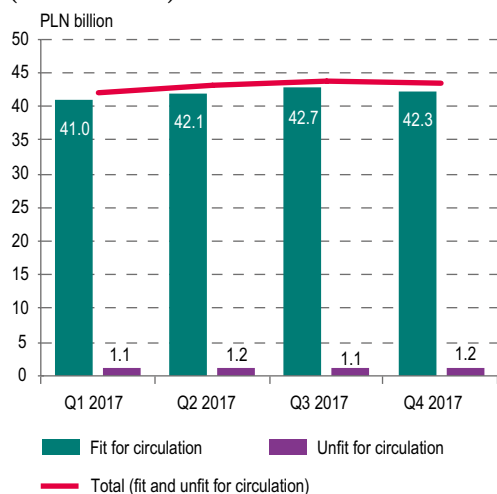
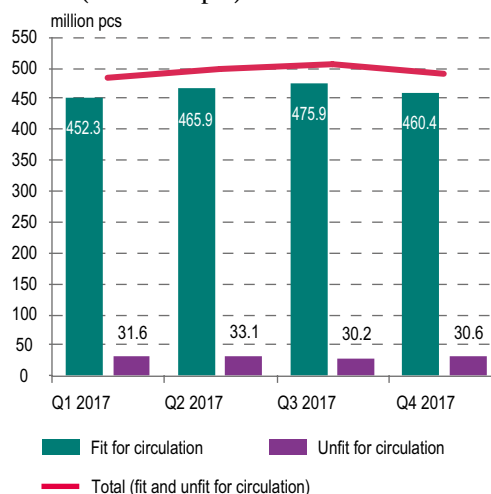
Denomination	Value		Number		Structure by value		Structure by number	
	2016	2017	2016	2017	2016	2017	2016	2017
1	2	3	4	5	6	7	8	9
500 zł	0.0	521.4	0.0	1.0	0.0%	0.3%	0.0%	0.1%
200 zł	32,302.2	38,522.9	161.5	192.6	18.7%	22.3%	8.0%	9.7%
100 zł	115,185.7	109,912.9	1,151.9	1,099.1	66.7%	63.6%	57.1%	55.5%
50 zł	21,180.6	19,102.7	423.6	382.1	12.3%	11.1%	21.0%	19.3%
20 zł	2,543.9	3,215.9	127.2	160.8	1.5%	1.9%	6.3%	8.1%
10 zł	1,515.9	1,442.6	151.6	144.3	0.9%	0.8%	7.5%	7.3%
Total	172,728.2	172,718.4	2,015.8	1,979.9	100.0%	100.0%	100.0%	100.0%

Source: study of Narodowy Bank Polski Cash and Issue Department.

Note: for analytical purposes, figures were rounded to one decimal place.

In terms of number, in 2017, banks lodged fewer banknotes fit for circulation than in the year before (by 2.4%) and more banknotes unfit for circulation (by 8.4%).

While analysing the number of banknotes lodged in Narodowy Bank Polski by banks in consecutive months of 2017, a weak growth trend was observed. Banks lodged the lowest number of banknotes in February (138.2 million pcs) and the highest number in May (186.1 million pcs) (Figure 7).

Figure 8. Value of banknotes fit and unfit for circulation lodged in Narodowy Bank Polski (in PLN billion)

Figure 9. Number of banknotes fit and unfit for circulation lodged in Narodowy Bank Polski (in million pcs)


Source: study of Narodowy Bank Polski Cash and Issue Department.

Note: for analytical purposes, figures were rounded to one decimal place.

100 zł denomination banknotes represent the highest number of banknotes fit and unfit for circulation lodged in Narodowy Bank Polski, whereas the number of lodged 500 zł and 10 zł denomination banknotes was the lowest (Table 18).

In 2017 Q4, the value of lodged banknotes fit for circulation increased compared to 2017 Q1 by 3.2%, and in the case of banknotes unfit for circulation by 9.1% (Figure 8).

The number of lodged banknotes fit for circulation increased over the first three quarters of 2017, while in the last quarter it decreased. In 2017 Q4, banks lodged 1.8% more banknotes fit for circulation in Narodowy Bank Polski than in 2017 Q1. At the same time, the number of banknotes unfit for circulation lodged in Narodowy Bank Polski dropped by 3.2% (Figure 9).

5.2.2. Coins

In 2017, the value of coins lodged by banks increased by PLN 31.7 million, i.e. by 4.9% compared to 2016.

In terms of value and number, the share of coins lodged in Narodowy Bank Polski in 2017 remained at the same level, whereas in terms of quality:

- coins fit for circulation made up 99.8% of all coins lodged,
- coins unfit for circulation made up 0.2% of all coins lodged.

In terms of value, in 2017 banks lodged 5.0% more coins fit for circulation in Narodowy Bank Polski than in the previous year and 31.6% less coins unfit for circulation (Table 19).

The number of lodged coins fit and unfit for circulation in 2017 was 2.9% lower than in 2016. In 2017, banks lodged 2.9% fewer coins fit for circulation and 29.4% fewer coins unfit for circulation than in the previous year (Table 19).

Table 19. Value and number of coins lodged in Narodowy Bank Polski in 2016-2017 with breakdown into fit for circulation and unfit for circulation (in million)

Value or number	Type	2016	2017	Change in numbers (col. 4 - col. 3)
1	2	3	4	5
Value	fit for circulation	649.3	681.6	32.3
	unfit for circulation	1.9	1.3	-0.6
	total	651.2	682.9	31.7
Number	fit for circulation	574.3	557.9	-16.4
	unfit for circulation	1.7	1.2	-0.5
	total	576.0	559.1	-16.9

Source: study of NBP Cash and Issue Department.

Note: for analytical purposes, figures were rounded to one decimal place.

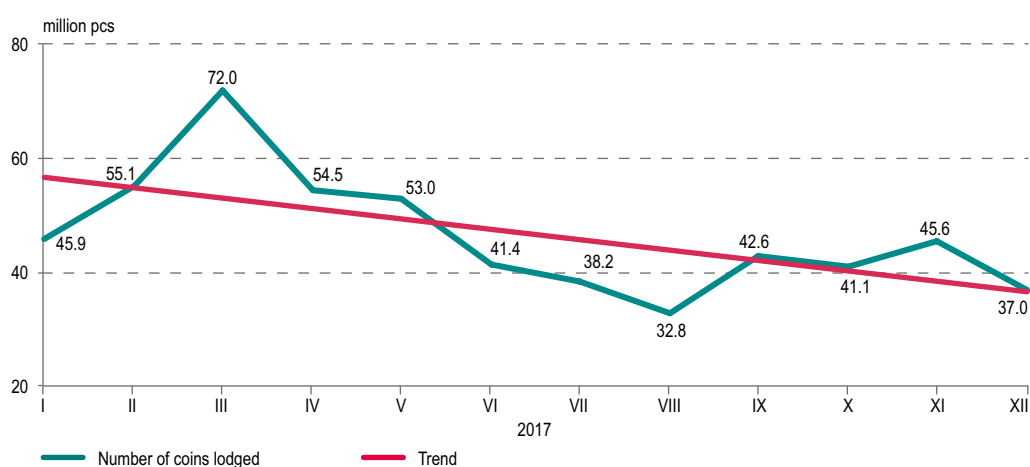
Table 20. Value and number of coins lodged in Narodowy Bank Polski in 2016-2017 (in million)

Denomination	Value		Number		Structure by value		Structure by number	
	2016	2017	2016	2017	2016	2017	2016	2017
1	2	3	4	5	6	7	8	9
5 zł	241.5	290.3	48.3	58.1	37.1%	42.5%	8.4%	10.4%
2 zł	230.8	219.7	115.4	109.8	35.5%	32.2%	20.0%	19.6%
1 zł	121.0	117.9	121.0	117.9	18.6%	17.3%	21.0%	21.1%
50 gr	39.4	37.7	78.7	75.4	6.0%	5.5%	13.7%	13.5%
20 gr	10.1	9.5	50.5	47.6	1.6%	1.4%	8.8%	8.5%
10 gr	5.8	5.4	57.8	54.5	0.9%	0.8%	10.0%	9.7%
5 gr	1.6	1.4	31.9	28.9	0.2%	0.2%	5.5%	5.2%
2 gr	0.6	0.6	28.1	27.6	0.1%	0.1%	4.9%	4.9%
1 gr	0.4	0.4	44.3	39.3	0.07%	0.06%	7.7%	7.0%
Total	651.2	682.9	576.0	559.1	100.0%	100.0%	100.0%	100.0%

Source: study of Narodowy Bank Polski Cash and Issue Department.

Note: for analytical purposes, figures were rounded to one decimal place.

In the structure of lodged coins in terms of value, as in 2016, the highest share was recorded in the case of 1 zł, 2 zł and 5 zł denomination coins (92.0% of all coins lodged). In terms of the number of coins lodged in Narodowy Bank Polski, the following denominations predominated: 50 gr, 1 zł and 2 zł (54.2% of all coins lodged). In terms of number and value, in 2017, the lowest levels of lodged coins were recorded for low denominations, i.e. 1 gr, 2 gr and 5 gr: 0.36% and 17.1%, respectively, of all coins lodged (Table 20).

Figure 10. Number of coins lodged in Narodowy Bank Polski by banks in 2017 (million pcs)


Source: study of Narodowy Bank Polski Cash and Issue Department.

Note: for analytical purposes, figures were rounded to one decimal place.

In 2017 Q4, the value of coins lodged in Narodowy Bank Polski fit for circulation decreased compared to 2017 Q1 by 8.2%, and in the case of coins unfit for circulation by 87.5% (Figure 11).

In 2017 Q4, the number of coins lodged by banks also decreased compared to 2017 Q1 (by 28.4% for coins fit for circulation and by 60.0% for coins unfit for circulation) (Figure 12).

Figure 11. Value of coins fit and unfit for circulation lodged in Narodowy Bank Polski (in PLN million)

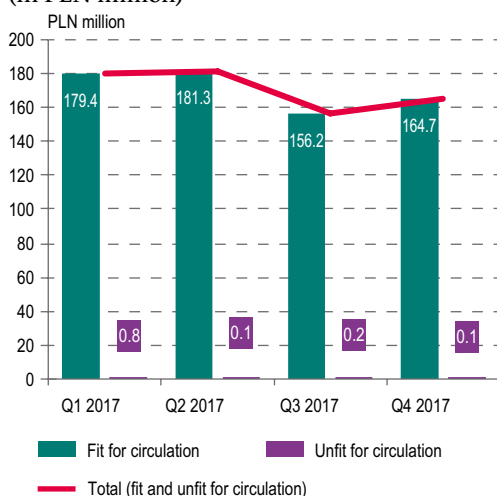
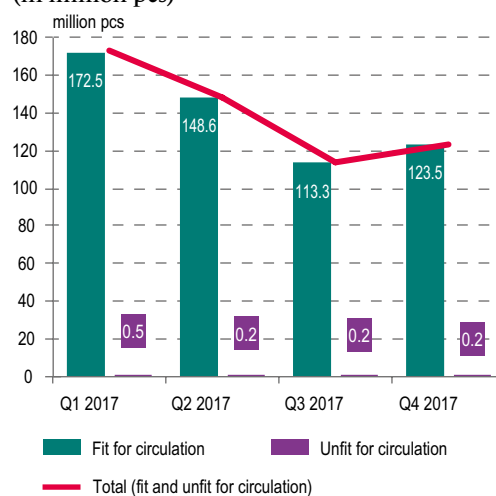


Figure 12. Number of coins fit and unfit for circulation lodged in Narodowy Bank Polski (in million pcs)



Source: study of Narodowy Bank Polski Cash and Issue Department.

Note: for analytical purposes, figures were rounded to one decimal place.

Box 3. Trends in supplying Polish currency to banks in 2013-2017

1. Banknote and coin withdrawal

In 2013-2017, the number of banknotes withdrawn from Narodowy Bank Polski decreased year by year. In 2017, banks withdrew 15.3% fewer banknotes from Narodowy Bank Polski than in 2013.

In the case of the number of coins withdrawn from Narodowy Bank Polski in the same period, an opposite tendency was observed – in 2017 banks withdrew 13.0% more coins than in 2013. Only compared to 2016, was a decline in the number of coins withdrawn (by 19.6 million pcs) recorded (Table 1).

Table 1. Banknote and coin withdrawals in 2013-2017

Banknotes/coins	2013	2014	2015	2016	2017
Banknotes (number)	2,419,320,000	2,367,260,000	2,278,663,000	2,208,782,500	2,049,518,500
Coins (number)	1,346,935,000	1,432,784,500	1,500,368,000	1,541,346,500	1,521,794,500
Banknotes (change)	3.2%	-2.2%	-3.7%	-3.1%	-7.2%
Coins (change)	5.3%	6.4%	4.7%	2.7%	-1.3%

Source: study of Narodowy Bank Polski Cash and Issue Department.

2. Banknote and coin lodgements

In 2013-2017, the number of banknotes and coins lodged in Narodowy Bank Polski decreased year by year. In 2017, banks lodged 13.9% fewer banknotes in Narodowy Bank Polski than in 2013. The share of banknotes unfit for circulation in the total number of banknotes lodged in Narodowy Bank Polski was stable and amounted to 6.1% on average.

In the case of the number of coins lodged in Narodowy Bank Polski in this period, a 7.2% decline was recorded. The share of coins unfit for circulation in the total number of coins lodged in Narodowy Bank Polski remained at the same level, except in 2016. In that period, a slight increase in the number of coins unfit for circulation lodged in Narodowy Bank Polski was recorded (by 666,863 pcs in relation to the previous year) (Table 2).

Table 2. Banknote and coin lodgements in Narodowy Bank Polski in 2013-2017

Banknotes/coins	2013			2014		
	Fit for circulation	Unfit for circulation	Total	Fit for circulation	Unfit for circulation	Total
Banknotes (number)	2,129,893,000	170,413,900	2,300,306,900	2,082,421,550	124,966,600	2,207,388,150
Coins (number)	601,003,500	1,475,650	602,479,150	590,426,700	978,248	591,404,948
Banknotes (share)	92.6%	7.4%	100.0%	94.3%	5.7%	100.0%
Coins (share)	99.8%	0.2%	100.0%	99.8%	0.2%	100.0%
Banknotes (change)	0.4%	-14.4%	-0.9%	-2.2%	-26.7%	-4.0%
Coins (change)	22.9%	37.2%	22.9%	-1.8%	-33.7%	-1.8%

Source: study of Narodowy Bank Polski Cash and Issue Department.

Table 2. Banknote and coin lodgements in Narodowy Bank Polski in 2013-2017, cont.

Banknotes/coins	2015			2016		
	Fit for circulation	Unfit for circulation	Total	Fit for circulation	Unfit for circulation	Total
Banknotes (number)	1,994,487,500	109,693,400	2,104,180,900	1,900,008,717	115,750,400	2,015,759,117
Coins (number)	581,898,550	1,017,487	582,916,037	574,287,005	1,680,350	575,967,355
Banknotes (share)	94.8%	5.2%	100.0%	94.3%	5.7%	100.0%
Coins (share)	99.8%	0.2%	100.0%	99.7%	0.3%	100.0%
Banknotes (change)	-4.2%	-12.2%	-4.7%	-4.7%	5.5%	-4.2%
Coins (change)	-1.4%	4.0%	-1.4%	-1.3%	65.1%	-1.2%

Banknotes/coins	2017		
	Fit for circulation	Unfit for circulation	Total
Banknotes (number)	1,854,387,500	125,512,084	1,979,899,584
Coins (number)	557,891,500	1,170,618	559,062,118
Banknotes (share)	93.7%	6.3%	100.0%
Coins (share)	99.8%	0.2%	100.0%
Banknotes (change)	-2.4%	8.4%	-1.8%
Coins (change)	-2.9%	-30.3%	-2.9%

Source: study of Narodowy Bank Polski Cash and Issue Department.

3. Banknote and coin circulation structure

In 2013-2017, an increase in the number of banknotes and coins in circulation was observed. In the denomination structure, the 100 zł denomination banknote was predominant. Its share in circulation in 2013-2016 increased successively (to 59.5% in 2013, 60.8% in 2014, 62.2% in 2015, and 62.6% in 2016); only in 2017, was a slight decline recorded – to 61.6%. In 2017, the share of the 200 zł denomination banknote significantly increased compared to 2013 (by 3.6 percentage points). At the same time, it was observed that the share of the 50 zł denomination banknote in the structure of circulation decreased (from 14% in 2013 to 9.5% in 2017). In the case of 20 zł and 10 zł denomination banknotes, only a slight decline of their share was observed (Table 3). On the other hand, the share of individual denominations of coins is stable.

Table 3. Banknote and coin circulation structure in 2013-2017

Status as at end of year	Banknotes								
	Number in million pcs							Banknotes total	Value (PLN million)
	500 zł	200 zł	100 zł	50 zł	20 zł	10 zł			
2012		121.5	741.3	176.0	80.4	133.4	1,252.5	110,164.6	
2013		141.5	815.6	189.8	82.9	141.2	1,371.1	122,428.9	
2014		163.5	931.2	196.5	89.8	149.4	1,530.3	138,932.5	
2015		196.4	1,062.6	197.6	98.8	153.6	1,708.9	158,921.7	
2016		252.4	1,192.5	187.9	112.0	161.4	1,906.2	182,975.2	
2017	7.2	274.6	1,218.9	188.0	123.7	166.4	1,978.7	193,950.2	

Banknotes	Coin												Banknotes and coins
	Number in million pcs											Value (PLN million)	
	5 zł	2 zł	2 zł NG	1 zł	50 gr	20 gr	10 gr	5 gr	2 gr	1 gr	Coins, total		
2012	212.6	296.8	217.9	411.1	444.4	959.9	1,568.4	1,647.7	2,323.6	4,686.4	12,768.8	3,250.1	113,414.6
2013	229.5	311.8	230.3	435.1	468.4	1,004.5	1,670.7	1,729.9	2,455.2	5,039.4	13,574.7	3,454.9	125,883.8
2014	256.2	335.7	237.0	464.4	498.2	1,064.9	1,780.8	1,835.6	2,596.7	5,411.3	14,480.6	3,728.5	142,661.0
2015	287.2	366.8	238.4	491.3	531.1	1,134.3	1,902.1	1,949.5	2,737.2	5,774.2	15,412.1	4,030.2	162,951.9
2016	314.1	398.2	239.1	523.1	567.2	1,210.1	2,031.5	2,073.8	2,886.0	6,134.7	16,377.8	4,319.8	187,295.0
2017	314.5	428.4	239.3	559.6	604.4	1,286.2	2,170.3	2,198.7	3,031.3	6,506.6	17,339.1	4,479.3	198,429.5

Source: study of Narodowy Bank Polski Cash and Issue Department.

Note: for analytical purposes, figures were rounded to one decimal place.

Coins with the lowest denominations, i.e. 1 gr, 2 gr and 5 gr make up almost 70% of coins in circulation.

Frequency rate of return of banknotes and coins

Frequency rate of return of banknotes and coins, informing about the frequency of their recirculation to Narodowy Bank Polski, provide supplementary data on the level and structure of banknotes and coins withdrawn and lodged, as well as on circulation. In the case of banknotes, a systematic decline of the rate in cycles is noticeable. Banknotes were recirculated to Narodowy Bank Polski, less and less frequently (in 2013, on average, every 208 days, in 2017, already every 352 days). A similar situation occurred for coins (in 2013, on average, a coin was recirculated to Narodowy Bank Polski, every 8,619 days, in 2017, every 10,983 days).

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