

Resolution and depositors' trust empirical analysis of three resolution cases in Poland

Three
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Poland

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Abstract

Purpose – This paper aims to evaluate the role of depositor-specific features in a bank resolution. As the resolution framework in the EU is rather new, there are no empirical studies referring to the efficiency of this mechanism in protecting financial stability. Thus, the authors have checked the role of societal awareness of deposit guarantee schemes and the resolution, as well as the trust in public institutions, in avoiding bank runs in the case of resolution scenarios.

Design/methodology/approach – The study is based on telephone interviews conducted with 1,000 Poles, including bank customers whose banks have undergone resolution in recent years, and basic statistics of the resolved banks. The authors then apply two classes of models: binary probit regression and ordered probit regression.

Findings – The findings have indicated that the trust in public institutions and the experience gained with age play a key role in overall depositor behaviour. However, for resolutions, declared trust is replaced by case-specific trust based on the obtained information.

Research limitations/implications – The survey is based on a sample of Polish citizens. In the future, international surveys may help diagnose cross-country differences among depositors. Moreover, studies on communication approaches may also support finding highly effective ways to reach various cohorts of depositors.

Originality/value – The existing literature on depositor behaviour in bank failure scenarios has relied on an experimental approach to test various research hypotheses. The research sample is not based on an experiment but on the responses of customers whose banks have actually undergone resolution.

Keywords Bank resolution, Depositors' knowledge, DGS, Communication

Paper type Research paper

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1. Introduction

Resolution as an intervention or a crisis management tool has been known since the 1980s. It gained in popularity in the aftermath of the global financial crisis (GFC). Its implementation was aimed at reducing public costs and enhancing transparency. On the global level, the Financial Stability Board determined in 2011 a set of key attributes of effective resolution regimes (FSB, 2011; FSB, 2014). These rules shaped the regulations adopted in various countries, including the EU, where a Bank Restructuring and Resolution Directive (BRRD) was approved in 2014.

Poland is one of the few EU member states that has already applied resolution tools to deal with problem banks under the BRRD framework. Each of the three bank resolution cases conducted in Poland from 2020 to 2021 has been resolved differently. The first resolution procedure started in January 2020 and was targeted at a large independent cooperative bank that had issued subordinated bonds listed on the official bond market in Poland (Catalyst). This bank was one of about 20 cooperative banks that used this source of funding. Since “the first step is always the hardest”, this case attracted much media attention and showed that the public did not understand what was happening and what the rules were in such a process. Two other banks were resolved later, namely, in April 2020 (a small cooperative bank operating within an institutional protection scheme [IPS]) and in January 2021 (a medium-sized commercial bank).

As defined in article 31 (2) of BRRD, the objectives of a resolution are as follows:

- To ensure continuity of critical functions, which are identified based on individual assessment;
- To avoid significant adverse effects on the financial system, i.e. to minimise the risk of contagion;
- To protect public funds, i.e. to minimise the burden on public finance;
- To protect depositors (deposit guarantee scheme) and investors (investor compensation scheme); and
- To protect the funds and assets of clients.

Per se, all these goals should help maintain trust in the banking sector by protecting depositors, client funds and assets; while reducing the risk of contagion in the financial system. Maintaining trust, however, is only possible when society’s perception of resolution procedures is good, and society is aware of the rules of this protection. On the one hand, BRRD rules can be seen as trust-strengthening measures, but depositors’ or customers’ perceptions can (potentially) be a trust-reducing factor. In this study, we are seeking to evaluate which factors are significant to avoid bank runs in the case of resolution scenarios. Our research is based on telephone interviews conducted with Poles, including customers of resolved banks.

The goals defined for the interview included an evaluation of the following:

- Awareness by the society of deposit guarantee schemes (DGS) and resolution as well as trust in public institutions. According to previous studies (Cwynar *et al.*, 2019; Kurowski and Górski, 2021), the overall knowledge and awareness of economics in Polish society is not satisfactory, although it is increasing. This is the first attempt to diagnose knowledge (i.e. facts and information on the resolution) and the awareness of resolution (i.e. understanding general information) combined with other aspects.
- Effectiveness of resolution, associated with the theoretical framework of a bank run. A resolution is seen as effective when trust is maintained, and depositors do not withdraw deposits.
- Impact of society’s resolution awareness on the effectiveness of the resolution framework. This goal combines the first two issues; it is assumed that knowledge

and understanding of how deposits are protected and how the resolution is organised help to reduce the withdrawal of depositor funds.

All these goals are of high importance for policymakers since they are focused on the reduction of market turbulences when banks have problems, i.e. the reduction of potential bank runs.

The paper is structured as follows: In Section 2, we present a review of the existing literature. In Section 3, three resolution cases in Poland are briefly presented. In Section 4, we explain the interview design and present descriptive statistics. Section 5 discusses the results of the interviews. In Section 6, we present the methods of analysis, and in Section 7, we present the results of our empirical modelling with a discussion. Finally, Section 8 provides conclusions and policy implications.

2. Literature review

The literature review focuses on four streams of research. The first concerns the overall effectiveness of the DGS compared to the suspension of deposit convertibility. The second relates to the communication policy and the role of various types of information on the behaviour of depositors. The third stream analyses the effectiveness of resolution actions in the context of a bank run. The fourth stream presents the role of depositors' knowledge of the deposit guarantee and resolution in shaping their behaviour. In this section, we also put forward two research hypotheses, supporting them with conclusions from the literature review.

The literature on banking panics was developed with an article by [Diamond and Dybvig \(1983\)](#), which was especially relevant in the early 1980s. They focused on a coordination problem that led to the existence of multiple equilibria. The expected Pareto effective equilibrium was that depositors withdrew funds according to their liquidity needs. Another was the bank panic in which depositors decided to withdraw their funds, believing that other customers would behave likewise. Diamond and Dybvig analysed two instruments to prevent bank panic: the suspension of deposit convertibility (a measure historically used to restrain deposit outflow) and the establishment of government guarantees. The suspension of deposit convertibility makes optimal risk sharing difficult to achieve, as some entities may not have access to the funds needed for essential consumption. An effective equilibrium is, therefore, likely to be achieved in the presence of deposit insurance. In the long term, according to [Engineer \(1989\)](#), the suspension of deposit convertibility may not stop banking panic.

Research on consumer behaviour in the context of bank runs often focuses on experimental games using the preventative instruments mentioned by [Diamond and Dybvig \(1983\)](#) in the construction of game scenarios. In this context, [Madies \(2006\)](#) conducted several experiments on a sample of 210 students. These experiments observed, *inter alia*, the participants' behaviour in the event of the occurrence of two Diamond and Dybvig instruments: the suspension of deposit convertibility and the existence of deposit insurance. Once the bank run had started, depositors needed to make a decision, within some timeframe, whether to stay in front of the bank (i.e. continuing the bank run) or to leave and stop the deleterious withdrawals. According to the observations, suspension of deposit convertibility in such a case was not an effective measure of preventing a bank run. The run, according to [Madies \(2006\)](#), could only be contained if deposit insurance provided complete coverage.

Furthermore, [Schotter and Yorulmazer \(2009\)](#) highlighted the role of crisis information and its development in the decisions of the experiment's participants. The authors analysed information on the number of people who withdrew funds and what pay-off depositors received. They demonstrated that with the increase in the scope of information about crisis development, the participants' tendency to withdraw funds from the bank also decreased. They also showed that the existence of deposit insurance reduces the severity of bank panic.

Generally, two types of information are considered by the literature in the context of a bank run: knowledge about the behaviour of other depositors and the financial standing of a bank. [Calomiris and Mason \(2003\)](#) also highlighted that a bank run is largely caused by depositors' beliefs about their bank's financial stability rather than the actions taken by other depositors. However, [Chakravarty et al. \(2014\)](#) found that in times of economic instability, depositors' decisions were sensitive to the behaviour of other bank customers.

Some specific types of information have been considered by [Brown et al. \(2016\)](#). They noted that when clients are aware of financial linkages among banks, withdrawals are more contagious. [Schotter and Yorulmazer \(2009\)](#) pointed to an information campaign about the crisis. This is an important factor in times of financial shock when depositors are particularly sensitive to information reaching them. [Hasan et al. \(2013\)](#) found that in Central European countries, the scale of deposit withdrawals increases with the intensity of negative news in the media. The relationship between information in the media and the behaviour of depositors was also noted by [Pyle et al. \(2012\)](#). They examined the impact of the degree of media freedom in Russia on the run scale. According to their results, depositors who are exposed to information from independent media are more willing to withdraw funds in the aftermath of a financial shock. Access to reliable news provided by independent media made depositors more vigilant about the bank's financial standing. However, the influence of media freedom on the bank run in Russia was later undermined, for example, by [Benov and Semenova \(2021\)](#). Literature on negative information in the media about the bank's situation focuses not only on the intensity of the bank run but also emphasises the importance of the information campaign for the movement of bank stock prices ([Wisniewski and Lambe, 2013](#)). Public institutions play an important role in informing the public in times of crisis. In the example of Northern Rock, [Albu and Wehmeier \(2014\)](#) showed that to avoid banking panics, transparent communication is crucial. [Shakina and Angerer \(2018\)](#) focused on two types of information: public information about economic conditions and private information about bank fundamentals. Based on their experiment, they found that not only macroeconomic conditions but also the possibility of communication between participants have a large impact on deposit withdrawals, leading to fewer runs. However, the mood of communication is sensitive to the economic situation.

In our study, we focused on the role of communication between resolution authorities (or a bank) and depositors. The communications that we analysed concerned the safety of depositor savings. Against this background, we have suggested the following research hypothesis:

H1. The clarity of the information provided by the bank or the Bank Guarantee Fund about the safety of depositors' funds after the resolution decision plays a significant role in the latter's decision concerning deposit withdrawal.

[Campioni et al. \(2017\)](#) tested the importance of information with regard to the depositors' financial literacy in the context of a bank run. According to their study, the factor determining the scale of bank runs was the disclosure to the research group of information about financial literacy at the group level. They found that when no information on financial literacy was provided, the scale of runs increased together with bank size. In turn, when information on financial literacy was revealed, the likelihood of runs in large banks decreased, while it increased in small banks. That study suggested that the level of financial literacy itself did not affect the scale of the bank run, but an important feature is that the information provided to the depositor about the average level of financial literacy of the whole group may suggest some behaviour of the entire community.

The behaviour of depositors after the decision on the resolution of their bank is a key factor that affects the success of the resolution process. In this respect, our study contributes to the literature examining the effectiveness of resolution actions. Resolution regimes and depositor behaviour are the subjects of a study by [Walther and White \(2020\)](#). They showed

that the wide discretion of regulators can lead to inefficient bail-in policies. Under such conditions, any bad news regarding a bank's exposure may create a bank run. An example is a financial crisis in Cyprus in 2013 (pre-BRRD) when regulators decided to temporarily close a bank to avoid a run while finalising the bail-in process. The optimal resolution regime in such a case includes a higher level of discretion in the environment of favourable public news. However, regulators are required to be more cautious in the event of bad news. The Cypriot case faced an unfavourable environment from several directions, including high exposure to Greece, accumulation of NPLs, acute political news leading to pressure on the central bank, denied financing from Russia and difficulties with access to international financial markets (Philippon and Salord, 2017). The decision of Italian banks to apply BRRD in 2015 also caused a flight of depositors (Bocuzzi and De Lisa, 2017). Furthermore, the literature does indicate that the announcement of bail-out and government no-bail-out policies may increase the risk of a bank run (Wang, 2013; Keister, 2016). The aforementioned actions by Cypriot and Italian resolution authorities have shown that resolution is most effective if the crisis is not systemic in nature. When current banking sector conditions threaten financial stability, the decision to initiate resolution may result in large deposit outflows (both insured and non-insured). During a nine-month period beginning in June 2012, Cyprus Popular Bank recorded a 40% run-off rate amounting to EUR 10bn of deposit outflows (Amamou *et al.*, 2020). Consequently, market confidence weakened, and the entire financial system was threatened.

Our research pays special attention to the role of financial education (in particular, knowledge about the DGS and resolution) in shaping depositor behaviour in the event of a resolution announcement. In this area, Kim (2016) indicated, based on a sample of US citizens, that the financial literacy of respondents who lived close to bank branches reduced deposit outflows (following FDIC enforcement actions). The stability of the deposit held by financially literate customers was not only evident during the bank's difficulties but was also noticeable in normal times (Jin *et al.*, 2021). The aforementioned research focuses mainly on the financial literacy of consumers, which is the broadly understood ability to manage personal finances. However, in bank runs, it is important to not only check consumer knowledge regarding personal finance management but also to especially check the existence and principles of deposit insurance and the resolution process. There is limited literature on the impact of knowledge about deposit insurance on consumer behaviour. One of the studies was conducted by Bijlsma and Van Der Wiel (2015). Using survey data from The Netherlands, they noted that customers with a higher level of knowledge about deposit guarantees hold higher amounts of deposits. They indicated that knowledge about deposit insurance is particularly low for customers of small banks.

Against this background, we have suggested the following research hypothesis:

H2. Depositors' knowledge about deposit guarantee schemes and resolution, as well as trust in public institutions, play a significant role in their decision not to withdraw deposits in the case of a bank resolution.

Our study has several distinctive features that differentiate it from other experimental research on bank runs. Firstly, our research focuses on the behaviour of customers after the decision on their bank resolution. Second and most importantly, the research sample is not based on an experiment but on the responses of customers whose bank actually underwent resolution. The concept of the resolution process in its current form in the EU was conceived after the GFC. In 2014, BRRD established a detailed framework for the recovery and resolution of credit institutions and investment firms. From this perspective, our study evaluates customer behaviour in a relatively newly established process, which is key to managing a bank under difficult financial conditions.

3. Resolution cases in Poland

Following EU regulations, BRRD was implemented in Poland in October 2016. As a resolution authority, the Bank Guarantee Fund (Bankowy Fundusz Gwarancyjny or BFG) was appointed. Since its inception in 1995, BFG has acted as a deposit guarantee scheme. In 2020–2021, three resolution cases took place in Poland under the BRRD regime. All these banks faced financial troubles, i.e. huge losses and low capital ratios. These three cases include the resolution of two cooperative banks (one large, operating independently outside IPS – Podkarpacki Bank Spółdzielczy in Sanok or PBS; one smaller – Bank Spółdzielczy w Przemkowie or BS Przemków) and one middle-sized commercial bank (Idea Bank SA or Idea Bank with a balance sheet total of PLN 14bn).

The resolution tools, defined in article 37 (3) of the BRRD, may be used separately (except for asset separation) or in combination. These are: sale of the business, bridge bank, asset separation and bail-in. The write-down and/or conversion of capital instruments should take place before or together with resolution tools.

The first resolution case of PBS took place in January 2020 (as of 2019 year-end: PLN 2.8bn of total assets and PLN 2.7bn of deposits). This large independent cooperative bank operated mostly in South-Eastern Poland; however, its credit activities were spread country-wide due to cooperation with financial companies. Bank problems began in 2017 when the bank reported a loss (PLN 7m). In the following year, the bank's situation deteriorated further (PLN 35m of losses and a significant drop in capital ratios, below regulatory requirements). PBS's financial statements were published periodically since the bank was listed on the Catalyst market, which is the regulated bond market in Poland. The bank's capital position was weak, and it was doomed to fail as no other recovery measures could be applied. Therefore, it was in the public interest to resolve the bank. On 15 January 2020, the BFG decided on PBS's resolution and took control of PBS two days later. Except for write-down and conversion, the resolution tool applied was a bridge bank since no investor was interested in purchasing the business. The bank resumed operations on 21 January 2020 as Nowy Bank BFG (New Bank BFG). On 27 October 2021, Nowy Bank BFG was sold to other entities operating in the cooperative sector (Wielkopolski Bank Spółdzielczy or neoBANK). Since it was the first case of a resolution in Poland, it also attracted much attention in the media for the following reasons: firstly, deposits of local government units are not, according to the law, covered by DGS, and these deposits had been written down to cover losses. Secondly, subordinated bonds listed on Catalyst were also written down. The media and related parties focused their commentaries on these two facts and showed signs of surprise. This underlines the low level of awareness regarding resolution as it pertains to its goals and mechanisms, even though BRRD was implemented in Poland in October 2016.

The second case of resolution was BS Przemków, a small cooperative bank (PLN 0.19bn in deposits, and due to huge losses, had only PLN 0.01bn in total assets as of 30 April 2020). After the revision of its 2018 financial statements, the bank reported a loss of PLN 54m, which was considerable compared to its size. Unlike the first resolution case, this bank operated within the association agreement with the Spółdzielcza Grupa Bankowa (SGB Group) and the IPS of this group, which was introduced under the CRD IV/CRR package. Although it provided services to local government units, it did not issue bonds. This bank was resolved with the sale of the business as the main tool in May 2020. BS Przemków became a branch of the associated SGB Bank. In this specific case, local government units did not suffer a loss of deposits since the financial resources of the IPS were used to cover losses. Media interest was low, and it was mainly the local press who focused on the story.

The last and largest resolution case took place at the turn of 2020/2021 (PLN 13.4bn in deposits and 14.4bn in total assets as of 31 December 2020). Idea Bank was a joint stock

company listed on the Warsaw Stock Exchange and the issuer of subordinated bonds listed on Catalyst. In the audited financial report for the year ending 2018 (published in April 2019), a huge loss was disclosed (PLN –1.8bn vs PLN 0.28bn profit in 2017), which practically depleted the bank’s capital. Capital ratios were also much below regulatory standards. Although Idea Bank was in financial trouble (as widely commented on in the media), it did not experience liquidity problems. This phenomenon is explained by the very high interest rates offered on deposits. Depositors usually placed their money in Idea Bank up to the guarantee level to avoid losses in the event of the bank’s bankruptcy (or resolution). This approach to liquidity management is detrimental to market discipline. One can claim that only well-informed depositors took this risk and played this game (which is a moral hazard). Subsequent recovery measures and a recovery plan did nothing to improve Idea Bank’s financial position since it was extremely undercapitalised (according to BFG based on PWC Advisory estimations: PLN –0.48bn). The major shareholder was not in a position to increase bank capital to a reasonable level. Therefore, after several failed self-restructuring attempts, on 30 December 2020, the Polish resolution authority decided to start restructuring of the bank. On 3 January 2021, Idea Bank was taken over (sell of the business tool) by the second largest bank in Poland, Pekao SA, after write-downs and conversions (shares and subordinated debt). The media coverage of this resolution case was excessive due to the size of the bank and the history of its major shareholders. However, in many interviews with professionals, it was underlined that “everybody” had been waiting for a decision on the resolution of Idea Bank to avoid further market distortions.

In addition to the questions asked during the interviews, in cooperation with the Polish resolution authority (BFG), we analysed media information that appeared within a week after the resolution decision. The BFG divided the information into three categories: positive, neutral and negative news appearing on TV, radio, the internet and newspapers. During the analysis, we took into account the potential number of people who had contact with the news from a given source. For the newspaper, we considered the circulation, for radio – listeners, for TV – the audience, unique users for websites, blogs and forums, followers for Facebook, Twitter, Wykop and Instagram and subscribers for YouTube. Then, we created the “share of bad news” variable, which is the share of the number of potential recipients of negative news in relation to the potential recipients of all news related to the resolution. We present the basic statistics on the mood of media campaigns related to resolution in [Table 1](#).

A high share of bad news may be attributed to the “pioneering” role of media coverage during the initial phase of the resolution process in PBS. In Przemków’s case, the media coverage was low and local. This bank did not have good press coverage. Later on, when Idea Bank was resolved, bad news showed again that subordinated debt holders suffered; however, the intensity of the decline was much lower.

4. Interview design and sample characteristics

To evaluate the effectiveness of three resolution cases, we conducted computer-assisted telephone interviews (CATI) in September 2021 with 1,000 Polish citizens through random digital dialling. Due to the need to reach customers of resolved banks, the interviews involved 100 residents of the Przemków commune, 400 residents of the Sanok district and 500 residents of large cities of over 100,000 residents. For the research sample, 500 residents of large cities were selected to reach potential customers of Idea Bank which operated throughout the country. As indicated by respondents during telephone interviews, we were able to reach 301 clients of resolved banks (78 clients of a cooperative bank in Przemków;

Table 1.
Media resolution-
related news

Bank	News range	Number of news found			Average number of recipients of a single source			Negative news share (%)
		Positive	Neutral	Negative	Positive	Neutral	Negative	
Idea Bank	Country-wide	139	563	62	8,667,181	4,820,273	1,422,312	2.20
PBS Sanok	Sanok district	44	86	41	42,258	44,023	72,825	34.59
BS Przemków	Przemków commune	1	16	6	866	7,714	7,707	27.12

Note: "Negative news share" – is the share of the potential recipients of negative news in relation to the potential recipients of all news related to resolution
Source: Authors' own creation based on information obtained from the Bank Guarantee Fund

158 clients of PBS in Sanok; and 65 clients of Idea Bank). [Table 2](#) presents the basic statistics of the research sample.

The interviews were divided into three parts, depending on whether the respondent was a client of a resolved bank or not:

- (1) Questions for all respondents (for the entire research sample, $n = 1,000$);
- (2) Questions for clients of banks that were resolved ($n = 301$); and
- (3) Questions for respondents who were not clients of resolved banks ($n = 699$).

We have presented the specific stages of the survey in [Figure 1](#).

The questions for all respondents (see [Appendix 1](#)) concerned demographic characteristics (gender, age and educational status), questions that verified the level of knowledge of a given respondent about the deposit guarantee scheme (three questions from 1.4–1.6 in [Appendix 1](#)), questions on resolution (three questions from 1.7–1.9 in [Appendix 1](#)) and questions that verified confidence in the public institutions (including financial safety net institutions) and the number of bank branches that operated close to each respondent's place of residence.

Questions for clients of resolved banks (see [Appendix 2](#)) were related to the amount of deposits the respondent held at the bank and the amount of deposits the customer withdrew after the decision on bank resolution was made. In this part, the respondents were asked to assess the clarity of the information provided by the bank or the Bank Guarantee Fund about the safety of their funds after the resolution decision. Customers of resolved banks answered questions from [Appendices 1](#) and [2](#).

Questions for respondents who were not customers of resolved banks (see [Appendix 3](#)) focused on the amount of deposits the respondent currently holds at the bank and the amount of deposits the customer would potentially withdraw after a resolution decision on their bank. Clients of banks that were not subjected to resolution answered questions from [Appendices 1](#) and [3](#).

5. Analysis of the interview results

The interview questions concerning the knowledge of Polish society with regard to DGS and bank resolution are provided in [Annex 1](#) (questions from 1.4–1.6 for DGS and 1.7–1.9 for bank resolution). The knowledge within Polish society about DGS and bank resolution is very low. Only 23% of the respondents provided correct answers to the basic question about the amount of deposit guarantees in Poland. Only two people (out of 1,000 respondents) answered all five questions on DGS and resolution correctly. In the knowledge test, we included the following question: “Before participating in this interview have you ever heard of bank resolution?” From the answers, over 65% of respondents had never heard of a bank resolution procedure before (see [Figure 2](#) and the results for [Question 1.7](#)). From the financial system stability perspective, the lack of awareness in society on the scope of guarantee raises serious concerns. Less than 50% of respondents were aware that savings in shadow bank institutions are not covered by the guarantee system.

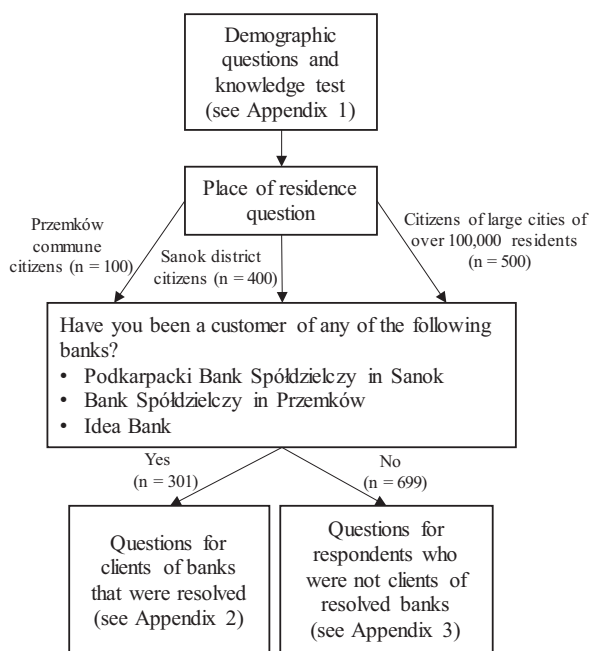
The most numerous group of respondents, who were clients of resolved banks, were people who decided to withdraw all their funds from the bank. However, such decisions differ depending on the analysed bank. In Idea Bank SA and PBS in Sanok, almost half of the respondents withdrew all their funds. In the cooperative bank in Przemków, the largest group were people who did not withdraw any funds (see [Figure 3](#)). However, a greater scale of withdrawal of funds was declared by respondents who had not yet experienced a

Table 2.
Sample characteristics

Characteristic	Total sample size (<i>n</i> = 1,000)	Clients of banks under resolution (<i>n</i> = 301)		
		Idea bank (<i>n</i> = 65)	BS Przemków (<i>n</i> = 78)	PBS Sanok (<i>n</i> = 158)
Women	566 (56.6%) 1.57	25 (38.5%) 6.03	37 (47.4%) 5.65	90 (57.0%) 3.94
Men	434 (43.4%) 1.57	40 (61.5%) 6.03	41 (52.6%) 5.65	68 (43.0%) 3.94
Age 18–25	148 (14.8%) 1.12	6 (9.2%) 3.59	8 (10.3%) 3.44	10 (6.3%) 1.94
Age 26–35	216 (21.6%) 1.30	13 (20.0%) 4.96	15 (19.2%) 4.46	32 (20.3%) 3.20
Age 36–45	226 (22.6%) 1.32	25 (38.5%) 6.03	13 (16.7%) 4.22	43 (27.2%) 3.54
Age 46–55	188 (18.8%) 1.24	11 (16.9%) 4.65	16 (20.5%) 4.57	28 (17.7%) 3.04
Age 56–65	123 (12.3%) 1.04	6 (9.2%) 3.59	13 (16.7%) 4.22	16 (10.1%) 2.40
Age more than 65	98 (9.8%) 0.94	4 (6.2%) 2.98	13 (16.7%) 4.22	29 (18.4%) 3.08
Degree elementary	21 (2.1%) 0.45	1 (1.5%) 1.53	0 (0%) 0.00	5 (3.2%) 1.39
Degree professional	116 (11.6%) 1.01	1 (1.5%) 1.53	17 (21.8%) 4.67	26 (16.5%) 2.95
Secondary school	401 (40.1%) 1.55	21 (32.3%) 5.80	29 (37.2%) 5.47	71 (44.9%) 3.96
Degree higher non-economic	337 (33.7%) 1.49	13 (20.0%) 4.96	13 (16.7%) 4.22	16 (10.1%) 2.40
Degree higher economic	125 (12.5%) 1.05	29 (44.6%) 6.17	19 (24.4%) 4.86	40 (25.3%) 3.46

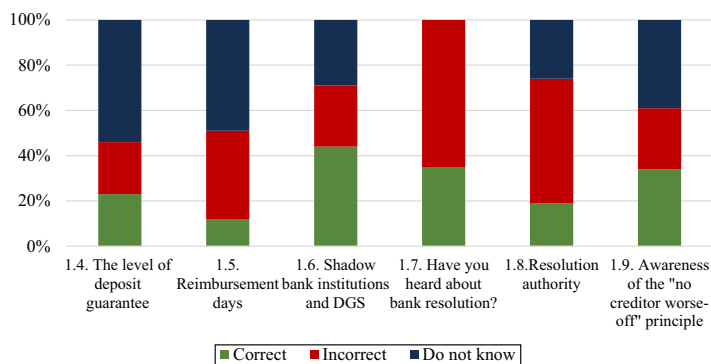
Notes: Based on the interviews, the share of each characteristic in the sample is shown in brackets. Standard errors are given in the second row (in percentage points). The total number of clients for each bank was approximately 10,000 for BS Przemków, 196,000 for PBS Sanok and exceeded both these figures for Idea Bank

Source: Authors' own creation



Source: Authors' own creation

Figure 1. Survey steps



Notes: Based on interviews. The full contents of the questions are provided in Annex. 1. For Question 1.7, i.e. “Before participating in this interview have you ever heard of bank resolution?” There were two possible answers – yes and no

Source: Authors' own creation

Figure 2. Knowledge of Polish society about DGS and resolution-test results

resolution of their bank. In this group, 74% of respondents declared that they would withdraw all of their funds in the event of their bank's resolution (see Figure 4).

The overview of interview results provides some insights into the reasons for the variation in the scale of deposit withdrawals between different banks. The percentage of correct answers to the DGS and resolution questions does not seem to influence the decision to withdraw deposits. Respondents who withdrew all funds from their bank had a similar level of knowledge about DGS and resolution as respondents who decided not to withdraw any funds (see Figure 5). Therefore, in the next section of the paper, we shall examine the role of knowledge. For this purpose, using the econometric models described in the research design section, we considered the interactions of the respondent's knowledge with other explanatory variables.

A variable that may affect the heterogeneity of withdrawals between different banks is the clarity of information provided by the resolution authority on the safety of depositor savings after the resolution decision (see Figure 6). The depositors of the cooperative bank in Przemków were less willing to withdraw their funds compared to the depositors of PBS (see Figure 3). At the same time, the clients of PBS indicated that they did not receive any information from the resolution authority about the safety of their funds. It should be noted

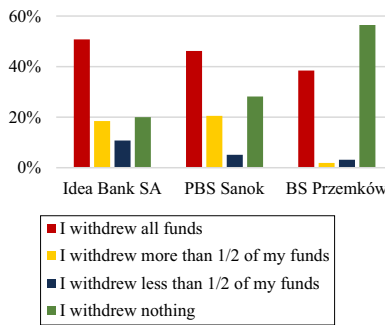


Figure 3.
Deposit withdrawals by respondents who are clients of banks that have undergone resolution ($n = 301$)

Note: Based on interviews
Source: Authors' own creation

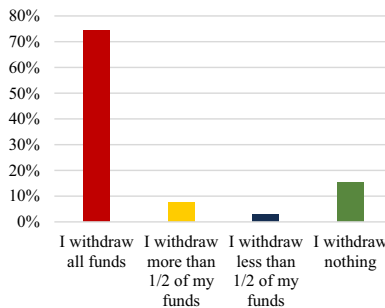


Figure 4.
Possible deposit withdrawals by respondents who are clients of banks with no resolution experience ($n = 699$)

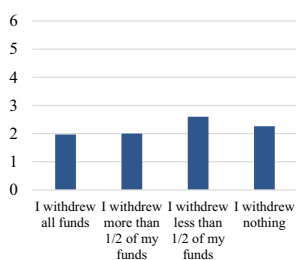
Note: Based on interviews.
Source: Authors' own creation

that the demographic characteristics of both banks' customers (i.e. gender, age, education level) appear comparable (see Table 1). Even respondents' higher economic education compared to other education levels is irrelevant in terms of knowledge and understanding of the information provided by the resolution authority.

6. Methods of analysis

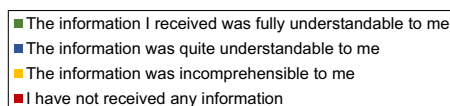
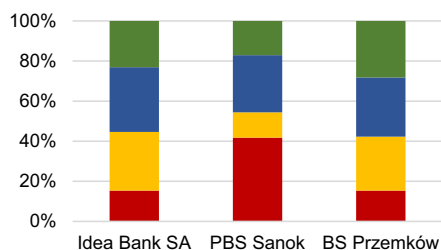
Based on interview data and basic financial information obtained from the Bank Guarantee Fund, we estimated models to evaluate the role of various factors in the decision of money non-withdrawal. The list of variables and their definitions are given in Table 3.

The choice of variables was based on a literature review. Following Diamond and Dybvig's (1983) approach, we defined the dependent variables regarding deposit non-withdrawal. With regressors, we controlled for socio-demographic features that characterise respondents (gender, age and education level). Since the behaviour of the depositor may be related to the amount of the deposit held in a bank (Bijlsma and Van Der Wiel, 2015), we introduced the variable "deposit5000+" because the overall level of deposits is much lower



Note: Based on interviews.
Source: Authors' own creation

Figure 5.
Average number of correct answers (out of six possible) to questions about DGS and resolution by each respondent (vertical axis) and the decision to withdraw funds (horizontal axis) – clients of banks subject to resolution



Note: Based on interviews
Source: Authors' own creation

Figure 6.
Clarity of information received by clients who experienced bank resolutions

Table 3.
Definitions of
variables used in the
regressions

Notation	Definition	Expected sign (for no withdrawal)
deposit non-withdrawal	dummy variable; for no withdrawal = 1; 0 otherwise (following our <i>H2</i> in which higher knowledge may be associated with lower run intensity)	dependent variable
deposit non-withdrawal ordered	ordered variable; (1) withdrawal; (2) partial withdrawal; (3) no withdrawal	dependent variable
gender	sex (female = 0, male = 1)	+/-
age46+ ^a	age 46 or more = 1; 0 otherwise	+
edu_primary	Degree primary	-
edu_profes	Degree professional	-
edu_secondary	Secondary school	-
edu_high_econ	Degree higher economic	+
edu_high	Degree higher non-economic	+
deposits5,000+ ^a	amount of deposits higher than 5,000 PLN = 1; 0 otherwise	+
banks number	number of bank branches	-
understanding	self-evaluation of understanding of information on deposits safety in the case of resolution (from 1 [no information] to 4 [all information clear])	+
Trust ^a	dummy variable; trust in public institutions = 1 (if self-evaluation was 2 or higher); 0 otherwise	+
knowledge DGS	knowledge on deposit guarantee scheme (% of correct answers)	+
knowledge resolution	knowledge on resolution (% of correct answers)	+

Notes: ^aThe information contained in the questionnaire allows for more profound classification of the variable; however, a dummy has been introduced because the thresholds provided in the table were the only significant ones – see comments below
Source: Authors' own creation

than the deposit guarantees in Poland. Initially, we used four intervals to differentiate depositors (i.e. up to PLN 5,000, from PLN 5,000 to 50,000, from PLN 50,000 to 450,000 and above PLN 450,000, which is approximately the equivalent of EUR 100,000); however, the differences were visible only between depositors having up to PLN 5,000 and above. This means that respondents who had deposits of at least PLN 5,000 reacted in a rather homogenous way. In the “age” variable, similar observations were made, i.e. there were differences between respondents who were below 46 years of age and those who were older than 46.

Depositor behaviour may also be influenced by the proximity of branches of other banks, e.g. Kim (2016). Therefore, we introduced a “banks number” variable. Although many customers switched to digital distribution channels outside the big cities, accessibility of the bank branches still seems to be an important decision-making factor.

The “trust” and “understanding” variables present respondents’ answers on their trust in public institutions and understanding of the information given in the case of the bank resolution process, respectively. Both are expected to reduce the tendency to withdraw deposits.

In studies on various aspects of financial literacy, test questions, e.g. Lusardi and Mitchell (2011), were used to assess the knowledge of the respondents. In this study, two sets of questions were used. The first was to evaluate respondents’ knowledge of deposit protection (DGS); the second was to evaluate their knowledge of resolution mechanisms.

Two classes of models were used in the study: binary probit regression and ordered probit regression. The dependent variable in the former was a dummy with a value of 1 in the event that no withdrawal took place (for those who experienced resolution) or no intention of withdrawal was declared (in the remaining cases). Since the respondents were also asked about the withdrawn amount as a fraction of their total savings, as a robustness check, we estimated a set of ordered probit regressions with the dependent variable standing for full withdrawal (1), partial withdrawal (2) or no withdrawal (3). Clearly, positive coefficients stand for the positive influence of the given regressor on the probability of keeping the savings in the bank account.

Given the binary nature of the dependent variable, one of the limited dependent variable class models for the dummy variables should be applied, with logistic regression and probit regression being the two most popular choices. Let $y_i = 1$ represent the situation in which the i -th customer of a bank (with $i = 1, \dots, n$) decides to keep all of their savings in the bank account and $y_i = 0$ otherwise. Further, let

$$y_i = \begin{cases} 1 & \text{if } y_i^* \geq 0 \\ 0 & \text{if } y_i^* < 0 \end{cases}$$

where y_i^* is the latent variable representing the propensity of an i -th customer to keep his savings in the bank. The y_i^* is further assumed to be the linear function of the regressors x_i , which describe the considered customer’s characteristics, the set of corresponding parameters β and the error term for the i -th customer denoted as ε_i :

$$y_i^* = x_i' \beta + \varepsilon_i$$

It is straightforward to derive the probability of keeping the entire savings in the bank account,

$$P(y_i = 1) = P(y_i^* \geq 0) = 1 - F_\varepsilon(-x'_i\beta)$$

where F_ε is the cumulative distribution function (CDF) of the error term. Assuming the symmetry of the distribution of the error term around zero, this can be simplified to:

$$P(y_i = 1) = 1 - F_\varepsilon(-x'_i\beta) = F_\varepsilon(x'_i\beta)$$

It is typical to assume that the error terms for the particular customers are independently and identically distributed; however, numerous possibilities exist regarding the assumptions regarding the particular distribution. The two most popular choices are to assume that the errors are distributed logistically, which yields the logit model or to assume they have standard normal distribution, which yields a probit model. The difference between the two is negligible, and in the considered application, both work equally well and provide practically identical results. This is because of the minute differences between the two distributions, which might also be viewed as different linking functions. For this study, we adopted the probit model; thus, the probability, P , is as follows:

$$P(y_i = 1) = F_\varepsilon(x'_i\beta) = \Phi(x'_i\beta)$$

where Φ stands for the CDF of the standard normal distribution. The latter also means that the effect of a marginal increase of a certain regressor $x_{k,i}$ on the $P(y_i = 1)$ requires computing

$$\frac{\partial P(y_i = 1)}{\partial x_{k,i}} = \varphi(x'_i\beta) \cdot \beta_k$$

where φ is the probability density function of the standard normal distribution and β_k is the parameter standing for $x_{k,i}$ in the model equation. Clearly, the value of the marginal probability change in response to a marginal change of a regressor depends on the values of all the regressors in x'_i and its unique value cannot be provided. However, it is easy to observe that the sign of the probability change is the same as the sign of the β_k . Thus, having estimated the β_k (with the use of the maximum likelihood estimator), we can provide the qualitative interpretation of the direction of influence of the $x_{k,i}$ on $P(y_i = 1)$ based on the sign of the β_k , conditional upon the statistical significance of the $x_{k,i}$.

The set of considered independent variables included gender, whose coding with a single dummy was natural and a couple of quantitative factors, whose values were used directly to code the appropriate variables (percent of correct/positive answers regarding the knowledge on DGS/resolution process).

An ordinal variable that described the understanding of information on the safety of deposits and the variable on the number of bank branches have been directly included. This could not be done with education, given that this factor is more nominal in character than it is ordinal, particularly because the distinction between tertiary and tertiary economic education is included. Consequently, a set of dummy variables for education was included, omitting primary education as a reference category. A similar approach was adopted with the age of the respondents, the amount that they kept in their bank accounts and their trust in financial institutions: each was measured on a scale (details are in the [Appendix 1](#)). However, in the estimated models, and for each of these three factors, there was a threshold that split the sample into two groups beyond which no further difference between the two

groups could be observed. The behaviour of customers in terms of their age differed between those aged below 46 and those aged 46 years and above. Similarly, customers with savings that did not exceed PLN 5,000 behaved differently from those whose savings exceeded PLN 5,000. Finally, the customers with low and very low trust index values (the bottom two answers) differed from the rest of the group. Consequently, for each of these factors, a dummy variable was created to replace the initial ordinal variable.

There were suspicions regarding the potential common influence of certain regressors rather than their independent influence. It seemed rational that the influence of regressors, such as knowledge of the DGS, on the decisions regarding withdrawal might be different between the group of customers with lower savings and those with higher savings. To account for such potentially different influences, we included a set of interaction terms in the model. The interaction of the high savings dummy and the knowledge of DGS and resolution mechanism were involved in the models for both customers who experienced resolution and those who did not. Further interactions were also included in the models estimated in the sample of customers who experienced resolution: those included the interaction of the knowledge of DGS and knowledge on resolution and the self-evaluation of understanding of information on deposit safety in the case of resolution. Customers with a higher level of knowledge were likely to evaluate their level of understanding of the information on resolution differently from others. Thus, the influence of the understanding of the resolution information may have different effects on withdrawal decisions. Technically, including the aforementioned interaction terms allows for the differences in the slope parameters on understanding and the value of deposits across the different levels of the DGS/resolution knowledge. Thus, failure to find their statistical significance suggests that the influence of the above-mentioned variables does not differ due to the differing level of the DGS/resolution knowledge.

In some studies on the impact of literacy on consumer behaviour, attention is drawn to endogeneity. This means that consumer behaviour can be shaped by literacy, and the way consumers behave can influence their level of literacy, e.g. [Lusardi and Mitchell \(2014\)](#) – for retirement planning or [Jappelli and Padula \(2013\)](#) – for saving decisions. A good example of endogeneity is stock market participation ([Van Rooij *et al.*, 2011](#)). The greater the financial literacy, the better the stock market participation. However, the more a given respondent participates in the stock market, the greater knowledge he (or she) gains. In our research, endogeneity is limited because the dependent variable represents *the decision not to withdraw* funds (or, for an ordered probit, how much money to withdraw), which in itself does not have an impact on the level of depositor knowledge concerning resolution and DGS.

7. Discussion of results

We present estimates of binary probit equations for the entire sample and for groups of respondents who experienced resolution and did not ([Table 4](#)). In each model, the dependent variable equals 1 if the customer decided not to withdraw any amount of money (for customers of banks that experienced resolution) or declared that they would not withdraw any amount of money if the bank was in trouble (for the remaining customers). We treated the models estimated for all respondents as baseline; however, there is a certain risk associated with merging the groups of customers who knew what they did with those who only declared what they would do. Thus, we also used different specifications for the group of respondents who experienced resolution ([Table 5](#)). In the discussion, whenever the concept of the significance of a variable is used, a 5% level is assumed for brevity. In [Appendix 4](#), we have also provided the results of corresponding ordered probit models in

Table 4.
Models for deposit
non-withdrawal-
binary probit
regression

Regressors (Model)	All (1.1)	Resolution (1.2)	Non-resolution (1.3)	All (2.1)	Resolution (2.2)	Non-resolution (2.3)
gender	0.0477 (0.51)	-0.196 (-1.26)	0.181 (1.46)	0.0554 (0.59)	-0.164 (-1.04)	0.174 (1.39)
age46+	0.247** (2.67)	0.464** (2.90)	0.0132 (0.11)	0.245** (2.64)	0.440** (2.74)	0.0115 (0.09)
edu_primary	0.0821 (0.26)	-0.705 (-1.25)	0.390 (0.86)	0.0583 (0.19)	(reference category)	0.402 (0.88)
edu_profes	-0.182 (-0.61)	-0.777 (-1.44)	-0.0134 (-0.03)	-0.201 (-0.67)	-0.843 (-1.58)	-0.0145 (-0.03)
edu_secondary	-0.265 (-0.81)	-0.960 (-1.66)	-0.0929 (-0.20)	-0.280 (-0.86)	-1.042 (-1.82)	-0.116 (-0.24)
edu_high_econ	-0.154 (-0.50)	-0.885 (-1.61)	0.144 (0.32)	-0.167 (-0.55)	-0.945 (-1.73)	0.144 (0.33)
edu_high	-0.0210 (-0.22)	0.0416 (0.26)	-0.0292 (-0.23)	-0.0383 (-0.26)	0.0883 (0.31)	-0.133 (-0.75)
deposit5,000+	-0.0844 (-1.80)	-0.0526 (-0.68)	0.0873 (1.20)	-0.0851 (-1.81)	-0.0372 (-0.48)	0.0874 (1.19)
banks number	0.300* (1.98)	0.136 (0.52)	0.510* (2.38)	0.304* (2.01)	0.160 (0.61)	0.520* (2.42)
trust	0.302 (1.65)	1.045*** (3.39)	-0.273 (-1.07)	0.140 (0.52)	0.515 (1.18)	-0.319 (-0.83)
knowledge DGS	-0.0832 (-0.51)	-0.318 (-1.20)	-0.297 (-1.24)	0.0301 (0.13)	0.0956 (0.27)	-0.500 (-1.42)
knowledge resolution						0.0977 (0.19)
deposit5,000+ # knowledge DGS						0.380 (0.81)
deposit5,000+ # knowledge resolution						-1.771*** (-3.35)
constant	-0.789* (-2.26)	0.226 (0.36)	-1.811*** (-3.45)	-0.767* (-2.18)	-0.924 (-1.78)	
N	1,000	301	699	1,000	301	699

Notes: *t*-statistics in parentheses; **p* < 0.05; ***p* < 0.01 and ****p* < 0.001
Source: Authors' own creation

Table 5.

Models for deposit
non-withdrawal –
respondents with
resolution experience

Regressors	(3.1)	Understanding (3.2)	(3.3)
gender	-0.187 (-1.19)	-0.157 (-0.98)	-0.192 (-1.21)
age46+	0.477** (2.94)	0.451** (2.78)	0.474** (2.92)
edu_primary		(reference category)	
edu_profes	-0.626 (-1.09)	-0.690 (-1.21)	-0.617 (-1.07)
edu_secondary	-0.748 (-1.35)	-0.812 (-1.48)	-0.739 (-1.33)
edu_high_econ	-0.963 (-1.63)	-1.037 (-1.76)	-0.959 (-1.61)
edu_high	-0.891 (-1.58)	-0.942 (-1.69)	-0.885 (-1.57)
deposit5,000+	0.0252 (0.15)	0.0331 (0.11)	0.0207 (0.13)
banks number	-0.0515 (-0.66)	-0.0384 (-0.49)	-0.0493 (-0.63)
understanding	0.241*** (3.43)	0.229** (3.24)	0.264* (1.99)
trust	-0.00974 (-0.04)	0.0202 (0.08)	-0.00967 (-0.04)
knowledge DGS	1.029*** (3.31)	0.551 (1.25)	0.970 (1.21)
knowledge resolution	-0.370 (-1.38)	-0.0385 (-0.11)	-0.194 (-0.28)
deposit5,000+ # knowledge DGS		0.937 (1.55)	
deposit5,000+ # knowledge resolution		-0.750 (-1.42)	
understanding # knowledge DGS			0.0178 (0.06)
understanding # knowledge resolution			-0.0679 (-0.29)
constant	-0.237 (-0.36)	-0.194 (-0.30)	-0.298 (-0.41)
N	301	301	301

Notes: *t*-statistics in parentheses; **p* < 0.05; ***p* < 0.01 and ****p* < 0.001

Source: Authors' own creation

which the dependent variable takes values of 1 (no withdrawal), 2 (partial withdrawal) and 3 (full withdrawal). These are treated as robustness checks of the obtained results.

The core models were estimated with the use of the complete sample of 1,000 customers. Results of Models 1.1 and 2.1 (Table 4) suggest that the probability of no withdrawal is reduced by age and trust in public institutions. The result for age (46 or above) may be associated with higher loyalty and higher “stickiness” of these bank customers. Moreover, at this age, people usually have more experience in financial services. Similar results regarding age and customer loyalty were obtained by Chiguvi and Guruwo (2017). The level of trust in public institutions also turned out to have a significant impact on depositor decisions regarding a bank run. A greater level of trust in public institutions (including, in particular, the financial safety net institution) limits the scale of withdrawing funds. The role of trust in public institutions in consumer behaviour was also confirmed by Alamsyah *et al.* (2020) and Carbó-Valverde *et al.* (2013).

The role of age was confirmed in the case of respondents who experienced resolution (Models 1.2 and 2.2), while the role of trust was confirmed for the respondents with no resolution experience (Models 1.3 and 2.3). Other variables were not found to be statistically significant for the decision on deposit non-withdrawal. Therefore, we assert that the overall in the society, depositors' experience related to age and trust in public institutions help curtail the withdrawal of deposits. While trust is significant for customers with no resolution experience, it is substituted by knowledge of DGS and understanding for those who have experienced resolution. We speculate that this might be a sign that the experience of resolution eroded trust, and under this specific stress-test scenario, awareness of the features of this process and its consequences play a key role in the decision-making process.

In Models 2.1–2.3, we introduced the interactions between deposits of 5,000+ PLN and the knowledge of DGS or resolution. All these results are not statistically significant, so no

differences are confirmed between depositors saving below or above 5,000+ PLN for the role of knowledge factors.

It should be noted that for customers of the banks that have undergone the process of resolution, the results are based on their true behaviour as described in the questionnaire. The remaining cases were solely based on customers' suppositions and beliefs regarding what they would do. Merging these two groups might be misleading, given that the true behaviour is not the same as the supposed behaviour. Furthermore, combining all the customers together risks having endogeneity of the regressors if the distribution of the variables included is different across these two groups. To account for these, the sample was split into 301 clients of banks that had undergone resolution and 699 remaining bank clients. As expected, the results varied across these two groups and did not fully comply with the generalised results of the entire sample. To explore the decision-making factors of the customers of banks that underwent resolution, we used specifications with the variable "understanding" (Models 3.1–3.3). From this variable, we assessed the importance of information clarity provided by the bank or the Bank Guarantee Fund about the safety of depositor funds after the resolution decision. In all models, it was confirmed that "age" decreases the probability of money withdrawal. The results also suggest that "understanding" reduces the risk of money withdrawal, and in certain specifications, the knowledge of DGS plays the same role. The importance of clarity of communication provided by public institutions to market participants in the banking panic context was confirmed by [Nier \(2009\)](#) and [Albu and Wehmeier \(2014\)](#).

While Model 3.2 illustrates the interactions of deposits of PLN 5,000+ and the knowledge of DGS and resolution, Model 3.3 presents interactions of understanding and knowledge of DGS and resolution. These interactions showed no statistical significance. This means that there are no differences in the role of knowledge factors between depositors storing below or above PLN 5,000 and that the knowledge factors did not influence understanding.

Our results based on probit equations are largely confirmed by robustness checks. The role of variables such as age, trust, understanding and knowledge on DGS is the same in various specifications. We assert that using three options in the definition of the dependent variable (i.e. withdrawal, partial withdrawal and no withdrawal) changed the role of certain factors since their impact was somehow blurred. Interestingly, in certain specifications, the proximity of branches of other banks increased the risk of deposit withdrawal. Sometimes bank customers are inclined to withdraw deposits when it is easy to place money in another bank. Since banking is becoming more digital (also in a cooperative bank sector), the role of this factor may be wiped away, as it was in baseline models and models for the group that underwent resolution procedures.

8. Conclusions and policy implications

Based on CATI, this study evaluates the role of depositor-specific features in depositor behaviour with regard to bank resolution processes. The interviews were conducted among 1,000 Poles, including customers of banks that had undergone resolution in recent years and basic figures of resolved banks. An important depositor-specific feature is age since life experiences are gained with age, including experience in financial services (learning by doing).

We proposed two research hypotheses (*H1* and *H2*), for which we found support in our results. For *H1*, we concluded that the understanding of information given to the customers plays a significant role in their decision on deposit non-withdrawal. Furthermore, the understanding of information is not based upon the knowledge of DGS and/or resolution, as

the interaction of these terms did not show statistical significance. Therefore, information should be given in an understandable way for various groups of depositors while accounting for their cohort. Hence, various channels of communication (TV, radio, information in press, websites, social media, etc.) and adequately framed messages are required to reach customers of all ages to meet this goal of understanding.

For *H2*, our results rendered partial support; hence, the role of trust in the public institutions (including financial safety net institutions) and the knowledge of DGS has been confirmed. The knowledge of resolution is probably too scarce to influence customer behaviour. What is important, for customers with no resolution experience is trust in public institutions, which reduces the probability of deposit withdrawal, while for customers who have experienced resolution, the knowledge of DGS plays an important role. Therefore, we argue that it is necessary to consider these two aspects together since they substitute each other depending on actual experience.

These results have policy implications. Firstly, it is necessary to assure bank customers (or households) of lifelong learning and understanding of their rights and legal protection, including financial services, to make them feel confident about their personal finances. As the rules are changing rather frequently, adequate information campaigns should be offered by public and private sector entities periodically, with the use of various communication channels to reach targeted groups.

Secondly, information campaigns about the role that public institutions play, including financial safety net players, should help build customer trust. Historically, in many countries, central banks have often been the most trusted, but it is necessary to build or strengthen trust in other public institutions as well. As former FDIC chairman William Seidman observed, “Our whole financial system runs on confidence and not much else when you get down to it. What we have learned is that when the confidence erodes, it erodes very quickly”. Therefore, we maintain that it is important to build or strengthen trust on a continuous basis, especially during times of crisis.

Thirdly, the information provided to customers should be clear and understandable. As our results have shown, declared (emotional) trust is being replaced by objective, case-specific trust based on information about the resolution process and its consequences. As previously mentioned, a wide variety of media and messages is needed to reach various cohorts of customers. As financial services become increasingly digitalised, and customers access many financial services on a cross-border basis, it is necessary to clearly show which of the public institutions or financial safety net players protect customers.

The ability of the financial system to continue to perform its functions properly (including payment and settlement functions) is also a key aspect of resolution. Based on three resolution cases in Poland, we have evaluated that regulatory and institutional frameworks were adequate to meet the goals of this process, and its course was well-organised. While these three banks were not large, one needs to keep in mind that the resolution of a systemically important bank can result in many negative consequences for the functioning of the financial system. A timely response by financial safety net institutions combined with an appropriate public information campaign can help increase the effectiveness of resolution and successfully mitigate fears of contagion.

Our study may be considered as a starting point for further research on depositor behaviour. For example, international surveys may help diagnose cross-country differences among depositors. Studies on communication approaches may also help find more effective ways to reach various cohorts of depositors.

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No.	Question	Possible answers
1.1.	Gender	Male Female
1.2.	Age	18-25 26-35 36-45 46-55 56-65 More than 65
1.3.	Degree	Elementary Professional Secondary Higher non-economic Higher economic
1.4.	What is the level of deposit guarantee in Poland?	PLN 10,000 EUR 10,000 PLN 100,000 EUR 100,000 I do not know
1.5.	If your bank will go bankrupt and all your savings are covered by the guarantee system, when will the guaranteed funds be reimbursed from the day of bank's closure?	seven days 14 days 30 days 60 days I do not know
1.6.	Let's assume that in each of the institutions such as: a cooperative bank, a credit union and a shadow bank institution, you have savings equal to 5,000 PLN. In which institution your funds will not be covered by the guarantee system?	Cooperative bank Credit union shadow bank institution Funds in any of these institutions will not be guaranteed I do not know
1.7.	Before participating in this interview, have you ever heard of bank resolution?	Yes No
1.8.	Which entity in Poland is responsible for the bank resolution process?	KNF (Polish Financial Supervisory Authority) BGF (Bank Guarantee Fund) NBP (National Bank of Poland) Government I do not know
1.9.	Is this sentence truth: "In the case of resolution depositors are protected at least to the same extent as in the case of bank bankruptcy"?	Truth False I do not know
1.10.	On a scale of 0 (no confidence) to 7 (high level of confidence), assess the current level of your confidence to the public institutions (including BFG, NBP, KNF)	Number from 0 to 7
1.11.	How many bank branches operate close to your place of residence?	No bank branch is operating There is one bank branch There are from 2 to 5 bank branches There are more than five bank branches

Table A1.
Interview form – all respondents

Source: Authors' own creation

Appendix 2

No.	Question	Possible answers
2.1.	Did you withdraw your funds held in the bank after the decision of its resolution?	Yes, I withdrew all funds Yes, I withdrew more than 1/2 of my funds Yes, I withdrew less than 1/2 of my funds No
2.2.	How much money did you have in the bank before the decision about resolution?	Lower than PLN 5,000 From PLN 5,000 to PLN 50,000 From PLN 50,000 to PLN 450,000 Higher than PLN 450,000
2.3.	How do you assess the clarity of the information provided by the bank or the Bank Guarantee Fund about the safety of your funds after the resolution decision?	I have not received any information The information was incomprehensible to me The information was quite understandable to me The information I received was fully understandable to me

Table A2.
Interview form –
clients of banks
subjected to
resolution

Source: Authors' own creation

Appendix 3

No.	Question	Possible answers
3.1.	If you hear information that your bank would undergo resolution process, you prefer to:	withdraw all funds withdraw more than 1/2 of my funds withdraw less than 1/2 of my funds withdraw nothing
3.2.	How much money do you have in your bank?	Lower than PLN 5,000 From PLN 5,000 to PLN 50,000 From PLN 50,000 to PLN 450,000 Higher than PLN 450,000

Table A3.
Interview form –
respondents who
were not clients of
banks under
resolution

Source: Authors' own creation

Table A4.
Robustness check –
ordered probit
regression

Regressors	(4.1)		(4.2)		(4.3)		(4.4)		(4.5)		(4.6)	
	All	All	Resolution	Non-resolution	Non-resolution	All	All	Resolution	Non-resolution	Resolution	Non-resolution	
gender	0.0705 (0.85)	-0.130 (-0.92)	0.142 (1.34)	0.0680 (0.82)	-0.130 (-0.91)	0.0680 (0.82)	0.133 (1.25)	-0.130 (-0.91)	0.133 (1.25)	-0.130 (-0.91)	0.133 (1.25)	-0.0628 (-0.59)
age46+	0.135 (1.61)	0.334* (2.25)	-0.0650 (-0.61)	0.136 (1.62)	0.325* (2.18)	0.136 (1.62)	-0.0628 (-0.59)	0.325* (2.18)	-0.0628 (-0.59)	0.325* (2.18)	-0.0628 (-0.59)	
edu_primary	0.102 (0.34)	-0.553 (-1.01)	0.263 (0.67)	0.109 (0.37)	-0.589 (-1.09)	0.109 (0.37)	0.290 (0.74)	-0.589 (-1.09)	0.290 (0.74)	-0.589 (-1.09)	0.290 (0.74)	
edu_profes	-0.0854 (-0.30)	-0.586 (-1.11)	-0.00745 (-0.02)	-0.0788 (-0.28)	0.00745 (-0.02)	-0.0788 (-0.28)	0.00972 (0.03)	-0.620 (-1.19)	0.00972 (0.03)	-0.620 (-1.19)	0.00972 (0.03)	
edu_secondary	-0.126 (-0.41)	-0.705 (-1.27)	-0.0395 (-0.10)	-0.120 (-0.40)	-0.0395 (-0.10)	-0.120 (-0.40)	-0.0415 (-0.10)	-0.749 (-1.36)	-0.0415 (-0.10)	-0.749 (-1.36)	-0.0415 (-0.10)	
edu_high_econ	-0.0306 (-0.11)	-0.639 (-1.20)	0.161 (0.43)	-0.0258 (-0.09)	0.161 (0.43)	-0.0258 (-0.09)	0.173 (0.46)	-0.679 (-1.29)	0.173 (0.46)	-0.679 (-1.29)	0.173 (0.46)	
edu_high	0.0779 (0.92)	0.190 (1.29)	0.0314 (0.29)	0.0770 (0.59)	0.0314 (0.29)	0.0770 (0.59)	0.173 (0.46)	0.392 (1.49)	0.173 (0.46)	0.392 (1.49)	0.173 (0.46)	
deposits,000+	-0.121** (-2.92)	-0.0869 (-1.22)	0.00522 (0.09)	-0.121** (-2.91)	0.00522 (0.09)	-0.121** (-2.91)	0.00498 (0.09)	-0.0783 (-1.09)	0.00498 (0.09)	-0.0783 (-1.09)	0.00498 (0.09)	
banks number	0.354** (2.60)	0.190 (0.78)	0.497** (2.83)	0.352** (2.59)	0.497** (2.83)	0.352** (2.59)	0.507** (2.87)	0.183 (0.75)	0.507** (2.87)	0.183 (0.75)	0.507** (2.87)	
trust	0.0852 (0.53)	0.675* (2.44)	-0.305 (-1.43)	0.141 (0.59)	-0.305 (-1.43)	0.141 (0.59)	-0.295 (-0.90)	0.581 (1.46)	-0.295 (-0.90)	0.581 (1.46)	-0.295 (-0.90)	
knowledge DGS	0.227 (1.59)	-0.0307 (-0.13)	0.0844 (0.43)	0.179 (0.87)	0.0844 (0.43)	0.179 (0.87)	-0.201 (-0.69)	0.261 (0.80)	-0.201 (-0.69)	0.261 (0.80)	-0.201 (-0.69)	
knowledge resolution												
deposits,000+ # knowledge DGS												
deposits,000+ # knowledge resolution												
cut1	0.495 (1.53)	-0.442 (-0.73)	1.187** (2.78)	0.500 (1.53)	1.187** (2.78)	0.500 (1.53)	1.150** (2.67)	-0.378 (-0.63)	1.150** (2.67)	-0.378 (-0.63)	1.150** (2.67)	
cut2	0.863** (2.67)	-0.0316 (-0.05)	1.573*** (3.67)	0.868** (2.66)	1.573*** (3.67)	0.868** (2.66)	1.537*** (3.56)	0.0339 (0.06)	1.537*** (3.56)	0.0339 (0.06)	1.537*** (3.56)	
N	1,000	301	699	1,000	699	1,000	699	301	699	301	699	

Notes: *t*-statistics in parentheses; **p* < 0.05, ***p* < 0.01, ****p* < 0.001

Source: Authors' own creation

Regressors	(5.2)	(5.1) Understanding	(5.3)
gender	-0.132 (-0.93)	-0.134 (-0.93)	-0.146 (-1.03)
age46+	0.346* (2.31)	0.339* (2.26)	0.338* (2.25)
edu_primary		(reference category)	
edu_profes	-0.484 (-0.88)	-0.516 (-0.94)	-0.451 (-0.81)
edu_secondary	-0.552 (-1.04)	-0.582 (-1.10)	-0.511 (-0.95)
edu_high_econ	-0.663 (-1.18)	-0.702 (-1.25)	-0.637 (-1.12)
edu_high	-0.624 (-1.16)	-0.658 (-1.23)	-0.594 (-1.09)
deposit5,000+	0.174 (1.18)	0.351 (1.33)	0.155 (1.04)
banks number	-0.0852 (-1.19)	-0.0786 (-1.09)	-0.0797 (-1.10)
understanding	0.180** (2.84)	0.174** (2.74)	0.317** (2.64)
trust	0.0912 (0.37)	0.0871 (0.35)	0.0957 (0.38)
knowledge DGS	0.662* (2.38)	0.611 (1.54)	0.725 (1.05)
knowledge resolution	-0.0535 (-0.23)	0.180 (0.55)	0.625 (1.05)
deposit5,000+ # knowledge DGS		0.0825 (0.15)	
deposit5,000+ # knowledge resolution		-0.476 (-1.03)	
understanding # knowledge DGS			-0.0484 (-0.19)
understanding # knowledge resolution			-0.281 (-1.31)
cut1	-0.0791 (-0.13)	-0.0370 (-0.06)	0.264 (0.39)
cut2	0.339 (0.54)	0.382 (0.61)	0.684 (1.01)
N	301	301	301

Notes: *t*-statistics in parentheses; **p* < 0.05; ***p* < 0.01; ****p* < 0.001

Source: Authors' own creation

Table A5.
Robustness check –
respondents with
resolution
experience – ordered
probit regression

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