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USE OF DE MINIMIS CREDIT GUARANTEES BY SMES FROM THE WHOLESALE AND RETAIL TRADE SECTOR IN POLAND

Abstract

Public guarantee programmes aim to improve access to financing for micro, small, and medium-sized enterprises (SMEs) and support entrepreneurship. The objective of our paper is to present and assess the de minimis guarantee programme for SMEs in the wholesale and retail trade sector in Poland. In detail, we analyze changes in the number and value of credit guarantees from national and regional perspectives. The research period covers the first eight years of the program functioning, i.e., 2013-2020. Data was gathered from Bank Gospodarstwa Krajowego (BGK), a Polish national development bank. The study reveals visible fluctuations in the number and value of de minimis guarantees obtained by the SMEs in the wholesale and retail trade sector. However, in 2019-2020 we observed their substantial growth. SMEs in the analysed sector primarily use the de minimis guarantee programme to secure revolving working capital loans. Micro-enterprises obtain 75% of the total number and 40% of the total value of guarantees. We observe substantial regional differences in the number and value of granted guarantees among 16 Polish voivodeships rooted in the voivodeship size. The t-test analysis confirmed that both numbers and values of credit guarantees

are significantly greater in 2019-2020, at a 1% significance level. Such results may indicate an increased need for external support for analysed SMEs due to changes in the de minimis guarantee program, stricter bank lending policy and the harmful effects of the COVID-19 pandemic.

Keywords: *de minimis guarantee programme, credit guarantee, wholesale and retail trade sector, SMEs,*

Introduction

Micro, small and medium-sized enterprises (SMEs) represent a heterogeneous group of businesses, primarily operating in the service, trade, agri-business, and manufacturing sectors (Lukacs, 2005). According to the European Union law, there are three distinguished classes of SMEs considering staff headcount and either turnover or balance sheet total, i.e., micro, small, and medium-sized enterprises. Micro enterprises employ up to 9 people, small enterprises employ between 10 and 49 people, while medium-sized enterprises employ between 50 and 249 people (EC, 2003). SMEs contribute significantly to the private sector, create jobs, and constitute a driving force behind GDP growth. It indicates that they are a vital building block of the entire economy (Ayyagari et al., 2007; Xia & Gan, 2020). The worldwide experience proves that small and medium enterprises appertain to primary triggers of economic development, both in developed and developing countries (Savlovschi and Robu, 2011). SMEs often become to the first victims of the economic downturns and recessions, mainly considering their lack of resources to create a sustainable competitive advantage in the market (Michael and Robbins, 1998; Petzold et al., 2019). They are the backbone of the European Union economies, being primarily responsible for wealth and economic growth, next to their crucial role in creation of innovation and R&D (Hartšenko & Sauga, 2013; Econometrics, 2014). SMEs have historically played and contemporary play an important role in contributing to economic development worldwide (Mukole, 2010). Generally, small and medium-sized enterprises are the main contributor to employment in the economy. It is especially relevant for new job creation, as

SMEs tend to employ more labour-intensive production processes than large enterprises (Fatoki and David, 2010).

A key element in the development of SMEs is access to finance for the creation, survival, and growth of small businesses (Hartšenko & Sauga, 2013). SMEs need to use external capital in investment and operating activities (Vasilescu, 2014). Access to finances remains the main obstacle for SMEs and limits their growth opportunities (Rizhamadze & Abeltina, 2021). One of the main constraints that SMEs face is limited access to finance (Rao et al., 2021). A vast literature has proved that both higher financing obstacles and effects of these financing constraints are more intense for SMEs than large enterprises (Beck et al., 2010). Due to SME status, which includes factors like poor credit scores, high operational and default risk, and significant information asymmetries, SMEs have limited financial access to commercial banks (Deng et al., 2018). SMEs formation and growth bear heavily the impact of imperfections in bank credit markets, and lead to credit rationing and higher interest charged to SME businesses, as compared to larger enterprises (Zecchini & Ventura, 2006).

To better promote financial access for SMEs, governments and financial institutions need to understand how SMEs obtain financing (Rao et al., 2021). The development of SMEs belongs to the priority goals for policymakers in many countries worldwide (Cowling & Mitchell, 2003).

Credit guarantees refer to multilateral agreements between lenders, guarantors, and borrowers. Lenders generally represent private financial intermediaries, guarantors have public or private status, while borrowers are typically underserved clients by the formal credit markets (Boschi et al., 2014). Public administrations might use guarantee systems to facilitate credit access due to market restrictions and imperfections (Garcia-Tabuenca & Crespo-Espert, 2010). Moreover, public credit guarantee schemes aim to reduce banking financial losses in cases of borrower default (Caselli et al., 2019). Governments in developed countries design programmes to improve the competitiveness of SMEs. Governments provide financial support for SMEs to promote businesses and, in consequence, accelerate economic growth. State financial support is crucial, particularly during a crisis situation (Hartšenko & Sauga, 2013). Public credit guarantees schemes to SMEs are one of the instruments used

to overcome difficulties limited access to credit markets for SMEs (Zecchini & Ventura, 2006). Credit guarantee funds have functioned at least since the beginning of the 20th century and have become increasingly popular over the past decades (Beck et al., 2010). Green (2003) observes that credit guarantee programmes have been implemented in about half of all countries in the world. Uesugi et al. (2010) find that since the global financial crisis 2008-2009, credit guarantees have been the most commonly employed policy for SMEs in the OECD countries. The banking sector recognizes credit guarantee schemes as the most common and influential state support programme for SME lending, more effective than directed credit and interest rate or regulatory subsidies (Beck et al. 2008). A common perception among academics and policymakers states that SMEs do not obtain appropriate financing and need special assistance, including government schemes that expand and increase lending(de la Torre et al., 2010). Public choice theory shows that credit guarantee programs are more effective and less costly in expanding access to external finance than direct lending, which is beneficial from the government point of view (Arping et al., 2010). However, others, including Cowling (2010), argue that the effects of credit guarantees are ambiguous, particularly in advanced economies. Public credit guarantee schemes constitute valuable instruments for expanding access to finance for particular groups of borrowers. However, their effectiveness and financial sustainability depend on proper design (Gozzi et al., 2016). Zecchini and Ventura (2009) find a causal relationship between the public guarantee and the higher debt leverage of guaranteed borrowers, as well as their lower debt cost.

The European legislator pays special attention to the state aid, appreciated as a form of state intervention in the economy, because of the risk of direct discrimination or competition distortion. The state aid prohibition rule affects trade between the Member States. However, the rule is not an absolute prohibition (Nita, 2014). In the EU in 2000, the European Council decided to reduce direct public support and concentrate on indirect assistance for SMEs (Waniak-Michalak & Michalak, 2019). De minimis aid is state aid permitted by EU law, which the state may grant without the need to obtain the consent of the European Commission, but it is subject to monitoring. De minimis aid may be provided by various institutions, in multiple forms, and

for various purposes. It is summed up and has permissible value limits set. The total value of de minimis aid for one entrepreneur may not exceed the equivalent of EUR 200,000 (or EUR 100,000 for an entity operating in the road freight transport sector) in three subsequent tax years (Nita, 2014). The de minimis guarantee is one of the forms of de minimis aid. The de minimis guarantee programme is implemented under the government programme "Supporting entrepreneurship with the use of sureties and guarantees from Bank Gospodarstwa Krajowego". De minimis guarantees were implemented to improve SMEs' access to financing and provide an offer of commonly available guarantees supporting the development and creditworthiness of these enterprises (Waniak-Michalak & Michalak, 2019). The de minimis guarantee programme aims to facilitate access to bank loans for SMEs in Poland (Andrzejak, 2017). The functioning of the de minimis guarantee program results from the Act on sureties and guarantees granted by the State Treasury and certain legal entities (Act, 1997) and has been established in the regulation issued by the Minister of Finance on the granting of de minimis aid by BGK in the form of a loan repayment guarantee (Regulation, 2014). The programme is granted by National Guarantee Fund (KFG) and is managed by Bank Gospodarstwa Krajowego (BGK). The design of the de minimis guarantee programme makes it an incentive to apply for a loan for SME companies whose problem is the lack of required collateral but which have the ability to repay the debt. The lending banks are responsible for assessing creditworthiness and, to some extent, for the decision on the amount of the loan margin and other fees. The de minimis guarantee programme has improved the operating conditions of many enterprises and enabled many enterprises to start lending cooperation with banks and build a credit history. Banks also appreciate the program's functioning as it is an effective and standardized product for SME business development (Sawicka and Tymoczko, 2014).

The wholesale and retail trade sector consists of enterprises engaged in retailing and wholesaling merchandise (without product transformation) and rendering services incidental to the sale of merchandise (Mroszczyk, 2008). This sector constitutes a linkage between producers and consumers and vitally contributes to the efficient and effective flow of goods and due its size and employment has a significant impact on the entire economy (Gong et al.,

2019; Putz Anderson et al., 2020). Ic et al. (2022) observe that retail sales and wholesale enterprises improve their financial structure to be more resilient to economic fluctuations and financial uncertainty. The development of trading companies, particularly SMEs, is dependent on access to financing. The most significant direct sources of external funding for these SMEs are credit lines, bank loans, and leasing (Istrate, 2019). However, wholesale and retail SMEs operate in unstable business environments where they face the critical issue of survivability because of intense competition within this industry (Falahat et al. 2018). Retail sales and wholesale SMEs are mainly based on low-profit margins and high volumes of customers, which in consequence, does not allow efficient borrowing (Altman & Sabato, 2005).

Our contribution is that we present and assess the de minimis guarantee programme in 2013-2020 within SMEs from the wholesale and retail trade sector in Poland. The analysis is conducted from a national and regional perspective. To our knowledge there are no other studies focusing on this issue for Poland. The results of our study might be exploitable for all agents engaged in the process of granting guarantees, i.e., government, banking institutions, and borrowers – SMEs.

The paper is organised as follows: the next section presents the methodology, particularly: the aim of the study, research hypothesis, and description of material and methods. The subsequent section displays our empirical findings, while the final section provides conclusions.

Methodology

We aim to present and assess the de minimis guarantee programme for SMEs in Poland's wholesale and retail trade sector.

We analyse all SMEs that, when applying for financing with the credit guarantee, have declared the type of activity they conduct as wholesale and retail trade, according to the Polish Classification of Activities (PKD). PKD is the classification that hierarchically systematized division of the social-economic activities carried out by economic subjects. The classification is fully coherent

and comparable with the NACE – the Statistical Classification of Economic Activities in the European Community (GUS, 2022).

We are focused on granted guarantees that secure investment loans and revolving and non-revolving working capital loans. An investment loan is a loan for enterprises intended for a specific purpose related to financing new or increasing the borrower's existing production and service capacities. We define revolving and non-revolving working capital loans as loans for enterprises, granted for any purpose related to the borrower's day-to-day operations. Revolving loans take the form of credit lines or overdraft facilities, while non-revolving loans are loans with a repayment schedule.

We formulate the following research hypotheses:

- **Hypothesis 1:** The number of de minimis guarantees among Polish SMEs from the wholesale and retail trade sector significantly increase in the consecutive years of the 2013-2020 period.
- **Hypothesis 2:** The value of de minimis guarantees among Polish SMEs from the wholesale and retail trade sector significantly increase in the consecutive years of the 2013-2020 period.

To verify our two research hypotheses, we apply the two-sample t-test (Snedecor & Cochran, 1989).

The applied formula of the two-sample t-test is as follows:

$$t = \frac{\bar{X}_t - \bar{X}_{t-1}}{\sqrt{\frac{s_t^2}{n_t} + \frac{s_{t-1}^2}{n_{t-1}}}}$$

where X_t and X_{t-1} are the average numbers and values of credit guarantees in consecutive years from the 2013-2020 research period, s_t and s_{t-1} refer to the standard deviations of the two analyzed samples, and n_t and n_{t-1} are numbers of observations in samples. The data are paired. Thus, we assume the existence of a one-to-one correspondence between the values in the two samples. That is, if X_{2014_1}, X_{2014_2}, …, X_{2014_n} and X_{2013_1}, X_{2013_2} , …, X_{2013_n} are the two samples, then X_{2014_i}corresponds to X_{2013_i}. As we conduct the analysis from the

regional (voivodeship) perspective, in the study, n equals 16, which refers to 16 pairs referring to all Polish voivodeships.

In the applied t-test the null and alternative hypotheses are as follows:

$$H_0: \mu_t = \mu_{t-1}$$
$$H_1: \mu_t > \mu_{t-1}$$

where and represent the mean number and value of de minimis guarantees in consecutive years from the 2013-2020 research period. The null hypothesis assumes that the analysed guarantee measures do not differ in both analysed years. The alternative hypothesis assumes the existence of a significant increase in the number and value of guarantees granted to analysed SMEs compared to the previous year.

The research period covers 2013-2020, i.e., the eight-year-long period from the beginning of the programme functioning. We conduct the analysis from a national (Polish) and regional (voivodeship) perspective. We obtained the data on the number and value of granted guarantees by SMEs from Bank Gospodarstwa Krajowego (BGK). BGK is a Polish development bank. Its main aim is to support the sustainable socio-economic development of Poland. The bank manages the granting institution of the de minimis guarantee programme, i.e., the National Guarantee Fund (KFG).

Research results

Since July 2018, thanks to the implementation of the National Guarantee Fund, the de minimis guarantee programme has been functioning as a permanent and systemic support instrument for entrepreneurs from the SME sector. The de minimis guarantee is granted as part of the admissible state aid to secure the repayment of working capital or investment loan for a micro, small or medium-sized enterprise (SME). The de minimis guarantee does not constitute a cash subsidy, is not directly related to the transfer of funds to the entrepreneur, and has no tax consequences. The total exposure under de minimis guarantees granted to a single borrower within one bank may not exceed PLN 3.5 million (in the period from January 1, 2021, to June 30, 2022,

the maximum amount of the guarantee may amount to EUR 1.5 million) for guarantees up to 5 years and EUR 750 thousand for guarantees over five years) (BGK, 2022).

Table 1 presents a catalogue of purposes for which working capital and investment loans secured with the de minimis guarantee can be allocated.

Table 1. Allocation options of funds from loans covered by the de minimis guarantee

Working capital loan	Investment loan
• payment of invoices for purchased goods and services • settlement of taxes, social security contributions, and other obligations that arose in connection with the conducted business activity • financing of the company's development goals • repayment of the loan(s) at the crediting bank or other banks	• construction, expansion, superstructure, or modernization of facilities related to economic activity, • purchase of cars, machines, and devices.

Source: own elaboration based on BGK (2022).

However, a loan secured by the de minimis guarantee cannot be used for:

- refinancing of expenses incurred before the conclusion of the investment loan agreement;
- capital investments;
- purchase of financial instruments;
- purchase of receivables;
- purchase of an organized part of the enterprise;
- the repayment of a loan granted to finance capital investments, purchase of financial instruments, receivables, and organized part of the enterprise.

The de minimis guarantee programme is Poland's largest and longest-running guarantee program. From the beginning of the de minimis guarantee programme until the end of May 2022, almost 229,000 SMEs took advantage of the de minimis guarantee scheme. The total amount of guarantees granted was PLN 140 billion, and the total amount of guarantee-secured loans equalled PLN 220 billion. De minimis guarantees are available in 18 banks and associated cooperative banks (BGK, 2022).

In Poland, the number of enterprises has been growing in recent years. In 2020, the number of active enterprises amounted to over 2.26 million. Compared to 2013, their number increased by 28%. According to GUS data, in 2020, 99.83% of enterprises were enterprises belonging to the SME sector. From the beginning of the de minimis guarantee programme until the end of 2020, SMEs from all sectors of the Polish economy obtained more than 380 thousand guarantees, and their total value amounted to almost PLN 90 billion. The total number of SMEs in the wholesale and retail trade sector in 2020 equalled 488 thousand, i.e., about 22% of all SMEs in Poland. The above-mentioned figures show that wholesale and retail trade SMEs constitute a vital link in the Polish economy. Trading enterprises are characterized by a low share of fixed assets in the structure of total assets, a high ratio of total liabilities, and a high debt ratio, which proves their considerable financial needs. However, banks prefer fixed assets as collateral for financing as this form of assets generally guarantees a higher recovery rate. As a result of the insufficient level of fixed assets, trading enterprises show a higher tendency to use additional collateral in the form of credit guarantees.

Table 2. The total number and value of secured loans and granted guarantees for SMEs in the wholesale and retail trade sector in Poland in 2013-2020

Variable	2013	2014	2015	2016	2017	2018	2019	2020
Number of guarantees	17886	21156	17746	15848	12693	11611	13530	19266
Change in number of guarantees (%)	-	18.28	-16.12	-10.7	-19.91	-8.52	16.53	42.39
Total value of guarantees (PLN million)	4156.6	3443.3	3815.7	3675.7	3747.6	3969.8	4701.6	7466.8
Change in the total value of guarantees (%)	-	-17.16	10.82	-3.67	1.96	5.93	18.43	58.82
Guarantee share in the total value of secured loans (%)	56.46	55.62	56.53	57.08	55.45	56.13	55.36	70.77

Source: Source: own calculations based on BGK data.

In the 2013-2018 period, we observe visible fluctuations in the number and value of guarantees (Table 2). Nevertheless, the total change in this period is negative. It might result from greater initial interest in the program. The reverse trend is observed in the last two years of the analyzed period

(particularly in 2020) when we find a substantial increase in the number and value of credit guarantees. It was due to several factors, i.e., the change in the program's functioning in 2018, the growing number of bank lenders engaged in the programme, and, most important, the unexpected outbreak of the COVID-19 pandemic. This substantial increase in the number and value of de minimis guarantees in 2019 and 2020 probably results also from the stricter lending policy of banks, including the increase in security requirements. It is confirmed by data from the National Bank of Poland (NBP, 2022). Additionally, in 2020, unsurprisingly, due to the changes in the programme induced by COVID-19, we observed a substantial growth in guarantee share in the total value of secured loans from about 55 to 70%. In the case of de minimis guarantees, the maximum guarantee level equals 60% of the banking loan value. During the COVID-19 pandemic, the maximum value of the guarantee increased temporarily (till June 2022) to 80% of the loan amount (BGK, 2022).

Table 3. The number and value of granted guarantees for SMEs in the wholesale and retail trade sector in Poland in 2013-2020; by enterprise size

Enterprise size	Measure	2013	2014	2015	2016	2017	2018	2019	2020
Micro	number	13111	17413	14208	12388	9102	7952	9279	13708
	value (PLN million)	1660.3	1177.9	1441.0	1392.6	1605.7	1784.8	2030.1	3103.1
Small	number	3928	3145	2843	2630	2711	3071	3339	4244
	value (PLN million)	1536.3	1767.8	1666.0	1713.0	1468.1	1453.1	1651.0	2638.7
Medium-sized	number	847	598	695	830	880	588	912	1314
	value (PLN million)	960.0	497.6	708.7	570.1	673.8	732.0	1020.4	1725.0

Source: own calculations based on BGK data.

Table 3 shows substantial changes in the use of the de minimis guarantee programme by all three types of SMEs in 2013-2020. In 2015-2017, we observed a decrease in the number and value of granted guarantees among micro and small enterprises, and the growth in the group of middle-sized enterprises. In 2020, i.e., the first year of the COVID-19 pandemic, we reveal a significant increase in the number and value of guarantees granted for all three categories of analyzed enterprises. It was due to the deteriorating financial situation of

SMEs as a consequence of government restrictions that temporarily enabled or limited the functioning of most Polish enterprises. In the entire research period, analysing the total number of guarantees, we revealed that 75% of guarantees were granted to micro, 20% to small, and only 5% to medium-sized enterprises. However, in the case of the total value of the guarantee, these proportions are different. 40% of the guarantees' total value was granted to micro, 40% to small, and 20% to medium-sized enterprises.

Table 4. The total number and value of granted guarantees for SMEs in the wholesale and retail trade in Poland in 2013-2020; by loan type (PLN million)

Size	Measure	2013	2014	2015	2016	2017	2018	2019	2020
Investment loan	Number	42	500	614	837	461	232	219	238
	value (PLN million)	15.3	141.0	116.9	124.5	128.7	110.2	94.2	148.5
Non-revolving working capital loan	Number	2416	5640	5726	3813	2822	2477	3524	4953
	value (PLN million)	335.2	425.6	497.0	382.0	364.1	361.7	488.3	891.8
Revolving working capital loan	Number	15428	15016	11406	11198	9410	8902	9787	14075
	value (PLN million)	3806.1	2876.7	3201.9	3169.2	3254.8	3497.9	4119.1	6426.5

Source: own calculations based on BGK data.

Table 4 shows that the vast majority of de minimis guarantees among SMEs from the wholesale and retail trade sector relate to the working capital loans. In more detail, about three-fourths of the total number and 87% of the total value of the guarantees are linked to revolving working capital loans. Moreover, regardless of the loan type, the total value of guarantees in 2020 was more than 50% greater than in 2019.

Table 5 depicts the use of the de minimis guarantee programme by SMEs in the wholesale and retail trade sector in Poland from the regional, i.e., voivodeship perspective.

Table 5. The number and share of granted guarantees for SMEs in the wholesale and retail trade in Polish voivodeships in 2013-2020

Voivodeship	Measure	2013	2014	2015	2016	2017	2018	2019	2020
Lower Silesian	number	1538	1897	1459	1336	996	915	1045	1603
	share	4.10	4.95	3.78	3.42	2.60	2.33	2.67	4.42
Kuyavian-Pomeranian	number	936	1154	894	748	584	470	626	989
	share	3.76	4.51	3.60	3.11	2.52	1.95	2.58	3.86
Lublin	number	817	935	772	644	549	548	733	972
	share	3.33	3.89	3.26	2.74	2.36	2.32	3.24	3.88
Lubusz	number	556	595	528	382	302	276	292	498
	share	4.08	4.25	3.75	2.81	2.25	2.03	2.17	3.71
Lodz	number	1254	1400	1085	939	820	804	823	1233
	share	3.37	3.71	2.98	2.66	2.35	2.29	2.43	3.72
Lesser Poland	number	1388	1811	1626	1453	1186	1140	1236	1688
	share	3.14	4.14	3.64	3.39	2.73	2.59	2.76	3.86
Masovian	number	2793	3261	3216	3139	2452	2209	2578	3132
	share	3.56	4.14	3.91	3.66	2.78	2.42	2.88	3.99
Opole	number	410	422	284	240	259	233	281	402
	share	3.86	4.09	2.70	2.28	2.56	2.24	2.76	3.85
Subcarpathian	number	731	867	756	660	488	447	634	868
	share	3.47	4.18	3.70	3.02	2.33	2.08	2.97	4.40
Podlaskie	number	542	574	450	469	331	353	418	568
	share	4.29	4.52	3.55	3.74	2.69	2.78	3.25	3.99
Pomeranian	number	973	1186	1082	989	761	645	741	1060
	share	3.73	4.48	4.08	3.59	2.78	2.35	2.81	3.84
Silesian	number	2123	2561	2149	1817	1539	1306	1432	2064
	share	3.39	4.17	3.56	3.09	2.60	2.19	2.54	3.62
Holy Cross	number	456	546	477	385	341	341	434	570
	share	2.77	3.44	3.03	2.42	2.17	2.21	2.89	3.88
Warmian-Masurian	number	662	635	522	427	339	289	394	566
	share	4.73	4.36	3.71	3.12	2.49	2.18	3.12	3.98
Greater Poland	number	1864	2361	1663	1563	1223	1193	1331	2303
	share	3.65	4.60	3.17	2.94	2.33	2.21	2.52	4.64
West Pomeranian	number	843	951	783	657	523	442	532	750
	share	3.72	4.39	3.60	2.86	2.41	2.03	2.55	3.01

Source: own calculations based on BGK data.

Table 5 shows that in total, the largest number of guarantees are granted to SMEs from Masovian voivodeship (22.7 thou.), Silesian (15.0 thou.), Greater Poland (13.5 thou.), while the smallest number of guarantees are obtained by enterprises from Opole, Lubusz, Holly Cross, Podlaskie, and Warmian-Masurian (less than 4 thou.). We observe that the total number of the guarantees depends on the voivodeship's size, primarily the number of operating enterprises, GDP, and population. In the 2013-2020 period, the most substantial increase (more than 20%) in the number of guarantees is observed in Holly Cross, Greater Poland, and Lesser Poland, while in Warmian-Masurian, West Pomeranian, and Lubusz, we find a visible decrease of obtained de minimis guarantees (greater than 10%). Analyzing the share of granted guarantees, precisely the number of granted guarantees in relation to the total number of registered enterprises operating in the wholesale and retail trade sector, we reveal that, on average, the highest value of this rate is observed in Holly Cross and Lodz, while the lowest in Podlaskie and Lower Silesian.

Table 6. The total and average value of granted guarantees for SMEs in the wholesale and retail trade in Polish voivodeships in 2013-2020

Voivodeship	Measure	2013	2014	2015	2016	2017	2018	2019	2020
Lower Silesian	total value	257.84	253.45	240.06	275.04	222.36	255.97	307.00	500.96
	avg. value	167.65	133.61	164.54	205.87	223.25	279.74	293.78	312.52
Kuyavian-Pomeranian	total value	220.02	172.93	179.83	156.75	171.70	151.56	222.67	385.36
	avg. value	235.06	149.85	201.16	209.56	294.01	322.46	355.70	389.64
Lublin	total value	183.19	159.58	185.41	163.60	181.61	208.42	255.05	387.91
	avg. value	224.22	170.67	240.17	254.03	330.80	380.34	347.95	399.08
Lubusz	total value	105.96	91.10	112.47	88.95	78.51	78.17	80.58	182.57
	avg. value	190.58	153.11	213.02	232.86	259.96	283.23	275.96	366.61
Lodz	total value	261.69	203.48	238.82	207.00	203.36	270.72	274.13	462.81
	avg. value	208.69	145.34	220.11	220.45	248.00	336.72	333.09	375.35
Lesser Poland	total value	345.39	274.01	372.09	323.95	328.08	380.34	405.29	636.28
	avg. value	248.84	151.30	228.84	222.95	276.63	333.63	327.91	376.95
Masovian	total value	829.89	718.36	880.10	872.39	910.60	904.78	1084.74	1415.07
	avg. value	297.13	220.29	273.66	277.92	371.37	409.59	420.77	451.81
Opole	total value	69.90	56.11	48.17	52.73	68.70	82.05	90.52	142.44
	avg. value	170.49	132.97	169.62	219.71	265.24	352.15	322.14	354.33
Subcarpathian	total value	162.44	117.64	135.68	111.61	126.29	108.59	161.85	299.79
	avg. value	222.22	135.69	179.47	169.10	258.79	242.93	255.29	345.38
Podlaskie	total value	123.60	93.85	81.19	107.67	103.40	121.41	154.46	263.12
	avg. value	228.04	163.50	180.42	229.57	312.38	343.93	369.52	463.24
Pomeranian	total value	198.14	187.32	203.42	213.68	214.48	204.75	247.21	396.47
	avg. value	203.64	157.94	188.01	216.06	281.84	317.44	333.61	374.03
Silesian	total value	565.45	439.73	468.37	431.24	435.67	474.41	520.35	933.84
	avg. value	266.34	171.70	217.95	237.33	283.09	363.25	363.37	452.44
Holy Cross	total value	107.57	80.95	95.41	93.83	97.14	105.22	124.24	186.22
	avg. value	235.89	148.26	200.03	243.71	284.88	308.56	286.28	326.70
Warmian-Masurian	total value	104.95	92.20	85.17	96.89	88.05	91.03	103.59	183.03
	avg. value	158.53	145.20	163.16	226.90	259.72	314.97	262.91	323.37
Greater Poland	total value	434.18	355.43	341.21	360.76	355.11	396.84	494.80	852.95
	avg. value	232.93	150.54	205.18	230.81	290.36	332.64	371.75	370.37
West Pomeranian	total value	186.37	147.13	148.32	119.59	162.51	135.54	175.08	238.00
	avg. value	221.08	154.71	189.43	182.03	310.72	306.64	329.09	317.33

Source: own calculations based on BGK data.

Table 6 shows that the total nominal value of guarantees granted to analysed SMEs increases in all 16 voivodeships in the 2013-2020 period. However, the growth varies regionally. As we previously mentioned, the total value of de minimis guarantees depends on the size of the voivodeship. SMEs from Masovian voivodeship are responsible for more than one-fifth of the total value of the guarantees, while enterprises from Opole – less than 2%. Moreover, Table 6 reveals the substantial differences in the average value of granted de minimis guarantees for SMEs in the wholesale and retail trade sector among Polish voivodeships. By far, the largest value of guarantees refers to Masovian (PLN 340 thou.), while SMEs grant the lowest values of guarantees in Lower Silesian, Subcarpathian, and Warmian-Masurian (ca. PLN 220-230 thou.). We observe a substantial increase in the average nominal value of guarantee in all voivodeships in the entire research period. From 2013 to 2020, in Opole and Podlaskie, the average value of guarantee doubled, while in Lesser Poland and Masovian, grows only about 50%.

To verify whether the mean values of the number and value of credit guarantees among analysed SMEs significantly increase in the consecutive years of the 2013-2020 period, we apply the two-sample t-test. Table 7 presents the estimated t-test statistics, and stars denote the test significance (*, **, ***).

Table 7. The granted guarantees for SMEs in wholesale and retail trade sector in Poland in 2013-2020 by voivodeship: t-test analysis

Annual change	Number of guarantees	Number of guarantees per number of companies	Total value of guarantees	Average value of the guarantee
2014-2013	4.63***	6.25***	-4.91	-10.25
2015-2014	-4.87	-8.35	2.02**	10.19***
2016-2015	-6.50	-6.93	-1.42	3.75***
2017-2016	-4.74	-7.26	0.83	8.06***
2018-2017	-3.51	-5.17	2.01**	5.79***
2019-2018	5.74***	7.62***	4.16***	0.20
2020-2019	6.21***	11.07***	6.29***	5.88***

* significance level 0.1; ** significance level 0.05; *** significance level 0.01

Source: Source: own calculations based on BGK data.

In our research hypotheses, we assume that both numbers and values of credit guarantees significantly increase in the consecutive years of the analysed period. We verify the null hypothesis that mean values of analysed guarantee measures do not differ significantly in the consecutive years, i.e., . The alternative hypothesis assumes the existence of a significant increase in the number and value of guarantees granted to analysed SMEs compared to the previous year, i.e., .

Table 7 results show that in the case of a total number of guarantees and a total number of guarantees per number of SMEs, we reject the null hypothesis (at a 1% significance level) only in 2014, 2019, and 2020. It implies significant increase in these values only in above-mentioned years. We observe statistically significant positive changes in the total value of guarantees in 2015 and 2018-2020 (at a 5% significance level). Moreover, the average value of guarantee among analysed SMEs significantly grows in 2015-2018, and 2020 (at a 1% significance level).

Thus, we can only confirm our two research hypotheses for specific years, which state that the number and value of de minimis guarantees among Polish SMEs from the wholesale and retail trade sector significantly increase in the consecutive years of the 2013-2020 period. Such results may indicate an increased need for external support for analysed SMEs due to changes in the de minimis guarantee programme, stricter bank lending policy and the harmful effects of the COVID-19 pandemic.

Conclusion

Due to SMEs capital structure characteristics, wholesale and retail trade enterprises have considerable financial needs and show a higher tendency to use additional collateral in the form of credit guarantees. Public guarantee programmes aim to improve access to financing for micro, small, and medium-sized enterprises (SMEs) and support entrepreneurship.

The study reveals visible fluctuations in the number and value of de minimis guarantees obtained by the SMEs in the wholesale and retail trade sector. However, in 2019-2020 we observe their substantial growth. SMEs in the

analysed sector primarily use the de minimis guarantee programme to secure revolving working capital loans. Micro-enterprises obtain three-fourths of the total number and less than half of the total value of guarantees. We observe substantial regional diversity in the number and value of granted guarantees among Polish voivodeships rooted in the voivodeship size. We confirm that both numbers and values of credit guarantees are significantly greater in 2019-2020.

The results of our study might be exploitable for all agents engaged in the process of granting guarantees, i.e., government, banking institutions, and borrowers – SMEs. Due to geopolitical, financial, and economic instability and uncertainty, a deeper analysis of the functioning of the de minimis guarantee programme in the following years is a challenge for future research.

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