
Reductions in payments to the State Fund for the Rehabilitation of Persons with Disabilities (PFRON) as a tool to reduce non-wage labour costs in enterprises

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Abstract: In this study, the authors attempted to identify employment costs, with particular emphasis on non-wage employment costs in terms of payments to the State Fund for the Rehabilitation of Persons with Disabilities (PFRON) and the possibility of their reduction. The main purpose was to identify and verify the effectiveness of legal and financial solutions aimed at stimulating Polish enterprises to employ workers with reduced competitiveness on the labour market and constituting a form of compensation for their employment in the context of reducing non-wage labour costs. The following research hypothesis was formulated: *applying financial penalties for not employing persons with disabilities is not severe enough for enterprises to significantly change their attitude towards employing such persons, even in the context of their systematically growing number, because the multidimensional costs of employing persons with disabilities are more severe than the penalties paid for not employing them.*

The conducted research and literature review allowed for identifying the basic factors and correlations between the severity of penalties and the employment level of persons with disabilities. A strong positive correlation was observed between their employment rate and the increase in the basis for imposing penalties. Employers, having noticed the increasing amounts of penalties, tried at least not to increase the basis for their calculation and systematically aimed at supplementing employment or

obtaining reductions in payments as a result of a lower ratio or the amount of payments made to the Fund owing to the cooperation with the employers of people with disabilities authorised to provide them.

The research covered the years from 2018 to 2022, the subjective scope included enterprises with at least 25 full-time employees and subject to the obligation of employing persons with disabilities.

The following research methods were used: critical analysis of source literature and legal acts, descriptive method, statistical analysis and correlation analysis based on the Pearson correlation coefficient.

Keywords: employment costs, payments to the State Fund for the Rehabilitation of Persons with Disabilities (PFRON), employment determinants

1. Introduction

Nowadays, the innovativeness and competitiveness of enterprises are determined by many factors, human capital is considered one of the most important (Armstrong 2003) of them. Employees are frequently compared to assets, which is not entirely correct in light of accounting theory, however this indicates their great importance for enterprises (Rouen 2019). Employees also generate costs which, from the perspective of enterprises striving to maximise benefits, may become the basis for seeking savings in this area of enterprise management (Chursin, Makarov 2015). Such costs may represent strictly wage costs, but non-wage costs are also important. In both of these areas, enterprises are looking for ways to either avoid or reduce them. Individual legal solutions applied in particular countries create opportunities to implement unique possibilities aimed at reducing employment costs. As a rule, they refer to the implementation of special functions performed by enterprises for the benefit of society, employee groups, or constitute a part of the labour market policy implemented by the state. In the case of Poland, these solutions are expected to, e.g. provide a financial incentive to make efforts to employ the groups disadvantaged on the labour market.

The purpose of this study was an attempt to identify and verify the effectiveness of the legal and financial solutions aimed at stimulating Polish enterprises to employ persons with reduced competitiveness on the labour market and constituting a form of compensation for their employment in the context of reducing non-wage labour costs. For the purposes of this study, the following research hypothesis was formulated: *applying financial penalties for not employing persons with disabilities is not severe enough for enterprises to significantly change their attitude towards employing such persons, even in the context of their systematically growing number, because the multidimensional costs of employing persons with disabilities are more severe than the penalties paid for not employing them.* The study covered the period 2018-2022, the subjective scope included enterprises with at least 25 full-time employees and subject to the obligation of employing persons with disabilities.

The following research methods were used: critical analysis of source literature and legal acts, descriptive method, statistical analysis and correlation analysis based on the Pearson correlation coefficient.

2. Employment costs – wage and non-wage costs

Labour costs represent one of the most important factors in the selection of employment forms by a given company (Antell 1999). Their share in the operating costs of an entity is significant. Employment costs are borne mainly by employers, however it should be noted that part of the burden is also on an employee's side (Figure 1). The amount of labour costs depends on numerous factors, such as basic wage, social security contributions, taxes and other charges (Hagendorf 2009). Gross wage constitutes

the main component of labour costs, which vary significantly across countries, similarly to other components of labour costs (Eurostat 2023). The basic wage is largely determined by the state in terms of the minimum wage level along with the elements of social security contributions and other public and legal burdens. The following components also add up to the important determinants of wages and thus wage costs incurred by enterprises: the general macroeconomic situation, in particular the situation on the labour market, type of industry and labour resources, as well as the inflation rate, etc. (Acemoglu et al., 2021). In the case of Polish enterprises/employers, wage costs, in addition to remuneration for work along with the derivative costs, also include charges related to unemployment insurance in the form of payments to the Labour Fund (LF) and the Guaranteed Employee Benefits Fund (GEBF) (Furmańska-Marszałek 2008) and also the Solidarity Fund (SF) (Act of 23 October 2018).

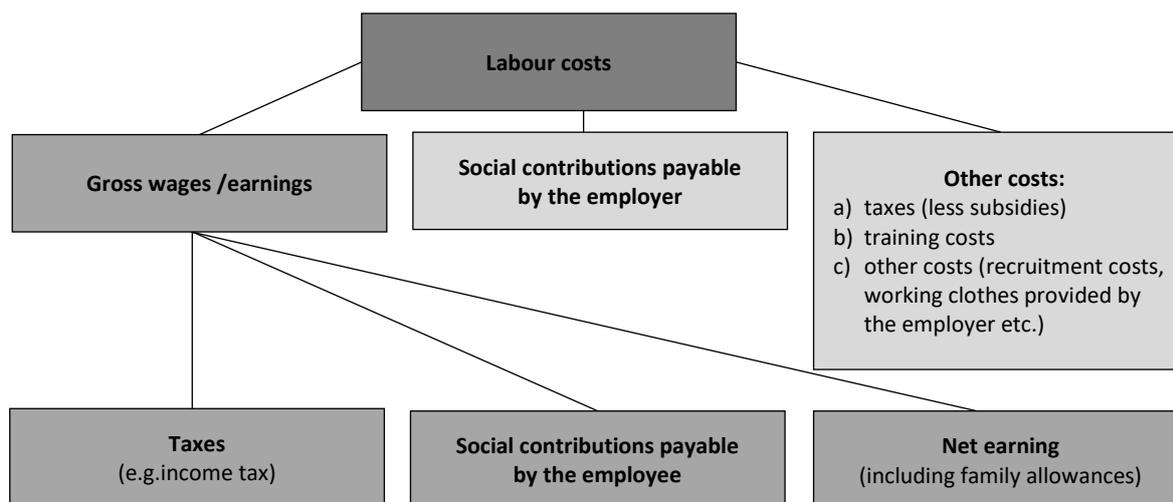


Fig. 1. Labour cost components

Source: Eurostat 2023 op. cit.

Non-wage costs should not be forgotten either as, according to employers, they can be even more burdensome (Borowska 2013). In light of the findings resulting from surveys addressed to the owners of small and medium-sized enterprises, the reduction of non-wage labour costs would have a positive impact on employment. More people could be hired which would reduce the shadow economy (Starczewska-Krzysztozek 2008).

3. Payments to the State Fund for the Rehabilitation of the Disabled and their financial consequences for enterprises

Some employers, in addition to the wage costs alone, along with payments for social insurance, LF, GEBF and SF, additionally have to make monthly payments to the State Fund for the Rehabilitation of Persons with Disabilities (PFRON) (Koza 2016), which constitute only balance sheet costs rather than tax costs. Pursuant to the provisions of Art. 23 sec. 1 point 29 of the Act of July 26, 1991 on personal income tax (Journal of Laws of 1991) (Act on PIT) and Art. 16 sec. 1 point 36 of the Act of February 15, 1992 on corporate income tax (Journal of Laws of 1992) (Act on CIT), payments to PFRON (both mandatory and sanctions) do not constitute tax costs for an entrepreneur–employer. Payments to PFRON are a type of burden that is not related to the statutory objective of employers, thus the equivalent of income allocated to the payment to PFRON is not exempt from income tax, unlike in the case of payments to LF, GEBF and SF. Therefore, payments to PFRON seem to be particularly financially painful for an enterprise, because apart from their amount, they are also neutral in terms of income. However, they affect the reduced financial result generated by an enterprise.

Payments to PFRON, which are part of the employment quota system (Thorton 1998), are intended to provide incentives for entrepreneurs to employ people with disabilities (Graffam et. al. 2002). They are, to some extent, a financial sanction for failing to achieve the statutory employment rate for the disabled (Koza 2014 and Koza, Politaj 2022). Hence, the entrepreneurs subject to the obligation of employing people with disabilities and not doing so decide to pay penalties to PFRON. Hence, these burdens, in a way, remain a consequence of the choice made by an enterprise in terms of opportunity cost (Bishop 2016; Skousen 2012).

The obligation to employ people with disabilities does not apply to all employers, but only to those who employ at least 25 full-time workers and do not meet the statutory employment rate for persons with disabilities – Art. 21 of the Act of August 27, 1997 on vocational and social rehabilitation and employment of persons with disabilities (Journal of Law of 1997). The amount of payments to the above-mentioned Fund is made monthly in the amount being the product of 40.65% of the average wage (Act of 17 December 1998), and the number of employees corresponding to the difference between the employment which ensures meeting the employment rate of the disabled amounting to 6% and the actual employment of persons with disabilities (Formula 1).

$$Ap = 0.4065 \cdot Aw \cdot (0.06Te - Epd), \quad (1)$$

where:

Ap – amount of payment to PFRON,

Aw – average wage,

Epd – employment status of persons with disabilities in terms of full-time work (from the reporting month – full-time jobs),

Te – total employment in terms of full-time work (from the reporting month – full-time jobs).

Therefore, the amount of the burden on enterprises in this respect is correlated with the amount of the average monthly wage (Table 1) and the number of vacancies for persons with disabilities necessary to meet the statutory employment rate for such persons in individual enterprises.

Table 1. Average monthly wage and amounts of payments to PFRON in 2018-2022

Quarter number when applicable	Years				
	2018	2019	2020	2021	2022
	PLN	PLN	PLN	PLN	PLN
Average monthly wage as the calculation basis of the payment to PFRON					
quarter I	4255.59	4580.20	4931.59	5168.93	5657.30
quarter II	4516.69	4863.74	5198.58	5457.98	5995.09
quarter III	4622.84	4950.94	5331.47	5681.56	6235.22
quarter IV	4521.08	4839.24	5024.48	5504.52	6156.25
Average of four quarters	4479.05	4808.53	5121.53	5453.25	6010.97
Amounts of payments to PFRON					
quarter I	1729.90	1861.85	2004.69	2101.17	2299.69
quarter II	1836.03	1977.11	2113.22	2218.67	2437.00
quarter III	1879.18	2012.56	2167.24	2309.55	2534.62
quarter IV	1837.82	1967.15	2042.45	2237.59	2502.52
Average of four quarters	1820.73	1954.67	2081.90	2216.75	2443.46

Source: authors' calculations based on the Official Gazette of the Republic of Poland "Monitor Polski" in 2018-2022.

When calculating the liability to PFRON, the average monthly remuneration in the national economy in the previous quarter should be used from the first day of the following month after the announcement by the President of the Statistics Poland – communication in the Official (Gazette of the Republic of Poland "Monitor Polski"), on the average remuneration, pursuant to Art. 20 point 2 (Act of 17 December 1998).

4. Exemptions and reductions in payments to the State Fund for the Rehabilitation of Persons with Disabilities (PFRON)

An employer operating for profit purposes, who does not employ 25 full-time workers or employs at least 25 workers in a given month in terms of full-time equivalents and the level of employment of persons with disabilities amounts to at least 6% of the total employment, is exempt from payments. In addition, there are possibilities to reduce penalties for not employing persons with disabilities. Firstly, this can apply to the employment of people suffering from specific diseases, and secondly, the purchase of products or services from the employers authorised to grant reductions in payments (Table 2). Reducing the statutory employment rate means that the employer relates the actual employment of persons with disabilities to the reduced required employment rate of such persons, and not to the statutory 6% employment rate.

Table 2. Instruments reducing payments made by enterprises to PFRON

No.	Instrument type	Instrument characteristics	Financial effects for the enterprise	Legal basis
1	Reduction or complete exemption from payments based on the employment of persons with disabilities	Supplementing the employment rate of persons with disabilities to meet the statutory rate or reducing the number of full-time jobs required to meet the statutory rate	Reaching the payment exemption rate. Reducing the number of required full-time jobs results in the liability reduction by the amount being the product of 40.65% of the average remuneration and the number of full-time employed persons with disabilities	Art. 21 section 1, points 1 and 2 of the Act of August 27, 1997 on vocational and social rehabilitation and employment of persons with disabilities
2	Reducing the statutory employment rate of persons with disabilities by employing the disabled suffering from specific diseases	Employment of a disabled person suffering from a disease which makes it particularly difficult to perform work. These conditions include: Parkinson's disease, multiple sclerosis, paraplegia, tetraplegia, hemiplegia, severe visual impairment (blindness) and amblyopia, deafness and deaf-mutism, HIV-positive and AIDS, epilepsy, chronic mental diseases, mental retardation, myasthenia gravis, late complications of diabetes	Reducing the amounts of payments to PFRON as a result of reducing the number of full-time jobs required to meet the reduced statutory employment rate for persons with disabilities	Article 21 par. 4 of the Act of August 27, 1997 on vocational and social rehabilitation and employment of persons with disabilities and the Regulation of the Minister of Labour and Social Policy of September 18, 1998 on the types of diseases justifying the employment rate reduction of persons with disabilities and the manner of its reduction (Journal of Laws of 1998)
3	Reduction of payments to PFRON as a result of cooperation with some employers of persons with disabilities	Purchasing services or goods from an employer authorised to grant reductions in payments made by the employer	Obtaining reductions in payments to the Fund. The payment is reduced by up to 50% of the payment to the Fund being the purchaser's obligation in a given month	Art. 22 of the Act of August 27, 1997 on vocational and social rehabilitation and employment of persons with disabilities

Source: authors' compilation based on the Act of August 27, 1997.

Thus, the statutory rate is reduced by the lowering factor: equal to the quotient of the sum of three times the employment of people with severe disabilities suffering from specific diseases and twice the employment of persons with moderate disabilities suffering from specific diseases, and the total employment (Formula 2).

$$LF = \frac{3ESD+2EMD}{TE} \cdot 100, \quad (2)$$

where:

LF – lowering factor,

ESD – employment calculated as full-time jobs of employees classified as severely disabled due to a specific disease,

EMD – employment calculated as full-time jobs of employees classified as moderately disabled due to a specific disease,

TE – total employment calculated as full-time jobs.

If an employer hires a person suffering from a specific disease on a full-time basis, then they have the option of reducing payments to PFRON for the employment of a person with disability (the number of full-time jobs required to reach the statutory rate will decrease). In addition, the statutory rate of the above-mentioned formula can be reduced if this employee with disability has a certificate of severe disability as a threefold option, and if this is moderate disability – a twofold option. At the same time, to qualify employees when determining the reduction factor, it is not required for a particular condition to result in either severe or moderate disability. The legislator only requires the employee's disability to be classified as severe or moderate and that he/she has been diagnosed with one of the specific diseases.

Another instrument allowing the reduction of payments to PFRON is the cooperation with an employer authorised to grant reductions in payments to the Fund. In such cases, the entrepreneur obliged to make payments to PFRON, when purchasing services or goods from such an employer (except for trade) becomes entitled to reduce the amounts of payments due to the Fund.

The following entities may be entitled to payment reductions: vocational activity establishments, social enterprises employing at least 10 full-time workers or other employers providing employment to at least 25 full-time workers. In the case of the latter, the condition for obtaining such an opportunity is the employment rate of persons with disabilities holding a legal certificate of disability to a severe or moderate degree, if they were diagnosed with: mental illness, mental retardation, pervasive developmental disorders or epilepsy and the blind, amounting to at least 30% of all employees.

The employer authorised to grant payment reductions determines the reduction amount to be granted to a particular employer obliged to make payments to PFRON according to the following formula (Formula 3):

$$Pr = \frac{\frac{Si}{Ti-Rsm}}{Ed(Ed-0.06Te)}, \quad (3)$$

where:

Pr – the amount of payment reduction,

Si – income from selling own services, excluding the seller's trade or production, carried out in a given month for the employer obliged to make payments,

Ti – total income from selling own services, excluding the seller's trade or production, carried out in a given month,

Rsm – the remuneration amount of the employees with disabilities of the authorised seller, classified as a severe or moderate degree of disability, reduced by their social security contributions,

Ed – employment status of employees with disabilities of the authorised seller,

Te – total employment of the authorised seller.

The amount of reductions that an entrepreneur obliged to pay to PFRON may receive from an employer authorised to grant it may not be higher than 50% of the net amount on the invoice documenting the purchase of goods or services in a given month. The due and unused amount of reductions may be included in payments to the Fund for a period not longer than six months from the date of receiving information regarding the reduction amount.

5. Analysis of the financial benefits obtained based on exemptions from payments to PFRON as a result of employing persons with disabilities in 2018-2022

In the period 2018-2022, approximately thirty thousand employers (Table 3) obliged to make payments (i.e. employing at least 25 full-time workers), were exempt from these payments as a result of meeting the statutory rate or the reductions obtained for the employment of people suffering from specific diseases¹. The employment of persons with disabilities was approximately two percentage points above the minimum statutory level entitling the employer to payment exemptions.

Table 3. Employers avoiding payments to PFRON based on meeting the statutory rate

Year	Number of employers meeting the statutory rate*	Average annual number of full-time jobs*	Total full-time jobs per employer (column 3:2)	Average annual number of full-time jobs of the disabled with the employer reaching the statutory rate*	Average number of full-time jobs of the disabled per employer (column 5:2)	Employment rate of the disabled (column 6:4*) %
1	2	3	4	5	6	7
2018	29 255	2 343 237	80.10	188 212	6.43	8.03
2019	29 750	2 396 886	80.57	191 822	6.45	8.00
2020	29 665	2 384 668	80.39	187 468	6.32	7.86
2021	29 720	2 390 371	80.43	185 787	6.25	7.77
2022	28 823	2 387 483	82.83	203 899	7.07	8.54

*(data from 12 months of each year were averaged)

Source: authors' calculations based on the data provided by PFRON.

In 2018-2022, an average employer exempt from payments employed over 80 people on a full-time basis, including six to seven full-time jobs for persons with disabilities. The 6% employment rate with such a total number of full-time jobs amounted to approximately five full-time jobs (Table 4).

Table 4. Amount of savings resulting from avoiding payments to PFRON based on the achieved statutory employment rate of persons with disabilities in 2018-2022

Year	Average annual number of full-time jobs with an average employer	Statutory 6% employment rate of the disabled calculated for the average number of full-time jobs	Average annual amount of payment calculated as 40.65% of an average remuneration per employer PLN	Average monthly amount of savings in payments per employer (column 3*4) PLN	Total annual amount of savings in payments per employer (column 5*12) PLN
1	2	3	4	5	6
2018	80.10	4.81	1820.73	8750.43	105 005.14
2019	80.57	4.83	1954.67	9449.27	113 391.19
2020	80.39	4.82	2081.90	10 041.84	120 502.04
2021	80.43	4.83	2216.75	10 697.59	128 371.11
2022	82.83	4.97	2443.46	12 143.51	145 722.09
Total in 2018-2022	–	–	–	51 082.63	612 991.56

Source: authors' calculations based on the data in Table 3.

¹ The data on payments to PFRON include employers obliged to make payments or exempt from such payments based on meeting the statutory rate.

As a result of reaching the statutory level of employment of persons with disabilities, employers saved about PLN 18 billion, and in 2022 alone over PLN 4 billion. The total savings per employer resulting from unpaid penalties to PFRON in those years exceeded PLN 600 thousand. Due to the growing average remuneration, which is the basis for imposing penalties, the highest financial benefits were achieved in 2022 (almost PLN 146 thousand on average).

6. Analysis of the financial benefits obtained from cooperation with employers authorised to grant reductions in payments to PFRON in 2018-2022

A definitely less popular form of reducing payments to PFRON, in the period 2018-2022, were the reductions in payments to the Fund obtained from the employers authorised to grant them by purchasing services or goods from these employers (Table 5). The number of entities authorised to grant such reductions – the so-called reduction issuers were significantly fewer than the number of employers–beneficiaries interested in such reductions. The amounts offered by the reduction issuers throughout the discussed period were also lower than the amounts of the entitlements obtained from the purchasers, which indicates that some beneficiaries, despite the acquired reductions on account of cooperation, could not settle them in payments to PFRON at the time of the transaction and had to settle them in subsequent periods (maximum in the next six months).

Table 5. Issuers of reduced payments to PFRON and their beneficiaries in 2018-2022

Year	Average annual number of employers granting (issuing) reductions in payments on account of cooperation*	Average annual amount of reductions in payments offered by authorised employers*	Amount of the reduction granted per issuer	Average annual number of employers benefiting from reductions (beneficiaries)	Average annual amount of the reduction obtained on account of cooperation	Average per beneficiary
2018	544	62 397 637	114 649	7 747	63 262 022	8 166.00
2019	540	62 151 919	115 114	7 764	62 887 799	8 099.92
2020	534	62 637 037	117 298	7 549	63 334 616	8 389.80
2021	539	69 193 404	128 453	7 704	69 830 983	9 064.25
2022	530	74 099 204	139 690	7 710	75 133 859	9 744.99
Total in 2018-2022	–	330 479 201	615 204	7 695	334 449 279	43 464.32

Note: * data from 12 months of each year were averaged.

Source: authors' calculations based on the data provided by PFRON.

The above resulted in the transfer of some of the deductions due to subsequent years, constituting a certain rollover of entitlements.

Throughout the period covered by the analysis, the number of employers authorised to grant reductions decreased, despite the very high interest in purchasing products or services from these employers. The number of employers willing to purchase reductions remained at the relatively constant level of approximately 7,700 employers. A significant increase was also recorded in the amounts of acquired entitlements in 2021-2022, i.e. the time of rapidly rising prices, a large increase in the average monthly remuneration constituting the basis for calculating payments to the Fund, as well as an increase in other wage and non-wage costs related to employment.

7. Analysis of the financial burden on employers as a result of failing to meet the statutory employment rate for persons with disabilities in 2018-2022

In the period 2018-2022, among the employers registered in PFRON reaching the employment rate at the level of at least 25 full-time jobs, the majority of employers did not meet the statutory employment rate for persons with disabilities, i.e. those obliged to make payments to PFRON (Figure 2).

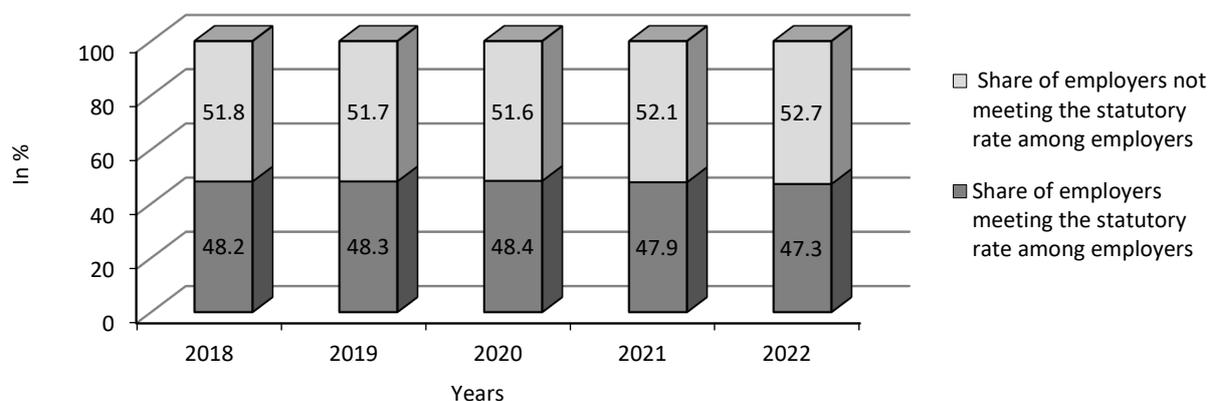


Fig. 2. Structure of employers providing employment to at least 25 full-time workers obliged and exempt from payments to PFRON in 2018-2022

Source: authors' calculations based on the data provided by PFRON.

The difference between the employers obliged to make payments and those exempt from them was relatively small and ranged from 3.2 percentage points in 2020 to 5.4 percentage points in 2022. A significant difference was observed in the average total number of full-time jobs and persons with disabilities (Table 6).

Table 6. Employers paying penalties to PFRON resulting from failure to meet the statutory rate in 2018-2022

Year	Average annual number of employers*	Average annual number of full-time jobs*	Average annual number of full-time jobs for the disabled*	Total average annual number of full-time jobs per employer (column 3:2)	Average annual number of full-time jobs for the disabled per employer (column 4:2)	Statutory 6% employment rate for the disabled (column 5*6%)
1	2	3	4	5	6	7
2018	31 420	5 174 631	75 293	164.90	2.40	9.89
2019	31 908	5 282 497	79 514	165.60	2.49	9.94
2020	31 573	5 212 005	80 121	165.10	2.54	9.91
2021	32 263	5 311 581	82 175	164.60	2.55	9.88
2022	32 120	5 388 306	84 636	167.80	2.63	10.07

Note: * data from 12 months of each year were averaged.

Source: authors' calculations based on the data provided by PFRON.

The employers obliged to make payments and not meeting the statutory employment rate employed, on average, about 166 full-time workers, which is more than twice as many as the employers meeting the statutory rate. The average employer should therefore typically employ approximately ten full-time disabled workers. In fact, the discussed employment level was slightly over 2.5 full-time jobs, which is several times below the statutory level. Therefore, these employers had to pay monthly penalties to the Fund in the average amount of over PLN 6.5 thousand in 2018 up to PLN 8.2 thousand in 2022 (Table 7). The average employer paid PFRON annually the amounts from approximately PLN 79 thousand up to almost PLN 99 thousand.

Table 7. The amount of savings resulting from avoiding payments to PFRON based on the achieved statutory employment rate of persons with disabilities in 2018-2022

Year	Shortfalls in full-time jobs for persons with disabilities	Average annual amount of payment calculated as 40.65% of the average salary PLN	Monthly payment amount (column 2*3) PLN	Annual payment amount PLN (column 4*12)	Total average payments to PFRON by employers obliged to make payments PLN
1	2	3	4	5	6
2018	7.49	1 820.73	13 637.27	163 647.21	5 141 795 414
2019	7.45	1 954.67	14 562.29	174 747.50	5 575 843 166
2020	7.37	2081.9	15.343,60	184 123,24	5 813 322 930
2021	7.33	2216.75	16 248.78	194 985.33	6 290 811 702
2022	7.44	2443.46	18 179.34	218 152.11	7 007 045 735
Total in 2018-2022	–	–	–	935 655.39	29 828 818 946

Source: authors' calculations based on the data provided by PFRON.

Thus, within five years, such an employer was forced to transfer nearly PLN 940 thousand to PFRON's account. During the period under study, the employers obligated to make payments paid a total of approximately PLN 30 billion to the Fund.

8. Financial determinants for using reductions and exemptions in payments to PFRON

Costs represent one of the most visible challenges related to adapting the employment strategy to the employee's market in the context of achieving the essential business goal, i.e. maximising the enterprise's market value and increasing the benefits for owners and shareholders (Sierpińska, Jachna 2007). Diverse and dynamic macroeconomic, legal, financial and tax conditions as well as the situation on the labour market may constitute a source of competitive advantage, but also become the reasons for a deteriorated financial condition of enterprises or even their bankruptcy (Hair et. al. 1995 and Fayerweather 2007).

An enterprise may find it difficult to comply with certain requirements, such as changing employment and wage regulations, which may impose additional expenditure. In addition, it may be necessary to invest in human resources to secure the quality of staff and ensure they are adapted to the changing needs of employees. Hiring employees can also be used to reduce costs, primarily if it concerns certain non-wage costs, such as payments to PFRON.

The analysis of the correlations between the employment of persons with disabilities and the financial penalties was based on the Pearson correlation coefficient (Garen 1998 and Elsevier 2023) in accordance with Formula 4:

$$r_{xy} = \frac{\sum(x_i - \bar{x}) \cdot (y_i - \bar{y})}{\sqrt{\sum(x_i - \bar{x})^2 \sum(y_i - \bar{y})^2}} = \frac{\frac{1}{n} \sum x_i y_i - \bar{x} \bar{y}}{\sigma_x \cdot \sigma_y} = \frac{cov(x, y)}{\sigma_x \cdot \sigma_y}. \quad (4)$$

where:

x_i, y_i – i -th observation values of population X and Y ,

\bar{x}, \bar{y} – mean values of population X and Y ,

σ_x, σ_y – standard deviation of population X and Y ,

n – number of observations.

In general terms, the Pearson correlation coefficient measures linear correlation between two variables. It is the ratio between the covariance of two variables and the product of their standard deviations, and results in the classification of correlation as weak or strong. Pearson's r adopts values in the range [-1,1] informing about the correlation strength. The interpretation of r correlation, presented as follows, is commonly used in economic research (absolute values):

0.00–0.10 negligible correlation, 0.10–0.39 weak correlation, 0.40–0.69 moderate correlation
 0.70–0.89 strong correlation, 0.90–1.00 very strong correlation (Schober et. al. 2018).

In 2018-2022, a strong correlation between the amount of financial penalties for PFRON and the employment rate of persons with disabilities was recorded (Figure 3). In the conditions of variable amounts of these financial penalties for not employing them, based on the Pearson correlation coefficient, it was possible to identify a strong correlation between the amount of penalties and the level of employment rate of the disabled. In order to determine the reasons for changes in the employment rate and its correlation, the authors decided to establish a relationship between the employment rate of persons with disabilities.

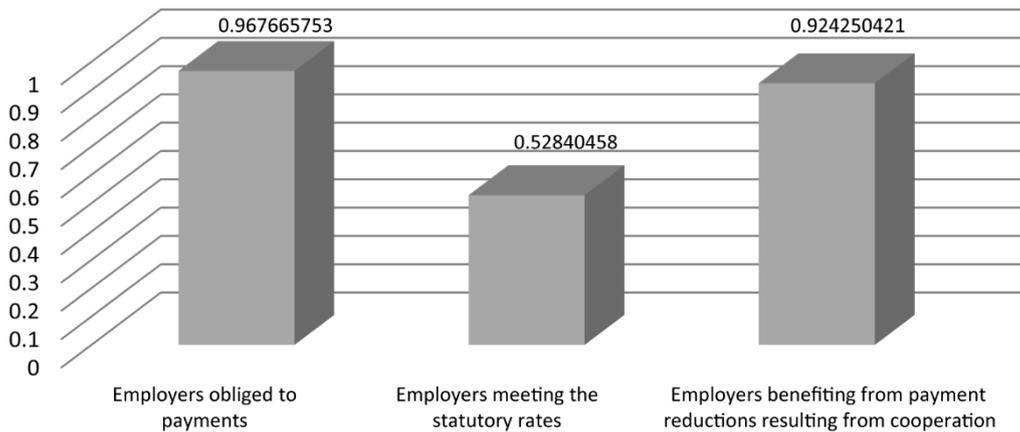


Fig. 3. Correlation between the amount of payments and the employment rate of persons with disabilities in 2018-2022

Source: authors' calculations based on the data provided by PFRON.

The assessment of the correlation between the average annual amount of payment to PFRON and the level of employment rate of persons with disabilities showed a strong relationship between these variables, amounting to 0.5284 for the employers who achieved the statutory rate, and as much as 0.9677 for those penalised for not meeting the statutory rate.

A similarly high correlation was observed for employers benefiting from lower payments to PFRON as a result of the reductions obtained from the employers authorised to grant them. In this case, the ratio was 0.924250421 regarding the correlation between the amount of monthly penalty and the amount of obtained reductions. The risk of a higher penalty did not have any effective impact on meeting the statutory employment rate for persons with disabilities, as shown in Figure 4.

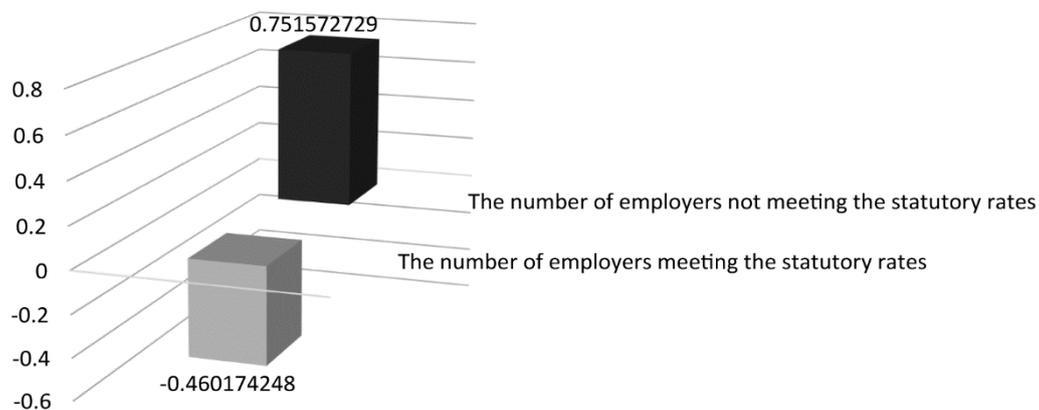


Fig. 4. Correlation between the amount of payments and the number of employers meeting and not meeting the employment rate for persons with disabilities in 2018-2022

Source: authors' calculations based on the data provided by PFRON.

The Pearson correlation coefficient at the level of 0.7516, calculated for the variable, i.e. the number of employers not meeting the statutory indicator and the penalty basis, showed that the growing number of employers obliged to make payments and the increasing amount being the basis for the penalty calculation demonstrated a very high correlation. The average negative correlation at the level of -0.4602 between the number of employers who reached the statutory rate and the increasing amount of the penalty indicates that the severity of the applied penalties was so low that some of these employers gave up avoiding it as the penalty increased.

9. Conclusions

The purpose of this study was to identify the possibilities and interest of employers in reducing non-wage costs regarding payments to PFRON resulting from not meeting the statutory obligation to employ people with disabilities, imposed on entrepreneurs–employers providing at least 25 full-time jobs. In addition, an attempt was made to determine the effectiveness of applying penalties for not employing people with disabilities in terms of motivating employers to supplement the statutory rate in order to avoid penalties and increased non-wage costs. The authors also tried to answer the question to what extent the increase in penalties imposed on employers and their growing interest in obtaining payment reductions for purchasing services and goods from the authorised employers (reaching over 30% of employment level of the disabled) stimulated the growth of employers' interest in acquiring the entitlements to grant them. These employers benefit from easier sales of their products or services, and thus have a stronger competitive position on the market.

In light of the conducted research and literature studies, the following conclusions were formulated:

1. In the analysed period 2018-2022, non-wage costs regarding payments to PFRON were systematically rising as a result of higher average monthly remuneration constituting the basis in calculating penalties for not employing persons with disabilities at the statutory level.
2. Throughout the studied period, the disproportion between the number of employers who did not meet the statutory rate, i.e. those paying penalties, and the number of employers who met the statutory rate, increased. Therefore, the threat of a penalty was not an explicit determinant for achieving the required statutory rate.
3. The declining percentage of employers who reached the statutory rate indicates that exemptions from payments are increasingly less profitable in relation to the costs of employing persons with disabilities, both in financial and organizational terms. Employees with disabilities often require special working conditions, have additional privileges and restrictions resulting from their diseases, which turns out to be such a burden and cost for employers that some of them refrain from employing such persons at the level required by law or reduce penalty payments by purchasing services or goods from the employers authorised to provide them.
4. A systematically growing difference between the total number of full-time jobs with an average employer paying penalties and meeting the statutory rate was observed. The employers paying penalties employed, on average, twice as many workers as those meeting the statutory rate. At the same time, the employers obliged to make payments tried not to increase the difference between the statutory rate and the percentage of employed disabled people constituting the basis for the penalty. The employers meeting the statutory rate also maintained a safe surplus of full-time jobs over the level required by law, ensuring their exemption from payments.
5. The number of employers entitled to grant reductions in payments to the Fund systematically decreased, so maintaining a 30% employment rate for persons with disabilities, and especially those most severely affected by their disability, became too much of a challenge, and as a result their number declined each consecutive year.
6. The issued amounts of reductions in payments were not sufficient to fully cover the amount of entitlements obtained by the buyers. Hence, the amounts of payment reductions obtained each

year could not be fully settled in payments to PFRON, and they were rolled over to subsequent periods and often disappeared completely after a period of six months from obtaining them.

7. Correlation coefficients between the basis for imposing a penalty, i.e. the figure of 40.56% of an average remuneration and the employment rate for persons with disabilities was very high, which indicates high effectiveness of the increase in the penalty amount as the determinant of employment growth. It was similar in the case of employers benefiting from reductions in payments to the Fund resulting from cooperation. In this case, a very strong correlation between the growing amount of the basis for calculating the penalty and the amounts of the demand for reductions reported to their issuers was also observed.
8. In assessing correlations between the average annual amount payment base to PFRON and the employment level of the disabled with employers exempt from payments, the Pearson correlation coefficient, set at a level slightly above 0.5, means a moderate correlation. However, these entrepreneurs were less concerned about an increase in the amount of payments to PFRON, which seems obvious, because they had a surplus in employing persons with disabilities in relation to the statutory requirements, and even the rate reduction did not constitute an expense on this account for them.
9. Despite the increasing amounts constituting the penalty basis for not employing persons with disabilities, the correlation between the number of employers not meeting the statutory rate and the amount of this basis at 0.7516 indicates that employers were not concerned about the increasing amounts of payments or were unable to achieve the statutory rate for many reasons, among others, due to the limited number of relevant candidates with disabilities available on the labour market, high costs of organizing their employment, or the limitations resulting from their health condition.
10. The average negative correlation between the basis for calculating a penalty and the number of employers with an employment rate of -0.4602 indicates that the systematically growing amounts of the penalty had an average impact on the decrease in the number of such employers.

Summing up, the authors identified a certain model of behaviour followed by Polish employers regarding the obligation to employ persons with disabilities, based on minimising the effects of imposed penalties and avoiding their increase, while maintaining a relatively constant level of employment. However, there is a growing interest in obtaining entitlements to reduce payments to PFRON resulting from cooperation with employers authorised to grant them. This does not require an increase in the employment of persons with disabilities, but due to the limited reduction amounts, the demand for such reductions does exceed the supply. The employers who have already reached the statutory rate try to keep it, while the employers who do not meet the statutory rate and are forced to make payments try to gradually increase the employment percentage of persons with disabilities and/or reduce the statutory rate by employing people suffering from special conditions. Therefore, it is difficult to explicitly indicate the particular effectiveness of payments to PFRON as determinants of employment growth in the context of a satisfactory situation on the labour market and their relatively small severity, as well as the legal possibilities to reduce their amount. Thus, the authors confirmed the research hypothesis put forward in the introduction to this study.

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