
Are the Sheltered Employment Workshops Still Necessary? - Change Factor and Market Conditions

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Dominik Czerkawski¹, Joanna Małecka²

Abstract:

Purpose: The paper fits into the social aspects of disability. The main objective of the study is to determine the change coefficient, which would make it possible to predict economic aspects related to the social demand for the number of Sheltered Employment Workshops (SEW) on the Commercial Labor Market (CLM).

Design/Methodology/Approach: The study uses source literature analysis, empirical and quantitative research: time series analysis and linear regression analysis. The time series analysis made it possible to study the dynamics and needs directions of the number of Sheltered Employment Workshops (SEW) on the Commercial Labor Market (CLM). Linear regression analysis was used to investigate the correlation between SEW and CLM. Empirical research was enriched with an own survey that confirms the social trend.

Findings: The results of the research confirmed the hypothesis. Studies have shown that the change coefficient is decreasing, which coincides with the social feeling of the surveyed group of respondents.

Practical Implications: The article will define the determinants of the social and political aspects of the disability community in Poland. These determinants include the number of Sheltered Employment Workshops (SEW) on the Commercial Labor Market (CLM), the percentage of respondents in the surveyed group expressing their social feelings, and political state.

Originality/Value: Based on the analysis of the literature, a research gap was identified in terms of the social aspects of disability in the concept of labor market. This study will contribute to the knowledge on the labor market condition, including the group of people, who still are not integrated part of our community. The study also contributes to the open discussion on the possibility of professional activation of people with disabilities and can be used in the creation of the state, local government and local policy in the studied area.

Keywords: Economic activity, disability, social factor, Sheltered Employment Workshop, change coefficient.

JEL classification: I14, I15.

Paper Type: Research article.

¹MSc. Eng., Faculty of Management Engineering, Poznan University of Technology, Poland, e-mail: dominik.sla.czerkawski@doctorete.put.poznan.pl;

²PhD, Faculty of Management Engineering, Poznan University of Technology, Poland, ORCID: 0000-0002-5017-0417, e-mail: joanna.malecka@put.poznan.pl;

1. Introduction

Disability is a factor that conditions the state of health of modern civilization. This issue has already been present in Ancient Greece, where beauty and physical strength were the canons of survival. In Sparta, there was an absolute order to get rid of infants who were born with disabilities. If any new-born baby disturbed the ancient harmony of the world, it was thrown off the rock. The Middle Ages considered disability as a “divine punishment” for sins committed in the family, therefore crippled persons were given either to organized, closed shelters located away from cities and human settlements, or used to work as a beggar, most often in the streets or near churches. The condemnation and contempt that disability has always faced was present during World War II and the rule of Adolf Hitler, and is still present, especially among tribal communities such as Yanks in Sudan or the African tribes.

However, do countries that are not only considered developed but also think about themselves in this category, sufficiently care for people with disabilities, providing them with access to socially desirable goods, even like ramps or suburban transport? Contemporary economic policy tries to treat all social areas with the same attention, including disability aspects. Therefore, there is no more talk of ‘contempt’ but of ‘social rejection’, no more of ‘condemnation’ but of ‘system gaps’. The behavior defined as ‘tolerance’ and ‘acceptance of otherness’ is intended to replace ‘embarrassment’ and ‘discrimination’.

According to the latest research, the population of people live longer (WHO, October 2021). The problem of disability does not only concern the elderly. It can also be observed in young people and even young children as a result of birth defects, postpartum, chronic diseases, accidents or injuries. This statement is reflected in the definition recognized by the World Health Organization (World Health Organization, 2011). At the same time, the economic activity of people with disabilities is decreasing in enterprises covered by public support – the so-called Sheltered Employment Workshops (SEW)³, with a simultaneous increase in the

³*The Sheltered Employment Workshop is an enterprise with a special legal status, which is adapted to employing people with higher degrees of disability. The principles of establishing and operating a sheltered employment establishment are regulated by the Act on Vocational and Social Rehabilitation and Employment of Disabled Persons of August 28, 1997. Decisions on granting the status of a sheltered employment workshop are issued by a vivid. Sheltered employment establishments are entitled to, among others: (1) exemptions from real estate tax, agricultural and forestry tax, (2) exemptions from tax on civil law transactions, (3) co-financing for the salaries of employed persons with disabilities, 4) co-financing of up to 50% of interest on bank loans taken, provided that these loans are used for purposes related to the professional and social rehabilitation of disabled people, (5) reimbursement of costs: construction or extension of the company's facilities and premises, transport, administrative provided that these are only additional costs of the employer resulting from employing the disabled.*

Commercial Labor Market (CLM). This may result from the desire to strongly participate in this group in social life and to be active among the general population of people able to work (Simpson *et al.*, 2001, pp. 233-244).

In this study, the phenomenon of disability is a social factor, considered in a multi-faceted manner, also in economic terms. The scale of the legitimacy of the existence of the research problem was shown in comparison with the population of able people against the background of a selected EU country - Poland.

The beginning of changes, referred to as the “new view on the issue of disability”, began in the 1970s, with the emergence of the so-called *Disability Studies*. At that time, this field did not take up the subject of disability in a partial way, trying to describe it in psychology, sociology, or economics, but spoke about it comprehensively in the context of the social current. Then words such as ‘cure’ or ‘fix’ were replaced by, e.g. ‘understand’ or ‘integrate’. Slowly, but more and more strongly, disability ceased to be just a disease, but became an increasingly noticeable correlate of all social aspects (Liggett, 1988, pp. 263-275).

British sociologist, first Professor of *Disability Studies* Michael J.H. Oliver is the author of the term “social disability model”. A key element of the social disability model is the distinction between physical disability and disability understood as the result of oppressive treatment by the social environment. Studies conducted by Olivier, mainly of a qualitative nature, showed the life situation of people with disabilities from their perspective. He discussed topics such as media images of disability, old age, and aging of people with disabilities, independent life, disability in various races and ethnic groups, emotional relationships, sexuality, and parenthood of people with disabilities.

Research on one of the precursors of the social disability model - writer and social activist for people with disabilities Victor Berel Finkelstein, have shown that physical disability is purely social i.e., after removing architectural barriers to integrate people with this dysfunction, its disappearance can be observed (Finkelstein, 1980). A similar effect was obtained by adopting this approach in an economic environment (Oliver, 1990; 1993, pp. 49-60). Social constructors argued that disabled bodies and mental disabilities are dependent on the Creator (God) (Bunge, 1999; 1996). Therefore, supporters of the social model maintain that the biological and physical features of disability are merely illusions, fully determined by the context and values of human perception (Kauffman, 2011). What is more, both Finkelstein and Oliver argue that disability is not a problem in itself – these are neutral conditions when we remove social barriers (Oliver, 2018; Finkelstein 1980).

The social model of disability, as defined by the Manchester Disabled People’s Access Group (MDPAG), presents a way of understanding access issues and social exclusion, and sees disability as a “disabling world”. All of the following are

examples of situations that can be changed, and thus enable people with disabilities to participate in mainstream society (Figure 1).

Figure 1. The social model of disability



Source: Own work based on MDPAG, March 2020.

The factor presented in the social model of disability: poor employment prospects, is one of the main problems related to the phenomenon of disability in the world, which also exists in Poland. It can cause inactivity of people with disabilities as potential employees on the Commercial Labor Market, introducing additional demotivating conditions.

The aim of the research was to indicate a change coefficient that would allow predicting economic aspects related to the social demand for the number of Sheltered Employment Workshops (SEWs) on the Commercial Labor Market (CLM), taking into account turbulently changing economic conditions. Therefore, based on the analysis of data collected in the years 2004-2019, in the field of fluctuations between the trends and changes resulting from the differences in the economic behavior of Sheltered Employment Workshops and people with disabilities active on the Commercial Labor Market, a research question was posed: *Are the Sheltered Employment Workshops still Necessary?*

It concerns the possibility of determining the coefficient of change, taking into account also the social aspect presented in the disability model (Figure 1) - the occurring alienation and, at the same time, the willingness to integrate people with disabilities who are active and able to work. That is, with the observed trend in the number of SEW occurring in the last 16 years on the Polish market, an attempt was made to define possible recommendations as to the possibility of modifying the current public finance policy, supporting economic entities of this category. At the same time, market conditions are understood as economic and social effects that

directly affect all micro-and macroeconomic indicators, defined in the literature on the subject as turbulently changing economic conditions.

2. Materials and Methods

The research used mathematical analysis and linear regression tools to illustrate the current situation on the labor market in the following correlation: the number of employers running the Sheltered Employment Workshop to the number of employees with disabilities, with the ability to perform paid work. The relationship is shown, indicating the coefficient of this change. On its basis, a mathematical equation was also proposed, enabling the calculation of the predictable number of enterprises supported by public support depending on the number of employees with disabilities. The results were supported by a survey conducted among members of the association, associating people with disabilities in Poland, which were correlated with global data conducted by government institutions.

Two mathematical variables were used to obtain the presented research results:

- X (independent variable, predictor): number of employees with disabilities on the Commercial Labor Market (CLM),
- Y (dependent variable): number of employers running the Sheltered Employment Workshops (SEWs), creating a coefficient of change that allows forecasting trends in market demand for SEWs, which is the basis for developing a formula for predicting the demand of the number of SEWs on the CLM.

To obtain the results of own research presented in the article, the linear regression principle was applied in the multi-prediction model, establishing the b_i direction coefficients, allowing for 16 observations, each of which is the result achieved in the following years 2004, 2005, 2006, ..., 2019 by economically defined as a post-transformation country. Hence, the year of Poland's accession to the European Union was adopted as the base year for research.

To create own survey 103 respondents were used. Two questions were asked: (1) What type of enterprise would you like to work in? Possible answers were as follows: (a) Supported Employment Workshops, (b) Commercial Labor Market. (2) Which terms will you identify with? Possible answers were as follows: (a) disabled people, (b) people with disabilities.

One of the aspects of such an approach is to set out further research directions, applications, and recommendations related to the economic activity of people with disabilities. The social factors are taken in the article: (1) disability, (2) economic activity, as well as (3) social conditions, are one of the most important issues in countries with a low level of social capital, which is also a determinant of the

development and creation of economic and financial policies of individual world economies.

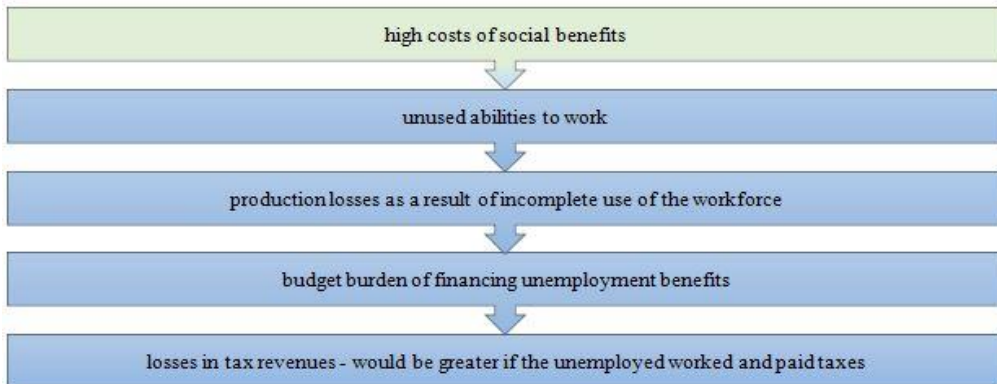
3. Conditions of Disability and Economic Activity as Social Factors – Discussion

Disability is a socially important global issue. Both from the point of view of people with disabilities and people not belonging to the group of both socially and economically “excluded” people (Gillberg, 2020; Rymsza, 2016, pp. 1-34; Marszałek, 2007, pp. 339-353; Söder, 1989, pp. 117-129; Söder 1990, pp. 227-241). The economically inactive population, being in the age of professional activity or unemployed, not participating in full social life often faces the barrier of the disappearance of creativity and entrepreneurship. What is more, if the costs of the budget of services aimed at helping people with disabilities are insufficient and inadequately managed, they constitute a burden for taxpayers, employers, who participate in the costs of these programs.

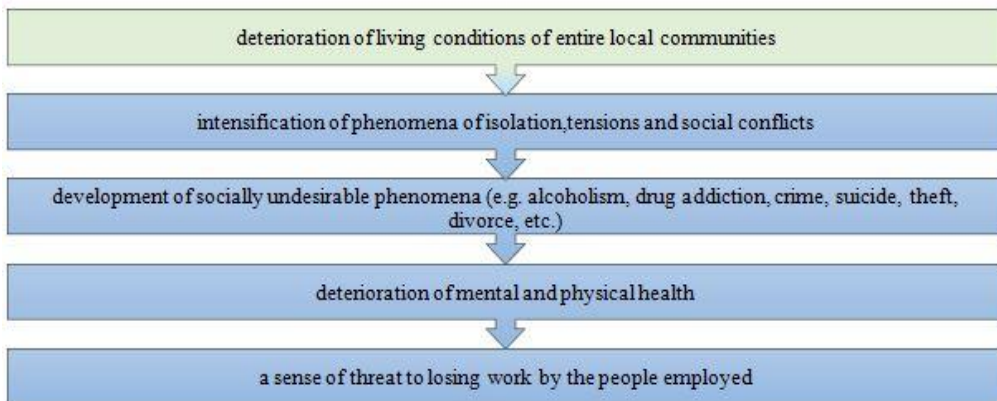
This issue becomes particularly significant when it is considered in the aspect of the size of enterprises, their possibilities, revenues, expenses, profitability, and investments (Małecka, 2015, pp. 91-122). The most important macroeconomic factors must be built by the smallest economic entities, belonging to the group of micro, small and medium enterprises, where the role and importance of quality remain the determinant of entrepreneurship development that feeds state budgets (Małecka, 2018, pp. 246-253).

In the aspect of the discussed issue – the professional activity of people with disabilities – the effects of one of the most important economic macroeconomic factors existing in the relevant literature – unemployment and its dimensions: economic, social, and psychological, which concern both non-disabled people and people with disabilities, who have received commission decision on the ability to work and show a willingness to take up professional activity should be indicated. Revenues from taxes paid by these economic entities play a significant role and position in the budgets of all world economies.

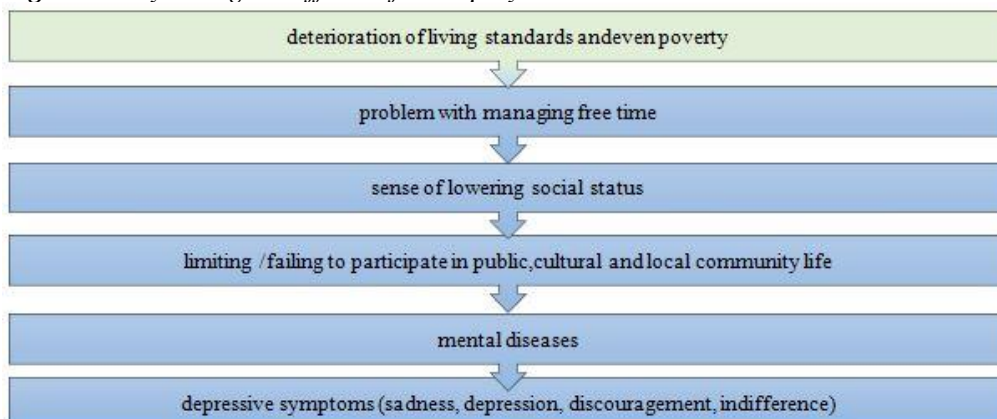
On the other hand, the costs of social benefits, benefits paid to the unemployed, benefits paid to the poor and people with deteriorating living conditions, support for housing funds for the unemployed, psychological consultations for chronic job seekers, courses enabling professional development and retaining for people who want to be among the professionally active, and consequently also larger funds allocated to government, social and local law enforcement services related to the development of socially undesirable phenomena, such as crime or theft, burden state budgets, and therefore each taxpayer, who is a component of the economy’s system, paying taxes – regardless of the level of taxpayer’s physical fitness, these revenues are one of the basic sources of public finances (Figures 2, 3, 4).

Figure 2. Economic effects of unemployment

Source: Own work.

Figure 3. Social consequences of unemployment

Source: Own work.

Figure 4. Psychological effects of unemployment

Source: Own work.

All described effects of being without work for more than 3 months, cause further disorders than those indicated, economic, social, and psychological, which have been observed among unemployment people after this time from being professionally inactive. Support systems that occur in economies considered to be developed can counteract this. It should be noted, however, that poorly designed forms of support may discourage entrepreneurs from creating new and subsequent jobs adapted for people with disabilities (Hoopengardner, 2001).

The factor appearing in the model of disability, *poor prospects of employment* – as already emphasized – is of global importance. The consequences of the lack of actions aimed at eliminating its importance in the social model of disability should constitute an important element of the policies of the governments of every market economy and their public finances, from which Sheltered Employment Workshops are directly supported.

In Poland, the collection of data on persons is carried out by state bodies, a study that is a study of public statistics. The problem of disability and economic activity as a social factor was also addressed in the framework of the National Censuses (NC) (Table 1).

Table 1. *Population and participation of people with disabilities (PwD) in the general population - the city vs. a village in Poland*

Including		Population				PwD*									
		Total		Men		Women		Total		Men		Women			
Total	2002	38	230	18	516	19	713	5	456	2	568	2	888		
	2011	38	511	18	643	19	867	4	697	2	166	2	530		
City	2002	23	610	11	234	12	376	3	213	1	488	1	724		
	2011	23	405	11	112	12	293	3	018	1	362	1	655		
Village	2002	14	619	7	282	238	7	337	477	2	243	1	079	1	163
	2011	15	105	7	531	184	7	574	748	1	679	804	799	874	213

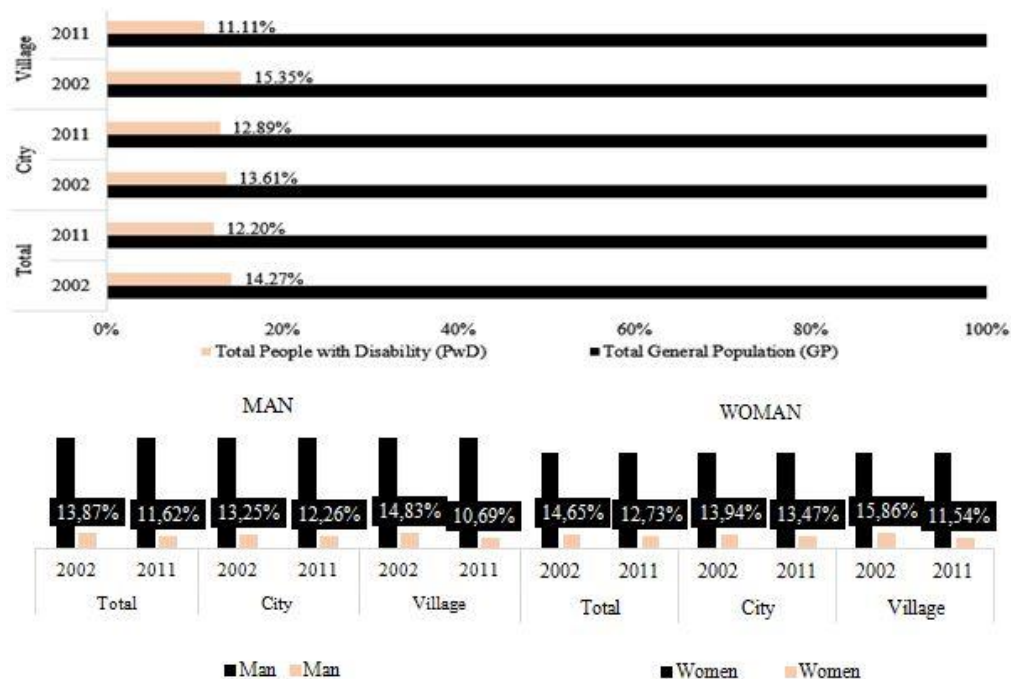
Note: *PwD - People with Disabilities

Source: Own work based on GUS, March 2020.

In general, the total population of people during the period under consideration increased by 0.7%, which reflects the general trend. At the same time, there are 16.2% fewer people with disabilities (respectively: in the city - 6.5%, in the village - 33.6%). This effect is associated with the migration of the rural population to cities where both the labor market and development opportunities, and above all, access to health care are much wider (Figure 5).

It was also noted that a higher percentage of people with disabilities occurs among the female population than the male population, both in the village and in the city (respectively, with the tendency: city 2002 – 0.69%; city 2011 – 1.21%; village 2002 – 1.03%; village 2011 – 0.85%).

Figure 5. Population structure in selected years – General Population (GP) versus People with Disability (PwD)



Source: Own work.

The problem of jobs for people with disabilities is a complex issue and is problematic on the scale of the European Union (EU), as the share of the economically active PwD groups is still high compared to the population of individual world economies. According to European reports, published at the end of 2019, the unemployment rate among this group at the turn of the analyzed years remains at the level of 15.9% - 20.2%, with the simultaneous employment of less than 50% of people with disabilities, who have a commission certified ability to take up professional work (Table 2).

Table 2. The economic activity of people with disabilities in the EU in 2008-2016 [%]

People with disabilities in the EU	Years									
	2008	2009	2010	2011	2012	2013	2014	2015	2016	
Employed	46.4	46.1	46.0	46.9	47.9	48.5	48.7	47.4	48.1	
Unemployed	15.9	17.3	18.0	17.4	18.1	19.0	19.6	20.2	19.6	

Source: Own work based on EUROSTAT, March 2020.

The information gap in Poland regarding the number of people with disabilities in periods not covered by the National Census (NC) is filled with survey questions and

annual reports of the State Fund for the Rehabilitation of the Disabled (PFRON), creating a scale of economic activity in the Polish society (Table 3, Figure 6).

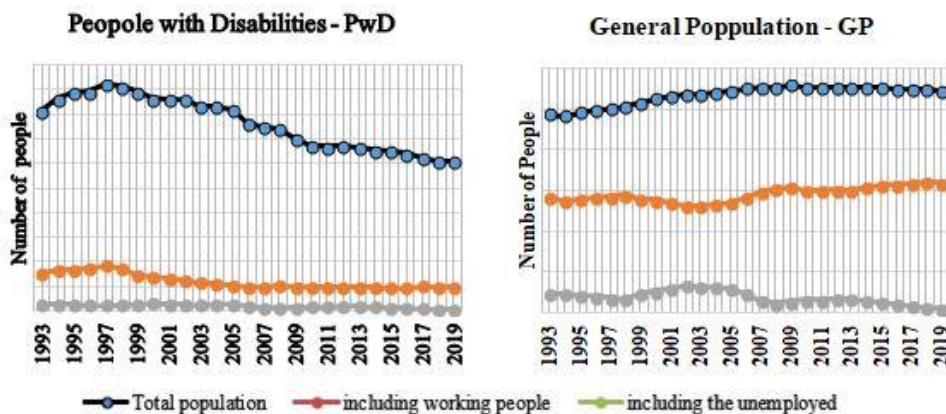
Table 3. *The economic activity of persons with disabilities and non-disabled persons in Poland in 1993 - 2019.*

Specification	Median value from 1993-2019	Median value from 1993-2019 [%]
Total population	30 953 000	100.0
including the employed	15 240 000	49.2
including the unemployed	1 923 000	6.2
*Total people with disabilities	3 806 000	100.0
including the employed	508 000	13.3
including the unemployed	97 000	2.5
**Total able people	27 245 000	100.0
including the employed	14 478 000	53.1
including the unemployed	1 702 000	6.2

Note: *disabled people over 16 years old, **non-disabled people over 15 years old

Source: Own work based on BPRSON, February 2020.

Figure 6. *The economic activity median in 1993-2019*



Source: Own work based on Table 3.

From a social point of view, taking into account the factor of weak employment perspectives and a slight percentage of economic activity of people with disabilities: working (13.3%), unemployed (2.5%), and economically inactive (84.2%), people started thinking about the legitimacy, and conditions of the statistics obtained – maybe enterprises covered by public support, destroying the status of Sheltered Employment Workshops (SEWs), are no longer an attractive form of employment for people with reduced skills? Hence, an attempt was made to determine the coefficient of change supporting the policy of enterprises of this type and their real number of demands on the Commercial Labor Market.

Sheltered Employment Workshops (SEWs) in Poland are market entities whose main source of income is business activity. Public aid subsidies constitute a small percentage of their financing (estimated 15-20%). There are also some SEW that receive less than 14% of the subsidy because they benefit from VAT refunds. These market entities enjoy privileges, incl. exemption from paying taxes (e.g., on real estate, civil law transactions) (NIEPELNOSPRAWNI.PL, November 2021).

After Poland joined the European Union (EU), the European Commission Regulation of December 12, 2002, on the application of Art. 87 and 88 of the European Community Treaty with regard to state aid for employment. It regulates, inter alia, the principles of granting aid from public funds for the creation of new jobs for people with disabilities (EUR-lex, November 2021).

According to the EU definition, sheltered employment is employment with an indicator of at least 50% for employees – people with disability - unable to work in a given enterprise. The rules for determining incapacity for work or the corresponding degree of disability are defined by the laws of a given country - they are not consistent for the entire EU, which was emphasized in the publication by Czerkowski *et al.* still in press.

In Poland, the definition of a person with a disability incapable of work is a legally obtained degree of considerable or moderate. Therefore, according to the EU regulation, in this country, the state subsidy is granted to protected enterprises i.e. Sheltered Employment Workshops (SEWs) that employ at least 50% of people with a severe and moderate degree of disability. This leads to a situation in which the vast majority of the SEW does not have a high enough employment rate for people with disabilities to meet EU requirements.

According to a statistic of the government information portal, the Office of the Government Plenipotentiary for Persons with Disabilities, it would be necessary to employ 2.5 times more people with severe and moderate disability. Currently, Sheltered Employment Workshops employ about 18% of people with a severe or moderate degree of disability. However, the employment rate of people with a certificate of disability on a global scale in Poland in these establishments is 55-60%. The reason for this is the fact that mainly people with a slight degree of disability are employed. After the EU regulations came into force, these people are not included in the protected enterprises' criterion (BPRSON, April 2021).

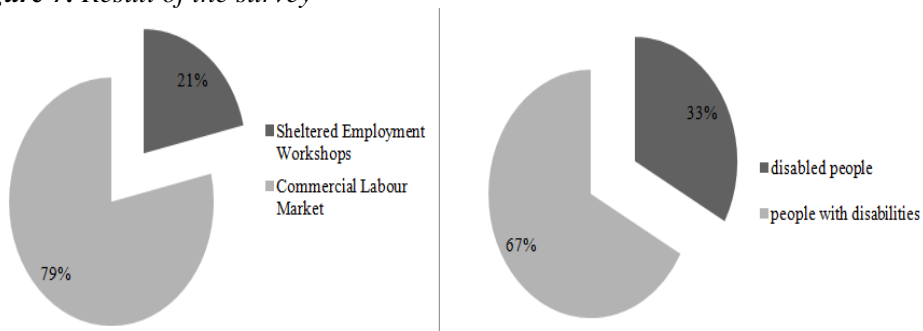
The institution monitoring the economic activity of people with disabilities in Poland is the PFRON structural unit called *Subsidy and Refund Service System*. It also collects information about the number of enterprises supported by public support, i.e. Sheltered Employment Workshops. The reporting activities of these institutions in Poland have been conducted since 2004 (BPRSON, March 2020; Garbat, 2017, pp. 99-114).

4. Coefficient of Change in the Light of Empirical Studies – Results

Own research conducted among the members of the “Nieprzeciętni” Association, check the economic and social conditions in the field of “attractiveness” of the Sheltered Employment Workshops on the current Commercial Labor Market. These data were correlated with general statistics of Poland, collected since 2004 by the governmental institution – PFRON. The number of employers from 2004-2019 was analyzed, comparing the number of people employed in the Sheltered Employment Workshops and other companies operating on the Commercial Labor Market showing economic activity in the analyzed period in Poland (Czerkawski *et al.*, 2021).

Own research showed that the *Sheltered Employment Workshops* are not an attractive form of economic activity among the respondents, as well as with the term *people with disabilities* to identify with (Figure 7).

Figure 7. Result of the survey



Source: Own work.

The presented result of 79% for the Commercial Labor Market to 21% for the Sheltered Employment Workshops (SEWs) may be the result of the narrative of the name "Sheltered Workshops" itself and not legal benefits related to the activities of protected enterprises among respondents to the survey. A similar ratio of the percentage value was observed for the popularization of the word disability (67% for people with disabilities and 33% for disabled people). The research attempt clearly showed that the social moods accompanying the issue discussed in the article, which may translate into a wider part of the community.

On the other hand, the results of the general population indicate that the number of employers running the Sheltered Employment Workshop (SEW) is decreasing depending on the increase in the number of employees with disabilities in the Commercial Labor Market. Therefore, a research question was formulated regarding the relationships between them (Table 4).

In an attempt to indicate the coefficient of change in the number of employers running a Sheltered Employment Workshop depending on the number of employees with disabilities on the Commercial Labor Market, actual data from 16 years (2004 - 2019) was selected for the analysis, as 16 independent observations: the number of Sheltered Employment Workshops from 2004-2019 (II) and the number of employees with disabilities employed in companies in Poland (II+IV) (Table 4). Just like the tendency of people with disabilities working in enterprises without the SEW status (except for 2008, where the growth was negative at the level of 2,947 people) can be called - at the turn of 16 analyzed years - upward (respectively, 2004 to 2019: 80.72%), so no similar trends were found in the Sheltered Employment Workshops (Table 5).

Table 4. *The number of employers running the Sheltered Employment Workshop and employees with disabilities on the Commercial Labor Market in Poland.*

Observation	*Month / Year	Sheltered Employment Workshop		Commercial Labor Market	
		I	II	III	IV
		Employer/ leader	Employees with disabilities	Employer/ leader	Employees with disabilities
1	12.2004	2 463	172 597	4 122	28 130
2	12.2005	2 356	173 885	4 934	32 902
3	12.2006	2 251	174 105	5 698	37 968
4	12.2007	2 185	178 796	6 950	42 188
5	12.2008	2 146	163 794	7 134	39 241
6	12.2009	2 087	188 704	11 507	58 444
7	12.2010	2 001	198 234	14 090	69 007
8	12.2011	1 806	173 815	15 676	71 688
9	12.2012	1 437	163 118	17 305	80 493
10	12.2013	1 392	166 862	19 318	85 142
11	12.2014	1 263	139 403	22 746	104 037
12	12.2015	1 163	124 467	25 036	121 611
13	12.2016	1 092	124 217	27 469	135 200
14	12.2017	1 028	122 453	29 337	138 479
15	12.2018	906	107 170	30 389	145 338
16	12.2019	848	99 862	31 666	145 808

Note: * the presented data - at the end of each year - arose as a result of the systematic collection of data from 12 months over 16 years - a total of 192 observations.

Source: Own work based on BPRSON, March 2020.

Table 5. *Deviation and tendency of employers running Sheltered Employment Workshop (SEW) and employees with disabilities on the Commercial Labor Market (CLM) in Poland*

Observation	*Month / Year	Number of disabled people working in the SEW and the CLM	Deviation [number]	Trend [%]
1	12.2004	200 727	0	100
2	12.2005	206 787	6 060	3.0190
3	12.2006	212 073	5 286	5.6525

4	12.2007	220 984	8 911	10.0918
5	12.2008	203 035	-17 949	1.1498
6	12.2009	247 148	44 113	23.1264
7	12.2010	267 241	20 093	33.1365
8	12.2011	245 503	-21 738	22.3069
9	12.2012	243 611	-1 892	21.3643
10	12.2013	252 004	8 393	25.5456
11	12.2014	243 440	-8 564	21.2792
12	12.2015	246 078	2 638	22.5934
13	12.2016	259 417	13 339	29.2387
14	12.2017	260 932	1 515	29.9935
15	12.2018	252 508	-8 424	25.7967
16	12.2019	245 670	-6 838	22.3901

Note: * the presented data - at the end of each year - arose as a result of the systematic collection of data from 12 months over 16 years - a total of 192 observations

Source: Own work.

To conduct an in-depth analysis, the following variables were defined:

- X (independent variable, predictor): number of employees with disabilities in the labor market,
- Y (dependent variable): number of employers operating the Sheltered Employment Workshop.

The calculations were performed on the tested data set from table 4 using linear regression with the multi-predictor option (formula 1):

$$Y_{\text{predicted}} = b_1X_1 + b_2X_2 + \dots + b_iX_i + a, \quad (1)$$

where:

$Y_{\text{predicted}}$: dependent variable, explained variable, predicted variable,

X_i : predictor in the model, another explanatory, predictive variable,

b_i : direction coefficient for the given predictor in the linear regression model,

a: intercept,

i: observation number.

Then, for each of the predictors, the direction coefficient (b_i) was determined, so that the calculations were transformed into the model (formula 2):

$$Y_{\text{predicted}} = b \cdot X_i + a, \quad (2)$$

Formula 2: Linear regression in a multi-prediction model with specific direction factors: a and b.

The values of the coefficients a and b were obtained successively using the formulas (formulas 3, 4):

$$a = \bar{y} - b \cdot \bar{x}. \quad (3)$$

Formula 3: Value of the a coefficient.

$$b = \frac{n \cdot \sum_{i=1}^n x_i y_i - \sum_{i=1}^n x_i \cdot \sum_{i=1}^n y_i}{n \cdot \sum_{i=1}^n x_i^2 - (\sum_{i=1}^n x_i)^2}, \quad (4)$$

Formula 4: Value of the b coefficient,

where the parameters of the equation model are, in formulas 3 and 4:

b: direction factor,

a: intercept,

$$\bar{y} - \text{mean } y: \bar{y} = \frac{\sum_{i=1}^n y_i}{n}$$

$$\bar{x} - \text{mean } x: \bar{x} = \frac{\sum_{i=1}^n x_i}{n}$$

n: number of observations,

i: observation number, $i = 1, 2, \dots, n$,

$Y_{\text{predicted}}$: dependent variable,

X_i : predictive variable.

On this basis, the values of regression parameters a and b were obtained, where:

$$a = 2\,723.549, \quad b = -0.013,$$

which, when applied to formula 2, allow to determine the value of the linear regression equation for the case considered in the study (formula 5):

$$Y_{\text{predicted}} = -0.013 \cdot X_i + 2\,723.549. \quad (5)$$

Formula 5: Linear regression in the multi-prediction model with determined values of direction factors a and b.

In this way, the results were obtained for the entire study population, which is the collections of individual 16 residual samples – 16 observations – from the years 2004-2019 for the defined X, as well as residual competencies $e_i = Y_i - Y_{\text{predicted}}$ were determined, and the relationships between X and Y predictor were indicated (Table 6), (Figure 8).

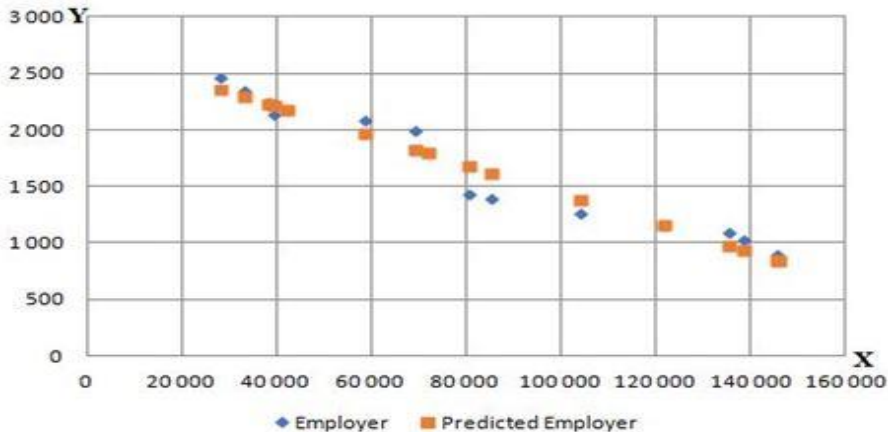
Table 6. $Y_{\text{predicted}}$ for X_i and (IV) from table 3 and values of residua components

Observation i	$Y_{\text{predicted},i}$	Y_i	e_i
1	2 358	2 463	105
2	2 296	2 356	60
3	2 230	2 251	21

4	2 175	2 185	10
5	2 213	2 146	-67
6	1 964	2 087	123
7	1 826	2 001	175
8	1 792	1 806	14
9	1 677	1 437	-240
10	1 617	1 392	-225
11	1 371	1 263	-108
12	1 143	1 163	20
13	966	1 092	126
14	923	1 028	105
15	834	906	72
16	826	859	33

Source: Own work.

Figure 8. Relationship between the predictor X and the answer Y for the value Employer and Predicted Employer



Source: Own work.

The course of research carried out in this way allows us to estimate the $Y_{\text{predicted}}$ values for a given X_i . Therefore, the dynamics of change were examined to interpret the b_i regression coefficient, assuming the “if then” condition in the form: if X increases by one unit, then Y changes value by an average of b units. Using formula (5), X was calculated at each iteration of Y (formula 6, Table 7).

$$\sum_{i=1}^{16} Y_{\text{predicted},i} = -0.013 \cdot \sum_{i=1}^{16} X_i + 2\,723.549, \quad (6)$$

Formula 6: Linear regression in the multi-prediction model with determined values of the a and b directional cofactors, taking into account 16 observations.

Table 7. Results for the studied relationship between $Y_{\text{predicted}}$ and X_i for formula (6)

i	$Y_{\text{predicted},i}$	X_i	$X_{i-1} - X_i$
1	16	208 273	-
2	15	208 350	77
3	14	208 427	77
4	13	208 504	77
5	12	208 581	77
6	11	208 658	77
7	10	208 735	77
8	9	208 811	77
9	8	208 888	77
10	7	208 965	77
11	6	209 042	77
12	5	209 119	77
13	4	209 196	77
14	3	209 273	77
15	2	209 350	77
16	1	209 427	77

Source: Own work.

The difference $X_{i-1} - X_i$ at each iteration was 77. Based on this observation, the interpretation of the regression coefficient b for the case under consideration was made, i.e.: *If the number of employees with disabilities on the market increases by 77 people, the number of employers running a Sheltered Employment Workshop should decrease by one unit.*

With such an interpretation of the b regression coefficient, for the research problem under consideration, the predictable number of employers running a Sheltered Employment Workshop was estimated with a variable number of employees with disabilities in the labor market, which takes a downward trend of -0.013 and is the coefficient of change in the topic of the issue.

Therefore, the main goal of the conducted research, in terms of the possibility of determining the coefficient of change, which would make it possible to predispose economic aspects related to the social demand for the number of Sheltered Employment Workshop (SEW) on the Commercial Labor Market, taking into account the turbulently changing economic conditions, has been achieved. The coefficient of change in the number of the expected Sheltered Employment Workshops can be used as a recommendation and be helpful for the government in supporting both micro and macroeconomic policies of each national economy – the number of enterprises of this type is adequate to the needs in the local and regional aspect, which will affect the national result.

The element of the scope of activities is important due to the limited possibilities of mobility and migration of people with disabilities. Detailed studies have shown that in the case of Poland, only 8.51% of all enterprises employing people with disabilities should apply for special government subsidies and the status of Sheltered Employment Workshops, implying additional economic benefits, for example in the form of reduced taxes. At the same time, the noticeable decreasing tendency of SEW confirms the lower market demand, with the simultaneous increase in the number of people with disabilities working in the Commercial Labor Market.

This may mean that either SEW are specialized in industries that are already unattractive to those interested and it would be advisable to revise those enterprises that are still subject to government visits, or consider how some of the funds allocated from public finance to SEW are transferred to the Commercial Labor Market by creating support and incentive programs for entrepreneurs employing people with disabilities to increase additional conditions motivating the employment of people from this social group.

5. Conclusions

From a social point of view, disability is a global issue. The Sheltered Employment Workshops (SEWs), using public aid to employ people with disabilities, by offering a protection package is becoming an increasingly less attractive workplace among those interested – as demonstrated by the downward trend in correlation: employer, employee. This was confirmed by the indicated factor being the subject of own research. Its negative value clearly illustrated a downward trend among the studied population.

The formula presented in the study, determined based on the change coefficient calculated from 16 observations, conducted in the years 2004-2019, provides for the expected number of employers running the Sheltered Employment Workshop depending on the number of employees with disabilities on the Commercial Labor Market. This factor can help determine the trend followed by these people when choosing their career path, as well as be helpful to the government, local government, and local institutions in creating policies regarding the importance of supporting the form of enterprises, which are the Sheltered Employment Workshops – still recognized as enterprises from social isolation of people employed in them.

The case study of disability as a social factor has shown a strong connection between the perception of issues related to physical disability, but also its acceptance by society at the same time, as evidenced by the increasing number of people with disabilities who are professionally active on the Commercial Labor Market. All over the world people with disabilities probably do not want to be equated with the words “disabled”, “protected”, “Sheltered Employment Workshops”. They prefer the phrases “with disabilities”, “help”, “Labor Market” and “Commercial Labor Market” to be common in public life, which could be clearly observed in the presented results

of own survey research. This narrative is reflected in some companies' global employment policies. Consider the Google company. When presenting the job offer, the company adds the following annotation to all of them: *...We are committed to equal employment opportunity regardless of race, color, ancestry, religion, sex, national origin, sexual orientation, age, citizenship, marital status, disability, gender identity or Veteran status...* (GOOGLE, October 2021) In this case, the people with a disability know that their disability is only one of their defining characteristics as a human.

Summing up, the observed declines in the Sheltered Employment Workshops are the result of two social factors and one political factor - as shown in the article. Social factors are: (1) the willingness to make people aware that disability is one of the human characteristics, (2) people with a disability can be valuable employees and fully participate in social life without succumbing to stereotypes - both are the results of the survey (Figure 7). The political factor shows shortcomings in the structure of economic entities such as the Sheltered Employment Workshops in Poland through their right to reimbursement of employment costs only for a significant and moderate degree of disability, disregarding the entire population of people with disabilities who are able to work - which was clearly emphasized at the end of the discussion part.

The obtained results will be used for the next stage of research, determining the direction of social behavior expectations of people with disabilities and their preferences – as for the creation by both commercial and governmental institutions, local government, and local institutions supporting professional activation of people with disabilities – possible applications and recommendations related to economic modeling of support for people with disabilities, taking into account the strength of social impact.

The presented results set another direction for research because, for the next possible recommendations to be complete, further inquiries should be made among the interested themselves, i.e. direct interviews with people with disabilities, professionally active in both markets, in the SEW and the CLM, examining the perception of both opportunities and barriers in making decisions about the workplace in both types of enterprises.

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