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TEMPORARY WORK AGENCIES AND UNEMPLOYMENT IN POLAND

Summary

During the last several years most European countries have noted a rapid increase in the share of temporary employment in the total number of employees. Among the forms of temporary employment have dominated: fixed-term employment contracts and temporary work agencies employment. [OECD]. Poland was located among the top of the countries with rapidly growing temporary employment and high unemployment.

In 2003, Poland introduced regulations regarding the employment of temporary workers. There was a sharp increase in demand for the services of temporary work agencies. The number of temporary workers rose from 0.23% of total employment in 2003 to 3.27% in 2012. Using empirical data, the author analyses the impact of temporary work agencies on the number of the unemployed. The results show that with the increase in the number of temporary work agencies, the number of the unemployed fell. Each agency employed an average of 795 unemployed. The largest group of temporary workers were those unemployed for 6 to 24 months.

Key words: temporary work agencies (IWAs), unemployment, Poland, temporary workers, employer –user.

1. Introduction

As business entities remain under constant pressure to improve efficiency, they are forced to seek new ways to reduce the costs of their activity or to achieve greater flexibility, which requires a partial replacement of fixed costs with variable costs, commensurate with the volume of produced goods and services. Among the most significant expenses of firms are costs of labour, which in many companies have undergone considerable modifications, mainly because of increased flexibility of the labour market and the associated changes in the labour law. Traditional contracts are being displaced by new flexible forms of employment, such as temporary contracts, telecommuting, self-employment, job sharing, management contracts, or outsourcing, enabling firms to adjust staff numbers as well as employment structure and rules to their needs, depending on the type and magnitude of performed tasks [*Elastyczne formy zatrudnienia...*, 2003, pp. 122-145]. These forms of employment are to ensure more flexible time and place of work, and alter the employee-employer relationships, as well as pay scales and job descriptions.

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Temporary work is a flexible form of employment which is immensely greatly popular with companies in Poland and most European countries. Employment relationship is here established among three parties: temporary work agency (employer), temporary employee, and employer-user (agency's customer). The activities of temporary work agencies has become the subject of discussion among researchers and the public due to the growing interest in this form of employment and its deregulation in many countries. Services provided by the agencies may be perceived as a substitute for regular employment. Typical research questions are concerned with such areas of research as determinants of the using of services of temporary work agencies [Forde, Slater, 2005, pp. 249-277; Vidal, Tigges, 2009, pp. 55-72; Spyttek-Bandurska, Szylo-Skoczny, 2008], the productivity of TWAs [Hirsh, Mueller, 2011, pp. 216-235], TWAs as a stepping stone to regular employment [Author, Houseman, 2010, pp. 96-128; Ichino et al., 2008, pp. 305-327]. Also data from the three largest temporary work agencies: Adecco, Work Service and Work Express, indicate that the number of contracts signed by these organisations with companies in need of staff grows along with the rise in unemployment rates [Wesołowska, 2012]. For instance, Adecco Poland report that in the third quarter of 2013, they were employing a record 11,450 temporary workers, 84% more than a year earlier. Similarly, studies conducted by the International Confederation of Private Employment Agencies and Boston Consulting Group on sample data from 46 countries across the world, including Poland, show that work agencies (incl. temporary work agencies) contribute to a reduction of unemployment by providing jobs to growing numbers of persons and help find a balance between supply and demand for labour.

These observations have prompted the author's interest in the link between temporary work agencies and the rate of unemployment in Poland, as expressed by the number of registered unemployed. The purpose of this paper is to analyse the dependence between the activity of temporary work agencies and the changes in the level of unemployment in Poland during the period 2003-2012.

On the basis of the above data, one can formulate a tentative hypothesis that temporary work agencies take care of a large proportion of the unemployed and provide a solution to slow down the rise in unemployment in Poland. To achieve the aim and verificate the hypothesis it will be used the following research methods: dynamics analysis of variables, basic statistical measures, correlation and linear regression model.

2. Legal and economic conditions of TWAs activity

Temporary work agencies are a type of labour market entity, and more precisely a type of employment agency. Under the Polish law, these organisations must function in accordance with the Act on the Promotion of Employment and Labour Market Institutions of April 20th, 2004 [Journal of Laws of 2008, No. 69, item 415 with further amendments], the Act on the Freedom of Business Activity of July 2nd, 2004 [Journal of Laws of 2004, No. 173, item 1807, with further amendments], the Act on the Employment of Temporary Workers of July 9th, 2003 [Journal of Laws of 2003, No. 166, item 1608, with further amendments], and the Regulation of the Minister of

Economy and Labour of October 13th, 2005 on the registration of entities conducting employment agencies and information submitted by employment agencies [Journal of Laws of 2005, No. 212, item 1770]. Article 18 of the Act on Promotion of Employment and Labour Market Institutions stipulates that work agencies provide employment services, both in Poland and abroad, as well as services regarding HR counselling, job counselling, and temporary work, and are entered in the regulated activity register of the relevant marshal's office. Such an entity can provide services in one, several, or all of the above-mentioned fields, and is obliged to submit annual reports on its activity to the marshal of the relevant voivodeship.

Under the Polish law, temporary work, as a flexible (non-standard) form of employment is also regulated by the Act on the Employment of Temporary Workers. This law rules that the formula of temporary work encompasses three entities: the employee, the employer-user and the temporary work agency (as employer). A temporary employee is taken on by a temporary work agency on the basis of a fixed-term employment contract, a contract for a specified task, or a civil law agreement. The maximum length of time for employment by a single employer is 18 months within 36 consecutive months [Art. 20 of The Act on the Amendment to the Act on the Employment of Temporary Workers, Journal of Laws of 2009 No. 221, item 1737]. This period was extended from 12 to 18 months in 2009. According to the representatives of the Association of Employment Agencies (SAZ), the change was extremely important for maintaining the employment of workers hired for projects whose implementation requires more than one year. The amendment has also benefited employers from smaller towns, since the limit of 12 months made rotation of temporary workers among a small number of companies difficult [*Od dziś obowiązuja*, electronic document: http://www.saz.org.pl/a,662,Od_dzis_obowiazuja_nowe_przepisy_o_pracy_tymcz_asowej.html, date of access: 06.11.2013].

The Act on the Employment of Temporary Workers states that a temporary work agency and an employer-user agree on: 1. type of job, 2. expected term of employment, 3. qualification requirements, 4. working time, 5. place of work, 6. scope of information on temporary work necessary to calculate remuneration and working time, 7. duties resulting from health and safety at work regulations, 8. terms regarding holiday entitlement of workers employed by a given employer-user on contracts shorter than six months.

Under the Act on the Employment of Temporary Workers, employer-users are obliged to: 1. provide temporary employees with healthy and safe working conditions which are compliant with health and safety regulations, 2. keep records of working time, 3. permit holiday leaves for workers employed by them for more than six months, 4. provide professional training to workers employed for more than six weeks. The employer-user must not assign tasks other than those specified in the contract signed with a temporary work agency or offer temporary workers working and employment conditions inferior to those given to full time staff.

A legal framework for this form of employment is also provided by the European Parliament and Council Directive of November 19th, 2008 on temporary agency work. The document emphasises that temporary work is a solution to meet the needs of both

entrepreneurs (flexibility) and employees (reconciling family and professional life). It is also noticed that there exist large disparities across EU member states as regards the legal status of temporary employees and their working conditions. The discussed document was designed to ensure the safety of temporary workers and improve the quality of temporary employment by implementing the principle of equal treatment of temporary workers as compared with regular workers in matters of employment and working conditions. According to Article 5, item 1 of the Directive, an employer-user is required to guarantee that temporary workers have at least the same basic working and employment conditions as those that would apply if they had been recruited directly by the employer for the same position. The listed conditions include matters connected with: working time, overtime, breaks, rest periods, night work, holidays and public holidays, as well as the protection of pregnant women and nursing mothers, the protection of children and young people, equal treatment for men and women, the combat of discrimination based on sex, race or ethnic origin, religion, age, etc. They must be compliant with the binding legislative, regulatory or administrative provisions, collective labour agreements and other general provisions that are currently in force [Directive 2008/104/EC..., 2008].

The representatives of Polish HR Forum believe that the market of employment agencies in EU countries used to be extremely varied in terms of legal regulations. For instance, in Great Britain the sector was mainly regulated by free market mechanisms. It was not until the introduction of the analysed Directive, after the 12-week transition period, that temporary and permanent workers were formally declared as equal. In the Netherlands, the work agency sector was regulated by means of collective agreements. Neither of the two countries mentioned above had provisions concerning the maximum duration of employment. In Poland, meanwhile, the relevant regulations were laid down in the Act on the Employment of Temporary Workers, the Polish Labour Code and related acts, and – to a limited extent – by collective agreements. The substantial discrepancies in the applied solutions caused initial difficulties in the implementation of the Directive, which was to become a ‘happy medium’, i.e. to provide appropriate protection of temporary workers and to restrict the freedom of employment agencies [CIETT, 2013].

Taking into consideration the economic context of the cited legal provisions, it has to be said that for employer-users the profitability of hiring temporary workers in Poland is mainly a result of the increased freedom to employ and dismiss staff. The rules stipulating that: 1. a third fixed-term contract must by right become a permanent employment contract [Art. 25 of the Labour Code] and that 2. the employer must extend a fixed-term or probationary period contract of a pregnant employee until the day she gives birth, provided that the contract would expire after the third month of the pregnancy (Art. 177 of the Labour Code) do not apply to temporary workers. Moreover, employers are not legally compelled by the Group Redundancy Act [Journal of Laws of 2003, No. 90, item 844].

Also the lengthening of employment duration should be seen as advantageous for employer-users, since excessive fluctuation of workers taken on for some tasks, e.g. projects, generally results in a worsening of the final outcome and causes delays in their

completion. In addition, this amendment caters for the needs of employers in terms of flexibility of employment and maintaining/lowering labour costs [see also Nunziata, Staffolani, 2007, pp.72-104]. However, Miles [2000 pp. 74-101] and the Author [2003, pp.1-42] present empirical evidence of a positive correlation between employment protection and the development of the market of temporary work agencies in the USA. Also the OECD uses indicators of the strictness of employment protection legislation in temporary agency and regular jobs. The greater the relative difference between these indicators, the more likely it seems that employers will hire temporary workers. This is because with an economic downturn and diminished demand for products and services, it is much faster and cheaper to make redundancies among temporary workers (particularly those on civil law contracts) than among regular employees. Nevertheless, a rise in temporary employment can strongly depend on the extent in which work agencies are influenced by the requirements of employment protection legislation [see Baumann, et al, 2011, pp. 308-329] and may be associated with malpractices as regards certain types of jobs, or with the fact that employer-users choose to conclude civil law agreements rather than fixed-term contracts or contracts for a specific task. OECD data for 2013 on employment protection in Polish business entities reveal that the weakest protection was observed in the case of civil law agreements (0.5 on a 0-6 scale), temporary job contracts (1.8), and individual and collective dismissals (-2.4) [OECD Database Employment, 2013].

What is more, the change in the form of employment helps reduce such fixed costs as marked-up costs of remuneration incurred regardless of revenue levels and results in a rise of those variable costs whose level depends on demand for manufactured goods. Similarly, when a shortage of staff occurs because of a temporary increase in labour demand resulting, e.g., from a larger than usual number of orders, seasonal jobs or absence of regular employees, temporary work is a relatively cost-effective solution. That is why this form of employment is increasingly popular with employer-users. The growing demand for temporary workers has led to a proliferation of temporary work agencies.

This form of employment is relatively frequently used by companies with foreign capital, when the mother company refuses permission to employ more staff despite increased demand for labour in certain periods. Hiring temporary workers, who are not included in the company personnel statistics, provides a convenient solution to the problem. Temporary employment is also useful for firms operating in special economic zones and taking advantage of preferential conditions for business activity. This is because, regardless of their financial results, they are obliged to maintain a predetermined average annual number of full-time equivalent employees over an agreed period of time. Otherwise they have to return public subsidies, which would place them under considerable financial strain.

Among the results of a dynamic development of temporary work agencies in Poland, growing numbers of employer-users and temporary workers, as well as the necessity to adjust Polish legislation to the EU directive, is the fact that 222 entities have already been subjected to inspection by the National Labour Inspectorate. The institution's 2012 report confirmed the fact that employers overused civil law agreements, as 19% of

the surveyed workers were employed on such a basis even though they should have concluded temporary work contracts. An even more frequent transgression committed by temporary work agencies was failure to pay on time of remuneration for work and other labour-related benefits. Such was the case in 46% of the surveyed employees. The inspection also included employer-users. It was found that 18% of the controlled entities had infringed health and safety regulations, while 24.2% of them burdened temporary workers with tasks other than those prescribed by Art. 2, item 3 of the Act on the Employment of Temporary Workers. Other irregularities concerned non-compliance with the obligation to undergo health and safety training before commencement of work [PIP, 2013, p. 158].

As was already mentioned in the introduction, the growing popularity of temporary employment is a relatively widespread phenomenon, inevitable in many economies. The rise in the share of temporary workers in the employment structure is compatible with the concept created by Ch. Handy [1998], who stresses the need for diversification of staff. He compares an organisation to a three-leaved shamrock, as it can be said to encompass three types of workers which differ in their outlooks, are managed by means of different methods, are differently remunerated and vary in terms of internal structure. These three groups are: 1). professional core – key employees who are essential for the very existence of the organisation, and who are sought-after in the labour market because of their professional experience, qualifications, pay, time and cost of recruitment; 2). contractual professionals – important for the rhythm and continuity of the processes taking place in the organisation, relatively easy to find in the labour market; and 3). technical and service staff (self-employed specialists, temporary workers, freelancers), easy to find without the necessity to incur high expenses.

Temporary employment is becoming increasingly common since global economies, having experienced a serious worsening of their situation, have begun to return to the expected level of performance [Luo et al, 2010, pp. 3-16; Cappelli, Keller, 2013, pp. 576-596]. The staffing sector has considerably expanded: as many as 46 million people worked as agency employees in 2011. There are 140,000 private employment agencies providing organisations with temporary, leased, and temp-to-perm workers, who work as many hours as 12.4 million full-time employees. Meanwhile, global total annual sales revenues reached €259 billion. Penetration rate for agency work in Europe was 1.6%, while Poland and Germany took increasing advantage of temporary work to build their economic potentials [CIETT, 2013].

In 2004, when the Temporary Employment Act was passed in Germany, the country saw a steep rise in the number of temporary workers. Using empirical data from the Socio-Economic Panel Study (SOEP) of the German Institute for Economic Research (DIW), M. Garz [2013 pp. 307-326] analyses the impact of the deregulation on employment and pay levels. He observes that no significant changes in overall employment rates have been noted since regular workers started to be replaced by temporary ones. The share of regular employees in total employment (70.1% in 2003) revealed an irregular upward trend until 2009 (when regular employees accounted for slightly over 76% of all the employed). As the percentage of regular workers grew, so did the share of temporary workers in overall employment: from 1.01% before the reform

to 1.73% after the reform, until 2006, and later fell slightly, reaching ca. 1.6% in 2010. The unemployment rate remained at basically the same level of 6.94-6.98%. There was, however, an increase in the gap between the pay levels of regular and temporary workers, which proves that companies resorted to temporary employment to reduce the costs of labour. This was mainly achieved thanks to a greater number of worse-paid temporary workers as opposed to regular employees.

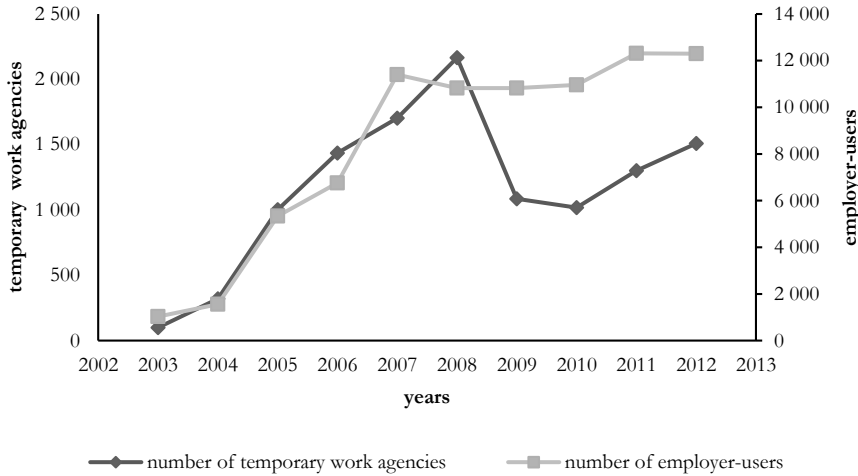
The favourable image of temporary work is slightly marred by the results of research conducted by M. Król [2011, pp. 341-349] into the degree of professional commitment of a sample group of 197 respondents. The study revealed a discrepancy between declared and perceived commitment. Although the respondents claimed to be fairly deeply committed to their jobs, their perceived attitudes did not confirm the existence of such commitment. They usually pointed to stability and length of service as factors which enhanced professional commitment, and which are obviously not guaranteed by temporary employment. The level commitment of temporary workers was also rated as very poor by the surveyed employers. It should be noted that the above factors are contradictory with the very idea of temporary employment and the significant reduction in the number of the unemployed resulting from the growing popularity of this form of flexible work arrangement. The available literature is lacking in analyses of the influence of temporary job agencies on the unemployment rate in Poland. But before this correlation is investigated and presented in the form of an econometric model, this paper will provide a brief history of the development of the agency sector in Poland, a discussion of the rising demand for agency services among employer-users, as well as a review of the changes in the number of unemployed and employed persons in the Polish economy.

3. Development of temporary work agency sector in Poland 2003-2012 in the light of statistical data

The Act on the Employment of Temporary Workers, of July 9th, 2003 and the Act on Promotion of Employment and Labour Market Institutions, of April 20th, 2004 laid the legal foundations for the operation of temporary work agencies in Poland. In view of the above, the presented analysis uses data for the period 2003-2012 and is based on statistics obtained from public labour institutions as well as on annual reports on temporary work agencies published by the Department of Labour Market of the Ministry of Labour and Social Policy (MPiPS) [<http://www.psz.praca.gov.pl/main.php?do=ShowPage&nPID=867997&pT=details&sP=CONTENT,objectID,867970>, data of access: 10.12.2013]. Similar data concerning the number of the unemployed and the unemployment rates were taken from labour market statistics available on the website of the MPiPS and Local Data Bank of Central Statistical Office of Poland [http://stat.gov.pl/bdl/app/dane_podgrup.dims?p_id=813177&p_token=0.3862882809673729, date of access: 10.12.2013]. According to the statistical data, the first temporary work agencies in Poland were registered in 2003 and have since become an inherent part of the labour market as an employer that provides labour services to

employer-users via temporary workers who were previously unemployed, or who sought additional employment in order to improve their economic circumstances. Figure 1. illustrates the distribution of the number of temporary work agencies operating on the Polish market and of the employer-users who were their customers in the analysed period.

FIGURE 1.
Temporary work agencies and employer-users in 2003-2012



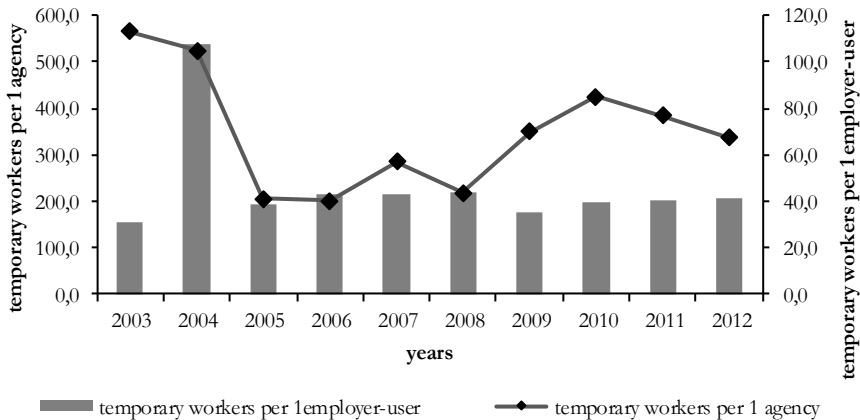
Source: [Informacja o działalności agencji zatrudnienia..., 2004-2013; Statystyki strukturalne..., 2004-2013; Local Data Bank...].

The aggregate data included in Fig.1 show that in Poland the work agency sector was developing dynamically, though unevenly. In 2003, 56 entities of this type were entered in the Register of Employment Agencies, to reach as many as 1509 agencies at the end of 2012. As the curve depicting the number of agencies clearly demonstrates, a sharp rise in their number took place between 2003 and 2008. The number of employers who used work agency services grew at a roughly similar pace. This confirms the existence of demand for the services offered by the agencies. In 2009, the growing trend was reversed and the number of TWAs dropped by nearly a half, i.e. by 1088. The year 2010 brought a closure of another 68 agencies. The decline of 2009 was a direct result of the previous year's decrease in the number of employer-users in need of employment services from 11,938 to 10,825 (i.e. by 5.1%). Other reasons included: ongoing global economic crisis, the processes of consolidation and specialisation of work agencies, deletion from the commercial register of 20% of the agencies operating in 2009, as they had failed to comply with binding regulations (Agencje zatrudnienia 2009), and a closure of smaller entities which had been unable to compete in the market. To verify the above conclusion, the following indicators were calculated: the number of employees per one

agency and the number of temporary workers per one employer-user. This is illustrated by Figure 2., which shows that the numbers of workers per agency varied widely.

FIGURE 2.

Temporary workers per 1 employer-user and per 1 agency



Source: [Informacja o działalności agencji zatrudnienia..., 2004-2013; Statystyki strukturalne..., 2004-2013; Local Data Bank...].

After the first two years of their functioning in Poland, many new agencies emerged. However, while it was relatively easy to establish such institutions, the falling demand for employment services made it difficult for their owners to continue business operations. Meanwhile, the average number of temporary workers per one employer-user continued to be fairly steady and averaged about 40 persons.

Despite the decrease in the number of agencies in 2009, the number of employer-users rose by 1 unit, reaching 10,826. The demand for agency services among employer-users kept growing until 2011, to fall slightly in the last of the analysed years (by 1pp). This was caused by the relatively dynamic, although less so in 2012, rise in the number of new agencies in the market. The number of agencies in operation at the end of 2012 accounted for nearly 70% of their population of 2008.

A comparison of the sets of employer-users and temporary workers shows that, although the latter's number fell by 20% between years 2008 and 2009, the former remained at the same level. This means that in 2009 some employer-users, in an attempt to safeguard their business against the effects of the crisis, reduced their demand for the services provided by temporary workers. After 2010, having realised that the economic effects of the crisis were not acutely felt, but at the same time being aware of the situation in the labour market and of the economic slowdown, some of the employer-users again started to resort to this flexible form of employment. As a result, as early as in 2011, the number of temporary workers exceeded that recorded in 2007. The growing popularity of temporary work is confirmed by the rise in the number of temporary workers: from 0.23% in 2003 to 3.27% in 2012. This proves that employers tended to eschew

conventional employment contracts in favour of alternative solutions, such as temporary work.

A preliminary analysis of the relationship between the numbers of temporary workers and the unemployed is also performed by the author of the present paper. Its results are presented in Figure 3.

The data included in Figure 3. demonstrate that in 2003, nearly 3,176,000 unemployed persons were registered in Poland. In the years 2003-2008, this figure shrank to 1,474,000. Such a substantial decrease in the number of the unemployed was accompanied by a steep rise (by 442,000) in the number of temporary workers. This means that around 26% of the unemployed joined the temporary workforce who were increasingly sought-after by employer-users wishing to lower their labour expenditures and improve the efficiency of their companies. When the situation of employers had worsened as a result of the economic slowdown, the number of the unemployed soared, which led to, as was mentioned earlier, a short-term decrease in the number of temporary workers. Since 2010, a reverse trend has been noted: the number of the unemployed has continued to grow steadily, though less dynamically, whereas the number of temporary workers is rising quite rapidly, which seems to confirm the predominant tendency of managers to take on temporary workers rather regular employees.

FIGURE 3.

Unemployed persons and temporary workers (in thousands) in years 2003-2012



Source: [Informacja o działalności agencji zatrudnienia..., 2004-2013; Statystyki strukturalne..., 2004-2013; Local Data Bank...].

In order to illustrate the dispersion of the above variables by means of basic measures of descriptive statistics, I calculated the arithmetic mean, standard deviation and the coefficients of variation for the selected variables. I chose the classical coefficient of variation because the data used in the study regard all the observations, as illustrated by Table 1.

The data in Table 1. reveal that the analysed variables (apart from the number of persons employed in the Polish economy) were characterised by a coefficient of variation higher than 10%. The coefficient of variation illustrates the relative dispersion, dependent on the arithmetic mean, of a given feature of each analysed variable. The above coefficients of variation are in a range between 25-45%. Average dispersion (20-40%) is observed in the case of such features as: the number of unemployed (25.1%), temporary workers on civil law agreements (30.08%), and temporary workers on job contracts (37.55%). The relatively large dispersion occurs variables such as: the number of temporary work agencies (52.8%), the number of employers users (52.3%). Having analysed these data, I propose a preliminary hypothesis that there exists a link between the establishment of TWAs and the changing numbers of the unemployed.

TABLE 1.
Basic measures of variables; years 2003-2012

Item	Mean	Standard deviation S	Coefficient of variation (CV) in % ²
Number of employed in economy (in thousands)	14,965.7	858.9	5.7
Number of temporary work agencies	1,164.04	615.03	52.8
Unemployment rate	14.3%	3.5%	24.6
Total unemployed (in thousands)	2,244.5	562.8	25.1
Number of employer-users	8,330.3	4,358.9	52.3
Temporary workers on employment contracts	44.5%	16.7%	37.55
Temporary workers on civil law agreements in persons	55.5%	16.7%	30.08
Number of temporary workers	347.7	166.1	47.8
Share of temporary workers in total employment	2.3%	1.0%	45.3
Number of temporary workers per one work agency	349.7	128.0	36.6
Number of temporary workers per one employer-user	46.3	21.9	47.3

Source: Author's calculations.

4. Empirical analysis of the relationship between the number of unemployed persons and the number of temporary work agencies

In view of the aim of the paper, and taking into account available literature on the subject as well as the above considerations of the changes occurring in the years 2003-2012, I ventured to perform an analysis of the relationship between the number of

² If the coefficient of variation does not exceed 10%, the dispersion of characteristics is a statistically insignificant [Zeliaś, 2000].

temporary work agencies and the number of unemployed persons registered in Polish job centres, using the Pearson product-moment correlation coefficient for 10 consecutive years, i.e. N=10 observations, and then by means of a descriptive econometric model. Analysis of the correlations among the variables will make it possible to determine their degree of interdependence and to verify the rationale for the selection of exogenous variables for the econometric model.

After correlation analysis, the values of the variables are as follows:

TABLE 2.

Correlation coefficients of potential variables X and Y

Item	Number of agencies (X)	Total number of unemployed (Y)
Number of agencies (X)	1	-0.8804
Total number of unemployed (Y)	-0.8804	1

Source: Own accounts.

It stems from the above that the correlation coefficient between the number of agencies and the number of unemployed persons is around -0.8804. This indicates a strong negative dependence: a rise in the number of agencies leads to a drop in the number of the unemployed.

The next step of the analysis was to investigate the dependence between the number of agencies and the number of the unemployed in the years 2003-2012. Taking the number of agencies as the exogenous variable X and the number of the unemployed as the endogenous variable Y, I constructed a scatter plot with a trendline (Fig.4) in order to identify an appropriate regression function and express it in the form of a mathematical function.

I made a preliminary assumption that the regression function takes the form of a simple linear regression with using the method of least squares:

$$Y = \alpha_0 + \alpha_1 X + \varepsilon, \quad (1)$$

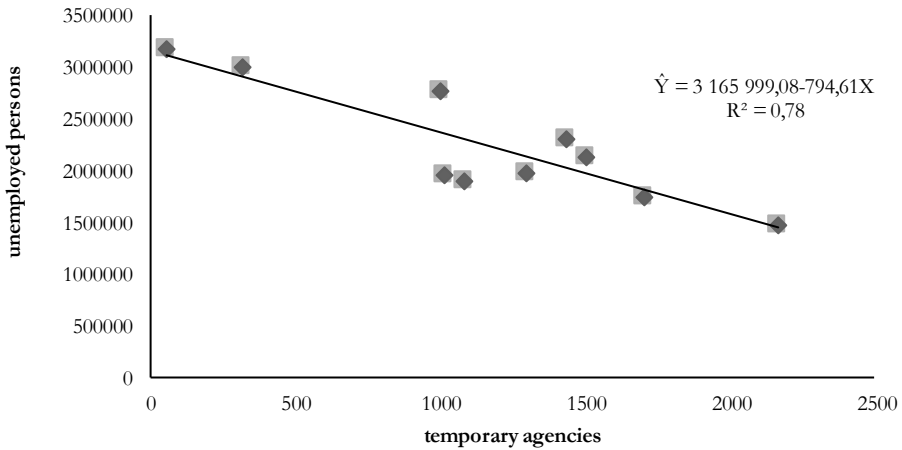
where: Y is a dependent variable, X – independent variable, α_0 , α_1 – unknown model parameters estimated from the data, ε – the error term. Also α_1 denotes the slope of regression line, α_0 – the Y-intercept.

Analysis of the scatter plot showed that linear regression does yield the best fit for the coefficient of determination R^2 and so the above linear model (1) can be used to describe the relationship. The coefficient R^2 best explains the percentage of variance for the variable Y which can be ascribed to the influence of the variable X.

In order to assess the regression model for the number of the unemployed (Y) and the number of temporary work agencies (X), parameters α_0 , α_1 were calculated using the function of regression. The studied model takes the form of the following equation:

$$\hat{Y} = 3\,165\,999.08 - 794.61X. \quad (2)$$

FIGURE 4.
Scatter plot for relationship between variable Y and variable X



Source: Own accounts.

Next, I checked the significance of the structural parameters of the model so as to find out whether the exogenous variable X has a significant influence on the endogenous variable Y. To achieve this, I verified the zero hypothesis.

$H_0: [\alpha_1 = 0]$ against the alternative hypothesis $H_1: [\alpha_1 \neq 0]$.

Table 3. contains statistics calculated for this function.

TABLE 3.
Estimation model of simple linear regression with using the method of least squares for equation (2), N=10 and $\alpha=0,05$; dependent variable(Y) = number of unemployed

Item	Coefficients	Standard error.	t-Studenta	p-value
const	3,165,999.08	196971	16.0734	<0.00001
Number of TWAs	-794,611	151,298	-5.2520	0.00077

R-squared	0.775175	Multiple of R	0.747071
The sum of squared residuals	6.41e+11	Standard error	283042.5
F(1, 8)	27.58318	Value p for test F	0.000772
LM-test for nonlinearity	0.278517	Value p for nonlinearity test	0.597675
Value p for test chi-square	0.87777	Value p for test White	0.086411

Source: Own accounts.

From the data in Tab. 3 it can be inferred that the total variation of the number of the unemployed is in 77.52% explicable by the number of TWAs, which means that the fit of model to the data is good. The standard error of 283,042.521 denotes an arithmetic mean deviation of 12.60%. Also the Fisher-Snedecor statistics value, with the assumed level of significance at 0.05 and $df=1;8$, demonstrates that the significance coefficient F amounts to $0.000772 \leq 0.05$, while its value $F_{estim} = 27.58 \geq F_{crit} = 5.8$, which means that the test is statistically significant. Therefore, we must reject the hypothesis of the lack of influence of the exogenous variable X . To determine the significance of the relationship between the variables, the 'R' coefficient was tested with the aid of the t-Student test, by comparing t_{crit} with t_{estim} . Assuming the level of significance to be $p=0.05$, with 8 degrees of freedom, the t_{crit} equals 2.306. Thus $t_{estim} = 16.073 > t_{crit} = 2.306$. Likewise, the t-Student distribution shows that the variable X has a significant impact on the endogenous variable Y . Also testing hypothesis of the linear regression model with using LM-test, test White, chi-square test proves correct their assumptions. The linear regression coefficient reflects the strength of interdependence between the variables under study. It can be concluded that there is a 95-percent likelihood that each newly-established temporary work agency led to a decrease in the number of the unemployed by nearly 795 persons on average.

The set of the unemployed is varied in terms of the length of the unemployment period. According to official statistics, the structure of the registered unemployed was as follows (Table 4).

TABLE 4.
Structure of unemployed by duration of unemployment (in %)

Year	Unemployed					
	Less than 1 month	1 to 3 months	4 to 6 months	7 to 12 months	13 to 24 months	over 24 months
2003	6.6	12.9	12.4	15.5	18.8	33.7
2004	6.8	13.2	12.2	15.5	17.0	35.1
2005	7.1	14.8	13.3	14.6	15.5	34.7
2006	7.1	15.6	13.3	14.5	15.4	33.9
2007	9.2	17.9	14.0	13.8	13.9	31.1
2008	12.4	23.3	15.8	14.2	12.2	21.7
2009	10.4	23.9	19.7	20.1	12.8	13.0
2010	11.2	22.9	18.3	18.4	17.1	11.9
2011	9.4	19.5	17.5	18.9	19.2	15.3
2012	9.6	19.6	17.2	18.0	17.6	17.8

Source: Own accounts.

It is evident from the data included in Tab. 4 that in the analysed period, the shares of particular groups of unemployed persons went through several changes. The slimmest of the groups comprises those who remained out of work up to 1 month, whereas the

members of the largest group were unemployed for over 24 months. The latter, however, shrank almost 3-fold between years 2003 and 2010, only to expand again in 2012, reaching 17.8%, i.e. a level comparable with the other groups. A similar trend can be observed among the unemployed who were out of work for more than 12 but fewer than 24 months. After 2007, the increase in all the above categories was a result of the economic slowdown caused by the global crisis, and the consequent wariness of entrepreneurs fearing further downturn in their situation. Observation of the economic practice of Polish business entities shows that the rise in unemployment could also have been brought about by increased use of technologies replacing human work and further modifications of the organisation of labour. However, to verify this, additional analyses that are beyond the scope of the present paper are required.

Obviously, the consequences of the global crisis were first, in 2007 and 2008, observable among the unemployed who had been out of work up to 6 months. A growth in the number of people out of work for more than 24 months occurred after two years. One might believe that some of the persons affected by the economic slump found it difficult to cope in the labour market and joined the ranks of the long-term unemployed. A question arises here: Which of the groups became of particular interest to temporary work agencies? To answer it, I gauged the interdependence of the compared characteristics using a correlation coefficient of variables, i.e. the number of the unemployed according to the duration of unemployment and the number of temporary work agencies. The values for the coefficients are presented in Table 5.

TABLE 5.

Correlation coefficients of TWAs and unemployed by duration of unemployment

Item	Number of agencies (Y)	Unemployed by duration of unemployment (in months)					
		Less than 1 (X ₁)	1-3 (X ₂)	4-6 (X ₃)	7-12 (X ₄)	13-24 (X ₅)	over 24 (X ₆)
Y	1.0	-0.6069	-0.5187	-0.7971	-0.9274	-0.8743	-0.6493
X ₁	-0.6069	1.0	0.8356	0.7524	0.6625	0.4906	0.0365
X ₂	-0.5187	0.8356	1.0	0.8526	0.6453	0.3103	-0.1317
X ₃	-0.7971	0.7524	0.8526	1.0	0.9335	0.7190	0.2920
X ₄	-0.9274	0.6625	0.6453	0.9335	1.0	0.8974	0.5684
X ₅	-0.8743	0.4906	0.3103	0.7190	0.8974	1.0	0.7693
X ₆	-0.6493	0.0365	-0.1317	0.2920	0.5684	0.7693	1.0

Source: Own accounts.

When analysing the data in Tab. 5, it should be noted that there is a negative linear correlation between the number of agencies and the number of the unemployed according to length of unemployment. This means that a rise in the number of agencies will lead to a decrease in the average number of unemployed persons across the groups. This decrease varies from one group to another. A strong interdependence is observed between the

number of agencies and the number of those unemployed for 7-12 and 13-24 months: $r_{YX4} = -0.9274$ and $r_{YX5} = -0.8743$ respectively. A slightly less strong, although relatively high, correlation is found for persons without work for 4-6 months: $r_{YX3} = -0.7971$. In the other two groups the correlation is of average magnitude. In these two groups greater interest in searching for work is associated with satisfying of the basic needs (as defined by Maslow), such as physiological needs and safety needs, possible thanks to received remuneration.

5. Conclusion

In this study, I pose the following questions: How do temporary work agencies affect the level of unemployment? What decided about an increase in demand for the services of temporary work agencies, especially in the legal and economic context?

Using data from the Public Employment Services and Local Data Bank of the Central Statistical Office of Poland for the period 2003-2012, as well as the current legislation, I attempt to answer the above questions. After the legislation concerning TWAs came into force in 2003, the Polish sector of temporary employment started to expand dynamically. The growing demand for temporary employees, created employer-users and newly established agencies, led to a rise in the number of temporary workers from 0.23% of total employment in 2003 to 3.27% in 2012. It must be added that according to OECD 2011 data, temporary employment in Poland accounted for almost 27% of dependent employment, whereas in Germany, this proportion stood at 17.2% (Database Employment OECD). Analysis of the binding regulations on employing temporary workers reveals that the rising demand for this form of employment results from more liberal legislation, allowing employers to dismiss workers faster than is prescribed by the labour code or the mass redundancy act. Lower pay cost, reduced by the amount equal to social security seems to be another factor that explains this popularity. Observation of the business practice in Poland confirms that this form of employment has been used to decrease or maintain, despite the growing costs of business activity, the level of funds for remuneration, and to transfer some of the obligations associated with the employment process onto temporary work agencies.

Still another reason for choosing temporary employment is the shift in operational activity costs which consists in reducing the costs of pay (fixed costs) in favour of variable costs in the form of outsourced services. Reports of the National Labour Inspectorate confirm that temporary job contracts are overused as employers conclude them in disregard of the nature of contracted services and the period and form of employment. More than a half of the temporary workers were employed on civil law agreements, which do not guarantee any workers' privileges or job security. Short-term (4-6 months) contracts prevailed, which temporary workers concluded with their employers, i.e. temporary work agencies.

The presented statistical data for the period 2003-2012 demonstrate that the number of TWAs grew dynamically from 56 in 2003 to 2166 in 2008. In 2009, a suddenly decrease in the number of agencies took place, and in 2010, their number began to

grow once again, reaching nearly 70% of the state from 2007. There were several reasons for the drop in the number of agencies in 2008: weaker demand among employer-users caused by their apprehension of the global crisis, the diminishing profitability of agency activity (expressed as the number of workers per agency), deletion from the commercial register of 20% of the agencies which had failed to comply with the regulations, the processes of consolidation and specialisation of work agencies, and a rise in unemployment resulting from the restrictions in the numbers of full-time workers employed for economic, technical and organisational reasons.

In 2003, almost 3,176,000 unemployed persons were registered in Poland. In 2003-2008, this figure went down to 1,474,000 – a drop by 53.6%. Such a sharp decrease in the number of the unemployed was accompanied by a rise in the number of temporary workers by 443,000. This means that ca. 26% of the registered unemployed joined the ranks of temporary workers, who were increasingly sought after by employer-users interested in lowering labour costs and improving or maintaining efficiency. When the situation of employers had worsened as a result of the economic slowdown, the number of the unemployed soared, which led to, as was mentioned earlier, a short-term decrease in the number of temporary workers and an even steeper decrease in the number of TWAs. Since 2010, a reverse trend has been noted: the number of the unemployed has continued to grow steadily, though less dynamically, whereas the number of temporary workers is rising fairly rapidly, which seems to confirm the predominant tendency of managers to hire temporary workers rather regular employees taken on by TWAs, whose number has been gradually growing since 2011.

The analysis of the dependence between the number of temporary work agencies and the number of the unemployed registered in Polish labour offices, conducted by means of the Pearson product-moment correlation coefficient for 10 consecutive years of observation of two variables, yields a strong negative correlation ($r = -0.8804$), i.e. the number of the unemployed decreases along with the rising numbers of TWAs. The model of regression of the number of unemployed (Y) against the number of TWAs (X) proves that one work agency helped reduce the number of the unemployed by an average of 795 persons. Further study of the structure of the unemployed divided according to duration of unemployment demonstrated that TWAs were interested in jobless persons who had been out of work for 7-24 months, while the smallest proportion consisted of persons who had been unemployed less to one month or over 24 months. It should be concluded, therefore, that temporary work agencies are not very popular with people who have just lost a job or who are new to the labour market and are searching for other than temporary work. Also the long-term unemployed are not very interested in temporary work, since they have little motivation to undertake relatively poorly-paid employment, which will not last long, or for which they are insufficiently qualified. Further, more in-depth research is required to explain why job agencies show relatively weak interest in these groups of workers, and vice versa.

It should also be noted that TWAs are one of the employers that hire most frequently unemployed. For the part of temporary workers this form of employment that allows to find a permanent job and move from unemployment to employment. Can not be excluded that there are other reasons for the decrease in unemployment, for example:

an increase in wages, an increase in unemployment benefits, an increase in the demand for labor and a higher propensity to employ on a fixed term employment contract, their previous experience of employers users and the like. Therefore, the obtained results indicate that relationship between number of TWAs and number of unemployed. Some of these factors are more difficult to verify and may be subject to further studies that investigate the changes in the number of unemployed.

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