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Inferring the Adequacy of Wage Expectations Among the Non-Working[1]

Abstract: Reservation wages and expected wages constitute different categories, both conceptually and empirically. The aim of this article is the construction of a method for inferring the adequacy of both kinds of wage expectations among persons who are not employed. This method is used to verify the hypothesis about the adequacy of reservation wages and expected wages among the unemployed in Poland. The key element of the analysis in this study is to what extent the reservation wages and wage expectations of the unemployed are in alignment with market conditions. We exploit a unique source of data on expected wages (National Bank of Poland survey) as well as data on reservation wages (Labour Force Survey) and develop a series of parametric and non-parametric counterfactual distributions for the registered unemployed. Our results indicate that expected wages are higher than reservation wages and continue to be positively correlated with wage pressure. We find that reservation wages in Poland from 2011 to 2014 were not excessive. This is important because if the wage expectations of the unemployed are in excess of market evaluation, unemployment and wage pressures prevail.

Keywords: Mincerian wage regression, counterfactual distribution, reservation wage, wage expectations, wage pressure, LFS

JEL codes: J31, J64

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Introduction

Average wage growth in the economy is an aggregate product of millions of bargaining processes between employers and employees. Such bargaining processes are most apparent at the time of forming an employment contract. This is when the wage expectations of job candidates have an important bearing on the outcome of these negotiations. Wage expectations in excess of what the market offers may be the cause of unemployment. Moreover, if these expectations are persistent, the scope of policies that may effectively reduce unemployment is limited. This adds to the risk of excessive wage growth when the demand for labour strengthens, regardless of the reasons.

Accounting for whether the wage expectations of the working are excessive is relatively straightforward. For the employed, one typically observes both productivity and wages, at the very least in aggregate growth terms. Thus, productivity measures provide an anchor for the wages as well as wage expectations of the working. Yet, for the non-working no such anchor exists, which makes it problematic to evaluate whether these wage expectations can contribute to excessive wage growth.

One of the possible anchors for the wage expectations of the non-working would consist of past wages. Yet, judging the extent to which wage expectations exceed or fall short of what the market offers – i.e. judging the adequacy of wage expectations – while basing desired wages on previous wages, would be inaccurate for two main reasons. First, typically past wages of the non-employed are unavailable or unreliable, while they also need not be indicative of the wage expected in the future. Second, relying on past (self-reported) wages would limit the scope of analysis to those who had wages in the recent past, thus eliminating the long-term unemployed, young market entrants, and those who want to re-engage actively in the labour market after a longer absence.

In this paper we propose to rely on the counterfactual distributions of wages. We employ a dedicated survey by the National Bank of Poland as well as a standardised Labour Force Survey (LFS). We construct a counterfactual distribution of wages conditional on individual characteristics and use the implied wages as an anchor for the wage expectations of the unemployed. We employ parametric and nonparametric methods to infer the counterfactual wage distributions. Both these approaches capture approximately 40%–60% of the wage variation, but perform relatively better among lower-paid workers, who tend to be more similar to the non-employed. We compare the performance of the wage expectations with the reservation wages, available from the LFS. We show that the expected wages have stronger cyclical patterns than the reservation wages, and thus may be more reliable as a leading indicator of intensifying wage pressure.

Our paper is structured as follows. First, we discuss the rationale of using this approach in analysing the wage pressure. Secondly, we discuss the relationship between the wage expectations and the wage changes. In order to do this we use two sources of wage expectations data: the LFS and a dedicated

survey among the unemployed administered annually by the National Bank of Poland. Then we move to discussing the method for obtaining the counterfactual wage distributions. Subsequently, we show the results of the application of the methods using available data for Poland. Finally we summarise the implications of our study.

Rationale for using micro-level data in analysing the potential wage pressure created by unemployed persons

Wage pressure is typically defined as a wage increase in excess of productivity. At the macro level, it can be defined as an increase in unit labour costs (ULC). At the firm level, however, increases of productivity may follow from an increase in the human capital of workers (*e.g.* changing composition), improving the utilisation of existing production capacity, etc. Thus, wage growth in excess of productivity growth is likely to occur in certain instances, whereas most firm-level observations would be associated with productivity growth and fairly stable wages. Wage pressure in the economy is a crucial indicator for central banks. It affects prices directly (*via* costs of products) and inflation indirectly (*via* increased demand). By the same token, accelerating unit labour costs dynamics can decrease the competitiveness of firms.

In theoretical models of job searches, the reservation wage of unemployed persons is one of the factors that play a key role in determining wages. In the continuous equilibrium model like the Diamond-Mortensen-Pissarides framework [Diamond, 1982, Mortensen, 1982, Pissarides, 1985], the optimal strategy of an unemployment person is to accept the first contract with a wage above their own reservation wage (minimal level acceptable by worker) and decline job offers of lower value.

However, the very concept of the reservation wage is far from straightforward. In a perfect world, individuals should determine their own reservation wages. In reality, however, it is not clear what a reservation wage exactly implies. On the one hand, it should reflect the expected individual productivity because ultimately competitive labour markets should yield wages not far departed from productivity. Clearly, the information on potential productivity is limited and will change depending on the employer. On the other hand, a reservation wage should be related to the individual costs of living and cover at least subsistence expenses. Finally, some occupations or working conditions may require higher compensation than others (notwithstanding individual heterogeneity), which would suggest that the reservation wage may actually be job-specific and related to the expected wage at a job rather than subsistence or individually perceived productivity at this job. The reservation wage is the lower limit of what an individual expects. What, then, would a typical value be? Such an expected wage should reflect the assessment of the labour market situation of a person with specific individual characteristics, but it should be kept in mind that the result of wage negotiations can be lower than this measure.

Given their complex nature, measuring and analysing changes in reservation wages (and wage expectations) involves important conceptual choices. For example, it can happen that unemployed persons repeatedly declare wage expectations in excess of what the employer considers appropriate based on their productivity (e.g. their expectations do not adapt fast enough). In such a situation, the average job search time will be longer and unemployment will be higher that it might be if expectations were lower. In addition, the changes in declared expected wages may be entirely unrelated to a stable (and lower) reservation wage of a given individual. Moreover, wage expectation fluctuations can also change the reservation wages [Lancaster, Chesher, 1983, Brown, Taylor, 2013]. Thus, the important question concerning the functioning of the labour market is if the wage expectations are too high.

Naturally, to specify "too high", one needs to know ``adequate'' in advance. At the aggregate level, judging wage expectations adequate is nearly impossible due to individual heterogeneity (*e.g.* skills). After all, it is rational that an experienced software developer should expect higher wages than an inexperienced secondary-school graduate even if they have both been unemployed for the same length of time.

Learning about the distribution of wages may be a problem for job seekers. First, graduates may simply not have the experience to assess their "market value". Secondly, previous experience in firms that offered substantial firm-specific wage components not related to general worker productivity [Böheim *et al.*, 2010] can be a source of misperception and excessive wage expectations. What is also important is that once wage expectations are set, they adjust relatively slowly to labour market conditions [Baltagi *et al.*, 2009, Brown, Taylor, 2014] because the initial evaluation significantly influences future expectations. It is also important that identification of the wage distribution can be difficult if the market valuation of certain skills changes fast due to technology changes or changes in the demand/supply match (e.g. due to an inflow or outflow of individuals with specialist skills).

The reservation wage determines the duration of a job search. Still, empirical observations confirm that reservation wages tend to decrease with the length of the unemployment spell. To separate the directions of causality, some publications use two measures simultaneously: expected wages and reservation wages when analysing the relation between unemployment and reservation wages [Brown, Taylor, 2009]. The most obvious reason is that in most countries, unemployment benefits expire with time [Addison *et al.*, 2009], so the value of the "not working" outside option in a search model declines. However, some empirical observations suggest that evidence for this relation is not always found [Krueger, Mueller, 2014] and household savings can be considered as a better determinant for the reservation wage of the unemployed. Unemployed persons can also adjust their reservation wage downwards, learning with time that their expectations may be too high to find a job in a reasonable time frame [Brown, Taylor, 2014, Krueger, Mueller, 2014].

The wage reservation analysis is often conducted using household surveys or special surveys targeted at unemployed persons. However, the Labour Force Survey (LFS) is a standard source of such data in many countries where the question about the minimum expected wage of the unemployed was asked with reasonable accuracy [Laroque, Salanié, 2002, Malk, 2014, Ahn *et al.*, 1999]. Some publications indicate that the method of conducting the LFS survey can lead to bias and overestimation of the reservation wage in high-unemployment regions compared with regions of low unemployment [Sestito, Viviano, 2011].

In the next chapters of this paper, we use econometric methods to compare the wage expectations of those unemployed with the actual market valuations of employed people who share similar characteristics. A similar micro approach based on simple Mincerian equations was used earlier by Prasad [2003] for Germany. The study concluded that human capital variables, age and some other demographic variables significantly influence the reservation wage. However, we use a wider variety of methods to answer the question of whether or not the expectations of unemployed persons are really unrealistic due to high natural unemployment and excessive wage pressure in Poland.

Data. How to measure the wage expectations of non-working persons?

The purpose of this section is to discuss the behaviour of aggregate expected wages, reservation wages and key macroeconomic indicators in Poland. We first discuss the nature of the data coming from an internationally standardised survey by Poland's Central Statistical Office and compare it to an alternative data source – a survey of persons registered as unemployed, carried out by the National Bank of Poland. Subsequently, some basic stylised facts concerning the similarities and differences between these two indicators are demonstrated. Namely, we argue that the standardised measure taken from the LFS is closer to the lower bound of the reservation wage, as discussed above, whereas the measure in the NBP survey seems to capture the properties of the expected wages. These expected wages seem to be the opinion of unemployed persons concerning their productivity for the potential employer.

There are two main sources of data regarding net wages expected by unemployed persons in Poland. Typically, in the LFS, the question is asked of individuals who fulfil the criteria of unemployment (within the labour force, actively seek employment and are able to undertake it on short notice) as defined by the International Labour Organisation (ILO). In the LFS, it is also possible to identify persons registered in local labour offices in Poland. In the case of the Polish LFS, the question about the self-reported reservation wage is referred to as the ``minimum compensation for a job offer to be accepted"; the question is not posed to individuals who are identified as inactive based on earlier questions in the survey. This question is phrased similarly in other

countries, which contributes to a growing body of research on the trends and characteristics involved (see Addison *et al.* [2009]).

In the Polish LFS, the question was absent in the survey from 2001 to 2003, but otherwise has been available at quarterly frequency, i.e. in each wave of the survey. The information on the reservation wage may thus be combined with the flow data. Also, whether or not a person is registered with the local labour office may be coupled with the reservation wage data for those who fulfil the ILO criteria for unemployment status when participating in the LFS.

In addition to the data collected by the Central Statistical Office, the National Bank of Poland (NBP) performs a dedicated survey among the registered unemployed (whether or not they fulfil the ILO criteria). The variables describing wage expectations from that survey are available for the years 2007–2014. However, due to changes in the questionnaire, comparable variables that describe individual characteristics are only available for the period 2011–2014. This survey is administered yearly and yields a sample similar in size to the effective pool of the unemployed in the LFS. The sample is selected randomly in two stages. First, out of 380 local labour offices, a random subpopulation of 65–68[2] is selected. Subsequently, NBP representatives randomly select a day to visit each local office during the four weeks during which the survey is administered and randomly select 80 participants in each office, replicating the gender and age composition[3], as observed in the data. The survey consists of two modules: the first covers all persons in the sample and includes mainly the description of the person, his/her household, past experience and current activities that make it possible to determine if a given person fulfils the ILO criteria of unemployment. The second module is exclusively addressed to persons who meet the ILO criteria and contains more detailed questions. The question about expected wages is phrased as follows: "Supposing you received a job offer, what net wage would you expect to obtain?". So, in fact, this question refers to the self-assessment of one's abilities rather than the lower boundary of the scope of the reservation wages.

The average reservation wage in the LFS was remarkably stable in relation to the average wage in the economy (see Figure 1). The average expected wage (NBP survey) was higher than the reservation wage. It was also more prone to labour market conditions (ULC growth) than the reservation wage.

Another difference between the observed wage expectations and reservation wages is the variance of observations. It is clearly higher in the case of expected wages observed in the survey of unemployed persons carried out by the NBP (coefficient of variance equal to 43%) than in the case of the distribution of reservation wages in the Polish LFS data (26% respectively). The

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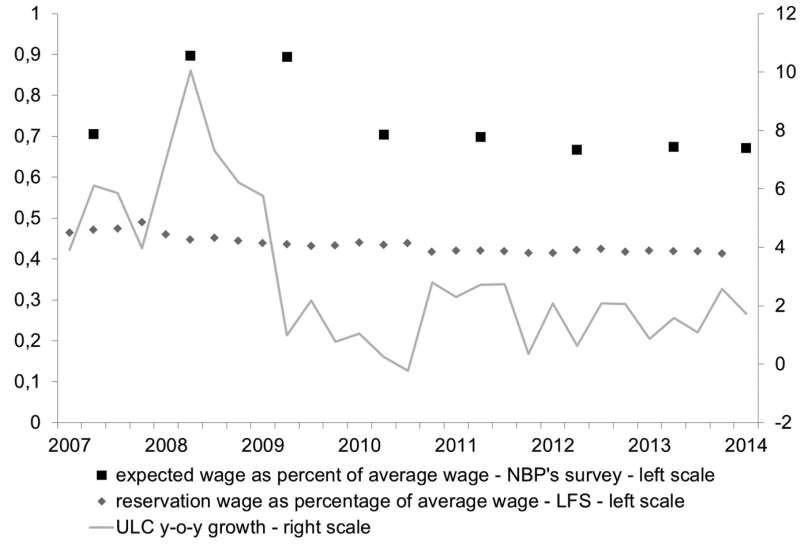
2 The subpopulation is expected to replicate the unemployment rate, with a representative draw from five regions and three size subclasses and rural/urban locations. Independent random subpopulations are drawn until the means of the unemployment rate within regions, subclasses and locations do not depart from the averages observed in the population by more than 0.1 pp.

3 Three age groups are considered: under 25; 25–45; and over 45.

heterogeneity of the skills of those unemployed and the small proportion of top-skills persons can also explain the rightward skewness of the distribution of wage expectations in comparison to the more symmetric distribution of reservation wages.

Figure 1. Expected wages, reservation wages, and ULC dynamics in Poland



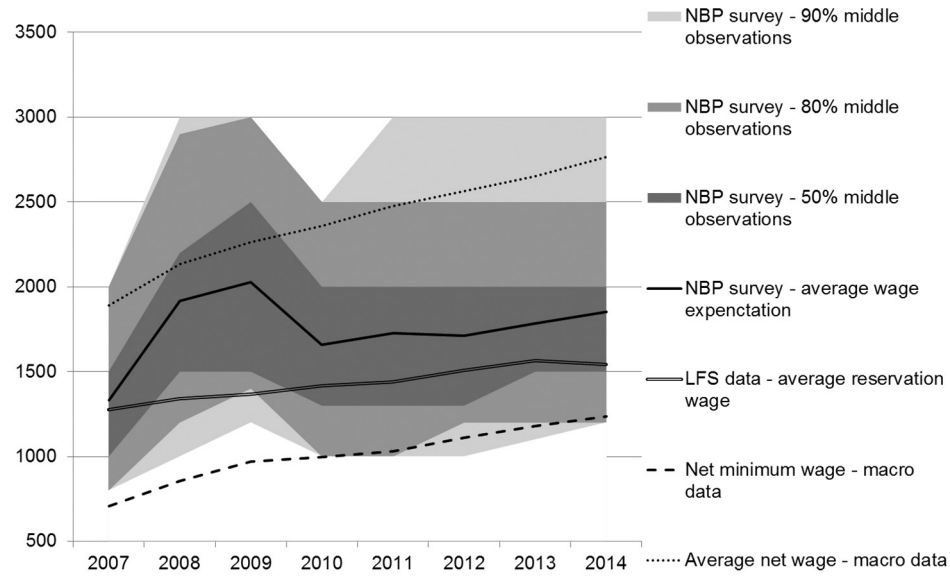
Source: Polish Central Statistical Office (PCSO), NBP surveys, Polish LFS.

In summary, the question about expected wages from the NBP survey better reflects the self-assessment of (expected) individual productivity as viewed by the unemployed, while the reservation wage data from the LFS can perhaps be treated as the lower bound of the wage covering basic living costs. Consequently, the wage expectations declared in the NBP survey seem to better indicate the real parameters that influence the duration of a job search for an optimal match. The NBP declarations also appear to be more informative about the actual wage pressure.

Changes in the wage expectations of the unemployed can directly influence the duration of a job search. They can also lead to changes in the reservation wage [Lancaster, Chesher, 1983, Brown, Taylor 2013]. Indeed, past data suggest that in 2007 and 2008, when unemployment was at a record low and ULC growth at a record high (Figure 1), the pressure on higher wages was also in line with sharp increases in the wage expectations of unemployed persons. In fact, the wage expectations of the unemployed increased faster than the average wage in the economy (Figure 2). This was due to factors such as dynamic wage growth in the domestic economy, peaking labour demand (a record number of vacancies for unemployed job seekers) and shortages of new workers due to a peak in the post-enlargement emigration wave. The changes

in expectations were observed across the distribution of expectations. Following the crisis (since 2010), the wage expectations of the unemployed have been changing only because of changes in the minimum wage, with the distribution of wages remaining largely unchanged. It should be also noted that the wage expectancies of unemployed persons adjusted with a delay to substantial changes in the labour market situation. For example, in the beginning of 2009 the wage expectations of those unemployed were still high while wage growth in enterprises and ULC adjustments were almost immediate.

Figure 2. The distribution of wages expected by unemployed persons registered in local labour offices (in PLN) versus average reservation wage from LFS data, and minimum and average wages



Source: NBP survey of unemployed persons, PCSO, own calculations.

As described earlier, an alternative way to approach wage expectations is to look at individual levels rather than the aggregates. Indeed, it is likely that the lower deciles of the reservation wages grow because the individuals with such wages have higher productivity potential. Thus, increasing reservation wages need not be indicative of growing wage pressure. In the next section, we move to analysing this specific aspect.

Method of assessing the adequacy of wage expectations

It is important to now introduce the methods for constructing the counterfactual distribution of wages. In order to do that, we have used two methods: a parametric and non-parametric one. For the parametric approach, we first

estimated a Mincerian wage equation on the Labour Force Survey dataset. We used a regression model (OLS) in order to obtain the link between the individual characteristics of employed persons (described by vector X_i^E) and the wages of those persons w_i^E.:

$$w_i^E = \beta' X_i^E + \varepsilon_i \tag{1}$$

The vector of individual characteristics included sex, age, educational attainment and region. The set of possible features was limited by variables available for employed persons and also by the variables available for use in the wage expectation datasets. In the next step, the individual characteristics of unemployed persons (described by vector X_i^U) and vector β,which represented the estimated parameters of equation (1), were in turn used to produce an out-of-sample prediction of the theoretical wages that can be considered adequate for unemployed persons:

$$\hat{w}_i^U = \beta' X_i^U \tag{2}$$

This counterfactual distribution of wages prepared for unemployed persons could be used as a benchmark for their individual expected wages. If the expected wages fell short of the predictions, it would mean that excessive reservation wages did not contribute to unemployment. If the opposite were true, wage pressure would likely materialise as soon as labour demand strengthened, since the compensation demanded by the unemployed would likely reinforce the upward pressure on wage growth. For brevity, we call such wage expectations excessive.

The wage equation used in this paper was not corrected for sample selection bias. The first reason was the relatively limited number of common variables in all the datasets used in the exercise. So, even controlling for the bias using standard methods [Heckman, 1979] does not guarantee a substantial reduction of the bias in a standard specification. Nevertheless, other publications [Newell, Socha 2007] report that the sample selection bias of the wage equation based on the LFS data for Poland is significant. Secondly, the potential wage bias should be downwards. Therefore, the OLS would underestimate the predicted wages. This means that if there is a bias it would be easier to reject the hypothesis that wage expectations are adequate over the hypothesis of excess expectations.

In addition, micro-level data used to infer about the adequacy of wage expectations is likely to be affected by the selection bias. This calls for a non-parametric benchmark. A solution to a downward bias in the linear approach is offered by a nonparametric estimation method proposed by Ñopo [2008]. In this method, the exact matching on observables is employed. The algorithm of this procedure is based on four steps. The first step is the selection of the unemployed person for whom the expected wage is observed. In the second step, all employed persons with the same individual characteristic are selected.

Next, a "synthetic individual" is constructed on the basis of the average observations selected in the previous step. In the last step of this iterative procedure, a pair of observations (the reservation wage of the unemployed person and the observed wage of the synthetic person) is saved. The whole procedure is repeated for all unemployed persons.

The advantage of the Ñopo [2008] approach is that it allows for the decomposing of the observed differences between the reservation wage and the counterfactual wage into differences due to the lack of common support – otherwise known as a lack of overlap in the distribution of observables – and differences due to unobservable variables. In our case, this would signify an unexplained difference between expected and attainable wages.

Since Ñopo [2008] relies on exact matching, this method has some shortcomings too. First, for some job seekers common support may exist but be quantitatively small. For example, there may only be a few working individuals who would share identical characteristics with the unemployed. Hence, it would not seem likely that the unemployed individuals would actually be able to secure employment at all, regardless of the wage expectations and reservation wages. Yet, the Ñopo [2008] algorithm will match the unemployed with the identical employed and produce an estimate of the unexplained difference between them. Thus, when applied to the problem at hand, this estimation technique requires analytical diligence.

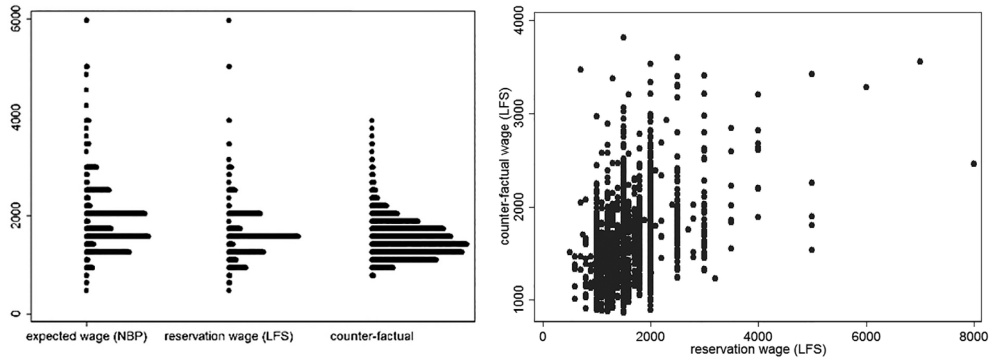
Results for the parametric and non-parametric approaches

The NBP survey used in this paper covers the second quarters of the years 2011–2014. We complement this data with the respective quarters of the Polish LFS. Data on wages in the Polish LFS comprises from 7,400 to 9,200 individuals, whereas the unemployed pool in both the LFS data and in the NBP data is composed of approximately 4,000 individuals. The LFS data have weights that permit the results to be extended to the complete population. However, since the NBP data have no inherent weights and weights are not particularly relevant for obtaining linear estimates, we proceed without weights. Despite these fairly large samples, in some cases data on the reservation wage is missing in the LFS, whereas in the NBP survey the question is not posed to effectively inactive unemployed. Thus, the final sample size falls slightly short of 6,000 unemployed.

Our regressions include standard economic variables for the Mincerian wage regression, i.e. education, age (linear and squared term), gender, occupation and region. We do not include controls for industry, because the NBP survey does not ask respondents about their previous industry of employment. As discussed earlier, the estimates are obtained from models where we do not control for sample selection. The results of these simple Mincerian wage regression models are characterised in Table A1 in the Appendix. They are consistent with intuition and publications concerning the determinants of wages

in Poland [Myck *et al.*, 2009]. Better education attainment and higher-skilled occupations lead to higher wages. There is also a significant gender wage gap and a significant inverted U-shape relationship between age and wages. Moreover, the parameters of the regression models are significant and relatively stable in time. These parameters are then used to construct the counterfactual distributions of the wages of unemployed persons using the LFS data and the NBP dedicated survey. At first glance, the comparison of the reservation wages from the LFS, the expected wages from the NBP survey, and the counterfactual wage distributions suggests three conclusions (Figure 3, left panel). First, expected wages are usually higher than reservation wages. Second, both reservation and expected wages fall within the rational boundaries observed for the market compensation, but a more formal test is needed to determine if there is a match at the individual level. Third, both reservation and expected wages are given mostly as so-called "psychological" values, typically round numbers. Thus, testing if reservation/expectations match what the market offers needs to account for these discontinuities; a mismatch may stem from observed uncoordinated shifts in the distribution of round values caused by unobserved, steady wage growth. The comparison of counterfactual and reservation wage observations for the same persons (Figure 3, right panel) leads us to the conclusion that these two are positively correlated and that most individuals mentioned reservation wages that were much lower than counterfactual wages.

Figure 3. Comparison of the distribution of reservation wages, expected wages, and counter-factual wages for 2014



The comparison of distributions **Comparison of observations for the same persons**

Data: Polish LFS for reservation wages and counterfactual wages, NBP for expected wages, own calculations.

Now we turn to formal statistical testing at the individual level (Table 1 and Table 2). We used a standard parametric test for the equality of means (based on the t-student statistic) as well as nonparametric rank tests (Wilcoxon signed rank test) and nonparametric tests for the equality of medians and distributions

(Mann-Whiney U test). Regarding reservation wages, the distribution in all the years tends to be symmetric. The paired tests of the equality of means and medians show that reservation wages are not significantly different from counterfactual wages. The whole distribution of reservation wages differs strongly from the distribution of counterfactual wages because of the aforementioned "psychological" values, which explains why at a significance level of 0.05 or higher the distributions are different according to the Mann-Whitney U-test.

Table 1. Main results – the difference between reservation wages and counterfactual wages

	2011	2012	2013	2014
Sample size	2715	2940	2948	2938
Mean reservation wage (LFS)	1481	1568	1596	1568
Mean counterfactual wage	1487	1563	1606	1563
Difference of means	**6**	**–5**	**10**	**–5**
Significance of diff (t-test)	0.475	0.591	0.252	0.551
Median reservation wage (LFS)	1500	1500	1500	1500
Median counterfactual wage	1432	1512	1555	1511
Difference of medians	**68**	**–12**	**–55**	**–11**
Wilcoxon signed rank test	0.539	0.101	0.021	0.101
Mann-Whiney U test	0.047	0.044	0.003	0.048

Data: Polish LFS for reservation wages and counterfactual wages, own calculations.

Expected wages in all the years were significantly higher than the counterfactual wages of the same persons (Table 2), in the case of both means and medians. However, except in 2014, the differences between the expected and market wages were not economically large (the difference of medians was approximately 5% of the net monthly wage and the difference of means was close to 10% of the net monthly wage), with their significance stemming mainly from the large size of the samples. In 2014, wage expectations were much higher than counterfactual wages (Table 2), but reservation wages remained almost unchanged (Table 1). The NBP survey also gives us an opportunity to observe the extent to which the expected wages of a given person are influenced by their work careers (wages in previous work before unemployment). Until 2012, more than half the unemployed individuals expected the same wages as in their previous job. By 2014, this percentage declined to about 40%. Of the rest, most expect higher wages. However, the percentage that expects lower wages increased from 10% to 13% from 2010 to 2014.

The quality of these analyses depends not only on the statistical tests employed, but also on the quality of the established counterfactual. Typically, Mincerian wage regressions are characterised by an R^2 of approximately 40% (see Table A1 in the Appendix). However, this statistic is uninformative of where the disparity between the fitted and actual values is most acute. In other words, to judge the relevance of the counterfactual, one needs to know if standard errors are larger for individuals with some characteristics or,

rather, in specific areas of the wage distribution. For the sake of brevity, we only show the dissection of the model quality across the deciles of the wage distribution (Figure 4). The fitted values understate the actual wages for low earners and overstate it for high earners. Given that the unemployed are more similar to low earners, this suggests that the counterfactuals are surely on the "safe side" when compared to the expected wages or reservation wages, because the residuals are systematically negative in these deciles. The average residuals are expressed as a percentage of wages, which implies that the lowest decile is overstated by the fitted values by as much as 30%–40% compared with the actual compensation. This analysis confirms that even if the differences displayed in Table 1 are statistically significant, they do not seem to be economically worrisome. Figure 4 is also reassuring in showing that the models perform similarly in all the years under consideration.

Table 2. Main results – the difference between expected wages and counterfactual wages

	2011	2012	2013	2014
Sample size	3265	4062	2193	4054
Mean expected wage (NBP)	1646	1720	1766	1854
Mean counterfactual wage	1472	1528	1623	1502
Difference of means	**175**	**192**	**143**	**352**
Significance of diff (t-test)	0.000	0.000	0.000	0.000
Median expected wage (NBP)	1500	1500	1600	1700
Median counterfactual wage	1433	1475	1523	1447
Difference of medians	**67**	**25**	**77**	**253**
Wilcoxon signed rank test	0.000	0.000	0.000	0.000
Mann-Whiney U test	0.000	0.000	0.006	0.000
Percentages of unemployed persons who expect:				
the same wage as in previous work	56%	51%	42%	41%
higher wage than in previous work	35%	39%	45%	46%
lower wage than in previous work	10%	10%	13%	13%

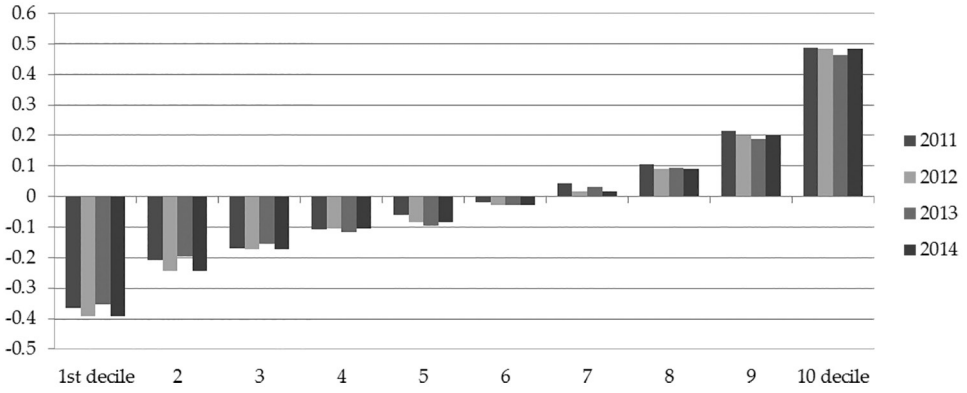
Data: Polish LFS for counterfactual wages, NBP for expected wages, own calculations.

This conclusion about the relatively low level of wage expectations is confirmed by the nonparametric analysis (Table 3). We use the exact matching method following Ñopo (2008), with the same characteristics as in the case of the parametric approach, i.e. education, age[4], gender and occupation (previous occupation in the case of the unemployed). We find that the raw differential is negative (individual expected wages are lower than what the market actually offers), whereas a part of this differential vanishes once we account for the differences in the observable characteristics. The adjusted gap due to factors unexplained by the characteristics used in the model is lower

[4] To facilitate the matching we constructed 5-year age groups rather than using a continuous variable.

than the raw gap. This means that those of the unemployed who find no exact match with the employed have somewhat better characteristics than those who find an exact match. Similar to the parametric approach, the model is able to capture a similar share of variation in all the studied years (approx. 70% of the unemployed and approx. 90% of the employed find the exact match in the analysed samples).

Figure 4. Fit in the linear regression – average residuals across deciles of wage distribution



Data: Polish LFS, own calculations.

Table 3. Nonparametric testing of the adequacy of reservation and expected wages

	2011	2012	2013	2014
Average of raw differences between average reservation wages and average counterfactual wages matched to unemployed persons	**–0.187**	**–0.181**	**–0.193**	**–0.181**
Decomposition of the gap:				
due to differences in characteristics of the matched individuals	–0.080	–0.075	–0.073	–0.075
due to unmatched employed persons having better characteristics	0.000	–0.004	–0.006	–0.004
due to unmatched unemployed having better characteristics	–0.051	–0.049	–0.058	–0.049
due to factors unexplained by characteristics used in the model	**–0.056**	**–0.053**	**–0.055**	**–0.053**
Percentage of matched employed persons	90%	88%	87%	88%
Percentage of matched unemployed persons	67%	70%	70%	70%

Data: Polish LFS for reservation wages and counterfactual wages, NBP for expected wages, own calculations.

To complete the discussion of the obtained results, we present some implications. First, since the populations of the unemployed in the LFS data and in the NBP survey may differ in terms of characteristics, it might be advisable to construct two separate counterfactuals. Second, it would be interesting to see which reservation/expected wages, if any, are misaligned with what the market offers. We pursue both these questions in Table 4, which compares the reservation wage and the expected wage across occupations (in 2014 only,

for the purpose of brevity). According to these results, we observe that reservation wages are usually not significantly different or lower than counterfactual wages, except in the case of the lowest-skill occupations and people employed as either salesmen or personal workers. However, the perception of expected wages is much higher than that of counterfactual wages. In formulating their expectations, people are less bound by the budget constraints of their households (absolute minimum) and more prone to declare wages close to their perceived market value. In addition, low-income workers can be aware of some unobservable features that may lead to the underestimation of counterfactual wages for the lowest wages presented in Figure 4.

Table 4. Reservation wages, expected wages, and counterfactuals by occupation in 2014

	Mean expected/reservation wages		Differences between declarations of unemployed and counterfactual wages	
	Reservation wage (LFS)	Expected wage (NBP)	Reservation wage (LFS)	Expected wage (NBP)
Low-skilled jobs	1414	1699	105***	379***
Machine operators	1632	1672	–10 0	394***
Technicians	1915	1801	–118***	61**
Office workers	1576	1528	–38 0	276***
Personal workers, salesmen	1314	1252	132***	389***
Craft and trade workers	1721	1725	–32 0	279***
Specialists	1372	1512	88 0	613***
Farmers, fishermen, etc.	2313	1985	–414***	–207***
Higher management, officials	2755	2681	–585***	297***

Data: Polish LFS for reservation wages and counterfactual wages, NBP for expected wages, own calculations.

Conclusions

The problem of overly high wage expectations and reservation wages is frequently mentioned as one of the reasons for the relatively high unemployment in Poland, even in periods of accelerated demand for labour. The objective of this study was to verify this hypothesis by providing a microeconomic method for evaluating the adequacy of wage expectations among the unemployed.

We showed that the expectations of unemployed individuals can be assessed using a counterfactual distribution of wages for the unemployed generated using parametric and nonparametric techniques. The estimates were used as a benchmark for evaluating whether reservation wages and expected wages are excessive relative to what the market offers. The results show that in the 2011–2014 period reservation wages were not significantly higher than the wages of employed persons with similar features. In fact, in most cases, reservation wages were significantly lower than counterfactual wages. This

observation confirms that in general the reservation wages of unemployed persons in Poland are not excessive and thus do not contribute significantly to either unemployment or excessive wage pressure. On the other hand, the expected wages from 2011 to 2014 were significantly higher than counterfactual wages. However, declarations regarding desired wages seem to be less binding in wage negotiations than reservation wages. What is also important is that the counterfactual wages for persons with the lowest wages are probably underestimated because of the limited number of available explanatory variables. Therefore the observed differences between expected wages and the potential market offering should be treated as the upper limit of the excessive wage expectations.

We have also discussed in detail the conceptual and empirical differences between reservation and expected wages. In the case of Poland, reservation wage indicators based on the LFS are not particularly volatile or indicative of wage pressure, whereas the expected wages seem to provide an improvement in the informational set. In fact, the reaction of the reservation wages to labour market conditions was very weak, at least in the 2011–2014 period. By contrast, the expected wages of unemployed persons were more prone to fluctuations in demand for labour than their reservation wages. Such expectations better reflect the difference between tight and slack labour markets and can therefore better describe the position of unemployed persons in wage negotiations (not only the bottom limit necessary for agreement). The observed differences lend additional support to microeconomic surveys with questions about expected wages aiming to identify a measure of wage pressure.

Appendix

Table A1. Results of wage equations used to define counterfactual wages in parametric approach

		2011	2012	2013	2014
Educational attainment	Tertiary	ref.	ref.	ref.	ref.
	Secondary general	–0.149***	–0.163***	–0.181***	–0.163***
	Secondary vocational	–0.143***	–0.157***	–0.17***	–0.157***
	Basic vocational	–0.246***	–0.253***	–0.258***	–0.254***
	Elementary	–0.322***	–0.288***	–0.343***	–0.287***
Demographics	Female	–0.233***	–0.225***	–0.217***	–0.225***
	Age	0.036***	0.034***	0.038***	0.036***
	Age squared	–0.0004***	–0.0004***	–0.0004***	–0.0004***
Occupation	Low-skilled occupations	ref.	ref.	ref.	ref.
	Artisans and industrial workers	0.133***	0.142***	0.148***	0.143***
	Technicians, middle managers	0.294***	0.294***	0.286***	0.294***
	Office workers	0.143***	0.155***	0.15***	0.155***
	Sales and personal services	0.047***	0.032**	0.016	0.031**
	Machine operators	0.205***	0.198***	0.187***	0.198***
	Farmers, fishermen	0.063	0.022	–0.01	0.021
	Specialists	0.415***	0.394***	0.382***	0.394***
	Higher management, policy makers	0.633***	0.582***	0.598***	0.582***
Region (voivodeship)	dolnośląskie	ref.	ref.	ref.	ref.
	kujawsko-pomorskie	–0.074***	–0.053***	–0.059***	–0.052***
	lubelskie	–0.081***	–0.066***	–0.072***	–0.066***
	lubuskie	–0.035	–0.046**	–0.034	–0.046**
	łódzkie	–0.051***	–0.049***	–0.011	–0.048***
	małopolskie	–0.019	–0.023	–0.044*	–0.023
	mazowieckie	0.091***	0.112***	0.08***	0.112***
	opolskie	–0.024	–0.005	0.008	–0.005
	podkarpackie	–0.139***	–0.145***	–0.12***	–0.145***
	podlaskie	–0.057***	–0.056***	–0.081***	–0.056***
	pomorskie	0.036*	0.036*	0.055***	0.037*
	śląskie	0.053***	0.072***	0.055**	0.073***
	świętokrzyskie	–0.123***	–0.103***	–0.119***	–0.103***
	warmińsko-mazurskie	–0.028***	–0.051***	–0.049**	–0.051***
	wielkopolskie	–0.028	–0.036*	–0.029	–0.036*
	zachodniopomorskie	–0.007***	0.017***	–0.002***	0.017***
	Number of observations	9238	8511	7393	8511
	Adjusted R-squared	0.403	0.4049	0.4058	0.4051

Data: Polish LFS, own calculations.

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METODA OCENY ADEKWATNOŚCI OCZEKIWAŃ PŁACOWYCH OSÓB NIEPRACUJĄCYCH

Streszczenie

Pojęcie płacy progowej różni się zarówno koncepcyjnie, jak i empirycznie od kategorii oczekiwań płacowych. Celem artykułu jest przedstawienie metody oceny adekwatności obu typów oczekiwań dotyczących płac osób, które nie pracują. Metoda ta jest użyta do zweryfikowania hipotezy o adekwatności płac progowych i oczekiwań płacowych bezrobotnych w Polsce. W artykule przeanalizowano, w jakim stopniu płace progowe oraz oczekiwania płacowe osób bezrobotnych są uzasadnione rynkową wyceną pracy osób o identycznych charakterystykach. W analizie wykorzystane zostały dane o oczekiwaniach płacowych (ankieta Narodowego Banku Polskiego) oraz płacach progowych (Badania Aktywności Ekonomicznej Ludności). Do oceny adekwatności oczekiwań płacowych użyto metod parametrycznych i nieparametrycznych umożliwiających porównanie rozkładów płac progowych, oczekiwań płacowych oraz skonstruowanych płac kontrfaktycznych. Wyniki analizy wskazują, że płace oczekiwane pozostają wyższe od płac progowych oraz są dodatnio skorelowane z presją płacową w gospodarce. Ponadto wyniki potwierdzają hipotezę, że oczekiwania płacowe osób bezrobotnych w Polsce w latach 2011–2014 nie były nadmierne. Wynik ten jest ważny, gdyż w przypadku, gdy oczekiwania płacowe osób bezrobotnych są wyższe niż ich wycena rynkowa, stanowi to źródło zjawiska bezrobocia i współwystępującej presji płacowej.

Słowa kluczowe: Mincerowskie równanie płac, rozkład kontrfaktyczny, płaca progowa, oczekiwania płacowe, presja płacowa, BAEL

Kody klasyfikacji JEL: J31, J64