

STARTING SALARIES: AN ANALYSIS OF JOB OFFERS FOR INDIVIDUALS WITHOUT EXPERIENCE BASED ON THE EXAMPLES OF KATOWICE, KRAKÓW, AND WROCŁAW

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Abstract: *This study examines the level, variance, and stability of entry-level salaries in Katowice, Kraków, and Wrocław. Analyzing full-time employment contract offers from the pracuj.pl portal (January–February 2026), the research employs descriptive statistics alongside proprietary salary uncertainty (UI) and attractiveness (AI) indices. The findings indicate a strong right-skewed salary distribution across all cities, highlighting a dominance of low base rates. Kraków and Wrocław report similar mean salaries (approx. PLN 7160 - 7184), exceeding Katowice (PLN 6739). The AI reveals that entry-level wages constitute 57% to 73% of respective regional averages. Furthermore, statistical analysis demonstrates that initial salary levels are determined primarily by the specific industry sector (e.g., logistics) rather than geographic location. The absence of a significant city effect implies that regional variations arise largely from local job offer structures. Finally, a low coefficient of determination ($R^2 = 0.040$) in the regression model emphasizes that the entry-level labor market remains highly complex and unpredictable, even under standardized contractual conditions.*

Key words: *salary, entry-level labor market, employment contract, regional labor markets*

JEL codes: *J24, J31, R23*

1. Introduction

Entering the labor market constitutes one of the key moments in a person's professional career. However, individuals without professional experience face significant information asymmetry between themselves and potential employers. Because employers do not initially know the actual skills and productivity of an inexperienced applicant, they must rely on statistical discrimination, basing their hiring evaluations on general statistics rather than proven individual competencies (Altonji & Pierret, 2001). The nature of this first job is of crucial importance for an individual's long-term career path. The initial workplace plays a significant role in explaining the long-term consequences of entering the labor market, strongly influencing future professional trajectories even when this entry occurs under difficult economic conditions (Oreopoulos et al., 2012).

The shaping of salary offers for this group is subject to macroeconomic pressure from two sides: the lower limit is determined by the mandatory minimum wage, amounting to 4806 PLN gross in the analyzed period (Journal of Laws 2025, item 1242), and on the other hand, market competition for workers prompts enterprises to formulate more attractive proposals. Another significant factor is the EU directive on wage transparency (Directive 2023/970; Journal of Laws 2025, item 807), the implementation of which forced the provision of salary ranges already at the recruitment stage. While previous wage transparency reforms in surveyed countries successfully reduced the pay gap (Bennedsen et al., 2023), the practice of presenting wide salary brackets in job advertisements voluntarily by employers still introduces wage uncertainty. Consequently, these wide brackets continue to generate uncertainty on the candidate's side - especially an inexperienced one - regarding the real level of earnings and hinder budget planning prior to deciding to accept an offer.

The issue of salary gains particular significance in the context of living expenses in large urban centers, especially rental costs. As indicated by studies on housing affordability in Central Europe, the rent-to-income ratio is systematically increasing, exacerbating financial barriers for individuals with lower earnings (Matějková, J. and Tichá, A., 2025). Otodom (2026) data confirm that the rental market in the largest Polish cities is reaching levels difficult to bear by individuals just entering the labor market and possessing salaries close to the minimum. According to data from Statistics Poland (GUS, 2026a - 2026f), mean earnings in voivodeship capital cities systematically exceed the mean salaries for their corresponding voivodeships. However, a research gap exists regarding whether, in the segment of offers for individuals

without professional experience, salaries are shaped by the general wage level in the region, or by the specificity of the performed work.

The main objective of the study is the analysis of the level, differentiation, and stability of salaries offered to individuals without professional experience in Katowice, Kraków, and Wrocław. The selection of these cities is dictated by several premises. Firstly, these are the three largest urban centers in southern Poland, representing diverse economic structures - Katowice as the center of the industrial and service Silesian agglomeration, Kraków as a leading academic and tourist center with a developing modern services sector, Wrocław as a dynamically growing IT center. Secondly, none of these cities is the national capital that would generate a particular salary premium due to the concentration of corporate headquarters and central institutions - which allows for the analysis of representative regional markets.

The study was based on job advertisements from the pracuj.pl portal (January - February 2026) guaranteeing an employment contract. To thoroughly analyze the structure of the offers, original research measures were applied, including the salary uncertainty indicator (UI) and the salary attractiveness index (AI) relative to the local market. During the analysis, the following research questions were posed:

To what extent does the location (city) and the type of work offered determine the salary level for individuals without professional experience?

How is the financial transparency of the job advertisements shaped, and how much salary uncertainty do candidates encounter in individual markets?

How are the initial salary proposals positioned relative to their mean level in the analyzed cities?

The answers to the above questions will allow assessing to what extent the ultimate financial prospects of a beginning candidate are determined by the geography of local labor markets, and to what extent by the specificity of individual sectors and types of positions.

2. Methodology

2.1. Data collection and selection procedure

The study was based on the analysis of primary data obtained from the pracuj.pl recruitment portal. The data were collected at the turn of January and February 2026. The process of obtaining and verifying job advertisements was conducted manually with the use of the Gemini 3 Pro and Gemini 3.1 Pro models, used for the separation of numerical values and keywords from the advertisements. Each job advertisement was subjected to the verification of the correctness of data imported by the models.

Only those offers which jointly met two criteria were included in the database:

- (1) a clear lack of the requirement to possess professional experience.
- (2) an explicitly provided salary or its range.

Job advertisements not meeting both conditions were rejected at the selection stage. Initially, job advertisements offering employment based on a mandate contract, B2B contract, and employment contract (EC) were collected. Considering, however, the specificity of legal and tax conditions, only offers guaranteeing employment based on an employment contract were subjected to the final analysis. A part of them were additionally rejected due to the impossibility of precisely calculating the gross salary. The final size of the research sample amounted to 377 job offers, the distribution of which was presented as follows:

Katowice: 169 offers were collected (including 98 EC), 91 were qualified for analysis.

Kraków: 223 offers were collected (including 124 EC), 116 were qualified for analysis.

Wrocław: 269 offers were collected (including 176 EC), 170 were qualified for analysis.

2.2. Data standardization and categorization

All collected financial data were subjected to the standardization process, recalculating them into the form of a monthly gross salary under the assumption of performing work on a full-time basis (160 hours). In order to examine the impact of the type of work performed on the size of the salary, the offers were divided into five main categories:

- B2C - positions based on direct interaction with an individual customer.
- Office work - positions of an administrative, conceptual, and organizational character in a corporate or official environment, not requiring specialized technical education from the IT area.
- IT - positions dealing with the creation, maintenance, and development of IT systems and network infrastructure.
- Blue-collar occupations - positions requiring physical effort, dexterity, or the operation of machines and tools.
- Logistics - positions dealing with the flow of goods, warehousing, transport, forwarding, and the service of logistics processes.

2.3. Research variables and original indicators

For each analyzed offer, the following salary parameters were determined:

- $W_{\min}$ - the lower limit of the unified salary in the job advertisement.

- $W_{\max}$ - the upper limit of the unified salary in the job advertisement.
- W_{avg} - the mean unified salary, calculated according to the formula:

$$\frac{W_{\min} + W_{\max}}{2} \quad (1)$$

In order to thoroughly analyze the structure of the offers, two dedicated research measures were applied:

- Salary Uncertainty Indicator (UI): determines the spread of the offer brackets for the offered position, calculated as:

$$\frac{W_{\max} - W_{\min}}{W_{\min}} \quad (2)$$

- Salary Attractiveness Index (AI): determines the market position of the offer, calculated as the ratio of W_{avg} to the mean monthly salary in the enterprise sector in a given city in February 2026 based on data published by Statistics Poland.

2.4. Methods of statistical analysis

The collected data was subjected to quantitative analysis. Descriptive statistics were applied (i.a., median, mean, standard deviation, coefficient of variation, and asymmetry coefficient). For the verification of hypotheses and answers to the research questions, the following were used: χ^2 test of independence, analysis of variance (ANOVA), Regression model (built separately for W_{avg} , $W_{\min}$, and $W_{\max}$).

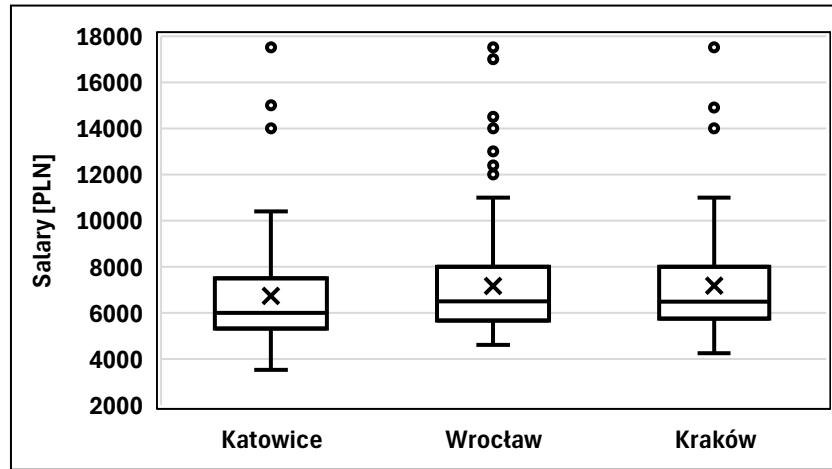
For the purposes of conducting the χ^2 test of independence, continuous salary variables ($W_{\min}$, W_{avg} , $W_{\max}$) were subjected to categorization and divided into four salary intervals calculated on the basis of quartiles. Due to the size of the research sample, the "IT" category was excluded from calculations within the ANOVA analysis and from the regression models. While constructing the regression models, the city of Wrocław and the blue-collar occupations category were adopted as reference variables. In all statistical tests conducted, a standard significance level of $\alpha=0,05$ was assumed.

3. Research results

3.1. Salary level in the analyzed cities

The analysis of the offered salaries (W_{avg}) for individuals without professional experience was commenced with the examination of their distribution in the selected labor markets: Katowice, Kraków, and Wrocław. A graphical summary of the shaping of rates in individual locations was presented in Figure 1.

Fig. 1 Distribution of offer salaries (W_{avg}) in the analyzed cities.



Source: Own elaboration based on data from the pracuj.pl portal.

As results from the box plots (Fig. 1), Katowice is characterized by a lower level of the offer median in comparison to the remaining two cities. The markets in Kraków and Wrocław, on the other hand, are very similar to each other in this respect. A common feature of all analyzed locations is the presence of numerous, high outliers. This indicates the occurrence of single, significantly higher salary offers, which well explains the high salary volatility and the poor fit of the subsequent regression models. The exact values of descriptive statistics were compiled in Table 1.

Tab. 1 Offer salary (W_{avg}) by city.

City	N	Median [PLN]	Mean [PLN]	Standard Deviation [PLN]	Coefficient of Variation [%]	Skewness
Katowice	91	6000.00	6739.45	2342	34.75	2.339
Kraków	116	6479.25	7184.04	2232	31.07	2.103
Wrocław	170	6500.00	7160.65	2209	30.85	2.003

Source: Own elaboration based on data from the pracuj.pl portal.

A detailed analysis of salaries (Table 1) indicates a moderate differentiation between the cities. The highest mean salary was recorded in Kraków (7184 PLN), very similar values occur in Wrocław (7161 PLN), whereas lower in Katowice (6739 PLN). The differences between the medians are minor (approx. 400 - 500 PLN), which suggests that the salary level for individuals without professional experience is relatively similar between the labor markets analyzed. High coefficients of variation (above 30%) and outliers (Fig. 1) indicate a high volatility of the data. High values of asymmetry coefficients (above 2) in all three cities indicate

a very strong right-sided skewness of the salary distribution, which means that the vast majority of offers for individuals without experience offer salaries close to the minimum, and only a few proposals are significantly higher. Katowice (2.339) exhibits the greatest inequality of salary brackets, whereas Wrocław (2.003) the smallest.

3.2. Uncertainty and spread of salaries

To assess the degree of predictability and financial transparency in job offers for candidates without experience, the spread of the offered salaries was analyzed. For this purpose, the Salary Uncertainty Indicator (UI) was used. The mean values for the analyzed cities were presented in Table 2.

Tab. 2 Mean Salary Uncertainty Indicator (UI) by city.

City	UI
Katowice	0.311
Kraków	0.376
Wrocław	0.377

Source: Own elaboration based on data from the pracuj.pl portal.

The UI indicator shows that the highest salary uncertainty occurs in Kraków (0.376) and Wrocław (0.377), while the lowest in Katowice (0.311). This means that in the analyzed urban centers, job offers more often contain wide salary ranges, which may indicate their dependence on the competence or performance of the employee.

To investigate this phenomenon more closely, the structure of the offer range spread (divided into three uncertainty intervals: low <10%, moderate 10–30% and high >30%) was compared with the location (Table 3) and the type of work offered (Table 4).

Tab. 3 Percentage distribution of offers according to the salary range spread (UI) in cities.

Spread [%]	Katowice [%] (N = 91)	Kraków [%] (N = 116)	Wrocław [%] (N = 170)
<10	39.56	19.83	23.53
10 - 30	24.18	36.21	32.35
>30	36.26	43.97	44.12

Source: Own elaboration based on data from the pracuj.pl portal.

The results of the comparison (Table 3) confirm previous observations regarding the mean UI indicator. A significant portion of the job advertisements analyzed contain wide salary

ranges (over 30%), which generates high uncertainty on the candidate's side regarding their final level. This is particularly visible in Wrocław and Kraków, where the number of offers with a high spread dominates over offers with a precisely defined salary (<10%). In Katowice, these proportions are more balanced.

Tab. 4 Percentage distribution of offers according to the salary range spread (UI) according to types of work.

Spread [%]	B2C [%] (N = 100)	Office work [%] (N = 94)	Blue-collar [%] (N = 104)	Logistics [%] (N = 57)	IT [%] (N = 25)
<10	35.00	21.28	27.88	17.54	20.00
10 - 30	24.00	31.91	37.5	42.11	20.00
>30	41.00	46.81	34.62	40.35	60.00

Source: Own elaboration based on data from the pracuj.pl portal.

This differentiation is also visible at the level of the specificity of positions (Table 4). Offers with the highest salary uncertainty (over 30%) prevail in the IT industry, office work and the B2C sector. In turn, positions related to blue-collar sector are characterized by greater stability - the distribution of offers here is more even with a high share of job advertisements with narrow ranges.

3.3. Salary attractiveness relative to the market

To assess how initial salary proposals position themselves against the background of the general macroeconomic situation of the examined markets, the values of the Salary Attractiveness Index (AI) were analyzed. The distribution of this indicator in the analyzed urban centers is presented in Table 5.

Tab. 5 Salary Attractiveness Index (AI) in the analyzed cities.

City	Mean salary in the city [PLN]	Mean offered salary [PLN]	AI
Katowice	11773.84	6739.45	0.572
Kraków	11634.82	7184.04	0.617
Wrocław	9877.78	7160.65	0.725

Source: Own elaboration based on data from the pracuj.pl portal and the Central Statistical Office.

The presented data indicate that the salaries offered to people without professional experience constitute from about 57% to almost 73% of the mean salary in a given city. Wrocław is characterized by the highest relative attractiveness of offers for beginner employees (0.725). A noticeably lower indicator was recorded in Kraków (0.617), while Katowice is

positioned the weakest in this regard (0.572), where the disproportion between the analyzed earnings and the overall mean salary in the enterprise sector is the largest.

The high indicator for Wrocław does not result solely from high initial salaries (Table 1), but also from the lowest reference base - the mean salary in the enterprise sector there amounts to 9877.78 PLN, while in Katowice and Kraków it is 11773.84 PLN and 11634.82 PLN respectively (GUS, 2026e).

3.4. Verification of differences in salaries: the impact of the type of work and location

To statistically verify the observed differences in the level of offered salaries and assess the strength of their relationship with the city and the type of work, a chi-square (χ^2) test of independence and an analysis of variance (ANOVA) were conducted. The calculations were performed taking into account the individual limits of the salary ranges: $W_{\min}$, W_{avg} , $W_{\max}$. The aggregate results of the conducted tests are presented in Table 6.

Tab. 6 Results of statistical tests for selected parameters and variables.

Statistical test	Dependent variable	Independent variable	Result	Conclusion
χ^2	$W_{\min}$ (quartiles)	Job type	$\chi^2 = 22.96$, $p < 0.05$	Significant
χ^2	W_{avg} (quartiles)	Job type	$\chi^2 = 12.66$, $p > 0.05$	Non-significant
χ^2	$W_{\max}$ (quartiles)	Job type	$\chi^2 = 31.21$, $p < 0.05$	Significant
χ^2	$W_{\min}$ (quartiles)	City	$\chi^2 = 7.39$, $p > 0.05$	Non-significant
χ^2	W_{avg} (quartiles)	City	$\chi^2 = 8.25$, $p > 0.05$	Non-significant
χ^2	$W_{\max}$ (quartiles)	City	$\chi^2 = 5.59$, $p > 0.05$	Non-significant
ANOVA	$W_{\min}$ (continuous value)	City	$F = 0.68$, $p > 0.05$	Non-significant
ANOVA	W_{avg} (continuous value)	City	$F = 1.27$, $p > 0.05$	Non-significant
ANOVA	$W_{\max}$ (continuous value)	City	$F = 1.29$, $p > 0.05$	Non-significant

Source: Own elaboration based on data from the pracuj.pl portal.

The analysis verifying the impact of the type of work on the salary level showed varied results. The chi-square test of independence confirmed the existence of a statistically significant relationship between the type of work performed and the lower ($W_{\min}$) and upper ($W_{\max}$) limits of the salary ranges. This means that the specificity of the industry has a statistically significant impact on the extreme values of the ranges of the offer in the job advertisements. In the case of mean salary values (W_{avg}), this relationship proved to be statistically insignificant. The conducted analysis of variance (ANOVA) and the chi-square test of independence showed a lack of statistically significant differences in salary levels between the examined urban centers.

3.5. The impact of location and type of work on the salary level - regression analysis

To simultaneously assess the impact of location and type of work on the amount of the offered salary, a regression analysis was conducted. The study was performed separately for mean (W_{avg}), minimum (W_{min}) and maximum (W_{max}) values. Table 7 presents the results of the estimation of model parameters for the mean salary.

Tab. 7 Results of estimation of regression model parameters for the mean salary.

Variable	Coefficients [PLN]	p-value
Constant (Wrocław, Blue-collar)	6798.37	0.000
Kraków	+5.72	0.984
Katowice	-440.21	0.134
B2C	+253.17	0.415
Office work	+475.00	0.136
Logistics	+1232.08	0.001
Model statistics: $F = 2.968$; $p = 0.012$; $R^2 = 0.040$; $N = 361$		

Source: Own elaboration based on data from the pracuj.pl portal.

The model is statistically significant ($F = 2.968$; $p < 0.05$), however, it is characterized by a very low coefficient of determination ($R^2 = 0.040$). This means that the selected variables explain only 4% of salary variability. The analysis of individual coefficients shows that most of the examined variables do not significantly affect salaries ($p > 0.05$). The only statistically significant factor is the logistics industry ($p = 0.001$). Based on the model, it can be stated that it offers, on average, a salary approximately 1232 PLN higher relative to the base category (blue-collar occupations).

The next analyzed variant was the model for the minimum proposed salary. The results of the estimation of its parameters are presented in Table 8.

Tab 8. Results of estimation of regression model parameters for the minimum salary.

Variable	Coefficients [PLN]	p-value
Constant (Wrocław, Blue-collar)	5819.91	0.000
Kraków	75.85	0.707
Katowice	-217.81	0.297
B2C	-93.01	0.674
Office work	277.85	0.220
Logistics	1174.81	0.000

Model statistics: $F = 5.789$; $p < 0.001$; $R^2 = 0.075$; $N = 361$

Source: Own elaboration based on data from the pracuj.pl portal.

The regression model for $W_{\min}$ is statistically significant ($F = 5.789$; $p < 0.05$), and its coefficient of determination is $R^2 = 0.075$. The variables explain 7.5% of the variability of the lowest proposed rates. The analysis of coefficients indicates similar trends as in the case of the model for W_{avg} . Location variables as well as work in the B2C and office areas are statistically insignificant ($p > 0.05$). The factor significantly shaping the lower limit of the range of offers ($p < 0.001$) is again the logistics industry. The model result shows that the minimum salary proposed in logistics is nearly 1175 PLN higher in relation to the base category.

The estimation results for $W_{\max}$ showed a lack of overall statistical significance of the model ($F = 1.728$, $p > 0.05$), due to which the presentation and detailed interpretation of its individual parameters were waived.

A common feature of all models is a very low value of the coefficient of determination ($R^2 < 0.10$). This results from the fact that the analyzed models only included the city and the general type of work, and the data analyzed were characterized by numerous outliers. The salary market is characterized by significantly greater complexity, which means that the selected explanatory variables did not possess sufficient informational power to fully explain the mechanisms shaping the salary rate levels.

4. Discussion

The conducted research critically evaluates the financial prospects of labor market entrants in southern Poland's major agglomerations, providing key insights into entry-level wage determinants and the economic costs of independence.

4.1. Theoretical implications: Salary determinants and labor market segmentation

The analysis reveals no statistically significant impact of location on entry-level salaries, contradicting classical wage differentiation theories. This aligns with the labor market segmentation theory (Musiał-Paczkowska, 2012), suggesting inexperienced workers enter a secondary market characterized by a standardized, supra-regional “initial salary” oscillating near the minimum wage. Instead of geography, industry specificity drives salary variations, exemplified by a premium in logistics (approx. 1200 PLN). This reflects the theory of compensating differences (Lavetti, 2023), resulting from labor shortages or demanding working conditions. Furthermore, analysis using the Salary Uncertainty Indicator (UI) highlights information asymmetry and statistical discrimination (Altonji & Pierret, 2001). The prevalence of wide salary spreads ($UI > 30\%$) in Wrocław and Kraków - particularly in IT, B2C, and office

sectors - demonstrates that employers mitigate uncertainty by shifting recruitment risks onto candidates.

4.2. Practical implications: Cost of living, spatial mobility, and transparency

Confronting net disposable income¹ with urban living costs (Tab. 9), particularly rent (Matějková & Tichá, 2025), reveals significant barriers to spatial mobility.

Tab 9. Percentage of the median of disposable income allocated to apartment rental.

City	Median net salary [PLN]	Mean rental cost [PLN]	Tent-to-income ratio [%]
Katowice	4711.43	2369	50.28
Kraków	5087.76	3148	61.87
Wrocław	5104.05	3115	61.03

Source: Own elaboration based on data from the pracuj.pl portal and the Otodom report (2026).

In Kraków and Wrocław, base rent alone consumes over 60% of an entry-level employee's median net income. This generates a “large city trap”: although Wrocław and Kraków exhibit the highest Attractiveness Index (AI), the real financial situation is less favorable than in Katowice, where the housing burden is the lowest (50.28%). Additionally, the high uncertainty indicator (UI) shows that despite the EU wage transparency directive (2023/970), broad salary ranges without clear award criteria fail to eliminate financial uncertainty for applicants. Ultimately, the mismatch between uniformly standardized initial salaries and highly differentiated metropolitan living costs may reshape future economic migration trajectories of graduates.

5. Limitations of the study

Despite identifying significant salary trends, this study has several limitations. Methodologically, utilizing data exclusively from pracuj.pl (January–February 2026) restricts the temporal and cross-platform representativeness. The strict focus on employment contracts omits mandate contracts and B2B agreements, which are prevalent among beginners and could impact mean salary estimations. Statistically, the very low coefficient of determination ($R^2 < 0.10$) reveals that the included variables are insufficient to fully explain salary-setting mechanisms. The regression models omit crucial determinants, including employee education

¹ Net amounts were estimated based on the median of gross rates assuming employment on an employment contract, the application of income tax exemption relief, standard tax-deductible costs and resignation from participation in Employee Capital Plans and the Guaranteed Employee Benefits Fund.

and competencies, enterprise capital and size, specific skill requirements, detailed industry classifications, bonus/commission systems, and exact position levels. Furthermore, substantial data variance, numerous outliers, and unobservable negotiation factors impair the fit of simple statistical models, justifying the future application of alternative approaches, such as quantile regression. Additionally, the proprietary indicators utilized currently lack a comparative reference base. Finally, an insufficient sample size necessitated the exclusion of the "IT" sector from ANOVA and regression analyses. Ultimately, these limitations underscore that the entry-level labor market is too complex to be precisely modeled relying solely on geographic location and broad occupational categories.

6. Final conclusions

To summarize, entering the labor market in the largest agglomerations of southern Poland is associated for people without experience with high financial uncertainty and a clash with high living costs, in particular apartment rental costs, which drastically lower the real disposable income. The conducted analyses showed, contrary to classical theories of salary differentiation, that the level of the initial salary is not significantly determined by the city of employment, but by the specificity of a given industry - led by the logistics sector, offering a clear salary premium. Furthermore, despite legal and market aspirations for transparency, wide salary ranges in job advertisements maintain information asymmetry and make it difficult for young adults to stably plan their budget prior to taking up work. Due to the complexity of market mechanisms, future research in this area should be expanded to include an analysis of additional employment forms, such as civil law contracts or B2B contracts, which constitute a significant market segment for beginners. It would also be justified to include a wider set of explanatory variables in the research models. To gain a deeper understanding of the dynamics of initial salaries, subsequent analyses may successfully utilize advanced statistical methods, such as quantile regression, and encompass within their scope other urban centers with a diversified macroeconomic structure.

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