Expectations Set High: Understanding Reservation Wages in North Macedonia

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The objectives of this study are to understand the determinants of reservation wages and measure the gap between reservation and market wages in North Macedonia. The study makes use of recently collected information on reservation wages in the Labor Force Survey 2016 and 2017. The analysis relies on ordinary least squares, propensity score matching, Heckman-corrected estimates, and panel fixed effects. The results suggest that it is mainly supply factors that shape reservation wages in the country. Higher education achievement sizably increases future wage expectations, while age and longer spells of unemployment reduce them. Demand factors are found to be insignificant for reservation wage formation. Observed by skill level, the results suggest that low-skilled individuals consistently value their skills higher than what the market offers and who set too high expectations. These circumstances are aggravated in cases where the household is well-off and/or receives remittances. By contrast, highly skilled individuals, despite maintaining a positive reservation wage gap, have a propensity to accept market wages even when they fall below their reservation wage, likely because these workers fear rapid depreciation of their skills.

Keywords: reservation wage, market wage, determinants, North Macedonia.
JEL classification: *J31; E24*

INTRODUCTION

High and potentially downward rigid reservation wages – below which unemployed persons would not accept a job – may be a key reason for high and persistent unemployment rates. North Macedonia's unemployment rate currently stands at 20.8%, though it has continued to decline since its peak of 36% in 2006. The decline – especially during the Global Financial Crisis - has been mainly driven by the government-supported expansion of foreign production capacities in the country and frequently generous programs for subsi-

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dizing employment, though also potentially interfering with the absence of a census since 2002 and the accelerated emigration from the country since then. The level of the unemployment rate in North Macedonia also reflects structural characteristics of the labor force: a large share of low-skilled job seekers, accompanied by sizable skill mismatches, prevents fast and smooth transition to decent employment.

Still, the role of reservation wage for unemployment should be viewed in at least two important aspects. First, there is almost no evidence about the trend of reservation wages, nor about the way of their formation given personal and labor-market circumstances. The reservation wage in nationally representative surveys – like the Labor Force Survey – has been included only in 2016, making the exploration of the job-search relationship between reservation wage, personal traits and institutional aspects (e.g. the generosity of the unemployment benefits) difficult so far. Second, despite the level and structural characteristics of unemployment in the country, the decline in a decade has still been sizable.

This paper has two objectives: first, to understand the determinants of reservation wages in North Macedonia; and second, to measure the gap between reservation and market wages. Both will enable understanding of the formation of reservation wages and its importance for tailoring of policies to alleviate its potentially adverse role for unemployment. We rely on two years of the Labor Force Survey – 2016 and 2017, despite maintaining only a pooled cross-section structure due to the short period on disposal. Given the constraints, the approach is only exploratory in nature, seeking to reveal facts about reservation wages in North Macedonia which were either unknown or assorted with anecdotal evidence only.

Results suggest that it is mainly supply factors which shape reservation wages in the country. Higher education attainment sizably increases future wage expectations, especially when persons are younger and with short unemployment spells. Then, reservation wage declines with age and with longer spells of unemployment. On the other hand, the insignificance of demand factors for reservation wage formation may suggest that job seekers either lack information about local conditions, or – more importantly – they are reluctant to fast accommodate, considering them substandard. The latter is especially the case for low-skilled individuals, who consistently value their skills higher than what the market offers and who set too high expectations. On the other hand, highly-skilled individuals, despite maintaining a positive reservation wage gap, have a propensity to accept market wages even when they fall below their reservation wage.

The paper is structured as follows. The next section briefly reviews the job search theory as the analytical foundation of the study. Section 3 presents a few descriptive facts about the reservation wages in the country. Sections 4 and 5 present the underlying methodology and data used, respectively. Section 6 presents and discusses the results. Section 7 concludes.

THEORETICAL FOUNDATION AND A LITERATURE OVERVIEW

The underlying theoretical construct of the reservation wage formation is the job search theory. We assume that an unemployed person will accept a job offer under the following condition:

$$w \geq w_R \qquad (1)$$

Whereby is the offered wage while – the reservation wage.

The probability that the unemployed person receives a wage offer depends on both demand and supply factors; the former include the general labor market conditions (e.g. companies' need for workers), while the latter include personal traits like skills, age, gender, the unemployment spell etc. This probability is negatively correlated with the level of the wage offer: the higher the wage offer, the more candidates it attracts for the job, hence lowering individual chances for getting the job. The probability that the person gets the job which depends on the personal characteristics and the reservation wage, then, is:

$$p_2(Z, w_R) = \int_{w_R}^{\infty} p_1(Z, w) \cdot f(w) dw \quad (2)$$

Whereby is the distribution of wages for various job offers, while the other notations are the same as before.

The expected wage of the accepted job offer in the next searching step is:

$$E(w|w \geq w_R) = \frac{\int_{w_R}^{\infty} w \cdot p_1(Z, w) \cdot f(w) dw}{\int_{w_R}^{\infty} p_1(Z, w) \cdot f(w) dw} \quad (3)$$

For the offer to be accepted, the present values of the accepted wage and of the returns to search must be equal. The present value of the reservation wage is given by:

$$\sum_{t=0}^{\infty} \frac{w_R}{(1+r)^t} = \frac{(1+r) \cdot w_R}{r} \quad (4)$$

If the offer is accepted in period t=1 instead of in t=0, the present value of the next research step is given by:

$$\sum_{t=1}^{\infty} \frac{p(Z, w_R) \cdot E(w|w \geq w_R)}{(1+r)^t} + u - c \quad (5)$$

Whereby u is the received unemployment benefits and c is the fixed search costs born in the previous step. On (5), we add the present values of the returns to search, and obtain:

$$\frac{(u-c) \cdot (1+r)}{r + p_2(Z, w_R)} + \frac{p_2(Z, w_R) \cdot E(w|w \geq w_R) \cdot (1+r)}{r(r + p_2(Z, w_R))} \quad (6)$$

Equating (6) and (4) and solving for gives:

$$w_R = \frac{r \cdot (u-c) + p_2(Z, w_R) \cdot E(w|w \geq w_R)}{r + p_2(Z, w_R)} \quad (7)$$

Equation (7) suggests that the reservation wage increases with the unemployment benefit and decreases with the search cost. It increases with the wage offer, as well with the endowment of personal characteristics.

In the empirical literature, the corpus of research of the reservation wage has been mainly determined by data availability. Studies on the topic exist since the 1980s, but mainly on developed economies and frequently lacking an extensive temporal or even empirical dimension. For example, Bloemen and Stancanelli (2001) only identify these basic elements of the job search theory through theoretical and auxiliary restrictions. Some empirically-grounded studies for developed countries include: Kiefer and Neumann (1979); Franz (1982); Lancaster and Chesher (1983); Feldstein and Poterba (1984); Maani and Studenmund (1986); Jones (1988); Blau (1991); Hui (1991); Gorter and Gorter (1993); Hogan (1999); Christensen (2001); Bloemen and Stancanelli (2001); Prasad (2003); Addison et al. (2004; 2009); Shimer and Werning (2007); Krueger and Mueller (2016); Schmieder et al. (2016); Le Barbanchon et al. (2019). In general, the empirical literature is positioned in two strands: i) the determinants of reservation wages; and ii) the nexus between reservation wages, unemployment duration and unemployment insurance. The first strand documents the significance of a set of personal and institutional characteristics which are relevant for the reservation wages in various setups; while the second strand documents that

both unemployment duration and insurance potentially affect the reservation wage, despite the sign and the direction of the causality in case of the unemployment duration has been frequently contested.

DATA

We make use of two yearly waves of the Labor Force Survey (LFS), 2016 and 2017. We restrict the sample to the working-age population, i.e. 15-64. The reservation wage, as a survey question, has been asked for the first time in 2016. This is advantageous in the sense that this study is the first to use this quite new information, though disadvantageous in the sense that panel structure of our data cannot be imposed, despite the fact that LFS – for the rest of the variables – has been on disposal since 2006. However, each year is composed of four quarterly survey waves, providing a total of eight periods for analysis. Furthermore, however, households are interviewed four times at most, every second quarter, and then they drop out. This is also a constraint for a panel analysis with longer temporal structure. The key question pertinent to this analysis is: "What is the monthly wage or salary which you would accept to work for?" to which the respondent could provide an answer in seven intervals. For our analysis, the middle point of the interval is taken and hence the variable is treated as continuous. The answer has been provided only by unemployed persons, i.e. those who are without a job and are actively searching for one. Annex 1 provides the definitions of all variables used throughout.

The following **Table 1** provides information for our sample. We have on disposal 10,787 observations of unemployed people distributed among 5,955 unique individuals. Out of these, 4,172 observations or 1,364 unique individuals appear in at least two time periods and have both employment and unemployment experience, so that for them we observe both the reservation and the market wage over a fairly short period of time.

STYLIZED FACTS

Reservation wages in North Macedonia follow a fairly typical normal-like distribution (**Figure 1**). However, compared to market wages, the reservation wage distribution is considerably narrower and bulged. Still, when both are compared in average and median terms, then no significant differences are evident (**Table 2**). This initial observation is against the widespread perception that reservation wages in North Macedonia are frequently set high so that they are an obstacle to accepting a job.
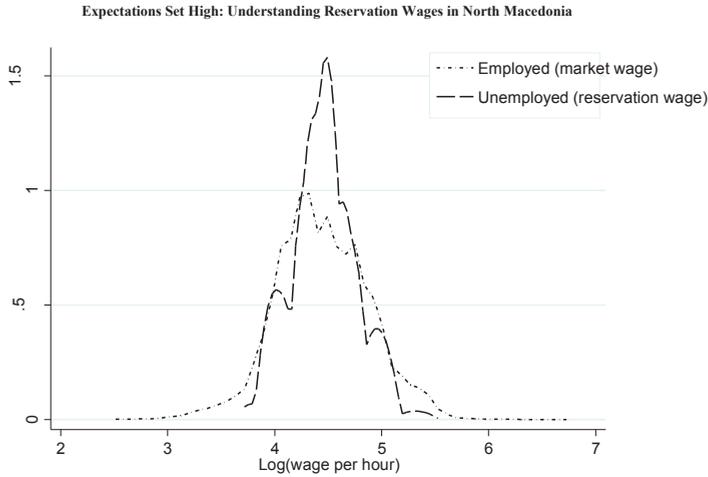
The same conclusion could be reached if reservation wages are contrasted with market wages at the skill level. **Figure 2** reveals that reservation wages grow with education, similarly as market wages do. In addition, tertiary-educated job seekers may be even more rigid in setting their expectations higher than what the market rewards them. What the figures do not reveal, though, is the potential differences – in observables and/or unobservables – of the employed and unemployed, which is frequently documented in various studies.

Table 1
Samples size

	Total sample	Individuals appearing at least two periods	Unemployed for at least one quarter over the observed period	Unemployed with employment experience over the observed period
Observations	69,712	61,112	10,787	4,172
Individuals	31,588	22,988	5,955	1,364

Source: Authors' calculations based on LFS.

Figure 1
Reservation and market wage distribution

Source: Authors' calculations based on LFS. Population weights used accordingly.

Table 2
Basic statistics of wages

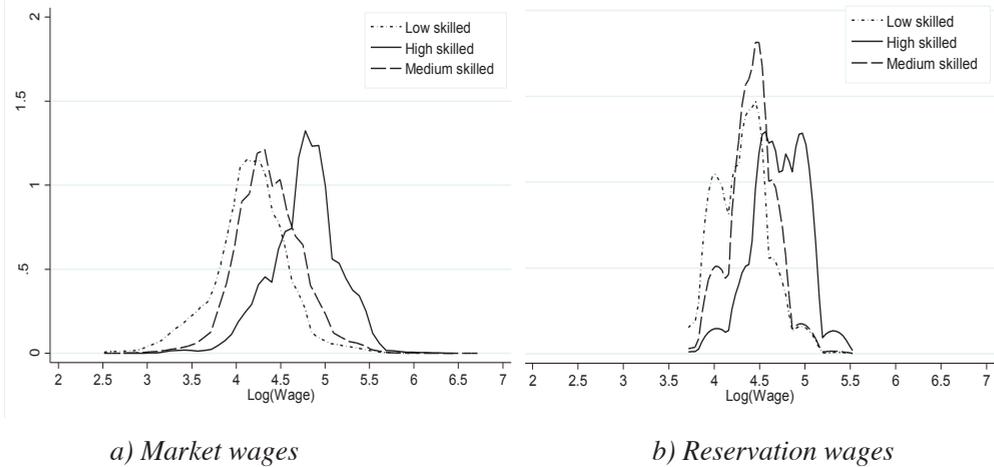|	Average	Lower bound	Upper bound	Median	Observations
		Confidence interval			
Market wage per hour	93.30	92.74	93.87	79.55	28,995
Reservation wage per hour	90.54	89.90	91.18	79.55	10,195
Ratio of reservation wages to market wages	0.97	0.97	0.97	1.00	

Source: Authors' calculations based on LFS. Population weights accordingly used.

Despite the general observation that reservation and market wages in North Macedonia do not significantly differ, still the process of reservation wage formation may be affected by individual characteristics whose role for already employed individuals is either attenuated or does not exist. **Figure 3** presents simple correlations of the reservation wages with the duration of the unemployment spell, the household income and the number of children living in the household. All three could capture, or be related with, the job searching costs. Apparently, the longer spells are related with declining reservation wages, while household income is related with rising reservation wage. The relation with the number of children is not clear-cut.

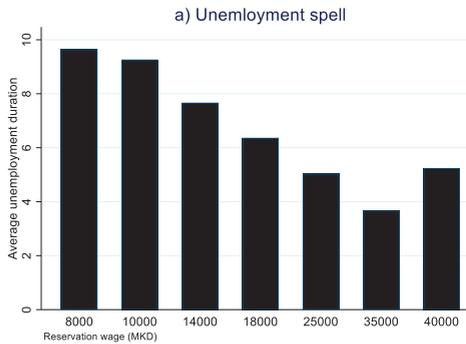Similarly, reservation wage formation could be affected by demand-side characteristics, prevalently the labor-market conditions. **Figure 4** presents correlations of the reservation wages with the average skill- and field-specific unemployment rates, per period. Higher reservation wages exist in areas where these rates are lower, potentially suggesting that the overall pressure existent on the labor market has a role

Figure 2
Reservation and market wage distribution, by skill level

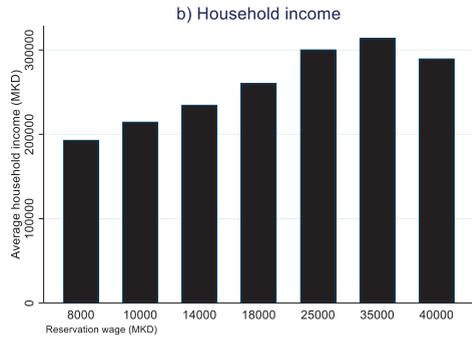*a) Market wages*   *b) Reservation wages*

Source: Authors' calculations based on LFS. Population weights used accordingly.

Figure 3
Reservation wage and some personal characteristics of the unemployed

Source: Authors' calculations based on LFS. Population weights used accordingly.

Figure 4
Reservation wage and some labor-market characteristics

Source: Authors' calculations based on LFS. Population weights used accordingly.

to play for the reservation wage formation in North Macedonia. Despite that, this finding may highly interfere with the personal skill level and field of education.

In conclusion, reservation wages in North Macedonia follow similar, though more compressed distribution as market wages. However, their formation may be interfering with factors which are potentially more relevant for unemployed persons, like the searching costs and local employment conditions.

METHODOLOGY

This paper has dual objectives: i) to analyze reservation wage determinants; and ii) to calculate the reservation wage premium or discount. The economic model to analyze reservation wage determinants is based on the job search theory exposed in Section 2. In particular, we convert equation (7) into the following estimable form:

$$w_{i,R} = \beta_0 + \beta_1 u_i + \beta_2 c_i + \sum_{j=3}^n \beta_j X'_{ij} + \varepsilon_i \quad (8)$$

Whereby is the reservation wage of person i, is the unemployment benefit, which given data constraints are explained below and which takes the form of a dummy variable of value 1 if the person is a recipient of unemployment benefit and 0 otherwise; is the search cost, which is approximated by the duration of the unemployment condition; and is a vector of observable characteristics. Using the unemployment benefit as a dummy may be a constraint and attenuate significant variability, but the LFS does not provide the actual absolute number. We divide the observable characteristics on supply and demand factors. The supply factors are divided in two groups: personal (gender, age, level of education, marital status, field of education and sources of living income: wages and pension of other household members, remittance receipt, social assistance receipt, income from capital) and household (the number of children in the household, the total income in the household). Marriage and the number of children in the household are also used as proxies to the search costs. The use of the supply-side factors is widespread in the literature; see e.g. Hogan (1999). The demand factors are captured by defining the skill- and field-related unemployment rate. Namely, as we observe skills (approximated by 11-level scale of education) and field of education (approximated by 11-type scale of fields) for both employed and un-

employed persons in our sample, we could calculate the skill- and field-specific unemployment rate (per period, where applicable). Both will measure the labor-market conditions for the skill- and/or field-niche of person i, hence enabling understanding of how demand may have shaped the reservation wage. Note that, in order to avoid collinearity of the skill- and field-specific unemployment rates with the personal level and field of education, we define them through the most disaggregated scale, while the personal variables are represented with some reasonable aggregation. Moreover, at the personal level, both level and field of skills are more time invariant (as the majority of people in the sample would have the schooling already finished at the time of interview). Franz (1980) discusses the dichotomy between supply- and demand-side factors. is the idiosyncratic error which is assumed to be well-behaved.

The inclusion of the unemployment spell as approximation of the search costs may be imprecise for various reasons. For instance, search costs may increase as the time goes by if the person is pressed by a shortage of income for livelihood; however, they may also be unrelated to the unemployment duration in case the person lives in a household well-endowed with a source of income or factors of production. The inclusion of the variables on the sources of livelihood and/or number of children should capture this variation. However, still the unemployment spell may well capture variations other than the search costs, like the depletion of human capital, or the learning of the labor market conditions which may lead to changing of the initially set reservation wage.

To estimate equation (8), we rely on a simple OLS estimation. We pool all unemployed persons over the eight quarters we have on disposal, rather than setting a panel. We do this because 45% of the unemployed

persons appear in our pooled sample only once, so that imposing a panel structure would not make much sense (see also the discussion in Section 3). Therefore, any unobserved factor relevant for the reservation wage (like ability) would remain in the error term only. Such factors may interfere with the observed factors and caution in the interpretation, and from this point of view, may be beneficial. On the other hand, however, having a panel structure would wipe out time-invariant indicators; a major part of our skill- and field-related education variables, are time invariant, especially given we have a span of only two years. We do include period-specific dummies, to capture general demand trends. The second drawback is that through this simple approach we may only understand correlations rather than causations. Some variables undoubtedly may suffer endogeneity bias. Take the unemployment spell: not only may longer spell press the reservation wage downward, but also high reservation wage may keep the unemployed persons out of a job longer. Hence, our estimates will be interpreted only in terms of relationships, rather than effects, though still concomitant with the objectives of the study.

In the second part of the analysis, we would like to provide estimates of the reservation wage gaps (premiums or discounts) existing in the Macedonian labor market. Namely, reservation wage may be indeed a stumbling block to (first) employment, if set very high, especially because the person does not have a full grasp of the potential of the local labor market. Or, contrary to that, people may be guided by the market wages of people in their surroundings, discounting the importance of their specific circumstances determined by their observed and unobserved traits. There is a third case in North Macedonia, whereby public service jobs have a wage premium of at least 10%, which together with the perception

that such a job is easier to perform, created a widespread wish for employment in the public administration. Hence, the reservation wage is being formed also taking this into account.

To estimate the reservation wage premium, we apply three procedures. In the first one, we compare unemployed individuals with their employed peers. We do this by applying propensity score matching, i.e. by comparing the average reservation wage of unemployed persons with the average market wage of employed persons similar in a few observable characteristics: gender, age, education and field of the studies. The predictions obtained in a probit model are used as scores to find as close as possible peers and then to compare them. In a similar fashion, in the second procedure, we predict the possible market wages of the unemployed, based on their observable characteristics and using information from Heckman-style coefficients obtained on employed individuals. The predicted market wage is compared with the observed reservation wage and the gap is calculated. In the third procedure, we compare unemployed individuals with themselves had they been employed in the past or in the future compared to the date when they reported a reservation wage. The disadvantage of doing this is that we drop from the analysis all unemployed persons who did not have any market wage during the time horizon of our analysis (which is anyway short). If those dropped are systematically different from those who stayed in the sample, then the obtained results would be biased. The advantage, however, is that the 'matching' is perfect, i.e. we compare each person with themselves, which would imply matching on both observables and unobservables; in contrast, the propensity score matching does it on observables only. In the third procedure, the reservation wage gap is calculated both backward (i.e. when the person was unemployed and

then got employed) and forward (i.e. when the person was employed and then became jobless). By so doing, we would be able to qualitatively judge if having employment acted as a learning mechanism of the market conditions.

RESULTS AND DISCUSSION

What determines reservation wages in North Macedonia?

The first contingent of results we analyze is the determinants of reservation wages in North Macedonia. They are presented in **Table 3**. The table is organized so that it adds the independent variables group by group. The complete economic model is estimated in column (5). Then, columns (6)-(8) divide by education level. The adding of independent factors group by group is important because some of them may refer to similar personal or household facets, as well because of measuring the same characteristic from the supply and demand side.

Females have lower reservation wages than men, by 7-8%, on average. The gender reservation wage gap is most pronounced among the low-skilled and then declines with education. Reservation wage reduces with age, by 0.2% per annum, reflecting a combination of depreciated human capital, lost motivation and hopes, learning about market conditions and so on. Most notably, hope and self-appreciation is most rapidly lost among tertiary educated. Marriage implies higher reservation wage by about 2.5%, though by more and only among low-skilled. The number of children matters as well: additional children in the household increase reservation wage by about 1.2%. As both marriage and the number of children may be used as a proxy for the searching costs, they imply that the increase of search cost works positively on the reservation wage.

The return to education is found significant, both statistically and economically, for the reservation wage. The completion of secondary education is related to about 7% higher reservation wage, compared to complete or incomplete primary education. On the other hand, the role of tertiary education is overwhelming and persistent: individuals with completed tertiary education have 32% higher expected wage compared to primary-educated ones, being a 25% premium over those with secondary education. The inclusion of other explanatory variables apparently attenuates the role of education. The result may be driven by the more favorable employment opportunities for tertiary educated, but also due to the long-lasting policies of the 2006-2017 government based on proliferation of the access to (not necessarily the quality of) higher education and the awareness-raising campaigns "Knowledge is power" which resulted in massive enrollment at universities.

The unemployment benefits work disparagingly for reservation wage: persons who receive them have a higher reservation wage, on average, than people who do not receive it, by about 2%. This is most prevalent among low-skilled workers, while it does not exist for the high-skilled ones. The longer a person is without a job, the lower the reservation wage, again concomitant to the searching costs: a year longer in unemployment reduces the reservation wage by 0.2%. The effect vanishes for the highly-skilled. However, one should note that due to potential reverse causality, this coefficient may be attenuated. As searching costs are captured in the model imprecisely, through both marriage/children variables and the unemployment spell variable, it is important to note that the inclusion of the latter in the model does not change previous conclusions, pointing to the model's robustness. Finally, households' welfare works positively for the reservation wage forma-

Table 3

Table 3

Determinants of reservation wages in North Macedonia

	Dependent variable: Log of the reservation wage					By education		
						Primary	Secondary	Tertiary
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Female	-0.071***	-0.074***	-0.074***	-0.082***	-0.080***	-0.106***	-0.082***	-0.048***
	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.013)	(0.008)	(0.015)
Age	-0.002***	-0.002***	-0.002***	-0.002***	-0.001***	-0.001*	-0.001***	-0.005***
	0.000	0.000	0.000	0.000	0.000	(0.001)	0.000	(0.001)
Married	0.024***	0.027***	0.025***	0.024***	0.022***	0.036**	0.015	0.031
	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.017)	(0.011)	(0.020)
Number of children	0.001	0.011***	0.012***	0.013***	0.013***	0.007	0.016***	0.011
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.007)	(0.004)	(0.013)
Secondary education	0.116***	0.100***	0.097***	0.086***	0.069**			
	(0.007)	(0.008)	(0.008)	(0.009)	(0.033)			
Tertiary education	0.414***	0.384***	0.380***	0.352***	0.327***			
	(0.010)	(0.011)	(0.011)	(0.013)	(0.052)			
Recipient of unemployment benefits		0.022**	0.023***	0.022**	0.021**	0.034**	0.026**	0.024
		(0.009)	(0.009)	(0.009)	(0.009)	(0.016)	(0.012)	(0.022)
Unemployment spell duration		-0.002***	-0.002***	-0.002***	-0.002***	-0.002***	-0.002***	0.000
		0.000	0.000	0.000	0.000	(0.001)	(0.001)	(0.002)
Log of household's welfare		0.048***	0.047***	0.045***	0.046***	0.005	0.054***	0.068***
		(0.008)	(0.009)	(0.009)	(0.009)	(0.020)	(0.011)	(0.021)
Sources of livelihood (Ref: Wages/Pensions of others) Social assistance — Remittances			0.047***	0.046***	0.044***	0.022	0.056***	0.021
			(0.015)	(0.015)	(0.014)	(0.028)	(0.018)	(0.032)
Social assistance			-0.034***	-0.034***	-0.033***	-0.060***	-0.021	0.032
			(0.011)	(0.011)	(0.011)	(0.016)	(0.015)	(0.048)
Capital income			0.075***	0.068***	0.067***	0.143***	0.014	-0.013
			(0.020)	(0.020)	(0.020)	(0.031)	(0.022)	(0.051)
Other income			-0.035*	-0.035*	-0.032	-0.123***	0.031	0.005
			(0.020)	(0.020)	(0.020)	(0.030)	(0.022)	(0.076)

Field of studies completed (Ref: General programs)								
Humanities and arts				0.008	-0.011		-0.014	0.018
				(0.017)	(0.068)		(0.088)	(0.126)
Social sciences				0.042***	0.027		0.016	0.061
				(0.010)	(0.052)		(0.063)	(0.099)
STEM				-0.01	-0.03		-0.075	0.075
				(0.008)	(0.068)		(0.084)	(0.130)
Agriculture				-0.008	-0.028		-0.06	-0.001
				(0.013)	(0.073)		(0.090)	(0.143)
Health care				0.125***	0.111**		0.061	0.187**
				(0.014)	(0.047)		(0.057)	(0.089)
Skill-specific employment rate					0.001			
					(0.001)			
Field-specific employment rate					0.001			0.002
					(0.002)			(0.003)
Urban					-0.022***	-0.092***	-0.004	0.016
					(0.006)	(0.012)	(0.007)	(0.016)
Observations	10,195	10,194	10,194	10,114	10,114	2,447	5,755	1,912
R-square	23.7%	24.5%	24.9%	25.5%	25.6%	13.1%	5.9%	7.1%

Source: Authors' calculations.

Note: *, ** and *** denote statistical significance at the 10%, 5% and 1% level, respectively. Standard errors provided in parentheses. Standard errors robust to heteroscedasticity. Period fixed effects included, but not shown due to space. Population weights accordingly used.

tion: when household income increases by 10%, the reservation wage increases by 0.4-0.5%, on average. The result vanishes for low-skilled individuals, likely reflecting the correlation between the level of education and the household income.

The sources of livelihood generally matter for the reservation wage creation. Particularly, persons living in a household who are recipients of remittances from a relative who is not a member of the household, have higher reservation wage by 4-5% compared to a person relying on the wages and pensions of other household member. Apparently, remittances expand the comfort zones for recipients, as has been also found in a recent study of Petreski (2019). However, remittances' role for the reservation wage is important only for the mid-skilled individuals. Interestingly, social assistance is negatively related to reservation wage. It could be that social-assistance recipients, who are already on the lowest part of the income spectrum have low expectation about wages, which may also be a reflection of their specific circumstances and endowment with some characteristics which have not been already captured by the other variables. The result appears for low-skilled individuals only, reflecting their higher probability to be low-educated. Yet, we should note that the negative coefficient on social assistance recipients may well be reflecting the insufficiently-proper targeting of the benefits, as discussed in Petreski and Mojsoska-Blazevski (2017). Likewise, with the opposite sign, capital income works positively: these are usually households well-endowed with various assets, positioning them on the high part of the income spectrum. The addition of the sources of livelihood for the unemployed persons does not alter any previous result, especially given that sources may capture related variation with household welfare.

Education fields are generally insignificant for the reference-wage differentiation, though with some exceptions. The reference category is 'general education and services'. Social sciences impose a reservation wage premium by 4.2%, yet the result vanishes when demand factors enter the regression. On the other hand, health care professionals expect a wage that is 11.1% higher than the reference category. The other profiles do not have a distinct wage expectation. However, a more robust picture is obtained when looking by the level of education, especially given the fact that primary school completion is not associated with different fields (i.e. all persons with at most primary education are classified under 'general education'). A degree in health inflates the reservation wage at the tertiary level. However, the latter should be observed against the international competitiveness of such profiles and their propensity to emigrate to Western Europe.

Finally, the two variables capturing demand – the skill- and field-specific employment rate – suggest that the role of demand is subdued, if at all present.

In conclusion, there are few factors which potentially work for inflating reservation wages in North Macedonia. Most notably, higher education attainment sizably increases future wage expectations, especially when persons are younger and with short unemployment spells, hence with lower probability of having past work experience. While demand is found not to matter for reservation wage formation, it could only mean that demand conditions are not taken into account in the process, leading to a dangerous gap between expectations and what the market could really offer. The condition is aggravated in cases where the household is well-off and/or receives remittances. On the other hand, however, longer spells and low household welfare – including the cases of social as-

sistance receipt – depress the reservation wage, suggesting a potentially precarious vicious cycle of skills – household welfare – reservation wage.

Reservation wage gap

The previous section provided the grounds for understanding what shapes reservation wages in North Macedonia. It still does not provide a meaningful guidance on how large the problem is, i.e. how distant expectations from reality are. To pursue the second objective of this paper, we compare reservation wages with market ones. To do this in a methodologically-grounded manner, we conduct three types of comparisons.

In the first comparison, we match unemployed individuals with likewise employed ones, based on a score similarity.[1] The score

is obtained from a probit function whereby age, gender, education and field of the educational profile are used. The probit results are presented in Annex 2. The reservation wage gap, after matching between individuals, is presented in **Table 4** for a few matching alternatives. Results robustly suggest that the reservation wage gap in North Macedonia is positive and hovers around 13-15% of the market wage. This finding is in stark contrast with our raw observations, however it suggests that consideration of personal characteristics – which lead to estimating an 'adjusted' reservation wage gap – plays an important role for reservation wage creation and is potentially more than or exclusively important compared to labor-market conditions (as found in **Table 3** also).

Table 4

Cross-section (between-person) reservation wage gap (%)

	Matching options				
	Default	Caliper (0.0001)	Nearest neighbor (10)	Nearest neighbor (50)	Caliper (0.0001), Neighbor (10)
Entire sample	15.66***	15.64***	13.58***	12.76***	13.41***
By education					
Primary	22.52***	22.53***	20.61***	18.51***	20.95***
Secondary	14.74***	14.84***	11.70***	9.60***	11.87***
Tertiary	9.00***	9.09***	7.73***	6.15***	7.83***
By field					
General programs	20.48***	20.38***	17.18***	14.75***	17.17***
Humanities and arts	9.19*	9.27*	7.81***	5.45***	11.80***
Social sciences	14.10***	13.93***	10.68***	8.56***	9.00***
STEM	8.35*	8.25*	9.34***	8.21***	8.65***
Agriculture	21.81***	22.34***	17.10***	12.50***	17.57***
Health care	11.46*	10.52*	12.20***	11.37***	10.94***

Source: Authors' calculations.

Note: *, ** and *** denote statistical significance at the 10%, 5% and 1% level, respectively. Population weights accordingly used.

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[1]   The comparison of unemployed individuals for whom the market wage is unobserved and employed individuals whose market wage is known, on observable characteristics, suggests that both groups are different in terms of the latter. The Hotelling test that the vectors of means are equal for the two groups results in an F-value of 260 and p-value of 0.000, providing evidence to reject the null hypothesis.

The reservation wage gap declines with education, though persisting at 7-9% at the tertiary-education level and being as high as 22% at the primary-education level. The declining reservation wage gap with education may be also related to the increased capacity for learning and access to market information with education. Hence, although we concluded that the reservation wage increases with education, the declining gap suggests that wage expectations rise with education in a similar manner as market wage. However, such increase is faster for expectations than for actual market wages, resulting in a persistent reservation wage gap even at the tertiary level.

The analysis by field of education suggests persistent reservation wage gaps across all fields. In particular, the reservation wage gap is high for general programs and agriculture, as a major part of primary-educated individuals belong to these fields. The rest of the fields face an 8-10% gap, without any statistically significant difference among them.

In the second comparison, we compare the reported reservation wage of unemployed individuals with their potential market wage. The latter is not observed, as they are unemployed. We rely on the approach of Prasad (2003) and use predictions for the market wages, based on the observed ones of employed individuals. We first run a Heckman-type (1976; 1979) two-stage Mincerian function to be able to predict market wages based on observable human-capital characteristics, accounting for the selectivity bias. The Mincer-equation results, corrected for selectivity, are provided in Annex 3.
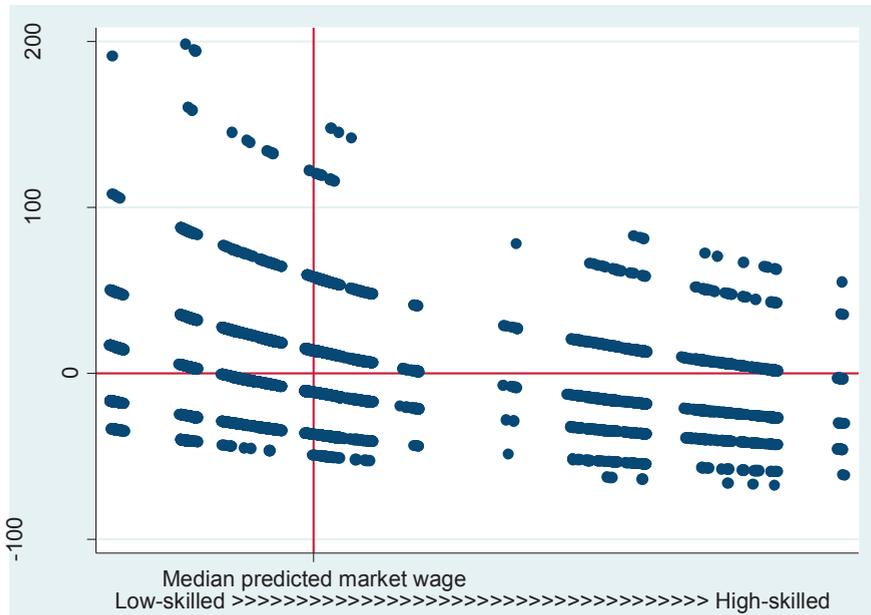
The findings about the declining reservation wage gap are largely corroborated. **Figure 5** plots the reservation wage gap against the potential market wage, which could be considered a conceptual measure

of skills endowment. There is a clear negative relationship between the gap and the skill level. For the highly-skilled individuals, the reservation wage gap is prevalently negative. For these individuals, the value of employment may be high enough so that their propensity to accept jobs even below their reservation wage is high. This could be related to the value they assign to their investment in higher education and the (fear of) accelerated depreciation of their human capital, but also to the greater understanding of market potential. By contrast, for a large fraction of low-skilled individuals, reservation wages are significantly over the potential market wage, presenting an obstacle for low-skilled individuals into finding and accepting a job.

In the third comparison, we compare individuals who, over the observed period, have had both employment and unemployment experiences, so that for them both market and reservation wage are available over a fairly short period of time. In such case, panel structure could be imposed; the utilization of fixed effects wipes out all unobservable factors which are potentially correlated with the reservation wage. The disadvantage is that we drop all unemployed individuals without employment experience over the observed period and those who appear only once in our sample, which reduces our sample to a quarter (see **Table 1**), which may unquestionably inflict selection bias. From this viewpoint, results should be approached with caution. However, this is the only point where we could make use of the anyway scant temporal information. We assume asymmetry in the reservation wage gap, i.e. in the reservation wage formation depending on whether it follows or precedes the earning of the market wage.

Results are provided in **Table 5**. The first thing to note is that we obtain higher reservation wage gap compared to the be-

Figure 5
Reservation wage and predicted market wage

Source: Authors' calculations.

tween-case in **Table 4**. This may actually suggest that i) persons who have had any work experience may be systematically different than the entire cohort of unemployed (e.g. live in considerable shortage of living funds); and/or ii) unobservable factors (e.g. higher motivation to search intensively) – which are not accounted for in the between-variation calculation – may have played an important role. This point remains a challenge for future work. Our focus, however, in **Table 5** is on another important aspect: individuals generally reduce their wage expectations only by about 2 percentage points, after an experience of employment. Nevertheless, the reservation wage gap remains high and persistent even after the person learned about market conditions through their own experience. It may suggest that many job seekers per-

sistently misjudge their prospects or anchor their reservation wage on their beliefs rather than on the previous wage. The finding may not be surprising for North Macedonia, given the prevalence of underemployment: for instance, Petreski and Davalos (2019) find that 57.1% of youth (15-29) in North Macedonia reported that at least two of the following underemployment conditions on the workplace prevailed: the person worked less than 35 hours per week though wanted to work more, the person had been over-qualified, the person expressed insecurity on the job; persons' salary had been below the reservation wage; and the person had temporary or no written contract. Hence, persons who faced such conditions of employment in the past, likely retain their high reservation wage, despite the sluggish downward adjustment.

Table 5

Panel (within-person) reservation wage gap

	Reservation wage gap before employment	Reservation wage gap after employment
Entire sample	24.9***	22.6***
By education		
Primary	33.1***	21.0***
Secondary	19.9***	21.1***
Tertiary	27.3***	27.2***
By field		
General education	29.1***	23.8***
Humanities and arts	17.2**	55.0***
Social sciences	26.4***	25.5***
STEM	19.4***	15.8***
Agriculture	30.5**	9.95
Health care	37.0***	10.2

Source: Authors' calculations.

Note: *, ** and *** denote statistical significance at the 10%, 5% and 1% level, respectively. Fixed effects accordingly used. Population weights accordingly used.

Observed by education, the high reservation wage is persisting at all levels, though the downward adjustment is faster at lower levels of education. This likely reflects the learning benefit for this group, corroborating the notions of Burdett and Vishwanath (1988) who argue that the selection process informs job seekers about market conditions over time. While there is no adjustment at the other two levels, corroborating our previous discussion on underemployment, which is more important at a higher level of skills. This is further confirmed when results are observed by field: large downward adjustment is observed in general programs and agriculture, as they largely correlate with low skills. Interestingly, downward adjustment is present in science, technology and engineering, while there is an upward adjustment in humanities.

In conclusion, the reservation wage gap in North Macedonia is persistent and statistically significant. In cross-individual context, it is about 13% of the market wage, corroborating the notion that it represents a binding constraint for people to search for and accept a job. However, the gap – as opposed to the level – of the reservation wage declines with education, suggesting that reservation wage rises with education, but learning and information-spreading mechanisms are more effective for low-skilled individuals to better align their expectations with reality. Still, persons who experienced periods of both unemployment and employment generally maintain a high reservation wage, with a somewhat downward adjustment reflecting the learning experience. This is especially true for lower-skilled individuals.

CONCLUSION

This study explores, for the first time, the nature of reservation wages in North Macedonia, by taking advantage of newly collected information from the Labor Force Survey 2016 and 2017. Given the fairly scant information on reservation wages, we mainly use it in a pooled cross-section context, while being aware of the limitations it imposes onto our conclusions. However, a number of interesting observations emerge, that suggest avenues for future research.

Results suggest that it is mainly supply factors that shape reservation wages in the country. That is, higher education sizably increases future wage expectations, especially when persons are younger and with short unemployment spells, hence with lower probability of having past work experience. Furthermore, the reservation wage declines with age and with longer spells of unemployment. On the other hand, the insignificance of demand factors for reservation wage formation may suggest that job

seekers either lack information about local conditions, or – more importantly – they are reluctant to fast accommodate, considering them substandard. The latter especially applies to low-skilled individuals, who consistently value their skills higher than what the market offers and who set too high expectations. These circumstances are aggravated in cases where the household is well-off and/or receives remittances. On the other hand, highly skilled individuals, despite maintaining a positive reservation wage gap, have a propensity to accept market wages even when they fall below their reservation wage. It is likely that hope and self-appreciation are most rapidly lost among the tertiary educated.

The findings of this study, combined with expanded future research, may be useful for policy makers in several ways. For example, the study disputes the widespread perception that reservation wages are only binding for high-skilled individuals and confirms this is also true for low-skilled individuals. The former are more likely to fear the accelerated depletion of their human capital and agree to work for a lower wage than their reservation wage. The latter are likely to persistently misjudge their prospects or anchor their reservation wage on their beliefs rather than on the observed wage. Therefore, increasing labor market information is more relevant for lower-skilled individuals. Still, the mechanism for the highly-skilled should be further explored, especially in the context of the skill mismatches, accelerated emigration and the constant complaint – made by employers – that it is hard to find workers in the country.

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Annex 1
Variables' definitions

Variable	Description
Log reservation wage	The logarithm of the wage self-reported as the level below which the respondent would not accept a job offer, per assumed work hour of a standard working week. The variable is observed only for unemployed persons.
Log market wage	The logarithm of the wage the respondent received at the time of the interview, per actual work hour. The variable is observed only for unemployed persons.
Female	1 if persons is women, 0 otherwise
Age	Age expressed in years
Married	1 if persons is married, 0 otherwise
Number of children	Number of children living in the household
Education	Three dummy variables for primary, secondary and tertiary education. Primary is the reference category.
Recipient of unemployment benefits	1 if the person received state unemployment compensation in the 4 weeks preceding the interview, 0 otherwise
Unemployment spell duration	The period, expressed in years, that elapsed since the last time the person was employed.
Log of household's welfare	Calculated variable, based on coefficients obtained from SILC. Note that LFS does not contain data on income except for wages. The following equation was used: Log of household's welfare = 0.151*Log of the wage per hour + 0.237*Average education level in the household + 0.022*Average age in the household -0.057*Number of children in the household + 6.81
Sources of livelihood	Five dummy variables created for the following sources: wages/pensions of others, remittances, social assistance, capital income and other income. Wages/pensions of others are the reference category.
Field of studies completed	Six dummy variables created for the following fields: general programs, humanities and arts, social sciences, STEM, agriculture and health care. General programs used as the reference category.
Skill-specific employment rate	The employment rate by skill by period.
Field-specific employment rate	The employment rate by field by period.
Urban	1 if the person is residing in urban area, 0 otherwise.

Source: Labor Force Survey.

Annex 2
Propensity Score Matching

Dependent variable: Probability of being unemployed	
Female	0.002
	(0.005)
Age	-0.009***
	0.000
Secondary education	-0.109***
	(0.007)
Tertiary education	-0.175***
	(0.008)
Humanities and arts	-0.013
	(0.012)
Social sciences	0.004
	(0.008)
STEM	-0.037***
	(0.007)
Agriculture	-0.009
(0.011)	
Health care	-0.079***
	(0.010)
Observations	40,095

Source: Authors' calculations.

Note: *, ** and *** denote statistical significance at the 10%, 5% and 1% level, respectively. Marginal effects reported. Standard errors provided in parentheses. Standard errors robust to heteroscedasticity. Population weights accordingly used.

Annex 3

Mincerian earnings function estimated with the Heckman method

	Outcome equation	Selection equation
	Dependent: Log observed market wage	Dependent: probability of employment
Female	-0.106***	-0.114***
	(0.006)	(0.017)
Age	-0.000*	0.019***
	0.000	(0.001)
Secondary education	0.162***	0.327***
	(0.009)	(0.025)
Tertiary education	0.537***	0.550***
	(0.012)	(0.033)
Humanities and arts	0.032**	-0.057
	(0.013)	(0.041)
Social sciences	0.057***	-0.006
	(0.009)	(0.028)
STEM	0.021***	0.123***
	(0.008)	(0.023)
Agriculture	-0.060***	0.102***
	(0.012)	(0.039)
Health care	0.107***	0.180***
	(0.012)	(0.039)
Married		0.355***
		(0.021)
Number of children		0.016*
		(0.009)
Constant	4.356***	-0.733***
	(0.018)	(0.038)
Observations	40,095	40,095

Source: Authors' calculations.

Note: *, ** and *** denote statistical significance at the 10%, 5% and 1% level, respectively. Standard errors robust to heteroscedasticity. Population weights accordingly used.

Sažetak

VISOKO POSTAVLJENJA OČEKIVANJA: RAZUMIJEVANJE UVJETNIH NADNICA U SJEVERNOJ MAKEDONIJI

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Ciljevi ovoga rada su analizirati odrednice visina uvjetnih nadnica nezaposlenih i izmjeriti jaz između uvjetnih nadnica nezaposlenih i plaća na tržištu rada u Sjevernoj Makedoniji. U radu se koriste nedavno prikupljeni podatci o uvjetnim nadnicama iz Ankete o radnoj snazi iz 2016. i 2017. godine. Analiza se oslanja na metodu običnih najmanjih kvadrata, tehniku uparivanja prema sklonosti, Heckmanovu korekciju i model fiksnih efekata na panel podatcima. Rezultati sugeriraju da čimbenici ponude uglavnom oblikuju uvjetne nadnice u zemlji. Viša razina obrazovanja znatno povećava očekivanja vezana uz buduće plaće, dok ih dob i duže razdoblje nezaposlenosti umanjuju. Čimbenici potražnjenisu značajni za formiranje uvjetne nadnice. Prema razini kvalifikacija, rezultati pokazuju da pojedinci s nižim kvalifikacijama dosljedno precjenjuju svoje kvalifikacije u odnosu na ono što se nudi na tržištu i imaju previsoka očekivanja. Te okolnosti povećavaju se u slučajevima u kojima je kućanstvo dobrostojeće i/ili prima uplate. S druge strane, usprkos tome što održavaju pozitivnu uvjetnu nadnicu, osobe s visokim kvalifikacijama sklone su prihvatiti plaće na tržištu rada čak i onda kada su te plaće niže od njihove uvjetne nadnice, vjerojatno zato što se takvi radnici boje brze deprecijacije svojih kvalifikacija.

Ključne riječi: uvjetna plaća, tržišna plaća, odrednice, Sjeverna Makedonija.