Assessing real wage flexibility in Albania

Papavangjeli, Meri

Bank of Albania

30 June 2018

ASSESSING REAL WAGE FLEXIBILITY IN ALBANIA

Meri Papavangjeli[1], Research Department, Bank of Albania

1. INTRODUCTION

Wage dynamics play an important role for macroeconomic analyses, and their appropriate measurement is essential in the policy-making process. In the real world, the existence of wage rigidities is expected to translate into persistent responses of wages to disturbances occurring in the economy. The literature has shown that the real wage flexibility may act as a crucial adjustment channel to asymmetric shocks, especially if cross-border labour mobility and fiscal flexibility is limited. Through determining the response of the economy to shocks, the nature of real rigidities has several implications for the conduct of monetary policy. In this context, a deeper knowledge of the extent of rigidity is uncommonly useful for evaluating the performance of monetary policy and building and calibrating more effectively macroeconomic models that are used for policy analysis and forecast.

This study aims at assessing the degree of real wage flexibility in Albania within a vector error-correction model, based on aggregate level data for real wages, where the real wage flexibility is defined through the responsiveness of real wages to shocks in unemployment and productivity. To the best of our knowledge, empirical evidence on wage flexibility in Albania for the whole economy is scarce. The published studies on this topic use a descriptive and graphical analysis of the development of wages over time, but do not use any econometric model to make a more rigorous analysis. In this context, this article contributes to the literature by offering empirical evidence on real wage flexibility in Albania using the latest available data.

2. LITERATURE REVIEW

2.1 THE CONCEPT OF REAL WAGE FLEXIBILITY

The labour market flexibility is a very broad notion. In principle, the disturbances in the labour market can be accommodated via two main channels: quantities (adjustment in number of workers and in working time), or prices (wages), or a combination of both. Due to limited mobility of workers within the labour markets, it is more likely to consider wage flexibility rather than migration as an efficient tool for coping with adverse shocks (Babetskii, 2006).

[1] *e-mail: mpapavangjeli@bankofalbania.org.* *The views expressed herein are of the author and do not necessarily represent those of the Bank of Albania. The author would like to thank Mr Altin Tanku, Head of Research Department and Mr Ilir Vika, Head of Economic Modelling Division, for their valuable comments and suggestions.*

The flexibility of wages as the price of labour is a key determinant of labour market flexibility (see Hyclak and Johnes (1992), Boeri et al. (1998), and Blanchflower (2001)) as adjustment in prices towards the equilibrium on the labour market, tends to be quicker and less costly than adjustment in quantities. Wage flexibility characterizes different aspects if defined as either a micro or macroeconomic concept. In the microeconomic framework, wage flexibility is typically assessed using the distribution of wages: a lack of wage decreases, for example, is interpreted as an indication of downward rigidity. In firm-level surveys, the concept of rigidity is related to the proportion of firms which freeze wages (nominal rigidity) or automatically link wages to inflation (real rigidity).

While microeconomic and survey-based estimates of wage flexibility bring valuable evidence on the distributional properties of wages and allow controlling for industry and firm effects, there are important costs involved in data collection and processing, and micro data on the Albanian labour market over time are not accessible. Hence, this article takes a macroeconomic perspective, the objective of which is to assess the degree of real wage flexibility in Albania. The use of aggregate data allows us to infer about real wage flexibility on the economy-wide level, which is of interest for policy makers.

From the macroeconomic point of view, aggregate wage flexibility can be expressed in nominal or real terms. Nominal wage flexibility is the responsiveness of nominal wages to changes in the price level or inflation, meanwhile real wage flexibility can be defined as the responsiveness of real wages to various shocks (e.g. shocks in productivity, unemployment, past wages, etc.) (Babetskii, 2006). Since the difference between real and nominal wage growth is given by inflation, real and nominal wage adjustment approach each other in a low inflation environment.

2.2 EMPIRICAL EVIDENCES ON WAGE FLEXIBILITY

Although substantial research has been performed on wage flexibility in the recent years, there is no full consensus yet in the literature regarding how to measure it. Theoretical models provide insight into the key macroeconomic influences on wage setting, but they are not informative about the particular relationship to be estimated. Most of the literature has therefore been primarily focused on studying empirical relationships.

Babecký and Dybczak (2012) present macroeconomic evidence on the extent of real wage flexibility in 24 EU member countries using Eurostat labour cost data for the period 2000Q1–2010Q2. Following the structural VAR approach, real wage flexibility is measured as the responsiveness of real wages to various shocks (shocks to productivity, unemployment and past wages). A similar approach is also used by Czech National Bank in its yearly assessments of the degree of economic alignment of the Czech Republic with the euro area (see section 2.2.1 in CNB, 2009, 2010), where real wage flexibility at the macroeconomic level is measured with the adjustment of real

wages to the unemployment rate (the Phillips curve). The data shows that the impact of the global financial crisis on real wage adjustment has not been uniform across the sample countries, with some evidence for an increase in real wage rigidity.

Heinz and Rusinova (2011) estimate the degree of real wage flexibility in 19 EU countries in a wage Phillips curve panel framework, using a distributed lag structure model. The latest provides e long-run relationship between wages, prices and trend productivity including the error correction term that serves as the speed of adjustment to the equilibrium. The authors measure wage flexibility in a broad way, using two indicators: the response of wages to cyclical unemployment as well as to productivity growth. The degree of real wage flexibility tends to be larger in the Central and Eastern European (CEE) countries than in the euro area; weaker in downturns than during upswings. Moreover, there exists an inflation threshold, below which real wage flexibility seems to decrease. Finally, the authors find that part of the heterogeneity in real wage flexibility and unemployment might be related to differences in the wage bargaining institutions and more specifically to the extent of labour market regulation in different country groups within the EU.

Marques, Martins and Portugal (2010) use both micro and macro data to provide empirical research on price and wage dynamics for the Portuguese economy during the period 1992-2007 based on a VAR model and a shock decomposition analysis. As regards firms' pricing behaviour, the most noticeable finding is that prices in Portugal are somewhat less flexible than in the United States, but more flexible than in the Euro Area. Regarding firms' wage setting practices, the evidence favours the hypothesis of aggregate wage flexibility, but changes in wages occur with less frequency than changes in prices. Recent evidence from both aggregate and disaggregate wage data, however, suggests that the responsiveness of real wages to unemployment changes may have declined over the last years.

Focusing on a cross-country analysis of labour markets in the enlarged European Union, Babetskii (2006) tries to assess empirically the role of aggregate wages as a correction mechanism for dealing with economic disturbances. The study uses three alternative econometric techniques, among which a cointegration analysis and an error correction model. A comparable quarterly data-set is constructed covering 1995–2004 for four central European states (CE-4), four new EU members participating in the Exchange Rate Mechanism-II (ERM-II participants), and three peripheral members of the euro area (EMU3). The macroeconomic data does not seem to support the argument that real wages are flexible in the considered EU member countries. The pattern of rigidities at the micro level does not differ much from the estimated macroeconomic indicators of wage flexibility. A similar finding of no significant wage flexibility is reported in Radziwiłł and Walewski (2003). The authors analyse a broad set of indicators at the macro and micro levels and conclude that wages are not flexible in six new member states (accession countries at that time), except for some evidence of flexibility in Lithuania.

In conclusion, most theories of wage determination (see Bean 1994 for a review) and empirical research confirm that, on average at the macro level, the aggregate nominal wage should be proportional to the (expected) price level and productivity, a decreasing function of the unemployment rate (an indicator of outside opportunities), and also influenced by a set of other factors including demographics, taxation, union power, and labour market institutions and policies.

3. EMPIRICAL ANALYSIS

3.1 WAGE FLEXIBILITY MEASURES

The economic disturbances enforce a change of the wage rate and flexibility is a measure of the pace with which actual wages respond to changed market conditions. In this article, we conceptualize real wage flexibility in a broad way, using two indicators. In the first place, similarly to Babetskii (2006), wage flexibility is defined through the responsiveness of real wages to unemployment rate. On the contrary, wage rigidity implies either an absence of such effect, or a considerably retarded one. The unemployment rate captures mostly supply-side determinants, as wage requests by unions are expected to become more moderate in the presence of higher unemployment. As a second indicator of wage flexibility, we assess the responsiveness of wages to changes in productivity, which has attracte less empirical research than the link with unemployment. Labour productivity is aimed at capturing labour demand: the higher the productivity of labour at given price level, the higher the nominal wages firms are willing to pay. For each of these indicators, we compare not only the coefficient sizes, but also the speed and lag structure of the response. As Kittel (2001) argues, it is important to consider not only the differences in the flexibility outcomes, but also in the way these outcomes have been achieved. The timeliness of the wage response to economic developments is also relevant, since if it is strongly delayed, then the adjustment might not be optimal any longer in the presence of new shocks.

In analogy with existing work (see Nickell, 1988; Manning, 1993; Bell, Nickell, Quintini, 2002; Nunziata, 2005), the estimated dynamic wage equation can be obtained as a reduced form specification incorporating both demand and supply-side labour market determinants. This assumes that there is an equilibrium relationship between the real wage level, the unemployment rate and labour productivity to which real wages will converge even if there are transitory shocks that divert wages from this equilibrium. Real wage flexibility is low when it takes time for a dis-equilibrium in the labour market to be eliminated. Similarly, a high degree of real rigidity entails a situation where real wages or mark-up of price over marginal costs respond little to demand pressures. Such a framework does not exclude the possibility of reverse causation and multiple long-run relations among the considered variables.

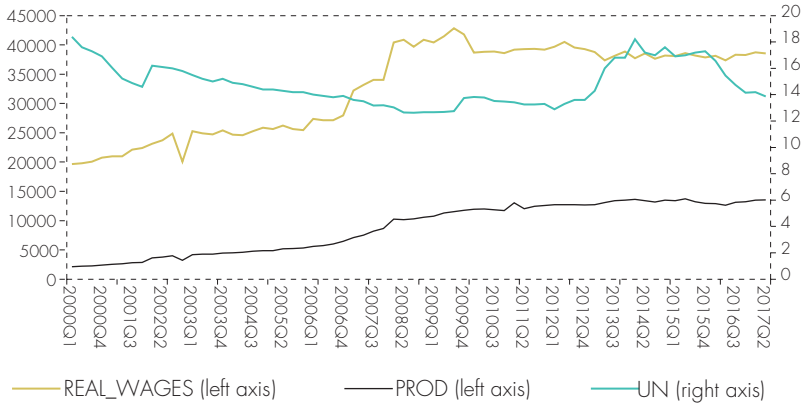
3.2 DATA

This section describes the data used for the empirical analysis of the article. The dataset includes quarterly time series on real wages, unemployment rate and labour productivity for the period 2000Q1-2017Q2. Except the unemployment rate, all the other series are seasonally adjusted using TRAMO/SEATS method.

The series of real wages is calculated as a ratio of the nominal wages of the private sector to the consumer price index multiplied by 100. The series of nominal wages is published by INSTAT in annual terms since 2000. The quarterly data are interpolated for the period 2000-2002 using the wages of the public sector, while starting from 2003 they are interpolated in line with the wage index from the Survey of Economic Enterprises conducted by the National Institute of Statistics (INSTAT). The unemployment rate is taken from the Quarterly Survey of Labour Force database conducted by INSTAT as well. Labour productivity is calculated by dividing the Gross Domestic Product at constant prices with the number of employees.

Figure 1 illustrates graphically the relation of the real wages with unemployment rate and labour productivity over the considered period. Real wages and productivity tend to follow similar positive trends (similar slopes), meanwhile the negative relation between wages and unemployment rate seems to be present until 2012Q1, and then after 2015Q4, with few short interruptions (short increase in the unemployment rate).

Figure 1 Development of the considered indicators over the period 2000Q1-2017Q2



Source: INSTAT and author's calculations, 2017.

3.3 METHODOLOGY

A Vector Error Correction model (VECM) is used to analyse the relation between real wages, productivity level and unemployment rate as a usual applied methodology in examining more than one endogenous variable, which also incorporates both short-run and long-run dynamics. A limited number of variables was chosen for the regression, because the aim of the analysis is not to explain real wages as much as possible, but rather to see whether wage developments observed in a certain time period were in line with what would be predicted on the basis of fundamentals or whether they were driven by some temporary or structural factors (policy or market driven for instance).

Incorporating demand and supply-side labour market determinants, the long-run wage equilibrium relationship is specified as:

$$\ln(real\_w_t) = \alpha + \beta_1 \ln(prod_t) + \beta_2 un_t + e_t \qquad (1)$$

where ***t*** indexes the time period, ***real_w*** denotes real wages, un is the unemployment rate, ***prod*** is the GDP per total employment and ***e*** is the disturbance term. While, the dynamic wage equation has the following form:

$$\Delta \ln(real\_w_t) = \mu + \sum_{i=1}^{p} \eta_i \Delta \ln(prod_{t-i}) + \sum_{i=1}^{p} \vartheta_i \Delta (un_{t-i}) + \gamma \widehat{e_{t-1}} + \varepsilon_t \qquad (2)$$

where $\widehat{e_{t-1}}$ is the residual from equation (1) and therefore γ measures the speed of adjustment to a random shock.

Except for the unemployment rate, we include the natural logarithm for real wages and labour productivity, in order to obtain the semi-elasticity of real wages with respect to unemployment and their elasticity with respect to labour productivity. In addition to the above basic specification, other authors include terms of trade among the explanatory variables (higher terms of trade expected to be reflected in higher wages, other things being equal). Alternative specifications are also estimated using nominal wages as dependent variable and adding the price level to the list of the explanatory variables.

As a first step of the estimation procedure, the stationarity properties of the data are assessed by applying the standard techniques: the augmented Dickey–Fuller (ADF) unit root tests. Overall, the series of real wages, labour productivity and unemployment can be characterized as integrated of order one I(1). Engel and Granger (1987) note that a linear combination of two or more I(1) series may be stationary (or I(0)), in which case we say that the series are cointegrated. Before testing the existence of such a relationship, it is necessary to determine first the optimal lag length in the vector autoregressive representation of the model. Referring to the different lag selection criteria, the number of lags is mostly found to be four, and only in one case one. As the VEC specification applies to cointegrated series, we should run cointegration tests to determine if there is any cointegrating relation between the variables and further the number of these cointegrating relations. These tests are

performed with three lags in our case, as the VEC model is estimated with one lag less than the optimal lag length of the respective VAR specification. Table 1 summarizes the results of the two Johansen tests (Trace and Max-Eigen value). They indicate the existence of one cointegrating relation among the real wages, unemployment and productivity in most of the cases.

Table 1. Johansen tests results summary.

Sample: 2000Q1 2017Q2					
Included observations: 66					
Series: L_REAL_W L_PROD UN					
Lags interval: 1 to 3					
Data Trend:	None	None	Linear	Linear	Quadratic
Test Type	No Intercept	Intercept	Intercept	Intercept	Intercept
	No Trend	No Trend	No Trend	Trend	Trend
Trace	1	1	1	0	0
Max-Eig	1	1	1	0	0
*Critical values based on MacKinnon-Haug-Michelis (1999)					

Source: Author's computation.

3.4 MODEL RESULTS AND THEIR INTERPRETATION

After confirming the existence of one cointegrating relation among the variables, we estimate this relation using a VEC model with three lags. The estimated coefficients presented in the Table 2. The specification can be regarded as a reduced form supply-demand system for the labour market. It also assumes that there is an equilibrium relationship between real wages, labour productivity and unemployment rate, to which real wages will converge even if there are transitory shocks that divert wages from this equilibrium.

Table 2 Estimated coefficients of wage equation through a VECM approach.

Dependent Variable:	L_REAL_W(-1)
L_PROD(-1)	0.602720*** (0.05370) [11.2229]
UN(-1)	-0.021958 (0.01780) [-1.23327]
C	4.438153 (0.65385) [-6.78773]
Error Correction Term	-0.120607*** (0.04816) [-2.50448]
R - squared = 0.485214	

*Note: *significance at 10%, **significance at 5%, ***significance at 1%.*
Source: Author's computation.

In addition, we perform several diagnostic tests to see if the necessary conditions of VEC approach are satisfied. According to these tests, there is no evidence of serial correlation and heteroskedasticity of the VECM residuals, and the stability test was passed successfully. Only the assumption of the normal distribution of model residuals is not satisfied, but this does not have implications for the aim of our analysis.

As it can be seen from Table 2, both explanatory variables have the expected signs, but only productivity results to be statistically significant in the long-run relationship. The insignificant effect of unemployment on wages can be explained by the vertical long-run Phillips curve. Notice that the long-run coefficients cannot be interpreted as elasticities in the strict sense, since each of the coefficients incorporates the effect of shocks to all variables (see Lutkepohl, 1994). However, as the objective of this article is to assess real wage flexibility, in the estimated cointegrating relation, we are more interested in the error correction term (ECT), which represents the speed of adjustment of real wages to the long-run equilibrium relationship rather than the estimated variable coefficients. As it can be seen, the ECT is statistically significant at 1% level of significance and it has a negative sign, which confirms the existence of the long-run relation between real wages, productivity and unemployment rate. Its value indicates that real wages need almost two years (8.3 quarters) to converge to their equilibrium values, in case of any shocks that diverge them from their steady-state.

In order to have a clearer view about the flexibility of real wages in Albania, we deepen the analysis further for the short-run period and investigate how important were the different shocks in accounting for the observed fluctuations in real wages, by looking at the forecast-error variance decomposition of real wages. The results of this analysis are shown in Table 3. As it can be seen, in the very short run (2-3 quarters), most of the variation in real wages forecast errors is explained by their past values (more than 70%) rather than by labour productivity or unemployment rate, with a higher role of productivity relative to unemployment shocks. However, their contribution to forecast error variance of real wages is low, which means that real wages do not respond significantly towards productivity and unemployment in the short run. One should be aware that these conclusions are based on a particular statistical methodology and may be affected by certain statistical problems due to the quality of the underlying data series.

Table 3 Sources of real wage flexibility.

Var. Decomp. L_REAL_W:			
Period	L_REAL_W	L_PROD	UN
1	99.29054	0.000000	0.709458
2	94.74190	4.363262	0.894835
3	81.15108	18.12083	0.728087
4	71.57257	22.28286	6.144565
5	75.38749	17.79730	6.815213
6	72.68193	20.42679	6.891274
7	68.61941	23.60401	7.776580
8	66.23193	24.64845	9.119627
9	67.39298	23.15692	9.450103
10	66.79215	23.71309	9.494765
11	65.58419	24.93315	9.482660
12	64.97251	25.35070	9.676783

Source: Author's computation.

Although the model appears to be correct econometrically and satisfies all the necessary conditions dictated by the estimation method, at the end of this session, it is important to stress that the results of this study are subject

to a number of caveats. An important limitation of the analysis is the fact that besides real wage adjustment, the adjustment in the labour markets can take many other forms (e.g. migration, changes in labour force, participation and part time arrangements or other factors). In the presence of these other mechanisms, real wages may react less than they would otherwise. A further complication is the existence of relatively extensive grey economy in Albania, which may influence the behaviour of wages, distort the official wage figures and might itself represent an alternative labour market adjustment channel. For instance, in the case of an aggregate demand shock, employers are more likely to fire first the informal employees and to cut wages of the workers unprotected by the labour protection regulations of the formal economy (Heinz and Rusinova, 2011).

4. CONCLUDING REMARKS

Based on aggregate level data for the period 2000Q1-2017Q2, this article aims at assessing the degree of real wage flexibility in Albania within a vector error-correction model, where real wage flexibility is conceptualized using two indicators: the responsiveness of real wages to unemployment rate and their responsiveness to changes in productivity.

The Johansen cointegration tests confirm the existence of one cointegrating relation among the three variables. The error correction term suggests that real wages need more than two years to converge to their long-run equilibrium values, a relatively long period of time which indicates real wage rigidity in Albania. In addition, we perform a variance decomposition analysis for the forecast errors of real wages, in order to identify which of the explanatory variables shocks contributes more to real wage fluctuations. In the very short run (2-3 quarters), most of the variation in real wages forecast errors is explained by their past values (more than 70%) rather than by labour productivity or unemployment rate. This analysis confirms the fact that real wages are slightly flexible towards these two variables. However, these conclusions are based on a particular statistical methodology and may be affected by certain statistical problems due to the quality of the underlying data series.

At the end of this article, it is important to highlight that an overall assessment of wage developments needs to look at a broader set of variables and shouldn't be limited to the indicators used here. Other aspects that could be included in the analysis are labour force shocks and the change in the sectorial structure of the economy. Furthermore, a disaggregated wage analysis based on firm-level surveys data would be helpful to have more detailed information on the frequency of wage changes in Albania. Government policies should also be taken into account when analysing the labour cost developments, as they affect wage dynamics both directly and indirectly through minimum wages, wage indexation laws, social security contributions and direct labour taxation etc.

REFERENCES

Arpaia A. and K. Pichelmann (2007), "Nominal and real wage flexibility in EMU", European Commission, Directorate-General for Economic and Financial Affairs, Economic Papers.

Babecký and Dybczak (2012), "Real Wage Flexibility in the European Union: New Evidence from the Labour Cost Data", Czech National Bank, Working Paper Series.

Babetskii, I. (2006), "Aggregate Wage Flexibility in Selected New EU Member States", Czech National Bank, Working Paper Series, No 1/2006.

Bean, C. (1994), "European Unemployment: A Survey", Journal of Economic Literature, vol. XXXII, pp. 573-619. Bean, C., Layard, R.

Bell, B., Stephen Nickell and Glenda Quintini (2002), "Wage equations, wage curves and all that," Labour Economics, Elsevier, vol. 9(3), pages 341-360.

Blanchard, O. and L. Katz (1999), "Wage Dynamics: Reconciling Theory and Evidence", American Economic Review, Vol. 89, No. 2, Papers and Proceedings of the One Hundred Eleventh Annual Meeting of the American Economic Association, (May, 1999), pp. 69 -74.

Blanchflower, D.G. (2001), "Unemployment, Well-being and Wage Curves in Eastern and Central Europe," Journal of the Japanese and International Economies, vol. 15, 4, pp. 364-402.

Boeri, T., Burda, M., and Köllõ, J. (1998), "Mediating the Transition: Labour Markets in Central and Eastern Europe". Centre for Economic Policy Research, London.

CNB (2009), "Analyses of the Czech Republic's Current Economic Alignment with the Euro Area 2009." Czech National Bank, Prague.

CNB (2010), "Analyses of the Czech Republic's Current Economic Alignment with the Euro Area 2010." Czech National Bank, Prague.

European Commissoion (2003), "Wage Flexibility and Wage Interdependence in EMU: Some Lessons from the Early Years" in The EU Economy: 2003 Review, pp. 153–200. DG ECFIN/391/03-EN. Brussels, November.

Guo, Si (2017),"Price and Wage Flexibility in Hong Kong SAR", IMF Working Paper.

Hyclak, T. and Johnes, G. (1992), "Wage Flexibility and Unemployment Dynamics in Regional Labour Markets". W. E. Upjohn Institute for Employment Research, Kalamazoo, Michigan.

INSTAT (2017), Statistical Database available at: http://www.instat.gov.al/.

Kittel, Bernhard (2001), "How Bargaining Mediates Wage Determination: An Exploration of the Parameters of Wage Functions in a Pooled Time Series Cross Section Framework", Max Planck Institut fur Gesellschaftsforschung Discussion Paper No. 01/3, July 2001.

Lutkepohl, H. (1994), "Interpretations of Cointegrating Relations". Econometric Reviews, 13, pp. 391–394.

Manning, A. (1993), "Wage Bargaining and the Phillips Curve: The Identification and Specification of Aggregate Wage Equations", Economic Journal, Royal Economic Society, vol. 103(416), pages 98-118, January.

Nickell, S. (1987), "Dynamic models of labour demand," Handbook of Labour Economics, in: O. Ashenfelter and R. Layard (ed.), Handbook of Labour Economics, edition 1, volume 1, chapter 9, pages 473-522 Elsevier.

Nunziata, L. (2005), "Institutions and Wage Determination: a Multi-country Approach", Oxford Bulletin of Economics and Statistics, Department of Economics, University of Oxford, vol. 67(4), pages 435-466, 08.

Radziwiłł, A. and Walewski, M. (2003), "Future EMU Membership and Wage Flexibility in Selected EU Candidate Countries". Center for Social and Economic Research (CASE) Working Paper, No. 265. Warsaw, December.

Schweitzer, M. E. (2007), "Wage flexibility in Britain: some micro and macro evidence", Working Paper no. 331, Banka of England.