The Impact of Minimum Wage on the Evolution of Earnings in Romania

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Abstract

Existence and nature of the relationship between the minimum gross guaranteed wage, average gross salary earning and economic growth are subjects which are reflected in the attention of economists for a long time, generating over time different theories and models. In the paper, we addressed the issue of the minimum wage from theoretical perspective and we analysed the causal linkages between the dynamics of the minimum gross guaranteed wage, the average gross salary earning and the economic growth. As a methodological approach, we used the multifactorial regression, the Toda-Yamamoto causality test, impulse analysis and variance decomposition in VAR models.

Keywords: minimum gross guaranteed wage, average gross salary earning, Granger causality, VAR models

JEL classification: C52, J31

Introduction

The years of transition to the market economy have limited the purchasing power of wages for Romanian employees and increased the job insecurity. For most employees, the salary is the main source of income and therefore the wage level decisively establishes the population standard of living. As a result, the minimum wage has an important role as a fundamental tool for ensuring a decent payment of the work and was legislated for the first time in Romania by the *Law no. 14/1991*.

The minimum wage is also an important instrument of economic policy. His adepts claim that minimum gross guaranteed wage avoids the abusive exploitation of labour and that he raise the standard of living to a minimum level of decency while opponents say that it favours less qualified workforce and lead to rising unemployment.

1. Defining the minimum wage through doctrinal vision

In an attempt to analyse the consequences of minimum wage on the distribution of earnings, the neoclassical model starts from assumption that imposing a minimum guaranteed wage diminishes the risk of dismissal for those employees with a level of labour productivity

lower than purchasing power of the minimum wage (Stigler, 1946), which reduces the dispersion of wages for those who stayed employed.

This forecasting model concerning the wage changes has known some nuances, such as Teulings model (1996), which takes into account the various types of skilled workers. Increasing the level of minimum wage led to dismissal the workers for which incomes are near to the quondam minimum wage. However, this increasing of salary, reduce the relative cost of most qualified labour. A shift in demand towards higher skilled labour imply that workers who earners a wage between the two minimum levels become able to find work in better pay conditions (the new minimum wage, or higher). Workers who initially earned over the current wage will be affected by the new lower limit. Their wages will rise, reducing the advance ripple effects in wage hierarchy. The net effect on the distribution of wages is reflected in the disappearance of wages below the new minimum level, accompanied by some increase in those with earnings above the minimum wage. The empirical researches revealed also the effects of the minimum wage that cannot be explained neither in the simple neoclassical model nor in the most complex. Thus, the existence of a peak of wage distribution exactly on the minimum wage indicates that a high proportion of them receive the minimum wage (Card, Krueger, 1995). As the minimum wage increases, the peak of distribution moves to the new minimum wage, which indicates that many of those who earned below the minimum in the past now obtain exactly the minimum wage. Although the existence of this concentration of distribution could not be clearly explained, its existence has been repeatedly verified empirically. (Card, Krueger, 1995).

In conclusion, the minimum wage influences the distribution of earnings in at least three directions:

- by reducing the share of people who were gaining minimum formerly;
- by increasing the share of those who earn exactly the minimum wage;
- by the spill-over effect aimed at workers who were previously above the new minimum.

2. The data

To highlight the evolution of the minimum gross guaranteed wage in Romania, during 2005-2015, as the first analyse, we built a multifactorial linear regression model. For this purpose, we used the time series concerning the quarterly values of the gross domestic product, the average gross salary earnings and the minimum wage, from January 2005 to December 2015.

Table 1: Evolution of the gross domestic product, the minimum wage and the average gross salary earnings in Romania, 2005-2015

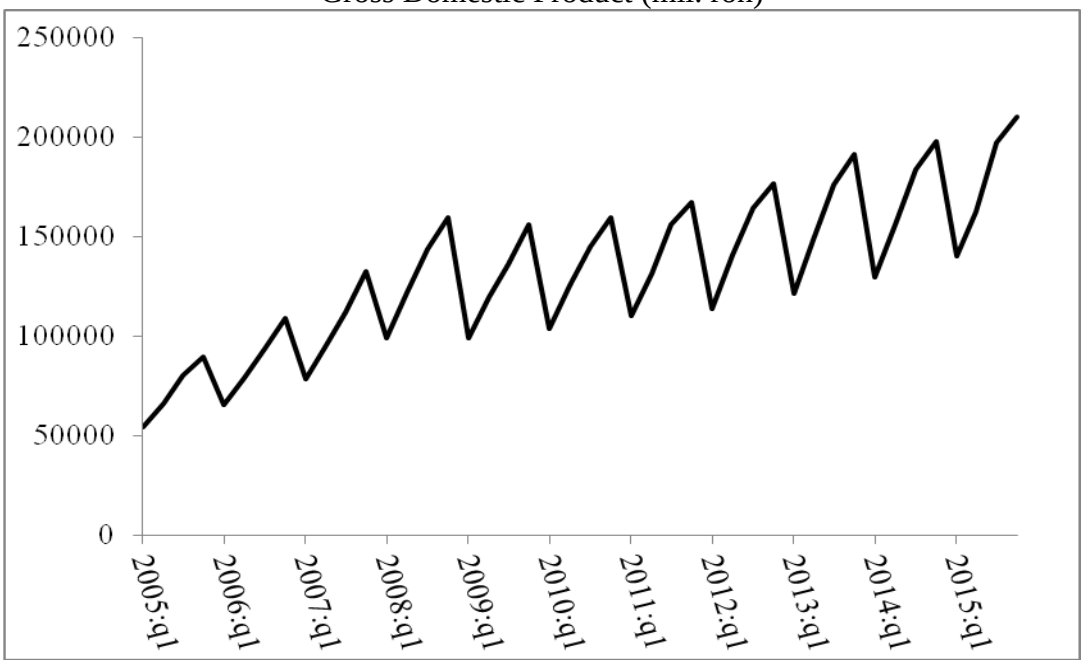
Year	Quarter	GDP (mil. ron)	Average Gross Salary Earnings (ron)	Minimum Gross Guaranteed Wage (ron)
2005	I	54460.6	915.33	310
	II	66300.4	953	310
	III	79891.1	961.67	310
	IV	89836.7	1037.33	310
2006	I	65302.0	1072.67	330
	II	79167.6	1113.67	330
	III	93662.4	1130.67	330
	IV	108872.3	1283	330

Year	Quarter	GDP (mil. ron)	Average Gross Salary Earnings (ron)	Minimum Gross Guaranteed Wage (ron)
2007	I	78168.1	1286.67	390
	II	95567.1	1375	390
	III	112064.1	1402.67	390
	IV	132458.6	1574.33	390
2008	I	99042.4	1601	500
	II	121805.6	1731	500
	III	143875.8	1749.33	500
	IV	159664.9	1887.33	540
2009	I	98906.9	1874.67	600
	II	119631.6	1890.67	600
	III	136070.5	1868.67	600
	IV	155913.8	1923.33	600
2010	I	103791.6	1993.67	600
	II	125279.8	1962	600
	III	145033.7	1853.33	600
	IV	159776.0	1937.67	600
2011	I	110356.3	1987.67	660
	II	131176.9	2033.33	660
	III	156218.5	2016.33	660
	IV	167345.5	2090.33	660
2012	I	113796.0	2058.67	700
	II	140715.6	2129.67	700
	III	164408.8	2128.67	700
	IV	176446.9	2218.33	700
2013	I	121620.7	2171	733
	II	148256.7	2245.33	750
	III	176151.3	2233.67	800
	IV	191427.3	2313.33	800
2014	I	129643.5	2284.33	850
	II	156353.5	2352.33	850
	III	183672.1	2352.67	900
	IV	197908.3	2450.67	900
2015	I	140355.7	2444	975
	II	162661.5	2526.67	975
	III	197252.5	2539.67	1050
	IV	209996.9	2727.67	1050

Source: www.insse.ro, www.mmuncii.ro.

In the following graphics, we presented these indicators, for Romania, during 2005-2015.

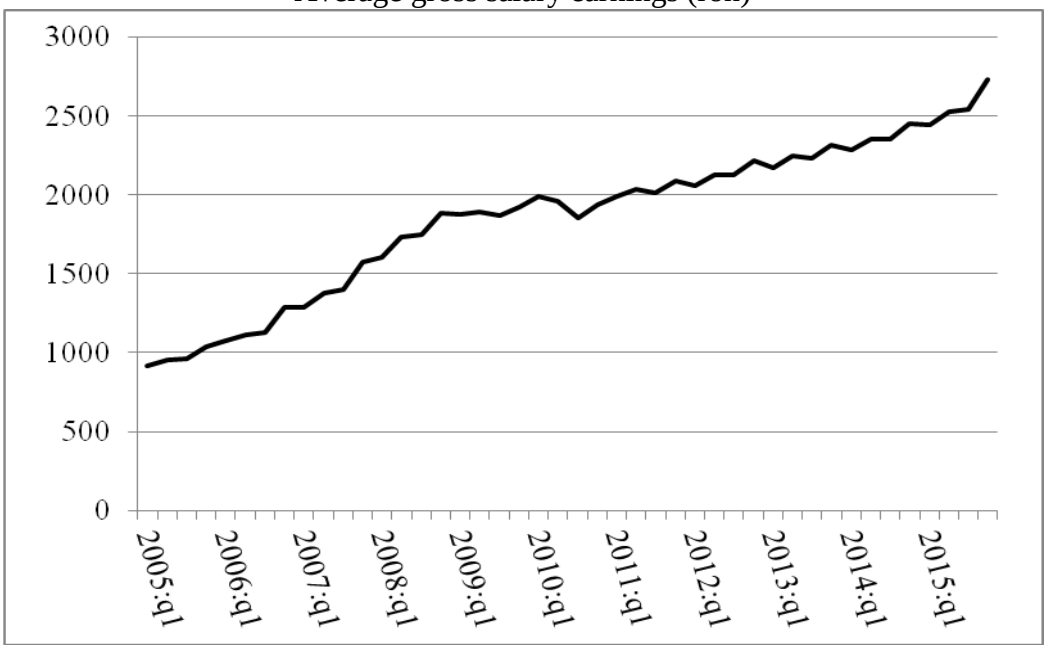
Gross Domestic Product (mil. ron)



Source: data from table 1, own calculations.

The diagrams presented above indicate the quarterly evolution of GDP, during 2005-2015. The overall dynamics of gross domestic product was due to increase in consumption and investments recorded in Romania, during this period.

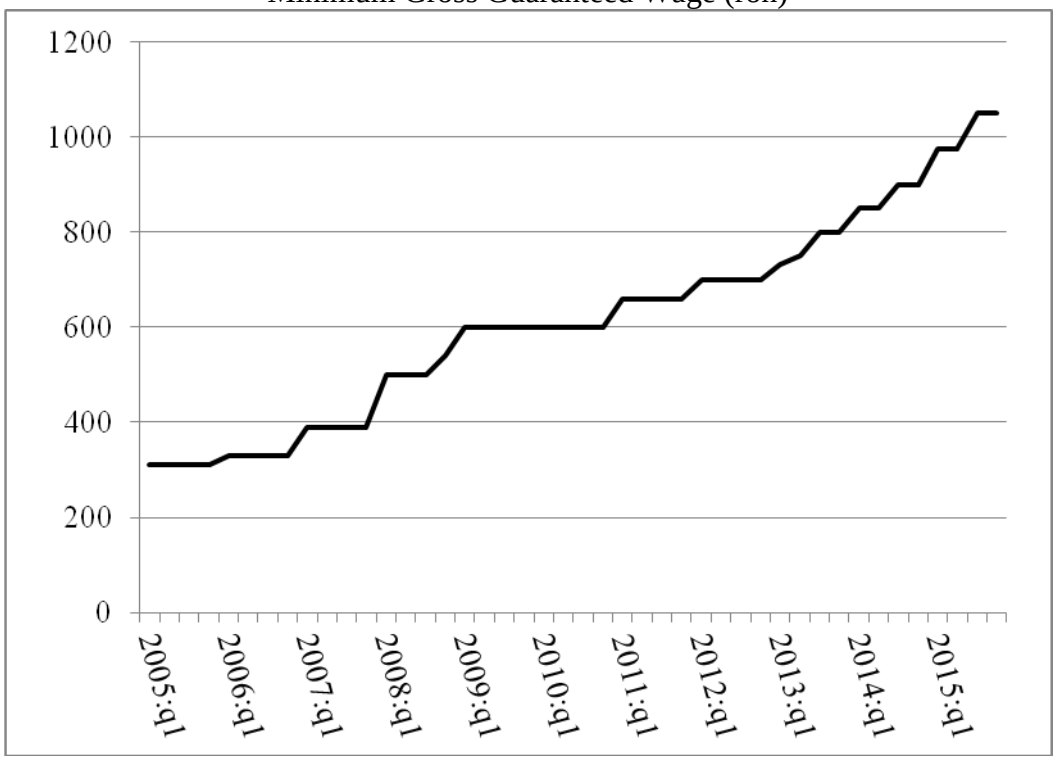
Average gross salary earnings (ron)



Source: data from table 1, own calculations.

The above diagrams show the dynamics of average gross salary earnings recorded in Romania, from 2005 to 2015. This dynamic was influenced by the recession that started with the 2009 crisis and then by the evolutions related to the resumption of economic growth after 2011.

Minimum Gross Guaranteed Wage (ron)



Source: data from table 1, own calculations.

The dynamics of minimum wage in Romania from 2005 to 2015 can be explained by the evolution of the economic environment and the bargaining power of trade unions and other professional organizations.

In order to analyse the relationship between the variables listed, we analyse as the first step, the nature of the series. As technical support, we used the Econometric Views (EViews).

b1. Gross Domestic Product (GDP)

Null Hypothesis: GDP has a unit root

Exogenous: Constant, Linear Trend

Bandwidth: 21 (Newey-West automatic) using Bartlett kernel

		Adj.t-Statistic	Prob.*
Phillips-Perron test statistic		-6.979883	0.0000
Test critical values:	1% level	-4.211868	
	5% level	-3.529758	
	10% level	-3.196411	

*MacKinnon (1996) one-sided p-values.

Source: EViews calculations based on data in Table 1.

According to Phillips-Perron unit root test, the GDP is a stationary series: test value is less than the critical value, it follows that the risk associated with rejecting the null hypothesis (the series has a unit root) is less than 1%.

b2. Average Gross Salary Earnings (AGSE)

Null Hypothesis: AGSE has a unit root

Exogenous: Constant, Linear Trend

		Adj.t-Statistic	Prob.*
Phillips-Perron test statistic		-1.808470	0.6832
Test critical values:	1% level	-4.211868	
	5% level	-3.529758	
	10% level	-3.196411	

*MacKinnon (1996) one-sided p-values.

Source: EViews calculations based on data in Table 1.

Phillips-Perron test statistic for Average Gross Salary Earnings is -1.808470 and its associated p-value is 0.6832. Test value is greater than the critical value (for 0.05), it follows that the risk associated with rejecting the null hypothesis (the series has a unit root) is greater than 5%. We do not reject the null hypothesis. We test the null hypothesis for the first difference.

Null Hypothesis: D(AGSE) has a unit root

Exogenous: None

		Adj.t-Statistic	Prob.*
Phillips-Perron test statistic		-6.355159	0.0000
Test critical values:	1% level	-2.621185	
	5% level	-1.948886	
	10% level	-1.611932	

*MacKinnon (1996) one-sided p-values.

Source: EViews calculations based on data in Table 1.

The risk associated with the null hypothesis (the series has a unit root) is less than 1%. Consequently, we admit that the series d(AGSE) is stationary, which means that AGSE is I(1). In econometric modelling we used the differenced series:

$$d(AGSE_t) = AGSE_t - AGSE_{t-1}.$$

b3. Minimum Gross Guaranteed Wage (MGGE)

Null Hypothesis: MGGE has a unit root

Exogenous: Constant, Linear Trend

Lag Length: 4 (Automatic - based on SIC, maxlag=9)

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-1.923430	0.6251
Test critical values:	1% level	-4.211868	
	5% level	-3.529758	
	10% level	-3.196411	

*MacKinnon (1996) one-sided p-values.

Source: EViews calculations based on data in Table 1.

Phillips Perron test statistic for "minimum gross guaranteed wage" is -1.92343 and the associated p-value of is 0.6251. Test value is greater than the critical value (for 0.05), it follows that the null hypothesis (the series has a unit root) is not rejected.

Null Hypothesis: D(MGGE) has a unit root
Exogenous: None
Bandwidth: 3 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-6.030667	0.0000
Test critical values:	1% level	-2.621185	
	5% level	-1.948886	
	10% level	-1.611932	

*MacKinnon (1996) one-sided p-values.
Source: EViews calculations based on data in Table 1.

Series D(MGGE) is stationary: the value associated test statistics Phillips-Perron is 6.030667 and the corresponding risk lies below 1%. We admit that the MGGE series is integrated of order 1. In econometric modelling we used the differenced series:

$$d(MGGE_t) = MGGE_t - MGGE_{t-1}.$$

3. The relationship between the minimum gross guaranteed wage, the average gross salary earnings and the economic growth in Romania

a. The regression analysis

Since the variables "gross domestic product" is stationary and "average gross salary earnings", respectively "minimum gross guaranteed wage" are non-stationary variables, we built the following econometric model:

$$d(MGGE_t) = a_0 + a_1 \cdot GDP_t + a_2 \cdot d(AGSE_t) + e_t,$$

where

- a_1 - is the parameter that measures the intensity of influence induced by the gross domestic product (GDP) on the minimum gross guaranteed wage (MGGE);
- a_2 - is the parameter that measures the intensity of influence induced by the average gross salary earnings (AGSE) on the minimum gross guaranteed wage (MGGE);
- e_t - is error variable.

The model is not econometric significant. Afterwards, we test the model:

$$d(AGSE_t) = a_0 + a_1 \cdot GDP_t + a_2 \cdot d(MGGE_t) + e_t,$$

As the previous, this model is not significant in terms of the conditions imposed by econometric analysis. Under these conditions, we tested a more complex relationship between those variables.

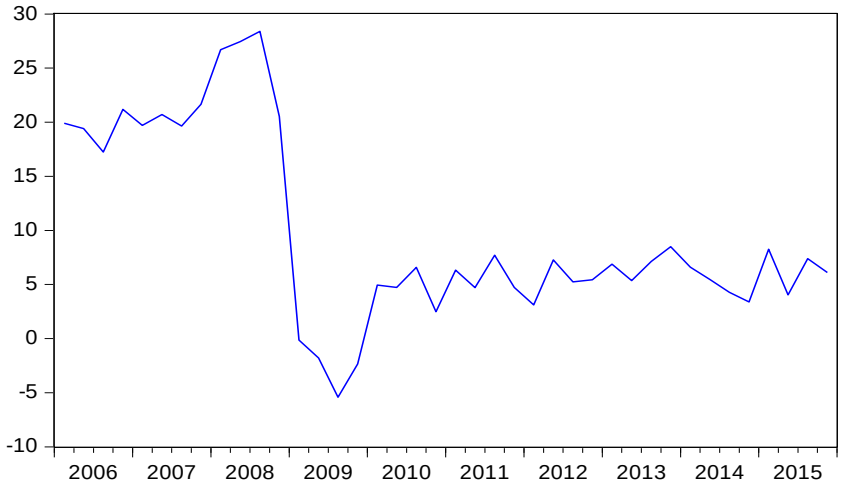
b. Causality tests

To identify the causal relationships between the GDP, the minimum gross guaranteed wage and the average gross salary earnings, we calculated the growth rates (compared to the same period in the previous year, i.e. one-year percentage change, in percent) and tested nature of the respective series.

b1. The nature of the variables used in the model

The dynamics of GDP (Gross Domestic Product Growth)

Year % change of GDP



Source: EViews calculations based on data in Table 1.

We note *pcy(gdp)* – one-year percentage change of GDP series. In order to identify the nature of the series, we use Ng-Perron Modified Unit Root Tests on pcy(gdp):

Ng-Perron Modified Unit Root Tests on pcy(gdp)
Null Hypothesis: PCY_GDP has a unit root
Exogenous: Constant
Lag length: 0 (Spectral GLS-detrended AR based on SIC, maxlag=9)
Sample (adjusted): 2006Q1 2015Q4
Included observations: 40 after adjustments

		MZa	MZt	MSB	MPT
Ng-Perron test statistics		-3.86125	-1.33914	0.34681	6.37923
Asymptotic critical values:	1%	-13.8000	-2.58000	0.17400	1.78000
	5%	-8.10000	-1.98000	0.23300	3.17000
	10%	-5.70000	-1.62000	0.27500	4.45000

Source: EViews calculations based on data in Table 1.

The four Ng-Perron tests do not reject the hypothesis of a unit root. Given the shape of the series (the previous chart), we perform a breakpoint unit root test.

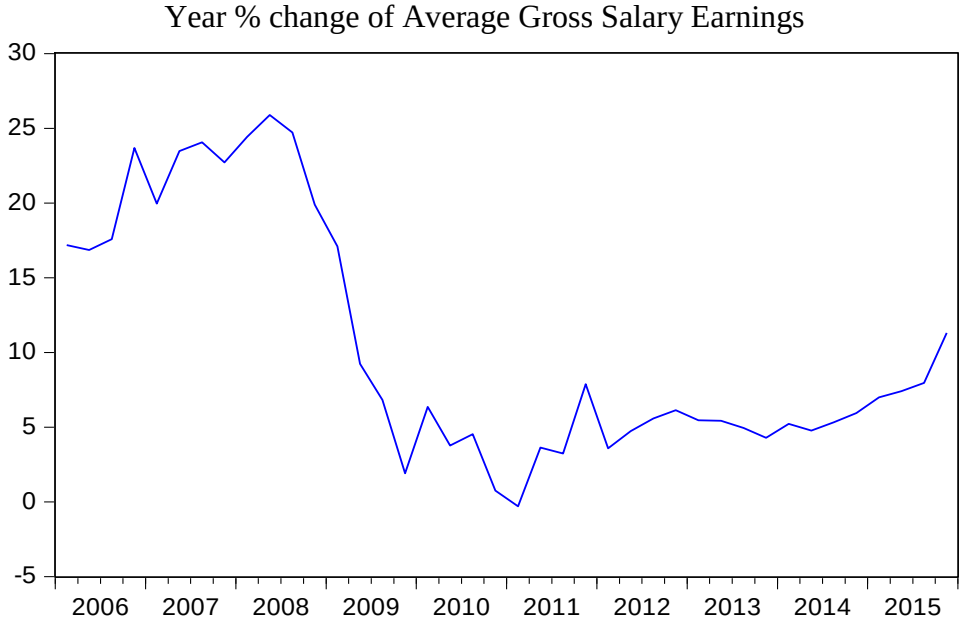
Unit Root with Break Test on @pcy(gdp)
Null Hypothesis: @pcy(gdp) has a unit root
Trend Specification: Intercept only
Break Specification: Intercept only
Break Type: Innovational outlier
Break Date: 2009Q1
Break Selection: Minimize Dickey-Fuller t-statistic
Lag Length: 3 (Automatic - based on Schwarz information criterion, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.477905	0.0459
Test critical values:	1% level	-4.949133	
	5% level	-4.443649	
	10% level	-4.193627	

Source: EViews calculations based on data in Table 1.

If we admit the hypothesis of a break in the series, recorded in Quarter 1-2009, then the series *pcy(gdp)* – year % change of GDP is stationary (the risk of type I error is 0.0459, below the standard threshold of 0.05).

Dynamics of Average Gross Salary Earnings



Source: EViews calculations based on data in Table 1.

We note *pcy(agse)* – one-year percentage change of *Average Gross Salary Earnings* series. In order to identify the nature of the series, we use Ng-Perron Modified Unit Root Tests on *pcy(agse)*:

Ng-Perron Modified Unit Root Tests on pcy(agse)
Null Hypothesis: PCY_AGSE has a unit root
Exogenous: Constant
Lag length: 2 (Spectral GLS-detrended AR based on SIC, maxlag=9)
Sample (adjusted): 2006Q1 2015Q4
Included observations: 40 after adjustments

		MZa	MZt	MSB	MPT
Ng-Perron test statistics		-5.17356	-1.60499	0.31023	4.74434
Asymptotic critical values:	1%	-13.8000	-2.58000	0.17400	1.78000
	5%	-8.10000	-1.98000	0.23300	3.17000
	10%	-5.70000	-1.62000	0.27500	4.45000

Source: EViews calculations based on data in Table 1.

The four Ng-Perron tests do not reject the hypothesis of a unit root. Given the shape of the series (the previous chart) we perform the unit root with break test on pcy(agse).

Unit Root with Break Test on @pchy(agse)
Null Hypothesis: @pcy(sal_med) has a unit root
Trend Specification: Trend and intercept

Break Specification: Intercept only

Break Type: Innovational outlier

Break Date: 2009Q1

Break Selection: Minimize Dickey-Fuller t-statistic

Lag Length: 0 (Automatic - based on Schwarz information criterion, maxlag=9)

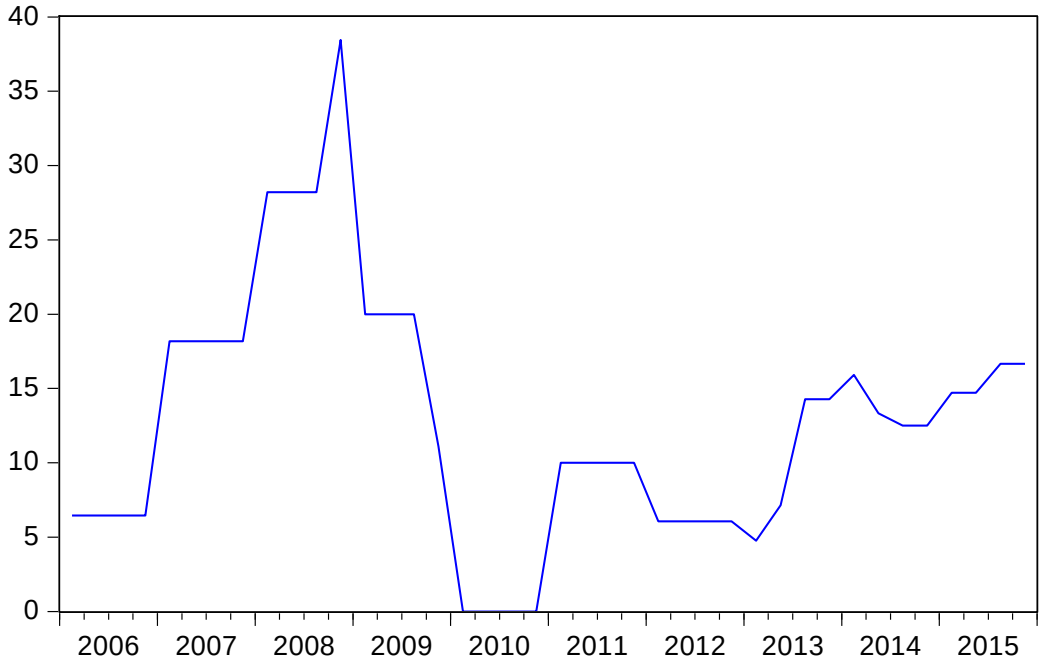
		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.445375	< 0.01
Test critical values:	1% level	-5.347598	
	5% level	-4.859812	
	10% level	-4.607324	

Source: EViews calculations based on data in Table 1.

If we admit the hypothesis that there is a break in the series, recorded in Quarter 1-2009, then the series *pcy(agse)* – dynamics of average gross salary earnings is stationary (the risk of type I error is less than 0.01).

Dynamics of Minimum Gross Guaranteed Wage

Year % change of Minimum Gross Guaranteed Wage



Source: EViews calculations based on data in Table 1.

We note *pcy(mggw)* – one-year percentage change of Minimum Gross Guaranteed Wage (MGGW) series. In order to identify the nature of the series, we use Ng-Perron Modified Unit Root Tests on *pcy*(*mggw*):

Null Hypothesis: pcy(mggw) has a unit root

Exogenous: Constant

Lag length: 0 (Spectral GLS-detrended AR based on SIC, maxlag=9)

Sample (adjusted): 2006Q1 2015Q4

Included observations: 40 after adjustments

		MZa	MZt	MSB	MPT
Ng-Perron test statistics		-6.22234	-1.73168	0.27830	4.04180
Asymptotic critical values*:	1%	-13.8000	-2.58000	0.17400	1.78000
	5%	-8.10000	-1.98000	0.23300	3.17000
	10%	-5.70000	-1.62000	0.27500	4.45000

Source: EViews calculations based on data in Table 1.

The four Ng-Perron tests do not reject the hypothesis of a unit root at the 5% threshold. As well as for the GDP and AGSE, given the shape of MGGW series (the previous chart), we perform the unit root test under the hypothesis of a break in trend and intercept.

Unit Root with Break Test on @pchy(mggw)

Null Hypothesis: @pcy(mggw) has a unit root

Trend Specification: Trend and intercept

Break Specification: Intercept only

Break Type: Innovational outlier

Break Date: 2009Q4

Break Selection: Minimize Dickey-Fuller t-statistic

Lag Length: 3 (Automatic - based on Schwarz information criterion, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.709441	< 0.01
Test critical values:	1% level	-5.347598	
	5% level	-4.859812	
	10% level	-4.607324	

Source: EViews calculations based on data in Table 1.

If we admit the hypothesis of a break in the trend, recorded in Quarter 4-2009, then the series pcy(mggw) – year % change of Minimum Gross Guaranteed Wage is stationary (the risk of type I error is less than 0.01).

b2. Toda-Yamamoto Test

We have tested the existence of a causality relationship between these variables by using the Toda-Yamamoto version of Granger causality test. To do this, in the first step, we calculated the maximum lag order in VAR model, which includes the three variables:

VAR Lag Order Selection Criteria

Endogenous variables: @pcy(mggw) @pcy(agse) @pcy(gdp)

Exogenous variables:

Sample: 2005Q1 2016Q4

Included observations: 36

Lag	LogL	LR	FPE	AIC	SC	HQ
1	-277.4291	NA	1636.406	15.91273	16.3086*	16.05090
2	-271.0466	10.63742	1908.230	16.05815	16.84991	16.33449
3	-252.1533	28.3399*	1127.05*	15.5085*	16.69616	15.9230*
4	-247.1419	6.681934	1474.263	15.73010	17.31362	16.28279

* indicates lag order selected by the criterion

LR: sequential modified LR test statistic (each test at 5% level)

FPE: Final prediction error

AIC: Akaike information criterion

SC: Schwarz information criterion

HQ: Hannan-Quinn information criterion

Source: EViews calculations based on data in Table 1.

The selection criteria suggest the choice of lag = 3 in 4 out of 5 cases (LR: sequential modified LR test statistic; FPE: Final prediction error; AIC: Akaike information criterion; HQ: Hannan-Quinn information criterion) and lag = 1 in SC: Schwarz information criterion. Consequently, we choose lag = 3.

According to Toda-Yamamoto test, we build VAR(3) model and have included as exogenous variables the lag = 4. Test series the causal is as follows:

VAR Granger Causality/Block Exogeneity Wald Tests

Sample: 2005Q1 2016Q4

Included observations: 36

Dependent variable: @pcy(mggw)

Excluded	Chi-sq	df	Prob.
@pcy(agse)	0.436513	3	0.9326
@pcy(gdp)	1.904502	3	0.5925
All	6.921544	6	0.3282

Dependent variable: @pcy(agse)

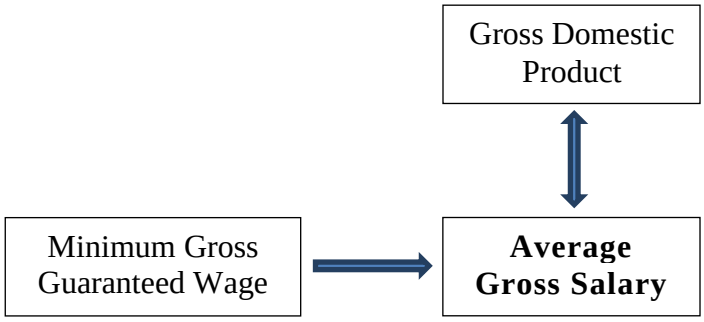
Excluded	Chi-sq	df	Prob.
@pcy(mggw)	9.241692	3	0.0262
@pcy(gdp)	11.98664	3	0.0074
All	21.63138	6	0.0014

Dependent variable: @pcy(gdp)

Excluded	Chi-sq	df	Prob.
@pcy(mggw)	3.919430	3	0.2703
@pcy(agse)	11.07042	3	0.0114
All	15.75172	6	0.0152

Source: EViews calculations based on data in Table 1.

The probability attached on hypothesis pcy(mggw) does not Granger Cause pcy(agse) is 2.62%, the probability calculated for the hypothesis pcy(gdp) does not Granger Cause pcy(agse) is 0.74%, the probability calculated for the hypothesis pcy(agse) does not Granger Cause pcy(gdp) is 1.14%. All the other non-causal hypotheses cannot be rejected at the 5% threshold. Identified causal relationships are shown in the following figure:



In other words, Toda-Yamamoto version of Granger causality test indicates a two-way relationship between *GDP growth* and *Gross Average Salary Earning* and that the *Minimum Gross Guaranteed Wage* does Granger cause the *Average Gross Salary Earning*.

c. The VAR model. Impulse Analysis and Variance Decomposition

Since the series pcy(gdp), pcy(mggw) and pcy(agse) are stationary (in the models with break in trend and/or in intercept), we have developed a VAR model with those three variables.

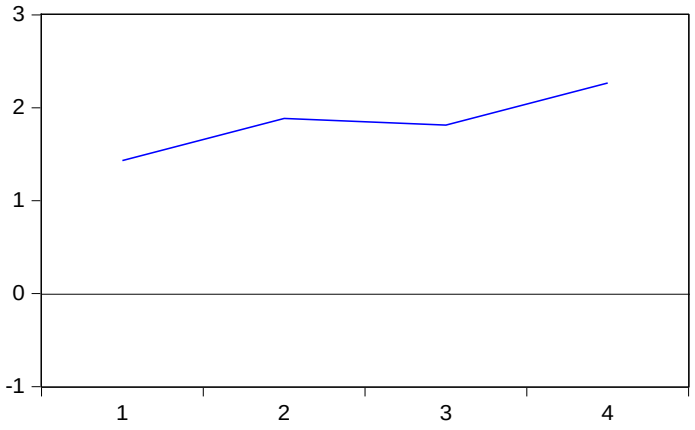
c1. Gross Average Salary Earning

Impact analysis

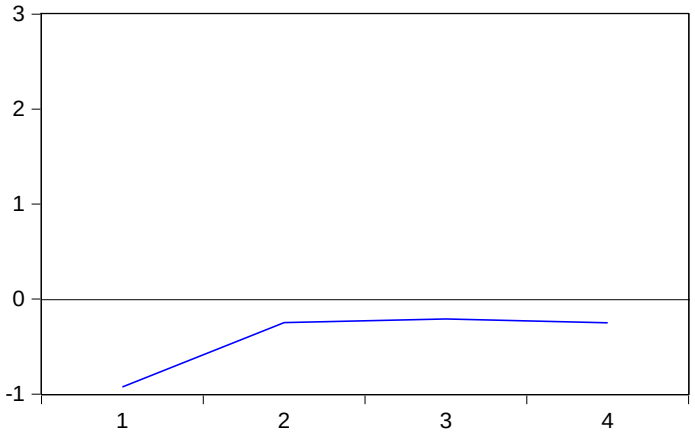
The impulse responses of variable "Average Gross Salary Earning" to one standard deviation shock intervened in economic growth, respectively on dynamics of Minimum Gross Guaranteed Wage is shown in the following charts:

Response to Cholesky one S.D. Innovations

Response of @pcy(agse) to @pcy(gdp)



Response of @pcy(agse) to @pcy(mggw)



If there is a positive shock in GDP dynamics, the answer of Average Gross Salary Earning is also positive and impact of GDP shock (the innovation) spreads in the medium run. If the shock occurs in the dynamics of the Minimum Gross Guaranteed Wage, then the Average Gross Salary Earning registered, as the first reaction, a contraction, and the response will be attenuated on the medium term.

Variance Decomposition

In the first period, the variance recorded for the variable "Average Gross Salary Earning" is explained in a large proportion (54.2%) by their own shock, about 32.3% by the shock in GDP dynamics and near 13.5% is due to the innovations in Minimum Gross Guaranteed Wage. The contribution of variables, to the variance recorded by "Average Gross Salary Earning", changes over time, so that, on the medium term, nearly 60% of pcy(agse) variance is explained by the evolution of GDP. The data are presented in the following table:

Variance Decomposition of @pcy(agse)

Period	@pcy(pib)	@pcy(mggw)	@pcy(agse)
1	32.28709	13.48702	54.22589
2	50.88303	8.323682	40.79329
3	52.78264	5.701543	41.51581
4	58.53269	4.267126	37.20018
5	59.49735	4.072858	36.42979

Cholesky Ordering: @pcy(pib) @pcy(mggw) @pcy(agse)

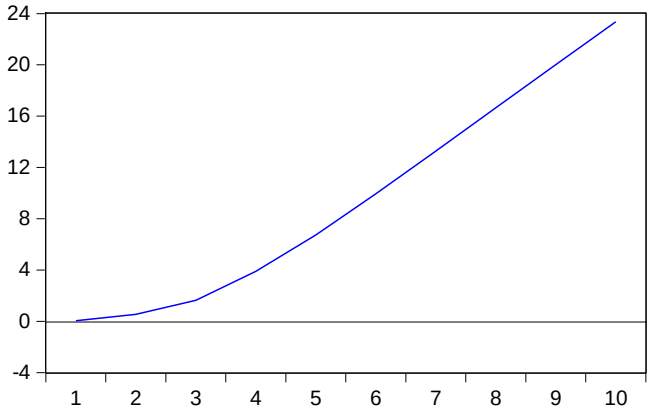
c2. Minimum Gross Guaranteed Wage

Impact analysis

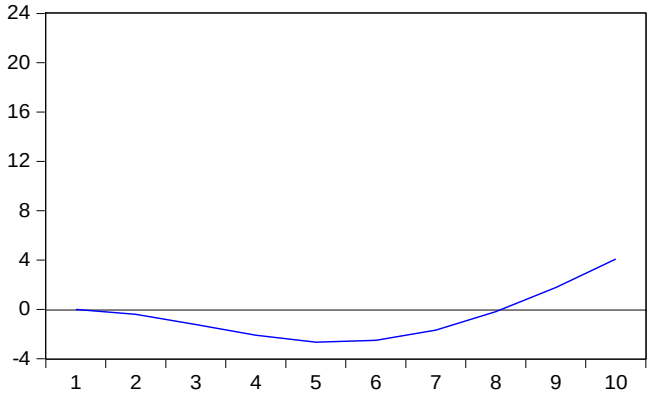
The impulse responses of variable "Minimum Gross Guaranteed Wage" to one standard deviation shock in economic growth, respectively on dynamics of Average Gross Salary Earning are shown in the following charts:

Accumulated Response of @pcy(MGGW) to Cholesky one S.D. Innovations

Accumulated Response of @pcy(mggw) to @pcy(gdp)



Accumulated Response of @pcy(mggw) to @pcy(agse)



The Minimum Gross Guaranteed Wage reacts positively to the innovations in GDP growth. A shock registered in Average Gross Salary Earning has a negative effect, in the short run, on the Minimum Gross Guaranteed Wage, but at medium and long term, the accumulated response is positive.

Variance Decomposition

In the first period, the variance recorded for the variable "Dynamics of Minimum Gross Guaranteed Wage" is explained, almost entirely (99.98%) by their own shock. On the medium and the long-run, nearly 60% of *pcy(mggw)* variance is explained by the evolution of GDP. The impact of Average Gross Salary Earning is significantly only on the long-run, even though the value does not exceed 10-11% in the "Dynamics of Minimum Gross Guaranteed Wage" variance decomposition. The data are presented in the following table:

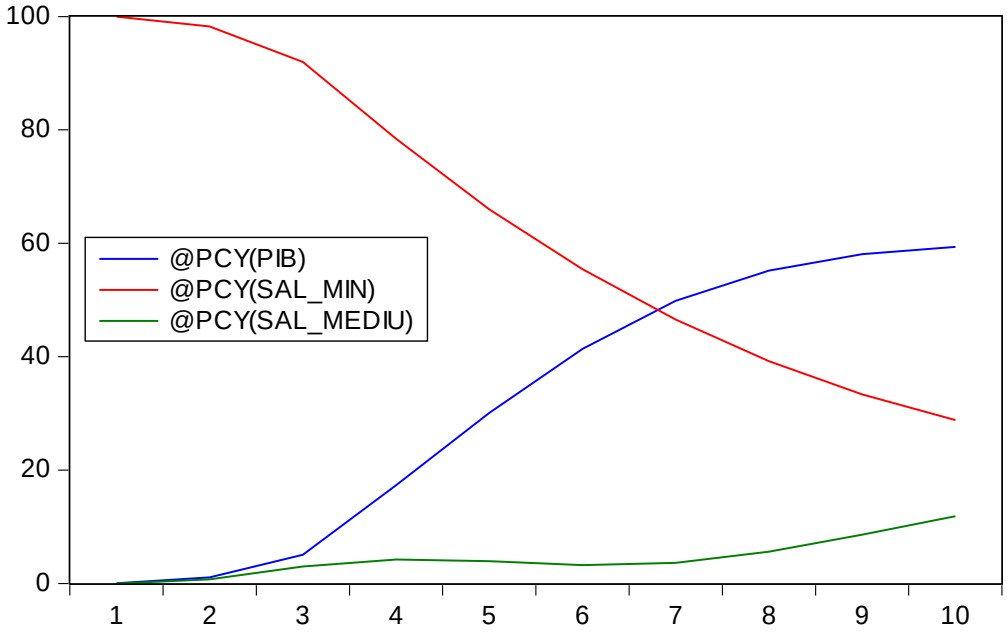
Variance Decomposition of @pcy(mggw)

Period	@pcy(pib)	@pcy(mggw)	@pcy(agse)
1	0.016698	99.98330	0.000000
2	1.045231	98.26441	0.690361
3	5.052518	91.97851	2.968977
4	17.32921	78.44319	4.227596
5	30.08239	65.99295	3.924657
6	41.39267	55.39810	3.209234
7	49.85420	46.52916	3.616640
8	55.16940	39.21671	5.613890

Period	@pcy(pib)	@pcy(mggw)	@pcy(agse)
9	58.08070	33.33766	8.581639
10	59.34051	28.80582	11.85368

Cholesky Ordering: @pcy(pib) @pcy(mggw) @pcy(agse)

Variance Decomposition of @pcy(mggw)



The impulse responses and the variance decomposition analyses suggest that the economic growth has a decisive role in the dynamics of the Minimum Gross Guaranteed Wage and, also, of Average Gross Salary Earning Dynamics. Shocks (innovations) occurred in wage variables (e.g. through administrative intervention) have positive effects, but of moderate intensity.

Conclusions

The paper shows that there are strong relationship between the three variables analysed (*the minimum gross guaranteed wage*, *the average gross salary earnings* and *the economic growth)* for Romania. These relationships are econometric significant.

The regression models constructed with stationary series are not significant in terms of the conditions imposed by econometric analysis. Under these conditions, we tested a more complex relationship between those variables. For this purpose, we have used the dynamics of variables, calculated as one-year percentage change (in percent).

If we admit the hypothesis of a break in the series (recorded in Quarter 1-2009, for economic growth and the average gross salary earnings and in quarter 4 – 2009, for the minimum gross guaranteed wage), then yearly changes of all the variables are stationary.

As one of the series (*minimum gross guaranteed wage*) is stationary only around a deterministic trend, we perform the Toda-Yamamoto version of Granger causality test. This test indicates a two-way relationship between GDP growth and *average gross salary earnings* and that the *minimum gross guaranteed wage* does Granger cause the *average gross salary earning*.

Further, we developed a VAR model. By using VAR lag order selection criteria (more exactly, information criterion as Akaike, Schwarz and Hannan-Quinn), we found that the best

description of data is carried out by the VAR(3) model. In this model, we performed an impulse analysis and the study of variance decomposition. We found that:

- If there is a positive shock in GDP dynamics, the answer of Average Gross Salary Earning is also positive and impact of GDP shock (the innovation) spreads in the medium run. If the shock occurs in the dynamics of the Minimum Gross Guaranteed Wage, then the Average Gross Salary Earning registered, as the first reaction, a contraction, and the response will be attenuated on the medium term.
- The Minimum Gross Guaranteed Wage reacts positively to the innovations in GDP growth. A shock registered in Average Gross Salary Earning has a negative effect, in the short run, on the Minimum Gross Guaranteed Wage, but at medium and long term, the accumulated response is positive.
- In the first period, the variance recorded for the variable "Average Gross Salary Earning" is explained in a large proportion (54.2%) by their own shock, about 32.3% by the shock in GDP dynamics and near 13.5% is due to the innovations in Minimum Gross Guaranteed Wage. The contribution of variables, to the variance recorded by "Average Gross Salary Earning", changes over time, so that, on the medium term, nearly 60% of pcy(agse) variance is explained by the evolution of GDP.
- In the first period, the variance recorded for the variable "Dynamics of Minimum Gross Guaranteed Wage" is explained, almost entirely (99.98%) by their own shock. On the medium and the long-run, nearly 60% of *pcy(mggw)* variance is explained by the evolution of GDP. The impact of Average Gross Salary Earning is significantly only on the long-run, even though the value does not exceed 10-11% in the "Dynamics of Minimum Gross Guaranteed Wage" variance decomposition.

The impulse responses and the variance decomposition analyses suggest that the economic growth has a decisive role in the dynamics of the Minimum Gross Guaranteed Wage and, also, of Average Gross Salary Earning Dynamics. Shocks (innovations) occurred in wage variables (e.g. through administrative intervention) have positive effects, but of moderate intensity.

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