

A stylized world map composed of a grid of dots in various shades of gray, with several dots highlighted in red. The map is centered behind the title text.

Minimum Wage as a Public Policy Instrument – Pros and Cons

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- presents arguments in support of the need to introduce/increase the minimum wage in the countries at the periphery of the European Union (including Romania)
- proposes an optimum level/evolution of the minimum wage in Romania, beyond which the net impact of its implementation tends to be negative
- analyzes the correlation between the increase of the minimum wage and the dynamics of labor productivity in Romania
- presents the extent to which the increase of the minimum wage has influenced or not the economic competitiveness, particularly in sectors with high rates of minimum wage employment
- analyzes the correlation between the increase in the minimum wage and the mitigation of income inequalities, as well as between the increase in the minimum wage and the reduction in the poverty/economic deprivation rate

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Abstract

The debates on the minimum wage issue remain intense, confirming the validity of arguments both in favor of and against the introduction of the minimum wage. Although both sides put forward relevant theories/empiric research, there has been a relative consensus recently concerning the need to implement the minimum wage as an instrument/measure to mitigate the economic and social inequalities, reduce poverty and economic deprivation and secure an inclusive economic growth. In recent years, the debate has primarily focused on the optimal level/dynamics of the minimum wage, beyond which the net impact of its implementation tends to be negative.

This research proposes a balanced approach based on theoretical/statistical/economic arguments that go beyond the constraints of an ideology or another. Although the limitations concerning the length of the data series make difficult the process of econometric testing of the response of certain economic variables to the changes in the minimum wage, we tried to use viable econometric techniques to model the economic and social effects of the minimum wage increase.

We started by presenting various minimum wage analysis perspectives: perfect competition vs. monopsony, the efficiency wage theory and the minimum wage impact adjustment mechanisms. In the next section – a review of the relevant literature – we sought to outline the main current theoretical debates on the correlation between minimum wage and employment, minimum wage and the informal sector of the labor market, minimum wage and income inequality, minimum wage, inflation and competitiveness, as well as those concerning the impact of the minimum wage increase in Romania. The third section of the paper explains why the introduction/increase of the minimum wage is necessary in the countries at the periphery of the European Union (including Romania). The high rate of workers (full time/part time employees) at risk of poverty, the deep income inequality, the

inequitable distribution of the net national income between labor and capital, the asymmetrical dissemination of the benefits of economic growth and the slow social lift, as well as the asymmetrical negotiation between trade unions and employers (especially after 2011, when a more flexible Labor Code was enacted in Romania) are arguments in favor of an increase of the minimum wage to a decent level able to boost the economic and social multiplier effects of using this instrument.

The next section discusses the optimal level of the minimum wage in the economy. Has it increased too much or not and what is the limit past which the net impact on the Romanian economy might be negative? The fifth section looks at the correlation between the increase in the minimum wage and the labor productivity dynamics and identifies two distinct periods in the existence of this relationship. In the sixth section, we see whether the increase in the minimum wage affected or not the economic competitiveness in Romania, analyzing the evolution of the personnel, turnover, gross value added and profit/loss of the financial year of the companies with the largest numbers of minimum wage employees – trade, processing industry, construction, transportation, hotels and restaurants, etc. The sixth and the seventh section investigate the connection between the increase in the minimum wage and the reduction of income inequality, on one hand, and between the increase in the minimum wage and the decrease in poverty/economic deprivation rate, on the other hand.

The way in which the evolution of the minimum wage was correlated with the dynamics of the minimum decent living income and the minimum subsistence income (calculated based on the minimum consumer basket) in Romania is detailed in the eighth section (through an analysis of households with 2 minimum wages and 2 child benefits, households with 2 minimum wages and one child benefit and households with 2 minimum wages).



The final section presents the results of the empirical research on the impact of the minimum wage in the economy of Romania, based on established estimation techniques, with a view to answering to several relevant questions in the literature: does the minimum wage have a negative impact on total employment and on youth employment? Does inflation act as a minimum wage increase adjustment mechanism in Romania? How does the average wage respond to the shocks of the minimum wage? Does the minimum wage have a negative impact on the competitiveness of companies? We show that, until 2013, Romania did not have a minimum wage policy and that the occasional minimum wage increases were rather related to inflation than to productivity improvement and economic growth. Since 2013, seven successive minimum wage increases have been applied in connection with tax reductions and economic recovery.

The reaction of the selected macroeconomic variables to the changes in the minimum wage was analyzed using the notions of elasticity and impulse response to certain shocks equivalent to a standard deviation point. The methods used for this purpose included the multiple regression for five equations and the VAR model, which are similar in point of the validity conditions that their variables and residues must satisfy. The main results obtained for Romania are consistent with the literature on emerging economies. Thus, the total employment rate is sensitive to the modification of the minimum wage, as the companies adjust the total employment level

depending on the evolution of the minimum wage and the contemporary elasticity is lower than and opposite to the annual one; initially, the total employment rises as a result of the higher minimum wage. The youth employment is also influenced by the wage shock, but has a relatively stronger response compared to total employment. While the adjustment through employment is significant in Romania, the adjustment through prices is less relevant. Thus, the pass-through effect of the minimum wage on consumer good inflation is rather limited, as demonstrated by the fact that the companies do not immediately transfer to prices the additional payroll costs generated by the wage increase. Furthermore, the increase in the minimum wage causes a minor decline in the economic competitiveness as a consequence of higher prices of industrial goods.

1. Minimum wage impact analysis perspectives

Generally, the decisions to introduce/increase the minimum wage are opposed by reactions that are typical to the neoclassical liberalism rhetoric: only negative effects will ensue, youth unemployment rises, workers migrate to the informal sector of the economy, etc. If this were exclusively the case, the literature would be unanimous in empirically confirming the neoclassical conclusions and the researchers would gradually lose interest in the topic. In this context, we propose taking this topic out from the neoclassical paradigm and approaching it from a more complex perspective, based on theories that refine the traditional approach, as well as on the particular features of the economies that implement a policy of this kind.

Thus, the existence of a monopsony in the labor market and the efficiency wage theory lead to the conclusion that there is not always a trade-off between higher wages and employment in an economy. In addition to that, the macroeconomic approach to the effects of the minimum wage reflects the positive impact on the consumption of the households of minimum wage workers. Their greater budget constraints make them spend to a greater extent the additional income, generating an increase in the aggregate demand and in employment. Even though the number of employees may decrease in certain companies as a consequence of the additional payroll costs, it will increase in other companies as a result of the higher incentives granted to certain categories of employees for entering the labor market, as well as of the higher aggregate demand.

Perfect competition vs. monopsony in the labor market

According to the neoclassical economic theory, introducing/increasing the minimum wage above the equilibrium rate in a labor market close to perfect competition results in higher wage costs and lower employment, particularly among the younger and lower-skilled population. The adverse effect on employment may also arise if the

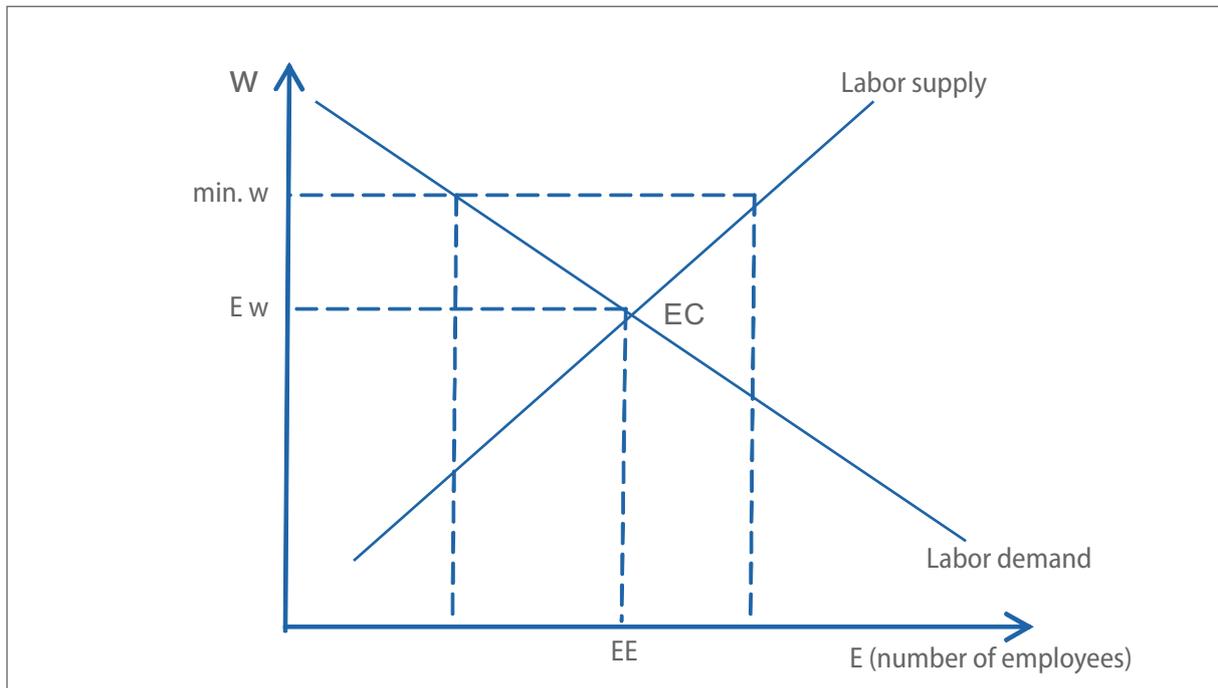
companies confronted with the minimum wage increase transfer the additional costs to prices, with a negative impact on the demand for their products and consequently on the volume of labor required. The minimum wage tends to deepen the segmentation of the labor market, as it will cause a contraction of employment in the lower productivity sectors, while the impact on the higher productivity ones will be extremely low.

On the contrary, if the labor market is closer to a monopsony, the increase in the minimum wage can generate higher employment. This conclusion applies to the labor market sector with low wages and dominated by a company with high market power. In such case, that company, acting on a low-skilled local labor market, can fix wages that are below the productivity level. When confronted with the rise of wage costs generated by the increase of the minimum wage, the employers will be stimulated to maximize their profits by expanding production and employment (the monopsony effect).

The labor market supply is the aggregate of the individual labor supplies of the workers who make decisions concerning the effort made depending on wage (w). In a perfect competition market, none of the many companies is able to fix the wage level, but only to decide on the number of workers they can hire in the context of the given wage. Therefore, such market strikes a balance when the labor demand equals the labor supply. The imposing of a minimum wage that is higher than the equilibrium rate causes a decrease in the labor demand of companies, as well as an expansion of the labor supply aimed at obtaining a higher income. The result is a labor supply surplus, i.e. unemployment, among those categories of employees that could have been paid the equilibrium wage, but not the minimum wage, in the absence of additional productivity gains. As a rule, the unemployed will be lower-skilled workers or young people who entered the labor market recently.



Figure 1. Impact of the minimum wage on a perfect-competition labor market



If the labor market in a specific area is dominated by a single company, it has a monopsony structure in which the employer has a high ability to influence the conditions of payment of employees. Depending on those conditions, the active population may accept the offer or decide to look for better jobs somewhere else. Unlike in a market with multiple employers, in a monopsony the workers with the same skills will be paid the same wage. If the company wants to hire additional workers, it will have to offer a wage above the average and such decision will result in an rise of wages for the existing employees, too. Thus, the monopsony is rather interested in the marginal cost of employing new workers if it is higher than the cost of the average wage, i.e. of the labor supply in that specific market.

Just like a monopoly that decides to decrease production in order to charge higher prices than in a competitive market, a company holding a monopsony position in the labor market will decide that it is profitable to restrict employment in order to lower the wage, i.e. the costs, below the level of the competitive market. This analysis is detailed in Annex 1, which shows that the introduction of the minimum wage in local monopsony markets can

determine a rise in wages and employment only to the extent that the minimum wage is lower than the wage specific to a perfect competition market (Figure 1). Otherwise, the minimum wage will generate a contraction of employment.

Efficiency wage theory

One of the arguments against the increase of the minimum wage is that it raises the income of the least productive workers or of those whose productivity has improved insufficiently. Nevertheless, the relationship between wages and productivity should not be seen unidirectionally, but also from the perspective of the impact of wages on efficiency, as the efficiency wage theory also states. This theory is based on the assumption that employers may voluntarily choose to pay to certain categories of employees a wage that is higher than the competitive equilibrium level. It is assumed that productivity is endogenous to the production process and can be stimulated for the employees concerned – knowing that the wage is higher than the market level, they work harder, are interested in improving their skills and in staying longer with the company and keeping their wages.

Furthermore, the payment of a salary above the market level limits the situations generated by adverse selection and moral hazards. The higher skilled workers are often more aware of the opportunities to avail themselves of their skills in other companies and realize that the period of looking for a better paid job is shorter and, as a consequence, the companies risk remaining with lower skilled workers. By raising the wages, the companies can reduce adverse selection and improve the workforce quality. The moral hazards occur because the employees tend to be less diligent at work, as there is not a proper system in place to monitor their performance. The wage increase raises the opportunity cost of unemployment caused by improper performance and stimulates the workforce to become more productive. According to this theory, the rise of the minimum wage can generate additional productivity gains among the workers with relatively lower skills.

Minimum wage impact adjustment mechanisms

Confronted with the expansion of production costs

as a result of the minimum wage increase, the companies may react differently, depending on their business standing and strategies and on the overall evolution of the economy. If all of the other conditions remain constant, a higher minimum wage can be adjusted by reducing employment or by raising inflation. If the increase of the minimum wage is not correlated with a similar evolution of the productivity or turnover, the companies will be rather inclined to contract the employment, contributing to a rise in the unemployment rate, than to accept a further decline in profits. If the business standing of the company is good, the expansion of the wage costs will be easier to internalize by cutting the profits or raising the prices paid by the final customers. As a consequence, during the periods when the companies manage to transfer the additional costs to prices without impairing the turnover or when the overall evolution of the economy supports an increase in the volume of products sold, the minimum wage will not have a negative impact on employment. Thus, the minimum wage should be introduced/ increased in periods of economic growth, when the companies are confident in the medium-term economic outlook.

2. Review of the relevant literature on the impact of minimum wage introduction/increase

While the initial studies exclusively focused on the connection between the minimum wage and employment, the literature gradually diversified as the authors started looking into other relationships, e.g. those with the informal sector of the labor market, with the wage and income inequality, with inflation and the competitiveness of companies. In this paper, we grouped the results in the relevant literature depending on the studied topics.

Relația salariu minim-ocupare

The first econometric estimations of the impact of the minimum wage on employment, e.g. Schaafsma

and Walsh (1983), showed that the minimum wage had a negative impact on employment for all the age groups included in the study. In general, the younger and the lower skilled persons are the most affected by the increase of the minimum wage, as they are remunerated close to its level. In the 1990s, the studies (e.g. Brown et al., 1982 and 1983) suggested that the elasticity of employment to the increase of the minimum wage ranged from -0.1 to -0.3, with higher values for the youth employment. In the 2000s, higher levels of elasticity were determined (e.g. Neumark and Wascher, 2006): -1 in USA, -4.6 in France for certain categories of employees, or +1 in some Nordic countries.



Alatas and Cameron (2003) analyzed the case of several emerging economies and showed that the minimum wage affected employment in smaller companies with local capital, but not in larger corporations with foreign owners. According to Kuddo et al. (World Bank, 2015) the trend in the recent literature is that the impact of the minimum wage on employment is, in general, low or insignificant and even positive in some cases.

Abowd et al. (2009) estimated, in the case of France, that the impact of the minimum wage on employment was higher if the share of the minimum wage in the country-level average wage was higher. Addison et al. (2009) demonstrated that the increase of the minimum wage caused only a marginal decline of employment in the sectors concerned, even in periods of significant economic recession. Therefore, the assumption that economic recession is the most unfavorable moment for increasing the minimum wage is not verified. Schmitt (2013) concluded that the negative impact of the minimum wage is lower if the minimum wage to average wage ratio is lower, if the share of wage costs in the total costs is smaller and if the companies are able to cushion the minimum wage effects by other measures. Conversely, the impact is higher if the proportion of employees earning the minimum wage or an income close to it is larger, as shown by Herr and Kazandziska, 2011. Broecke et al. (2015) reviewed the literature on the most relevant emerging economies in the world and demonstrated that the increase of the minimum wage has a low or statistically insignificant impact on employment, except for the vulnerable categories, i.e. low-skilled, young and low-income persons. The results obtained depend on the methodology used, as well as on the variables considered.

The IMF (2016a) estimated the impact of the minimum wage share on the youth employment rate based on a panel of 15 economies in Central and Eastern Europe. Thus, a 1% rise expansion of the minimum wage share caused a decline by 0.15% of

the youth employment rate after one quarter. Moreover, a 1% rise in the minimum wage to productivity ratio reduced youth employment by around 3%. In fact, the response of youth employment to the changes in the minimum wage tends to be more significant in the economies with higher unemployment rates, as Addison et al. (2013) demonstrated for the United States of America.

Relationship between minimum wage and the informal sector of the labor market

The minimum wage can be interpreted as a matter of labor market rigidity, often expressed in terms of ratio to the average wage. It is considered that, the higher this ratio, the greater the pressure on employment, due to the discrepancy between the productivity differential and the wage differential in the sectors with medium and higher skills, compared to the lower-skill sectors. One of the ways to adjust this discrepancy is by expanding employment in the informal sector or by increasing evasion by declaring a larger number of employees as being paid the minimum wage. On one hand, the increase of the minimum salary can reduce to a greater extent formal employment, if the ability of the informal sector to absorb the workforce surplus is higher. On the other hand, the wage increase in the formal sector can result in the employment of a larger proportion of persons who were previously active in the informal sector, as a consequence of the higher incentives for looking for a formal job, as estimated by Magruder, 2013, Bhorat et al., 2014. Regarding the impact of the minimum wage on the informal sector of the labor market, Fillion (2009) argued that, on one hand, the welfare recipients and informal workers would be stimulated to work in the formal sector of the economy and, on the other hand, the rise of the wage costs might determine the employers to avoid declaring all the employees or to pay formal wages for part time jobs, although the workers are used full time, which results in illegal wage payments.

Magruder (2013) showed that, by the positive



impact on consumption and aggregate demand, the increase of the minimum salary generates more jobs in the formal sector of the economy. In addition to that, the increase of the minimum wage diminished the tendency of certain categories of employees to leave the formal sector and boosted the participation in the professional training programs offered by companies in order to improve productivity and compensate for the rise in the wage costs. In fact, the sectors with a larger proportion of minimum-wage employees see a greater mobility of the workers and, as a consequence, the increase of the minimum wage improves the stability of workers within companies, as Addison et al. (2009) explained. Riley and Bodibene (2015) estimated that the companies with a large proportion of low-payment jobs responded to the increase in the minimum wage by measures intended to improve productivity. Georgiadis (2013) and Owens and Kagel (2010) empirically validated the positive impact of the minimum wage on the motivation of the lower-skilled workers.

To conclude, the minimum salary should be correlated with other public policy instruments, e.g. the enforcement of stricter control measures, in order to curb the tendency of employers to declare lower salaries, close or equal to the minimum level, for the purpose of diminishing their wage costs. Considering the existence of this behavior, the increase of the minimum salary can diminish evasion, by reducing the gap between the wage actually paid and the one entered in the accounts, but also expand evasion, if part of the wages that were previously higher than the minimum will be declared at the level of the minimum wage.

Relationship between the minimum wage and the wage/income inequality

The labor market is deeply divided into two segments: the primary sector, with higher-skilled workers and better working conditions, and the secondary sector, with lower-skilled workers and difficult working conditions. Since the salaries in the

primary sector of the labor market are higher than the ones in the secondary sector, the introduction of a minimum wage does not have any direct impact on the higher-skilled sector. However, the implementation of a minimum salary that is higher than the equilibrium level of the secondary sector results in higher unemployment among the lower-skilled workers, as shown in Figure 1.

In point of labor supply, the mobility between the two sectors is very unlikely, since higher skills cannot be acquired at once. In the long run, however, part of the unskilled workers who are unable to find a job in the secondary sector might upgrade their professional skills, expanding the labor supply in the primary sector and reducing the wage gap in the secondary one. In fact, the introduction of the minimum wage had already contributed to diminishing the wage gap. From the labor demand perspective, the minimum wage raises the cost of the lower-skilled labor compared to the higher-skilled one, which could result in a rise in the labor demand and wages in the primary sector, with a possible widening of the wage gap. As a consequence, the minimum wage has an ambiguous impact on the wage inequality between the primary and the secondary sector.

The increase of the minimum wage may generate effects not only on the lower-skilled workers, but on other categories of personnel that will be able to claim and obtain higher wages following collective bargaining, in order to maintain the wage differences justified by the level of training or length in service. These externalities are stronger in the case of wages that are closer to the minimum level, but tend to decline as the wages are higher compared to the minimum one. The increase of the minimum wage will generate the rise of the average wage to a greater extent if the externalities are more significant. If the wage increase that the group targeted by the minimum wage benefits from is higher than the one generated by externalities, the wage gap will diminish. Belman and Wolfson (2014) estimated that the increase in the minimum



wage in USA expanded the income of the target group, i.e. of the employees who earned slightly more than the minimum wage prior to the increase. Grimshaw et al. (2014) estimated that, when the minimum wage is taken as a basis for collective bargaining (e.g. in France), strong externalities are present to an average wage that is up to 10% higher than the minimum one, but extend up to wages that are twice as high as the minimum one. Conversely, in USA and UK, which are economies with low trade union power, the minimum wage either determines lower externalities for other categories of employees or generates a decline in the income of the employees that earned slightly above the minimum level. A microeconomic research conducted by CEB (2015) showed that, in the analyzed European countries, there was a positive correlation between the minimum wage and the average one and 20% of companies also raised the wages that were previously higher than the minimum.

Based on a meta-analysis of the studies concerning the impact of the introduction of the minimum wage, Neumark and Wascher (2008) concluded that the minimum wage is not an appropriate instrument in point of social policy, since it diminishes the employment opportunities for persons with lower skills and lowers the income of their families, generating a higher risk of poverty for them. In fact, the decision to increase the minimum wage does not automatically lead to a reduction in poverty and social inequality and complementary measures are required, e.g. lower taxation of lower wages and stimulation of lower-wage workers' participation in training programs to upgrade their professional skills.

The minimum wage can have a direct impact on income inequality only if the wages are index-linked to it, as demonstrated by Maloney and Mendez (2004) for the countries in South America. Otherwise, the income inequality is influenced not only by the wage differences, but by the capital and wealth income, progressiveness of taxation and

social transfer expenditures. However, compared to the latter factors mentioned, the minimum wage is not a costly instrument for the budget. The author et al. (2014) estimated a positive impact of the minimum wage on the distribution of income, due to the influence on the lower segment of income distribution.

The emerging and relatively less developed economies in Europe experience relatively greater income inequality, as a result of the polarizing tendency of economic activities, low employment rates, significant informal sector and the relatively lower share of the social welfare expenditure. According to IMF (2016a), the increase in the minimum wage is linked to the inequality of lower income only in Poland, Romania and Slovakia. In countries like Latvia, Hungary or Poland, the distribution of income has not changed significantly, although the ratio of the wages in the tenth decile to those in the first one decreased and the share of the minimum wage in the average one expanded. According to IMF (2016a), the distribution of wages in Romania is relatively similar to that of income, but the increase in the minimum wage does not generate a rise in income for all of the poorest households, since they are composed of inactive, retired or unemployed persons. As regards poverty, it is estimated that the minimum wage does not have a statistically significant impact on it in the emerging economies of Europe.

Relationship between minimum wage, inflation and competitiveness

From a social perspective, the minimum wage is a useful instrument for improving the living standard and social equity, but it puts additional pressure on companies for reasons related to the correlation with productivity, competitiveness and employment. Regarding the impact of the minimum wage on inflation, Andreica et al. (2010) estimated that it was a negative one, although very low, one year after the initial shock. The economic competitiveness of companies can be negatively

influenced by the increase in the minimum wage, if this decision results in a rise in prices and a decline in profits. The harsher the competition, including the international one, the more will companies seek for mechanisms, other than the price rise, to adjust the shock induced by the minimum wage.

However, for companies active in the sectors of non-tradable goods, the transfer of the minimum wage to prices will be more significant. Lemos (2008) showed that the transfer of the minimum wage to prices in USA was low, while Harasztosi et al. (2015) found the opposite in Hungary, with profits that maintained their previous levels. Sorkin (2015) demonstrated that, in the long run, the companies adjusted the rising wage costs by higher prices rather than by reducing employment. In general, the adjustment through prices is easier in the sectors with an inelastic demand to prices, because the rise in prices results in higher receipts, with no negative impact on employment. The emerging economies in Europe are more exposed to an erosion of external competitiveness as a consequence of the minimum wage increase, as they have a relatively larger share of labor-intensive exports and a larger share of wage costs, and of a higher rise in wages (including the minimum one) compared to productivity. Rahman et al. (2015) included the minimum wage among the factors that influence exports in the economies of Central and Eastern Europe, along with the global distribution channels, the quality of the human resources and the business environment conditions.

Review of the literature on the effects of minimum wage increase in Romania

Only a limited number of empirical studies exist on the adjustment of the micro- and macroeconomic impact of the minimum wage in Romania, in spite of the significant percentage of employees who are paid the minimum wage. The topic has become increasingly relevant with the frequent changes in the minimum wage level and the periods for which relevant information is available have extended.

Moreover, the literature expanded with an analysis of the microeconomic effects of the minimum wage, as well as with the inclusion of Romania in the comparative analyses made by international institutions, e.g. the IMF.

Thus, Aparaschivei et al. (2011) used a two-stage least squares (TSLS) model to demonstrate that the actual minimum wage has a negative and statistically significant impact on employment and the active population in all age groups, with the highest impact on the population aged 15 to 19. Andreica et al. (2010) estimated that the employment response to the increase of the minimum wage is not uniform, but is rather gradually adjusted depending on the planned wage funds. Thus, the increase of the minimum wage determines an expansion of employment after the first quarter, due to the incentives for hiring persons who are looking for a job, followed by two negative corrections 9 and 12 months after the initial shock, generated by the decisions of the companies facing the rise of wage costs. From 1999 to 2009, a 1% rise in the minimum wage increase rate led to a decline by 0.14% in the rate of increase of the gross average wage after one year. Antonie et al. (2010) demonstrated that the minimum wage has a positive influence on the correlation between the hourly productivity of labor and the hourly remuneration of the employees. Enache (2012) estimated that the national-level increase in the average wage is followed by an actual rise in the minimum wage and unemployment benefits, although relatively low.

The National Bank of Romania (2015) conducted a statistical research on the behavior of companies in the labor market as a result of successive minimum wage increases and reached the following basic conclusions:

- The increase of the minimum wage generated only a limited rise in the gross average wage, as part of the companies also increased the wages of certain categories of employees that earned more than the minimum wage.

- The expansion of the share of the minimum wage in the average wage can hinder the access to the labor market for the categories of employees targeted by the relevant regulations, i.e. lower-skilled or inexperienced workers.
- The impact of the minimum wage is felt to a greater extent by the SMEs in sectors where at least 40% of the employees are paid the minimum wage; the reduction of social security contribution compensated the effects of the initial minimum wage rises on the wage costs of the companies.
- Most companies stated that they would respond to the increase of the minimum wage by raising the prices and by limiting future employment.

The IMF (2016b) showed that the rate of increase of the minimum wage in Romania was the highest of all countries in the region, leading to an increase of the minimum wage share in the average wage in the economy, which was the lowest of all CEE countries in 2000. Nevertheless, the sectors with the highest share of employees earning the minimum wage (construction, trade, hotels and restaurants) did not feel the shock of the minimum wage increase, due to the low prior level and to the economic growth that expanded the turnover.

Regarding the impact, the IMF estimated that a 1% increase of the minimum wage triggered a 0.5% rise in the average wage, but the statistical significance of the impact was relatively low. Furthermore, the value added of exports to the EU declined by 0.08% as a consequence of an increase by 1% of the share of the minimum wage in the average one.

Șerban and Aceleanu (2015) analyzed the correlation between the minimum wage and productivity in the EU and emphasized its impact on the labor market flexibility, especially in the context of the decision of an economy to join the monetary union.

Mărginean and Crețu (2013) identified part of the factors that condition the transfer of the minimum wage increase to the labor market in Romania, e.g. the share of employees who are paid the minimum wage, the share of the minimum wage in the national-level average income and the youth employment rate.

Pană (2015) argues that the institutional rigidities created by the enactment of the minimum wage legislation generate transaction costs for the entrepreneurs in Romania, encouraging them to adopt an evasion behavior.

3. Why is the introduction and increase of the minimum wage to a decent level necessary?

The need to introduce and increase the minimum wage is mainly motivated by the fact that there are full-time employees who earn less than the minimum subsistence or the minimum decent living income calculated for households of employed persons. In spite of working full time, they are at risk of poverty and social exclusion.

The implementation of a decent minimum wage is even more imperative in the countries at the

periphery of the European Union/accession candidates, for at least five reasons.

Firstly, these are countries with a rate of poverty among the full time employees far above the EU average (Romania 14.7%, Serbia 13.8%, Greece 11.6%, Serbia 12.4%, Poland 10.7%, Italy 9.8% and Spain 10.3%, Portugal 9.6%), while the EU 28 average is 7.8%) (Figure 2).



The situation is even more concerning in the case of part-time workers in Romania, with a staggering 59.4%, which is almost four times higher than the EU

average of 15.4%. Serbia has 44.17%, Bulgaria 30.3%, Portugal 29.5% and Greece 28.2% (Eurostat statistics for 2015) (Figure 3).

Figure 2. Percentage of employees at risk of poverty in the total full-time contracts (2015)

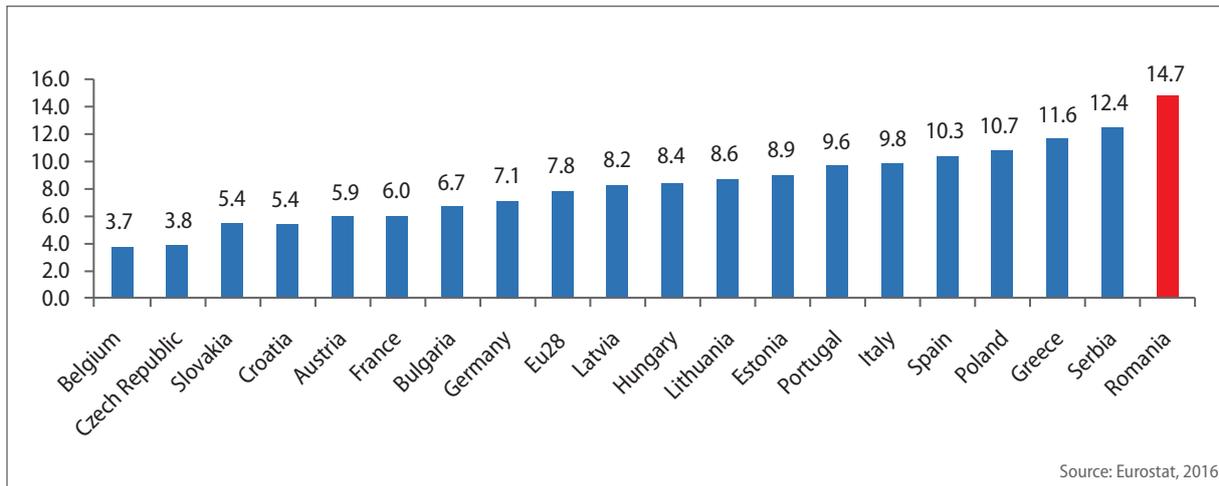
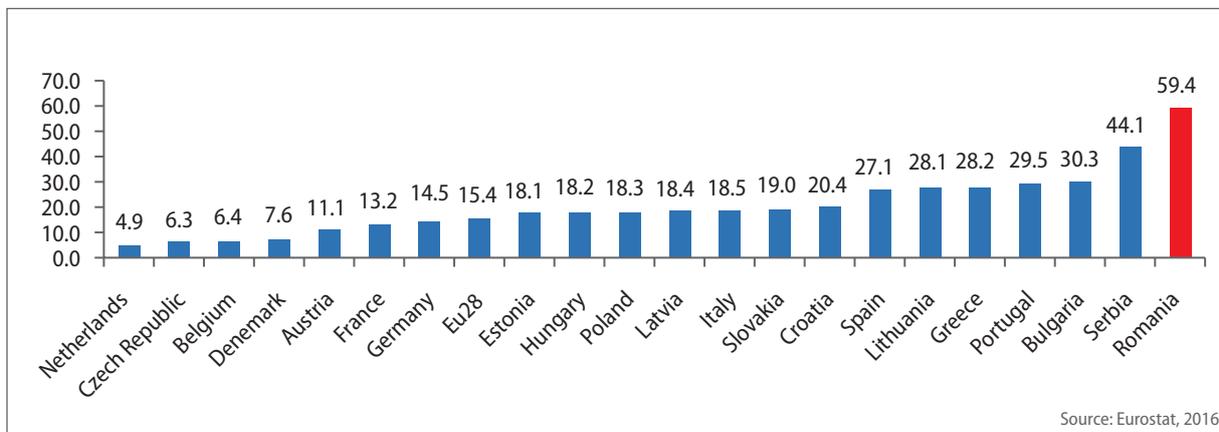


Figure 3. Percentage of employees at risk of poverty in the total part-time contracts (2015)



Secondly, these are countries with a deep income inequality, higher than the EU average. For instance, the Gini coefficient calculated for the equivalent disposable income (on a scale of 0 to 100 points, where 0 is perfect equity and 100 is perfect inequity) in 2015 was 34.8 in Estonia, 35.4 in Latvia, 37.0 in Bulgaria, 37.4 in Romania, 37.9 in Lithuania and 38.2 in Serbia, way above the EU28 average of 31 (Figure 4). In addition to that, Romania experiences a deep polarization of the population's income distribution

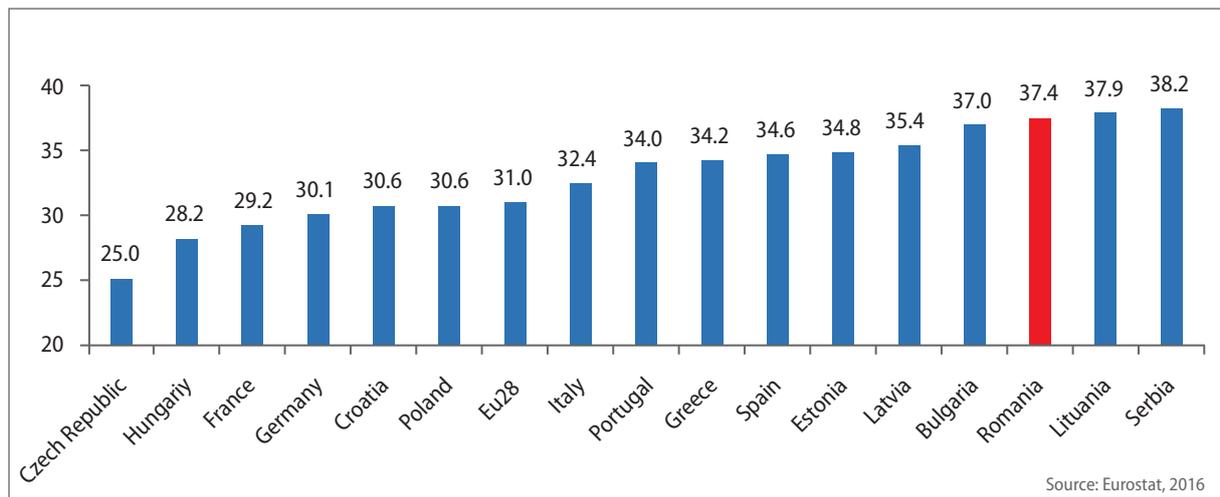
– a ratio of the income of the richest 10% households to that of the poorest 10% of 13.4, compared to 6.5 in Hungary and 8 in Poland. Secondly, these are countries with a deep income inequality, higher than the EU average. For instance, the Gini coefficient calculated for the equivalent disposable income (on a scale of 0 to 100 points, where 0 is perfect equity and 100 is perfect inequity) in 2015 was 34.8 in Estonia, 35.4 in Latvia, 37.0 in Bulgaria, 37.4 in Romania, 37.9 in Lithuania



and 38.2 in Serbia, way above the EU28 average of 31 (Figure 4). In addition to that, Romania experiences a deep polarization of the population's

income distribution – a ratio of the income of the richest 10% households to that of the poorest 10% of 13.4, compared to 6.5 in Hungary and 8 in Poland.

Figure 4. Income inequality in selected EU/non-EU countries expressed as GINI coefficient (2015)



The third basic reason for implementing an adequate minimum wage is the inequitable distribution of the net national income between labor and capital. While in developed countries the 50-55% of the GDP goes to employees' compensations, 35/40% to capital and 10% to net indirect taxes, in Romania, we see quite the opposite, as in 2015 only 33% of GDP was allocated to the remuneration of employees, 55% to capital and the rest to indirect taxes minus subsidies. Moreover, the public intervention for a greater increase of the minimum wage in the recent years was also determined by the need to correct an imbalance associated to the crisis, since the employees carried a significant part of the burden of recession (the share of employees' remuneration in GDP dropped from 42% in 2008 to 32.3% in 2015, according to Eurostat). the share of employees' remuneration in GDP in 2015 was 42.3% in Hungary, 37.4% in Bulgaria, and 37.2% in Poland.

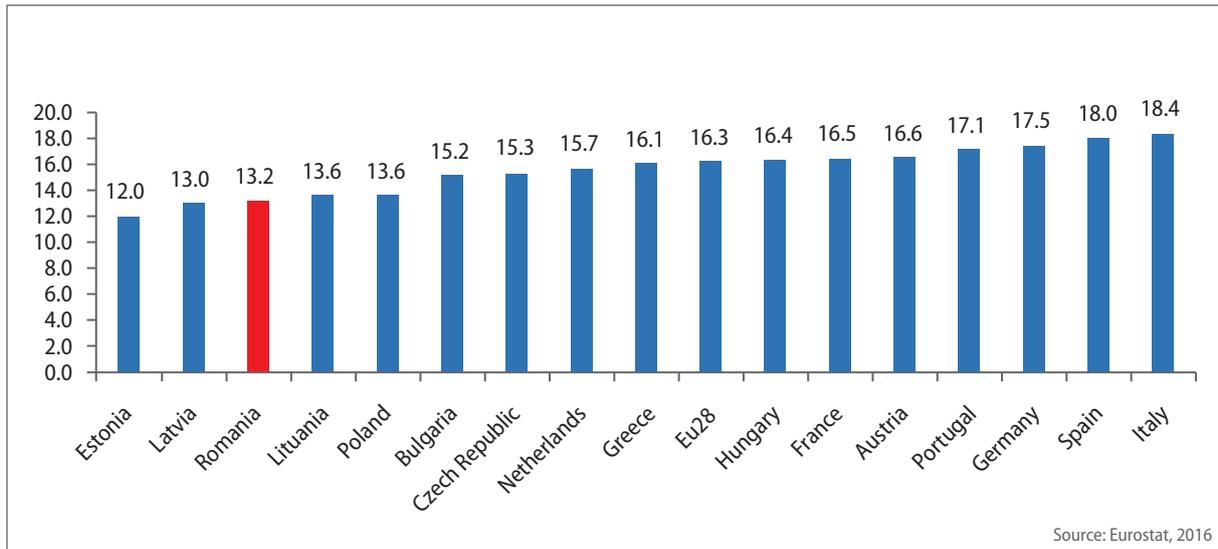
The fourth reason is related to the fact that the benefits of the economic growth are asymmetrically

distributed in Romania and the social lift (the advancement to a higher income decile) is slow.

Although the GDP rose by 28% in Romania from 2007 to 2015 (from EUR 125 billion in 2007 to RON 160 billion in 2015), the rate of poverty and social exclusion risk dropped by only 18.5% (from 45.9% in 2007 to 37.4% in 2015). Analyzing only the gross wages and other wage benefits, we see that 84% of population (the first 8 deciles associated to households, D1...D8) earn as much as 16% of population (the last deciles, associated to the richest households, D9+D10). The social lift is slow, considering that the income transition to a higher decile every 3 years applies only to 13.2% of the total population, below the EU average of 16.3% (of the EU member countries, only Estonia and Latvia rank lower than Romania, with 12% and 13%, respectively) (Figure 5).



Figure 5. Transition of population to a higher income decile over a period of 3 years in total population (2014)



The wage income differences have the most significant contribution to the decile distribution of the income of households, since the wage income of the households in the last decile are, on average, 44 times higher than those of the households in the first decile (RON 4,309.9/month/household in D10 compared to RON 98.7/month/household in D1). The asymmetry can be also seen from a different perspective: if we exclude from the analysis the 3 sectors with average wages significantly above the average of the total economy (financial, IT&C and extractive industry), we note that over 50% of the total number of full-time employees (2.3 million persons) earned in 2015 a gross average wage of RON 1,785 (below RON 1,250 net, i.e. EUR 278). (INSSE, Coordinates of the living standard in Romania, 2015). The fifth reason for implementing a minimum wage at national level and maintaining it at a decent level is the asymmetry of negotiation

power between trade unions and employers, as well as the more flexible Labor Code adopted in 2011. Even though the minimum wage in Romania is established at national level by the Government based on consultations between trade unions and employers, the decline of the rate of unionization (from 35.6% in 2008 to 19.8% in 2012/2013) (Table 1) and the changes in the labor regulations in 2011 weakened the ability of trade unions to achieve their objectives of assuring decent remuneration and reasonable working conditions.



Table 1. Unionization rate in selected countries (2000/2008/2012/2013)

Country	2000	2008	2012/2013
Austria	36.6	29.1	27.4
Belgium	56.2	54.4	55.1
Bulgaria	23	16.6	16.1
Croatia	37.2	34	30.9
Czech Republic	26.8	17.7	12.9
Denmark	73.9	66.3	66.8
Estonia	14.9	7.1	6.2
Finland	75	69.6	69
France	8	7.6	7.7
Germany	24.6	19.1	17.7
Greece	26.5	24	20.8
Hungary	21.7	14.4	10.4
Ireland	38	31.9	29.6
Italy	34.8	33.4	36.9
Latvia	24.4	15.1	12.7
Lithuania	18.4	9.6	8.8
Netherlands	22.9	18.8	17.6
Poland	17.5	15.1	12.3
Portugal	21.6	20.5	18.1
Romania	—	35.6	19.8
Slovakia	32.3	17.2	13.3
Slovenia	41.6	26.6	21.2
Spain	16.6	17.4	17.2
Sweden	79.1	68.3	67.7
UK	30.2	27.1	25.4

Source: Ilostat, 2016

It is absolutely necessary to restore the balance in the process of negotiation between the representative trade unions and employers on the working conditions in order to functionalize an economic model able to assure the economic sustainability. Staying in the vicious circle of low

wages and unsatisfactory working conditions will hinder the achievement of higher productivity and will send Romania into the "average income trap": poor and unevenly distributed economic growth, low investments in education, health care and human resources, etc.

4. What is the optimal level of the minimum wage in the economy? Has it increased too much in Romania?

As regards the optimal level and dynamics of the gross minimum wage in the economy, the International Labor Organization published in 1970 three fundamental principles for fixing a decent level of the minimum wage: correlation of the minimum wage with the consumption needs of workers and their families/the minimum consumer basket, correlation with the government's employment expansion targets and due consideration to the factors related to the need for productivity improvement and economic growth.

The European Social Charter revised in 1996 stipulates the need for a fair remuneration able to assure a decent living standard for workers and their families. This could be achieved through a net minimum wage equal to 60% of the net average wage. This corresponds to a gross level of 50% to 60% of the gross average wage, depending on the progressiveness of taxation (the higher the taxation progressiveness, the closer the gross minimum wage percentage to 50% of the gross average wage).

A joint report of ILO, OECD, IMF and WORLD BANK (G20, 2012) considers that a minimum wage level of 30-40% the median value of the gross average salary (equivalent to a minimum wage of 25-30% of the average wage) would have net positive effects.

IMF (2016a) concludes that, for the CESEE countries, if the minimum wage exceeds 45-50% of the average wage, the negative effects of the minimum wage increase can outstrip the benefits. It is stated, for instance, that "an increase of 10% beyond this

limit is associated to a 2% decline in youth employment." Conversely, if the minimum wage is 30% of the average wage, an increase by 10% in the minimum wage would trigger a contraction of youth employment by only 0.4%.

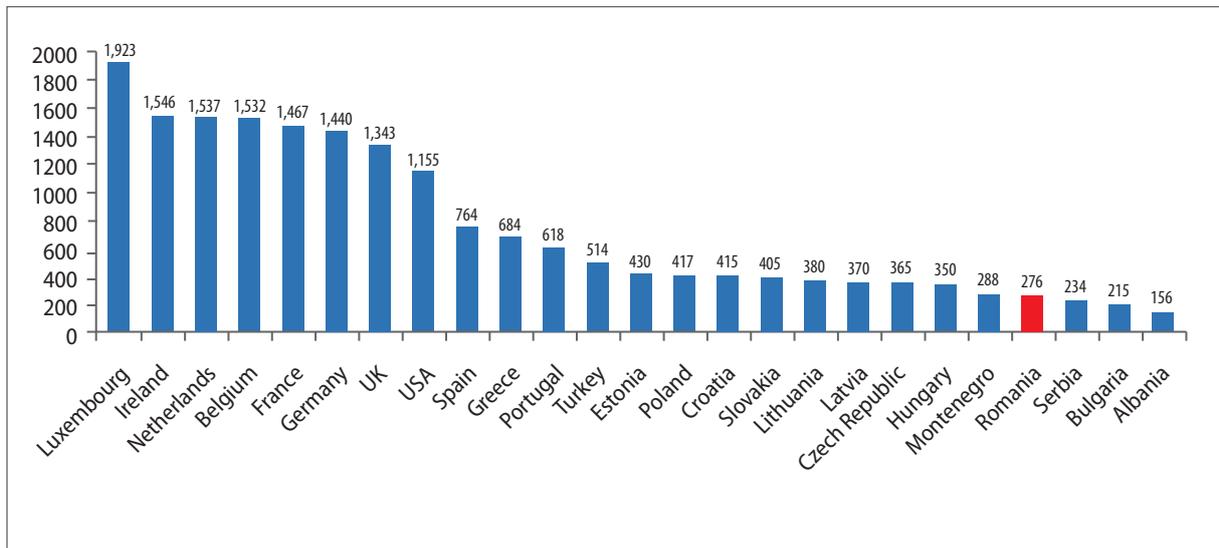
An IMF report (Country Report Romania, Selected Issues, No. 16/114, 2016b) shows that, following the increase in May 2016 to RON 1,250 (+78.6% from the end of 2012) the gross minimum wage "will reach 45.3% of the average wage, which is a high value according to the international standards".

The IMF experts do not necessarily say that the gross minimum wage (in EUR, for comparison purposes) is high, but that its increase is too fast. Specifically, its share of over 45% of the average wage exceeds the optimal threshold of sustainability beyond which an excessively fast positive evolution of the minimum wage would boost the negative effects on the economy (on employment, competitiveness, etc.) outstripping the benefits generated by this public policy (reduction of inequality, action of the efficiency wage theory, expansion of consumption, rise of the living standard and a favorable impact on the economic growth).

A comparative analysis of the minimum wage in the economy and of its purchase power in EU countries/non-EU countries in the region shows that in the second half of 2016 Romania ranked second to last in the European Union in point of minimum wage level in Euro (Figure 6) and third to last in point of minimum wage at purchasing power parity (Figure 7).

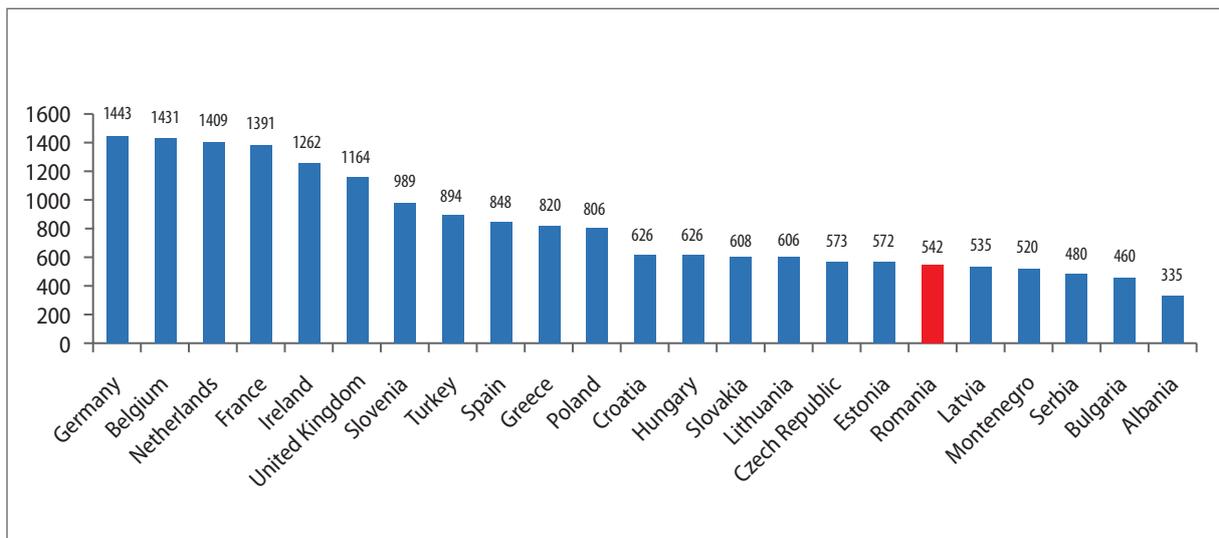


Figure 6. Minimum wage in selected EU/non-EU countries in Euro (H2 2016)



Source: Eurostat, 2016

Figure 7. Minimum wage at purchasing power parity in selected EU/non-EU countries in EUR (H2 2016)



Source: Eurostat, 2016

Within a few years, the "advantage" of cheap and relatively skilled labor will disappear as a result of convergence of income with the European average, even though at a slower pace than the convergence of prices with the EU average. The loss of this advantage will force the process of drawing high value added investments involving advanced technology and investments in human resources,

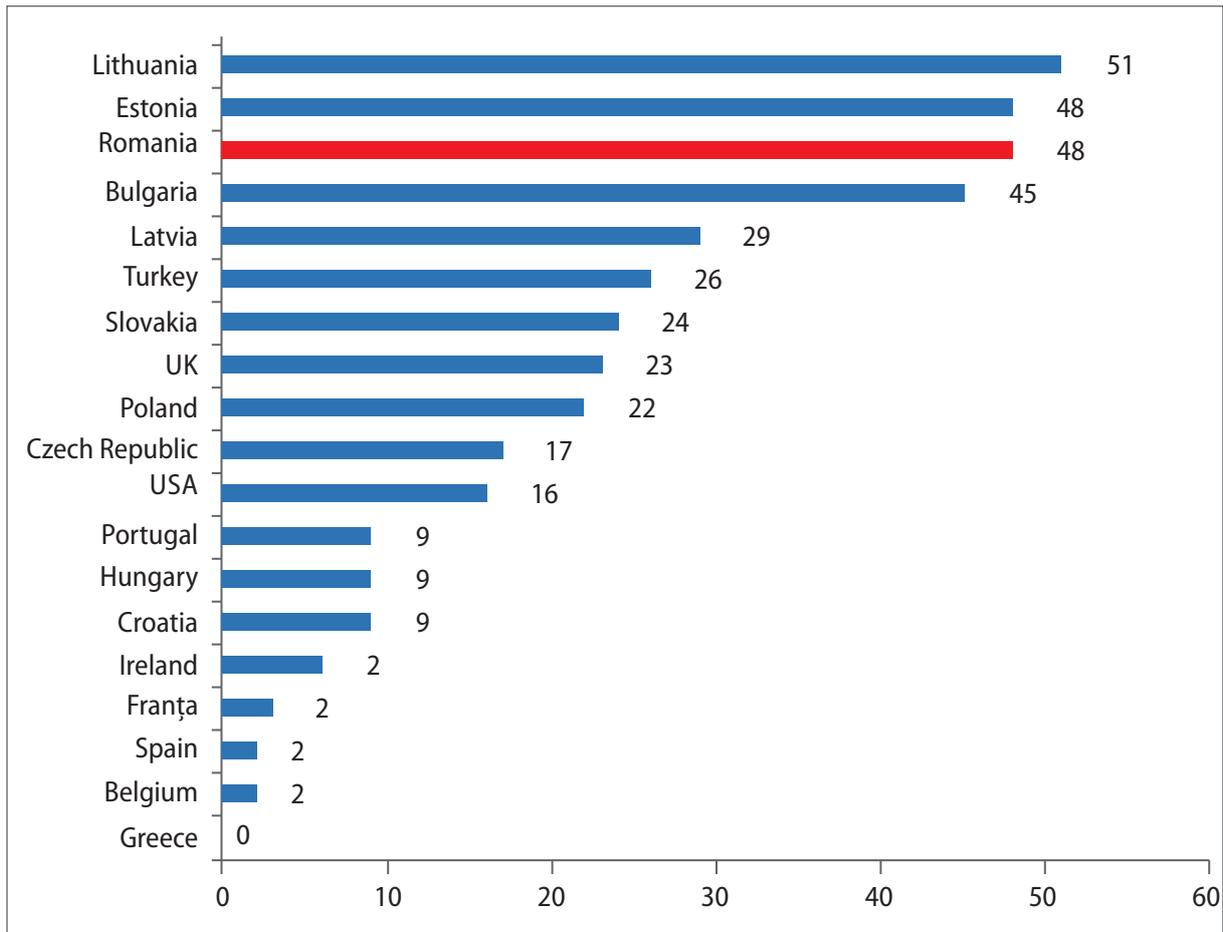
research and development, all boosting an endogenous economic growth. Romania will be able to access the target of making the transition from an efficiency-based economy to an innovation-based, according to the phases explained by the World Economic Forum in the Global Competitiveness Report.



The analysis of the increase in the gross minimum wage in the economy from H2 2012 to H1 2016 indicates an abrupt rise of the minimum wage in Romania (in EUR) (+48% – the third highest increase in EU after Lithuania and Estonia) (Figure 8).

However, we should be cautious in drawing a conclusion, since Romania started from the second lowest minimum wage in EUR in the European Union.

Figure 8. Increase of the gross minimum wage in selected EU/non-EU countries from H2 2012 to H1 2016



Source: Eurostat, 2016

We propose the assumption that the optimum level of the minimum wage for Romania is 50% of the average wage, in line with studies showing that in the CESEE countries with a low minimum wage (in EUR), high tax evasion, deep inequality and poverty, an established gray market in point of reporting and payment of actual wages, etc., the 50% share of the minimum wage in the average one is equivalent to 45% in developed countries.

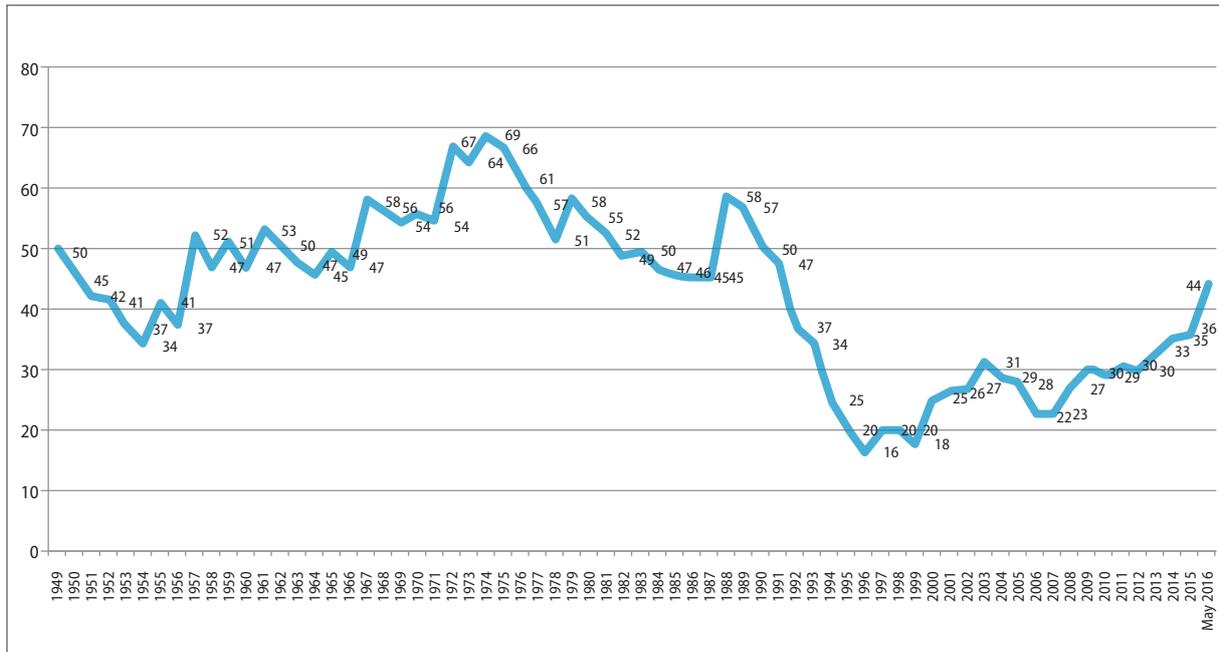
Therefore, we will consider the 50% threshold of the minimum wage share in the average one for Romania as the level that maximizes the net benefits in the economy and society, stimulating the aggregate demand and, consequently, the economic growth, correcting the imperfections in the labor market (market failure caused by monopsony situations, high costs of looking for a job, structural rigidities in the labor market, asymmetrical information and poor transparency), improving productivity and the living standard and reducing inequality and poverty.



Now, we can analyze what happened in Romania from 1990 to May 2016 or, more interestingly, we can see the evolution of the share of the minimum in the average wage over a longer period, specifically,

from 1949 to May 2016 (1949 being the year when the minimum wage was introduced in Romania (Figure 9)).

Figure 9. Evolution of gross minimum wage share in the gross monthly earnings (1949-May 2016)

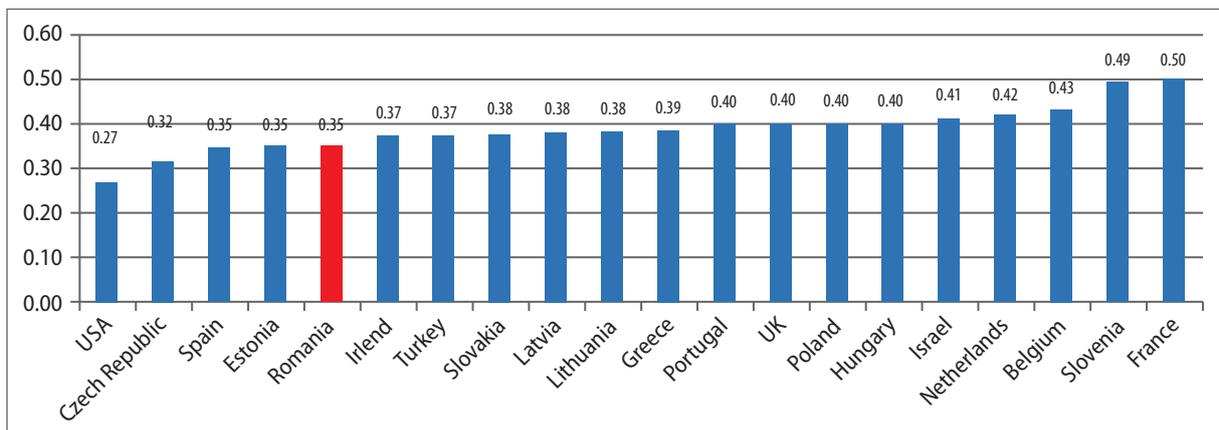


Source: Ministry of Labor, INSSE, 2016

We note that, over the entire 1992-2015 period, the gross minimum wage did not exceed 40% of the gross monthly earnings. The implementation of the neoliberal agenda's model, mostly in the first years of the transition, can be also illustrated by the evolution of this indicator, as the absence of

consistent policy to raise the income expanded the inequality and the economic and social polarization. The last 4 years saw a substantial increase in the minimum wage, from 30% of the gross average earnings in 2012 to 44% in May 2016.

Figure 10. Share of the minimum wage in the average wage in selected countries (2014)



Source: own processing of 2016 OECD data



As regards the comparison to other EU/non-EU countries, while until 2014 Romania was in the lower half of the rankings, with a minimum wage of 35% of the average one (Figure 10), in May 2016 it will make

it to the upper half, with a 44% level that is consistent with the need to reduce economic inequalities, poverty and economic deprivation and to boost work efficiency.

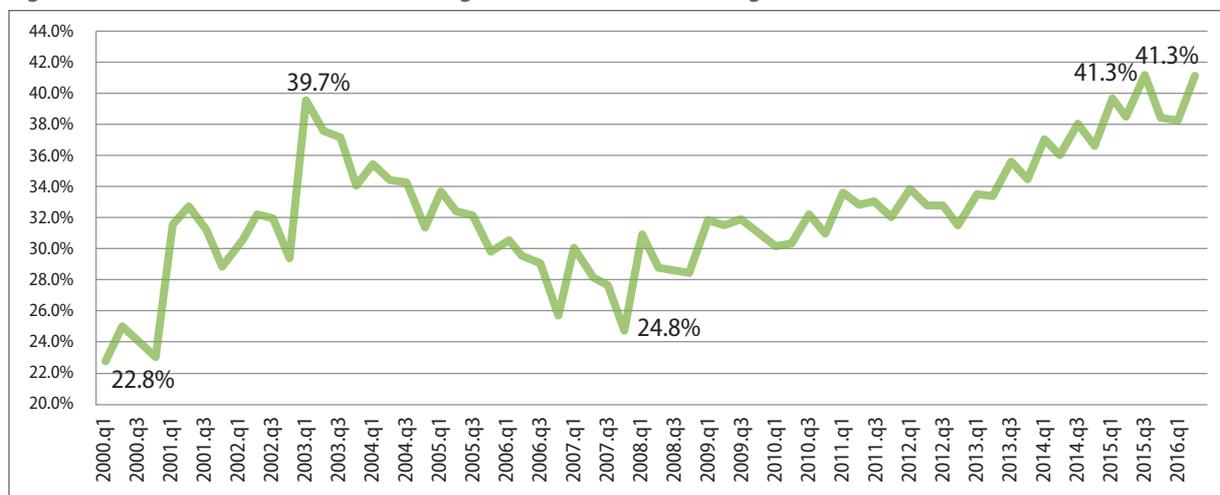
5. Was the increase of the minimum wage correlated with the rise in productivity?

The share of the minimum in the gross average wage at national level had two inflection points in the analyzed period (2000-2016), as shown in Figure 11. Thus, the percentages of increase in the minimum wage were high in the first three years (122% in 2000, 40% in 2001, and 42% in 2003), starting from a very low level, which resulted in a minimum wage of around 40% of the average one in Q1 2003. From 2004, the minimum wage was rather correlated to the evolution of inflation than to the economic growth and income expansion, so that in Q4 2007 it only amounted to about one quarter of the average one. The evolution differed from the average one in the countries of the region, where the minimum wage was above 40% of the average one. The option of the authorities in Romania for a slow increase of the minimum wage may seem surprising, considering that expansive taxation measures (flat tax and a reduction in social welfare contribution) were introduced to diminish the wage costs of companies. Moreover, the economic growth in

2004-2007 could have easily outweighed the impact of stabilization of the minimum wage at about 40% of the average one.

The around 40% year-on-year increase of the minimum wage in 2008 stabilized it at 30-32% of the average wage during the economic crisis, a percentage similar to those in other EU countries, such as the Czech Republic and Estonia, but at least 5% below the ones in Bulgaria, Hungary, Latvia, Lithuania, Slovenia and Poland. Since 2013, seven successive minimum wage increases have been applied in connection with tax reductions and economic recovery. The share of the minimum wage in the average one rose from 2013 to 2016 at a high rate compared to the economies in the region, but the level reached (41.3% in Q1 2016 and 44% in May 2016) is below the one in Poland, Slovenia, Hungary, Latvia and Lithuania. In fact, according to IMF (2016b), the mean percentage of the minimum wage in the average one is approx. 46% in the CESEE countries.

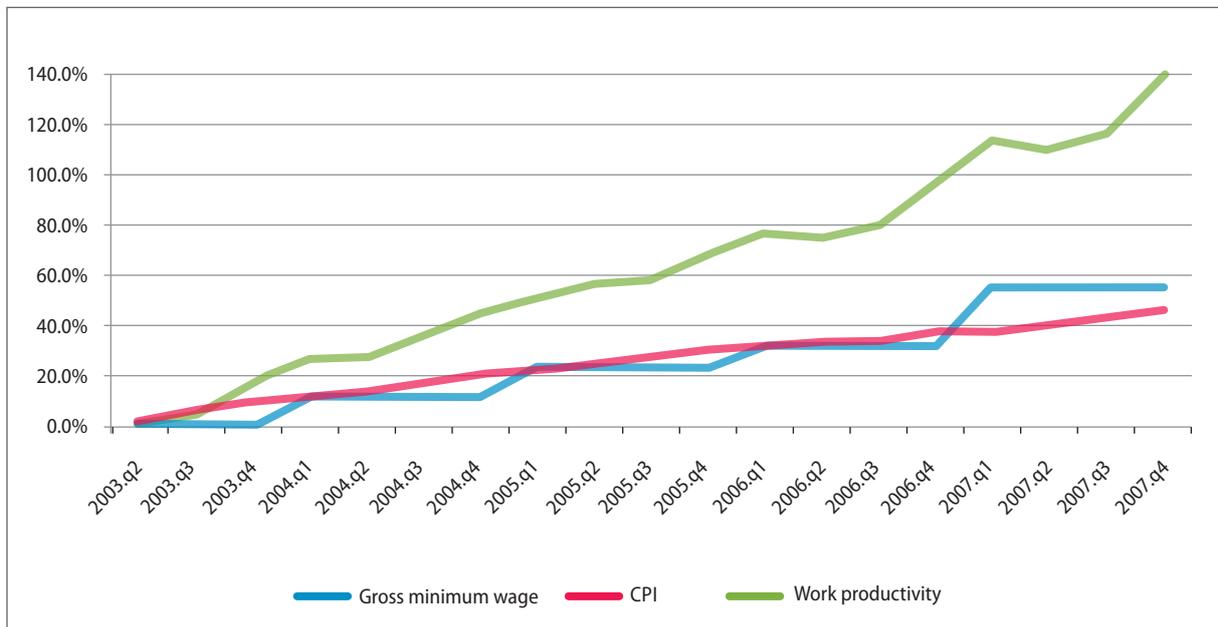
Figure 11. Evolution of the minimum wage in relation to the average one



Considering the two inflection points shown in the previous chart, we compared for two subperiods the dynamics of the minimum wage to the evolution of work productivity at national level (determined as the ratio of gross value added to employed population) and of the consumer price index. Thus, according to Figure 12, from Q2 2003 to Q4 2007, the productivity increase rate was 2.5 times higher than

that of the minimum wage, which rose by only 56% in nominal terms, with the values from Q1 2003 being considered as 100%. The dynamics of the minimum wage was even inferior to that of inflation up to Q1 of 2007, a fact also reflected by the decline in the purchasing power of the employees paid at the minimum level.

Figure 12. Relationship of the minimum wage to productivity and inflation (2003:2-2007:4)

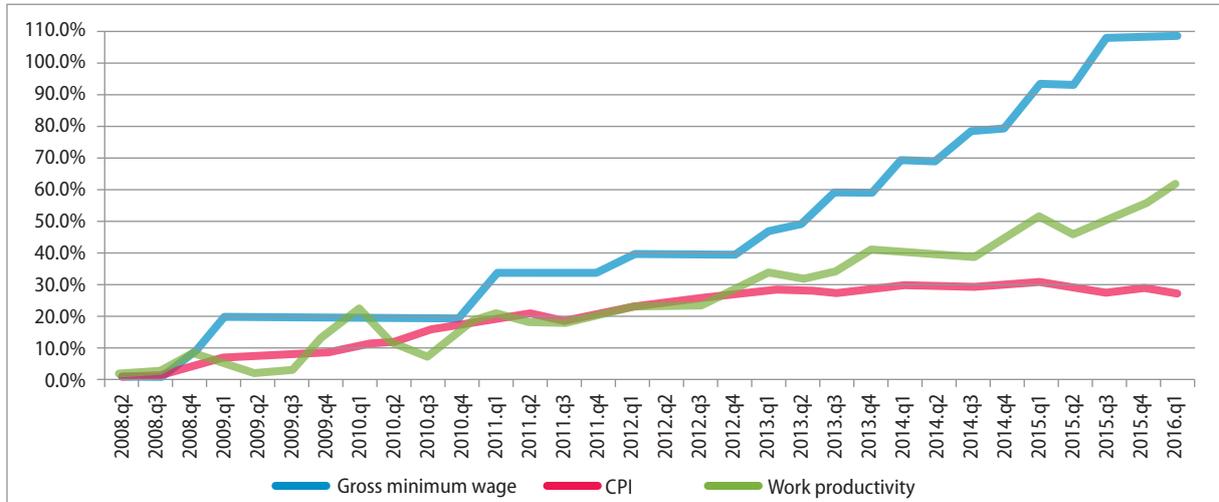


The lack of correlation between the minimum wage and work productivity, specific to the 2003-2007 subperiod, was also present in 2008-2016 (Figure 13), but in the latter the increase of the minimum wage was superior to that of productivity: 110% and 62.4%, respectively, compared to Q1 2008 (100%). The lack of connection to productivity and inflation was obvious from the moment when the minimum wage became a priority of the government policy. While before 2008 the minimum wage was neglected and not correlated to the overall situation of the economy, from 2013 the relatively high rates

of economic growth allowed for a rise in the wage ceiling, which, in turn, boosted consumption and growth beyond the initial forecast levels. Furthermore, the successive increases of the minimum wage expanded the purchasing power of their beneficiaries by 65%, in the context of the deflation pressure put on the Romanian economy by internal factors (cuts of VAT for food and of social welfare contributions, demand deficit, etc.), as well as by external ones (decline in the global price of raw materials, slow recovery of the global economy, etc.)



Figure 13. Relationship of the minimum wage to productivity and inflation (2003:2-2007:4)



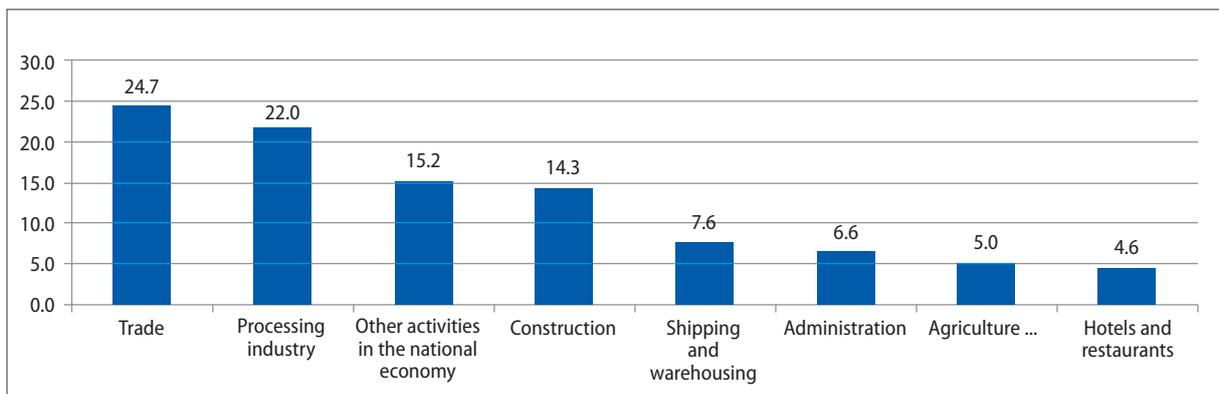
6. Did the increase of the minimum wage affect the economic competitiveness in Romania?

In this section of the paper, we will see how the increase of the minimum wage in the economy affected the economic competitiveness, especially in sectors with a significant share of employees paid at the minimum level. We will analyze how employment increased or decreased in these sectors, what happened to the personnel employed, the turnover of companies, the gross value added generated by them and the profit/loss of the financial year.

In 2013 (the last available data), 430,361 full-time employees, i.e. 11.2% of the total full-time workers,

had a gross income below the gross minimum wage in the country. The distribution of the workers with a gross income lower than/equal to the minimum wage in the economy shows that almost 80% of them were employed in trade, processing industry, construction, shipping and warehousing, agriculture, hotels and restaurants. Three sectors - trade, processing industry and construction - had 60% of the total employees with a gross income lower than/equal to the minimum wage in the country (Figure 14).

Figure 14. Distribution of the employees with a gross income lower than/equal to the minimum wage in the country



Source: INSSE, 2016



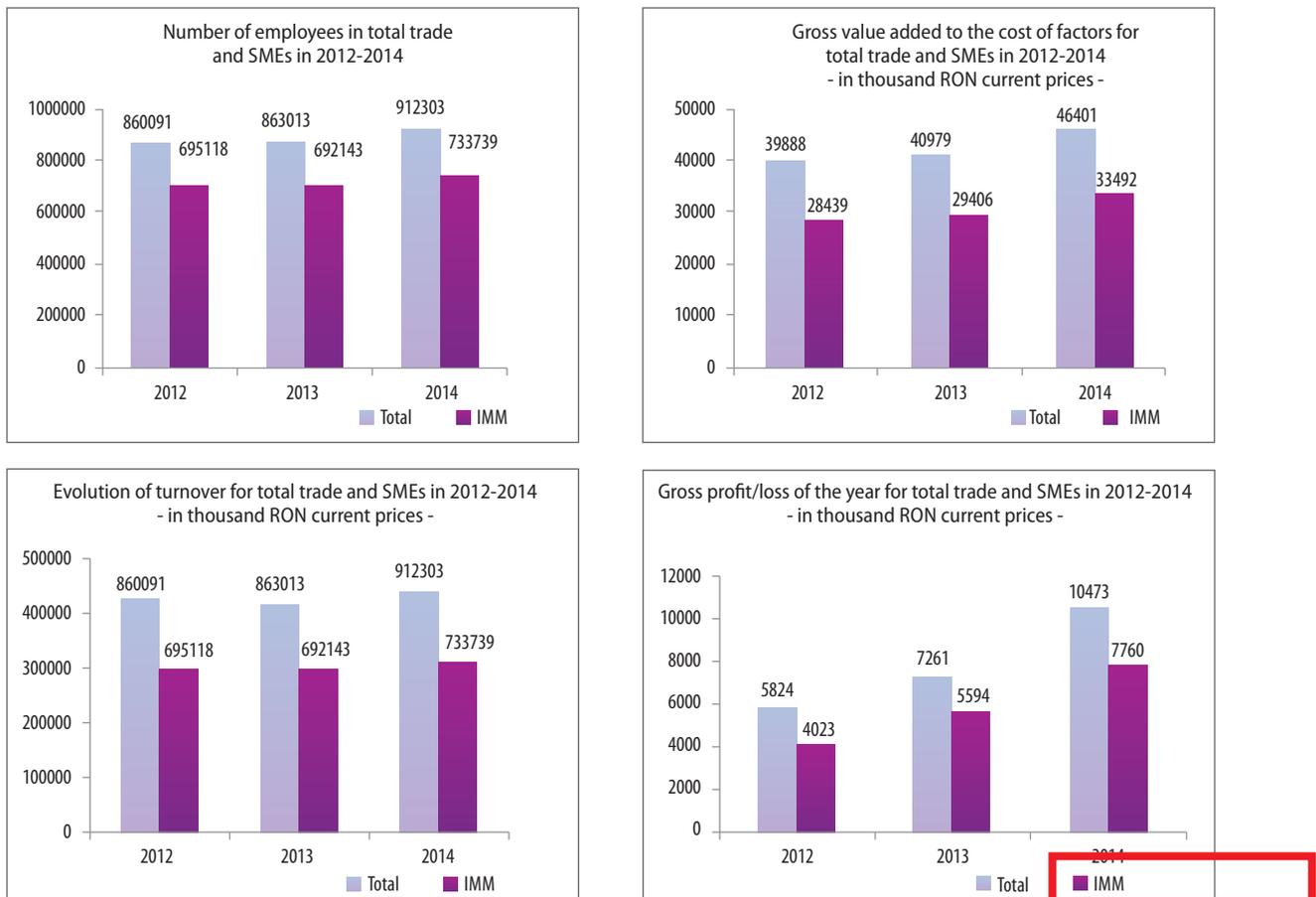
There are studies that indicate a negative correlation between the dynamics of the minimum wage and the evolution of the competitiveness of companies in sectors where the majority of workers are paid up to the gross minimum wage. The conclusion is that an increase in the gross minimum wage could lead to a decline in the number of companies active in these sectors (the higher labor costs would impair productivity or even cause a gross loss in the financial year, resulting in bankruptcy, insolvency, etc.), a decrease in the gross value added in these sectors, contraction of employment and a negative evolution of the turnover.

Based on the data made available by INSSE for the 2000-2014 period, we note that the indicators were influenced by the economic crisis that affected the aggregate demand from 2009 to 2011 rather than by the increase in the gross minimum wage in the economy.

IMF (2016a) considers that the gross minimum wage in the country increased significantly in the 2012-2015 period, from RON 700 to RON 1,050 (+50%). With no statistics available regarding the performance and results of companies in 2015, we will look at the 2012-2014 period to confirm or not the correlation between the increase in the gross minimum wage in this period (from RON 700 in 2012 to RON 900 in 2014, i.e. plus 29%) and the performance of the companies in the trade, processing industry and construction sectors.

In the trade sector, the number of employees rose from 2012 to 2014 by 52,212 persons, the gross value added expanded by 16.3%, the turnover augmented by 4% and the sector profitability grew by 80% (Figure 15). Similar evolutions were seen in the sector of services. The IMMs, which have a significant share of wage costs, had the same positive tendencies.

Figure 15. Results and performance of trade companies, 2012-2014



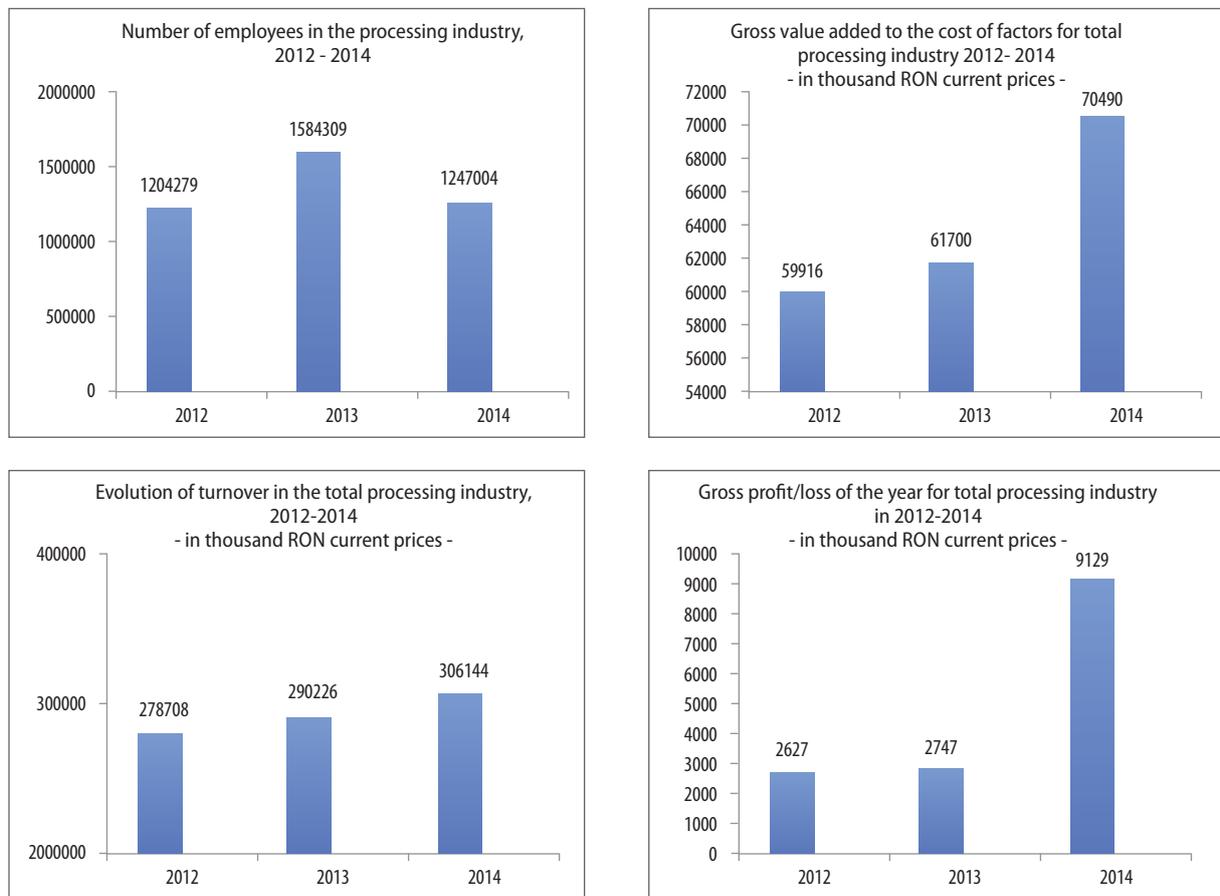
Source: INSSE, 2016



In the processing industry, the results and performance indicate positive evolutions of the gross value added, turnover and profitability, while employment expanded from 2012 to 2014, with a peak in 2013 (in 2014, the number of employees declined from 2013 by a smaller margin than that of the increase from 2013 to 2014, so that the evolution from 2012 to 2014 is positive).

Thus, the number of employees in the processing industry from 2012 to 2014 rose by 42,725 (a significant increase occurred from 2012 to 2013, after which it declined, but remained higher in 2014 than in 2012), the gross value added expanded by 18%, the turnover by 10%, while the gross profit in 2014 was 3.5 times higher than in 2012 (Figure 16).

Figure 16. Results and performance in the processing industry, 2012-2014



Source: INSSE, 2016

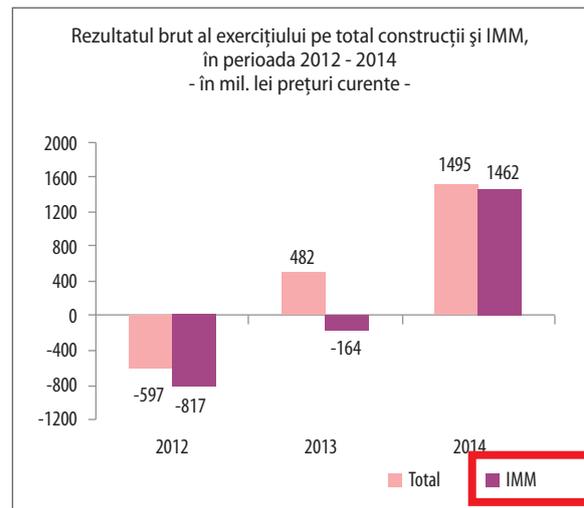
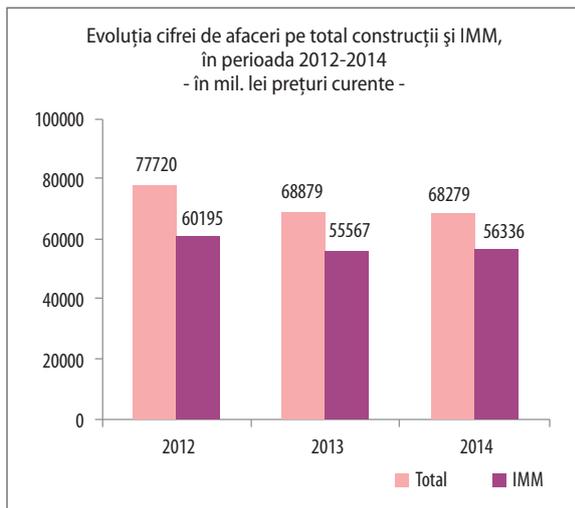
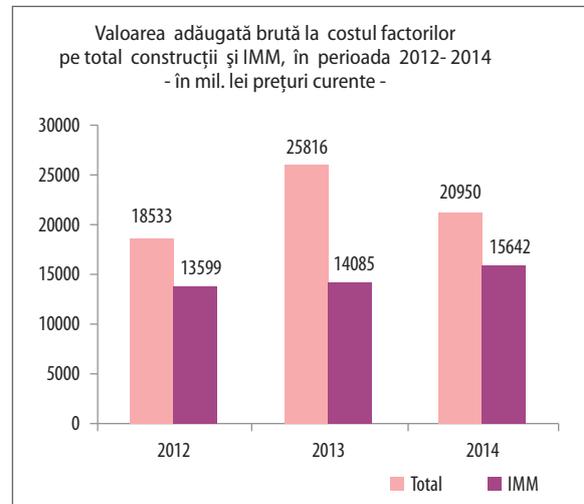
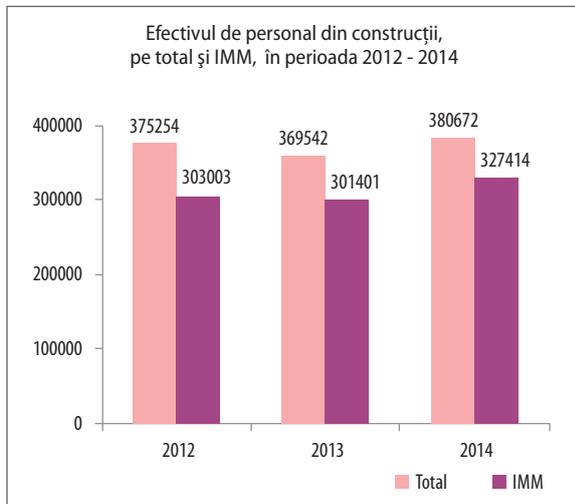
It is important to note that the processing industry accounted for 63% of the total exports in 2014 and can be considered as the main sector that produces tradables in Romania. The opinions according to which the increase of the gross minimum wage in the economy from 2012 to 2014 was abrupt and impaired Romania's external competitiveness are contradicted by the performance of the processing industry described by the indicators above. We can conclude that, overall, the companies in the

processing industry neither transferred the impact of the increase in the gross minimum wage to prices, nor laid off employees.

In the construction sector, the performance was lower, with an expansion of employment by 5,418 persons in 2014 compared to 2012, a value added in 2014 13% higher than in 2012 and triple profitability (Figure 17).



Figura 17. Rezultate și performanțe ale sectorului construcții 2012-2014



Source: INSSE, 2016

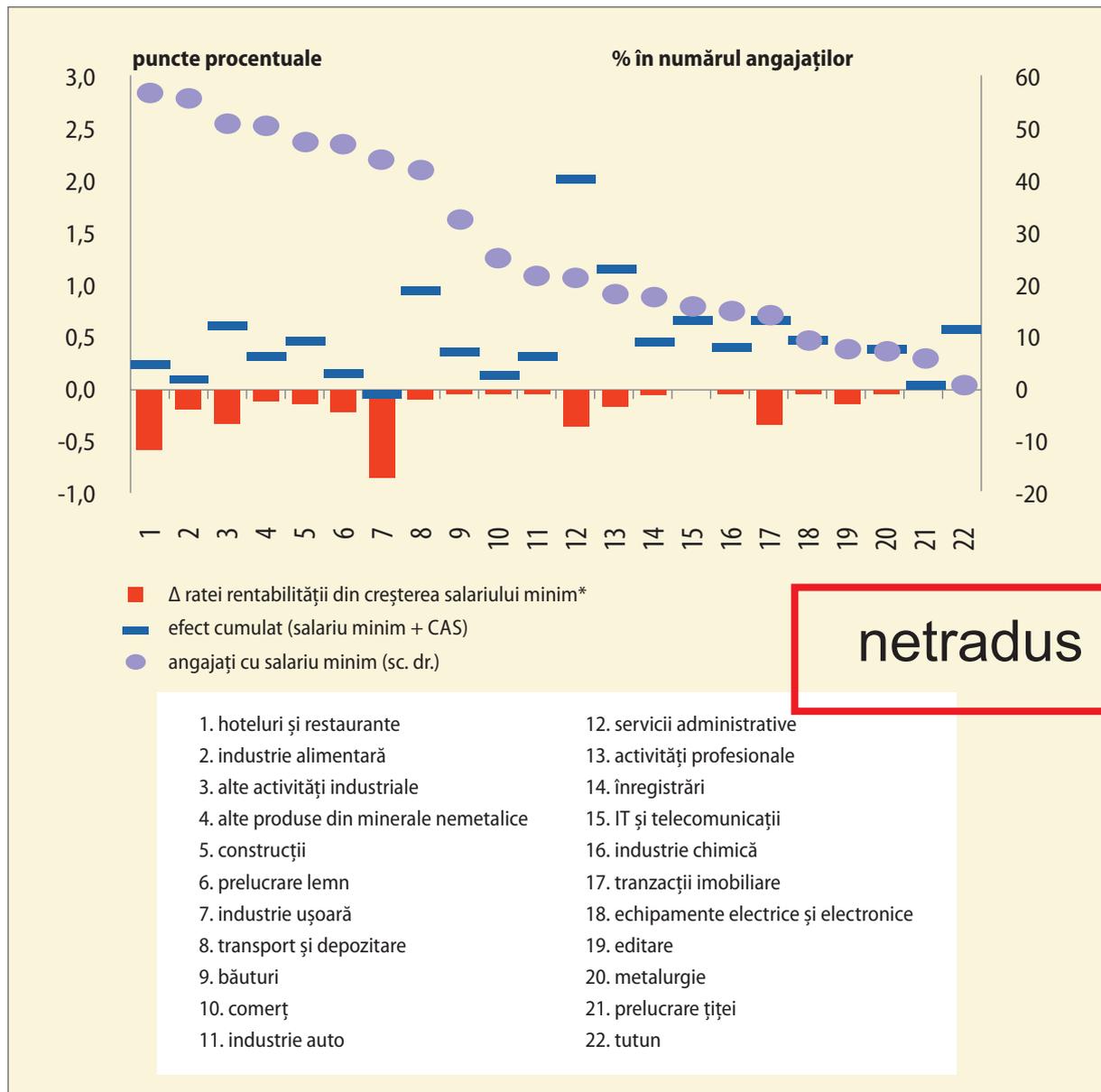
To conclude, the idea of competitiveness decline in sectors with a significant share of employees who are paid the gross minimum wage in the economy is not validated empirically, as the results in these sectors indicate a higher level of performance in 2014 compared to 2012, in spite of an increase by almost 30% of the gross minimum wage in the same period.

The idea of combining the increase of the minimum wage with a cut in the social welfare contributions payable by employers was included in the

government program for 2012-2016 and was implemented so that to obtain a net positive impact on employment and economic performance in the private sector, as the two measures boosted each other's effects. The combination was successful. The mix of minimum wage increase and a reduction by 5% of the social welfare contributions payable by employers had "a slightly positive net impact on the profitability rate of most economic activities, even though the impact was almost absent in certain sectors (food industry, trade) or even marginally negative (light industry)" (NBR, 2015) (Figure 18).



Figure 18. Impact of the changes in the minimum wage and social welfare contributions on the profitability of companies in 2014-2015



Sursa: BNR, 2015

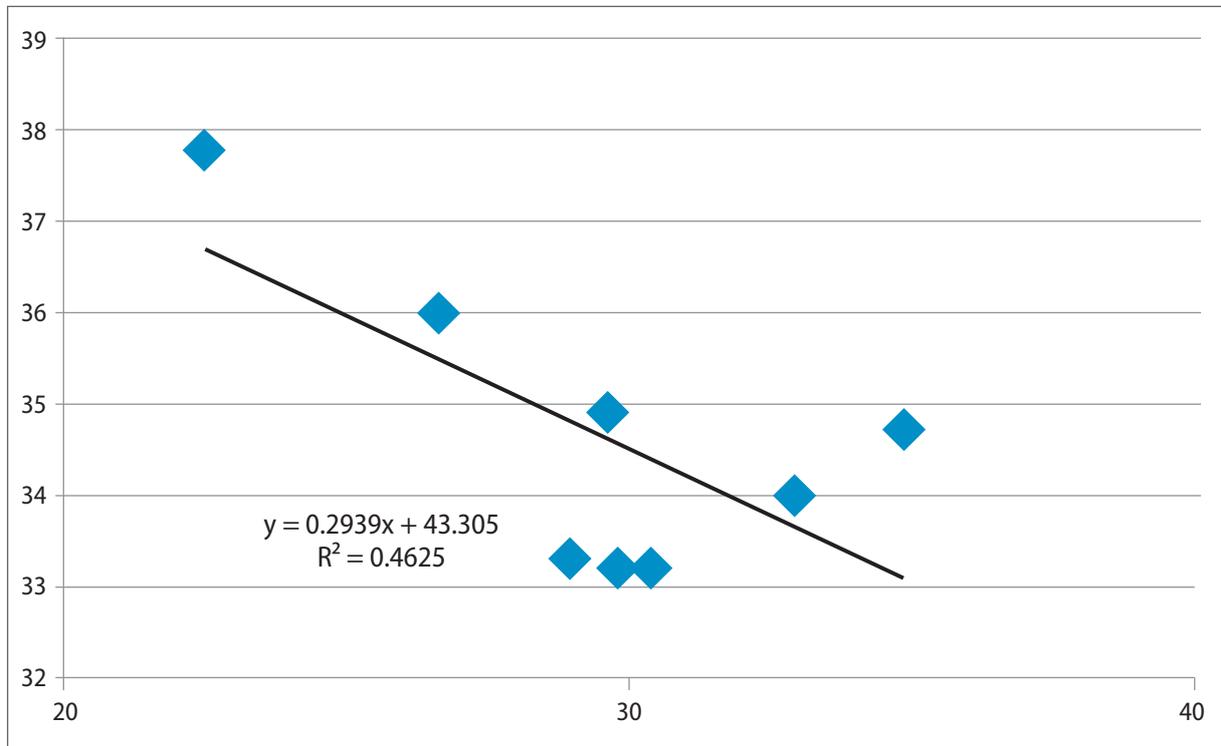
7. Did the increase of the minimum wage influence the reduction of income inequality?

Along with other social equity measures, the use of the gross minimum wage increase as an instrument to reduce income inequality in Romania yielded positive results. Thus, while the share of the minimum wage in the average monthly earnings rose from 23% in 2007 to 35% in 2014 (+12%), the GINI coefficient (which rates the income inequality on a scale of 0 - perfect equity to 100 - perfect

inequality) dropped by 3.1 points (from 37.8 in 2007 to 34.7 in 2014). However, the analysis of the simple statistical correlation does not indicate a strong connection between the increase of the gross minimum wage and the reduction of the income inequality reflected by the evolution of the Gini indicator (Figure 19).



Figure 19. Simple statistical correlation between the share of the gross minimum wage in the gross average earnings and the Gini coefficient of income inequality (2007-2014)



Another relevant indicator of the extent of income inequality shows combined evolutions, depending on the relationship type. Thus, while according to the S80/S20 ratio in 2007 the income of the richest 20% of households in Romania was 5.07 times higher than that of the poorest 20%, in 2014, the ratio went up to 7.2. If we look at the results from the

perspective of the ratio of average income of a person in the richest 10% of households to that of a person in the poorest 10%, we note a decline in the income inequality, as the ratio fell from 8.5 in 2006 to 7.6 in 2014, to rise to 8.4 in 2015. (For details, see the Social Tendencies Report 2007 and 2015, INSSE.)

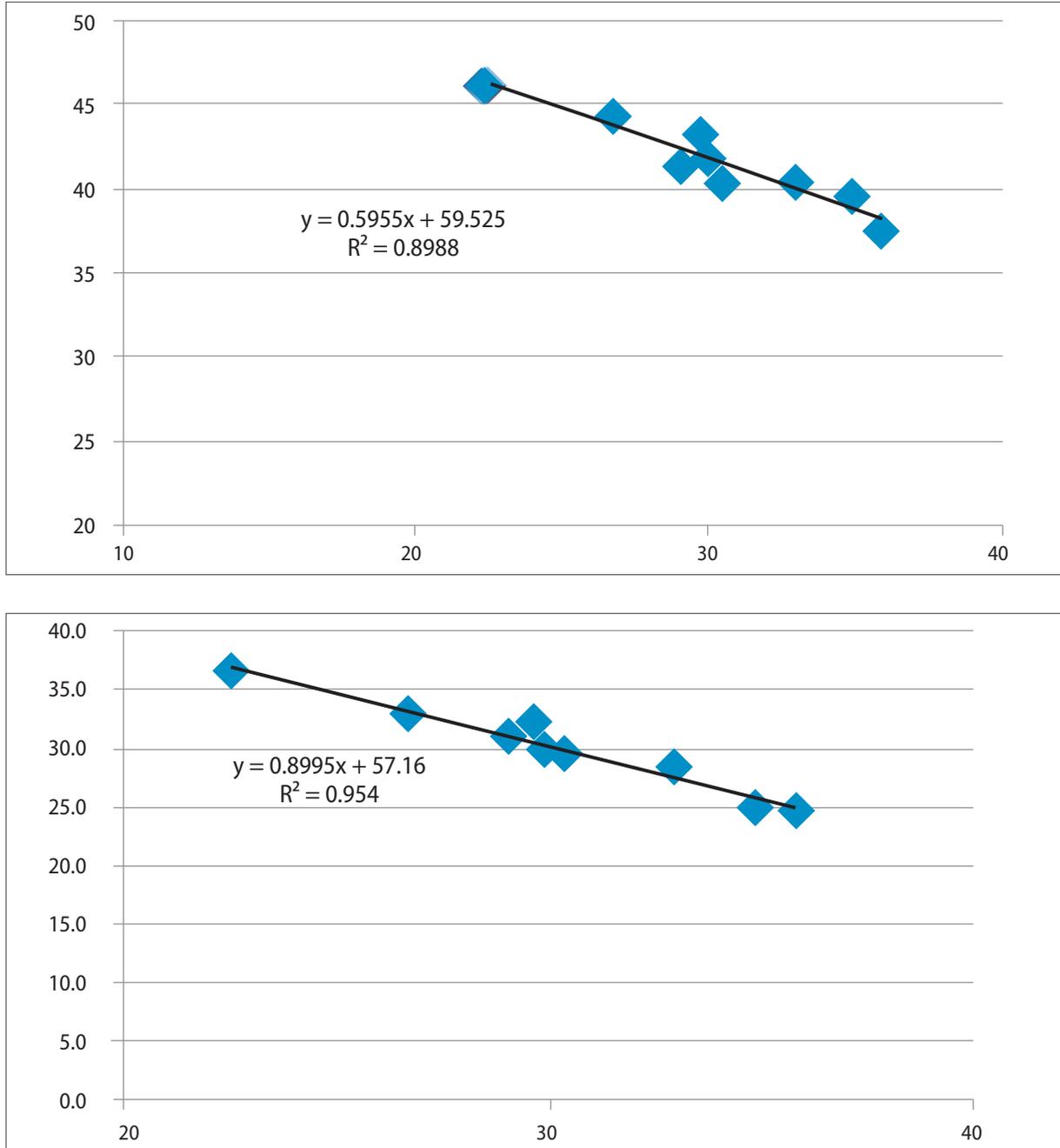
8. Did the increase of the minimum wage influence the reduction of poverty? Statistical analysis of the correlation between the increase of the minimum wage and the diminishing of the risk of poverty/reduction of the economic deprivation rate

As regards the effectiveness of the use of the minimum wage as an instrument to reduce poverty, we note a strong and negative correlation between the share of the gross minimum wage in the gross average monthly earnings and the rate of poverty and social exclusion, as well as between the share of the gross minimum wage in the gross average monthly earnings and the rate of economic

deprivation (Figure 20). Thus, with an increase in the share of the gross minimum wage in the gross average monthly earnings by 13% (from 23% in 2007 to 36% in 2015), the poverty and social exclusion risk rate dropped by 12.5% (from 45.9% in 2007 to 37.4% in 2015) and the economic deprivation rate by 11.9% (from 36.5% in 2007 to 24.6% in 2015).



Figure 20. The simple statistical correlation between the share of the gross minimum wage in the gross average earnings and the poverty and social exclusion risk rate (top) and between the share of the gross minimum wage in the gross average earnings and the economic deprivation rate (bottom) (2007-2015)



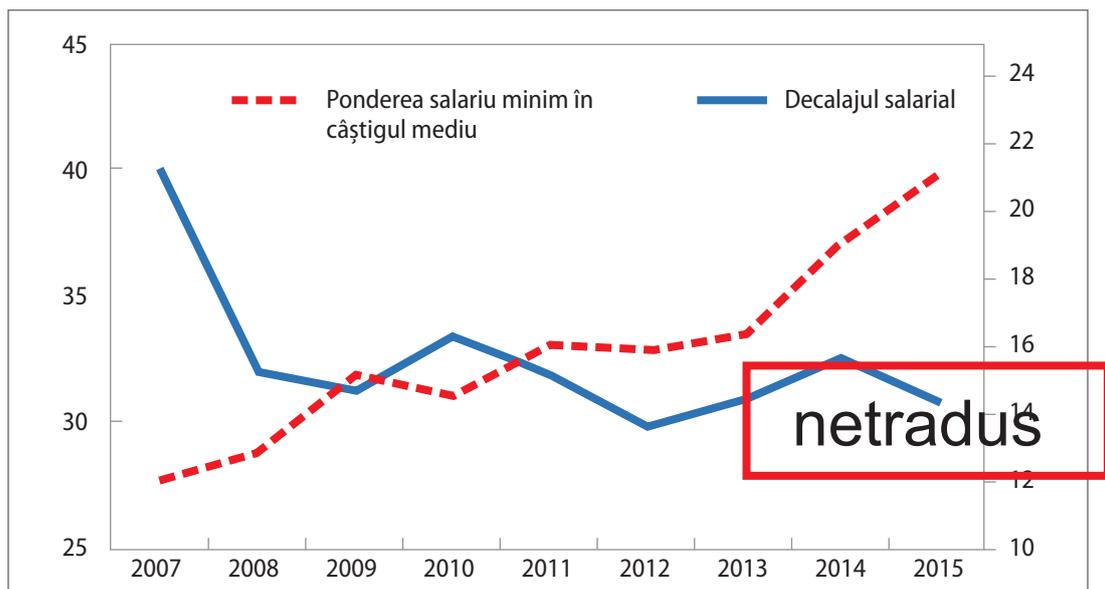
The latest studies show the relevance of the evolution of the economic deprivation rate as an indicator of reduction of poverty (especially of persisting poverty) and of decrease of income inequality. The analysis of the dynamics of the Gini indicator and of the rate of poverty and social exclusion becomes secondary in importance from

the perspective of methodology of formation of these indicators. We consider that the analysis of the impact of the increase in the minimum wage on the reduction of poverty and of the income inequality on the rate of economic deprivation is more relevant.

IMF (2016a) considers that "the minimum wage increase and its ripple effect across wage distribution gave boost to short-term consumer spending" and consequently to the economic growth. Moreover, "the minimum wage increase had a direct effect on wage distribution, raising the income of a relatively large number of employees at the bottom part of the wage distribution and

narrowing wage gaps between high and low pays". The analysis of the comparative evolution of the minimum-to-average wage ratio and of the wage gap (the ratio of the employment income of decile D10 - the richest 10% of households - to the one in decile D1 - the poorest 10%) confirms the facts stated above, especially in the last two years (Figure 21).

Figure 21. Dynamics of the share of the minimum wage in the gross average earnings vs. wage gap dynamics



Source: FMI, 2016a

9. Was the minimum wage dynamics correlated to the evolution of the minimum income for a decent living standard and subsistence?

The level and dynamics of the minimum wage should be correlated with the dynamics of the minimum consumer basket. To test this connection, we used the consumer basket for a minimum decent living standard and the one required to assure the minimum subsistence level, as calculated by Mihăilescu (2012) (researcher at the Quality of Life Research Institute of the Academy of Romania) for the 2001-2011 period. For 2012-2015, we extrapolated the normative method used by the author by inflating/deflating the minimum consumer basket of the previous year considering the specific annual specific weighting factor of the households of employees and the year-on-year Consumer Price Index (CPI) related to these

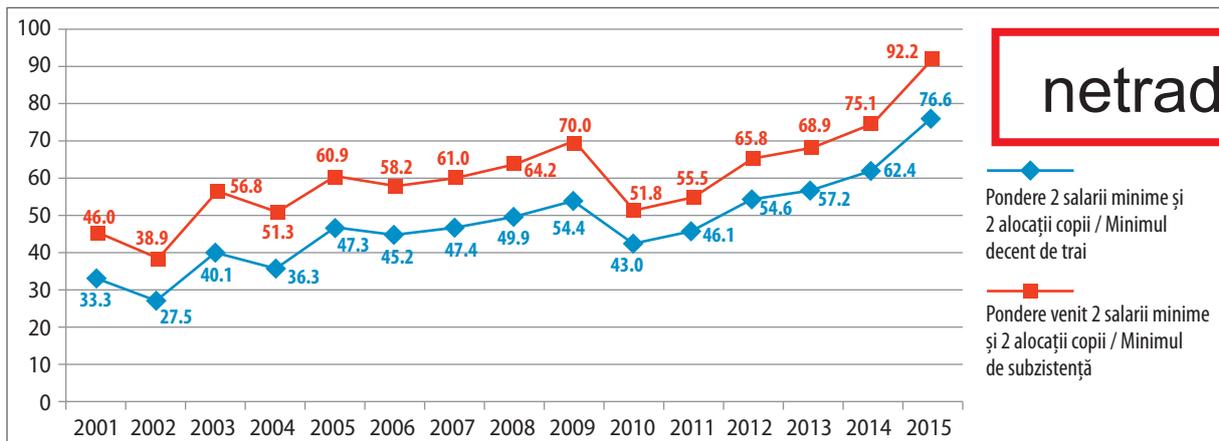
categories in October. Unlike the minimum subsistence basket, the minimum decent basket also takes into account expenses related to the participation of the person in social development activities (information, culture, travel). We mention that the minimum consumer basket in Romania was officially calculated in 2000-2003 in accordance with the Emergency Ordinance of the Government No. 217/2000. We tested the correlation between the minimum wage, the decent living minimum income and the subsistence minimum income for three categories of households: with 2 minimum wages and 2 child benefits, with 2 minimum wages and one child benefit and with 2 minimum wages.



The analysis of the correlation between the minimum wage and the minimum consumer basket for a household with 2 minimum wages and 2 child benefits shows that the income of these families covered neither the costs of decent living (in 2015, the ratio of income to the minimum decent living

costs was 76.6%) nor the minimum subsistence costs (in 2015, the ratio of income to the minimum subsistence costs was 92.2%) in any of the years of the period from 2001 to 2015 considered (for details, see Table 2).

Table 2. Ratio of the income of households with 2 minimum wages and 2 child benefits to the minimum subsistence and minimum decent living costs (2001-2015)

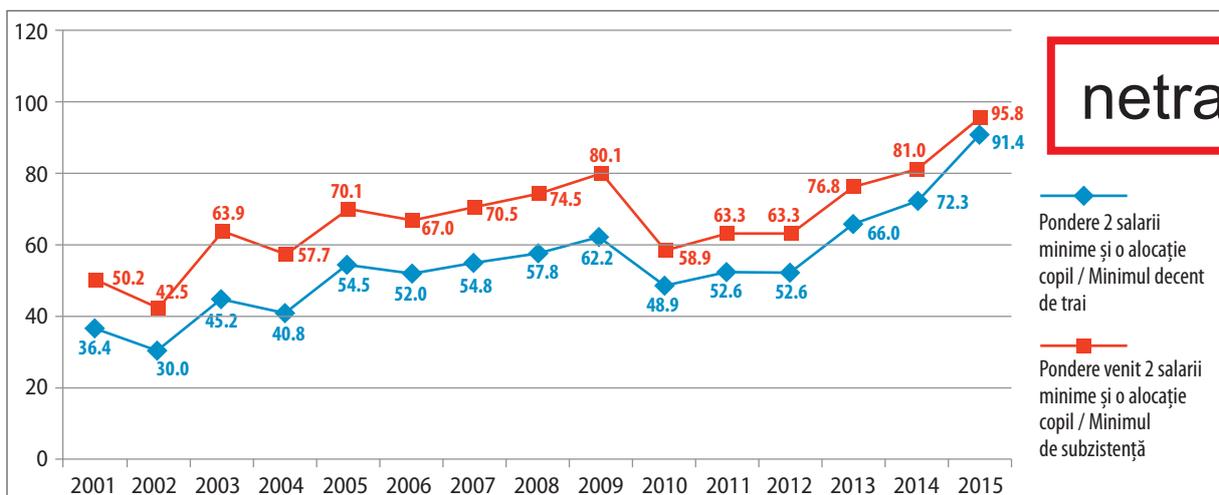


Source: For 2001-2011, estimates by Mihăilescu (2012); for 2012-2015, own estimates based on extrapolation of the ICCV method

The households with 2 minimum wages and one child benefit also failed to fully cover their minimum subsistence costs (a maximum ratio of 95.8% in

2015) or the minimum decent living costs (a maximum ratio of 91.4% in 2015) over the entire 2001-2015 period (Table 3).

Table 3. Ratio of the income of households with 2 minimum wages and 1 child benefit to the minimum subsistence and minimum decent living costs (2001-2015)



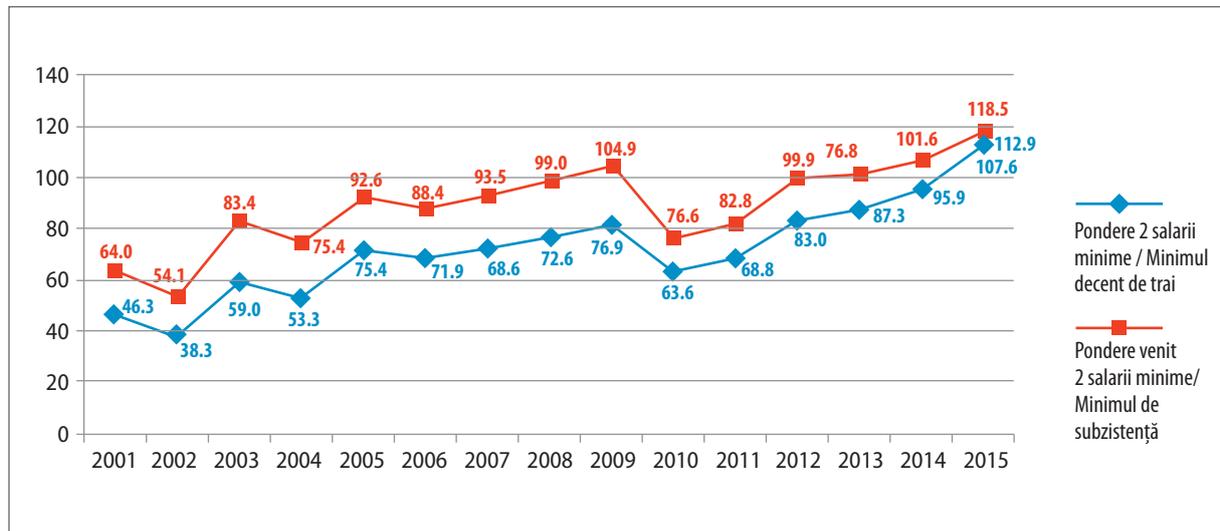
Source: For 2001-2011, estimates by Mihăilescu (2012); for 2012-2015, own estimates based on extrapolation of the ICCV method

The households with 2 minimum wages managed to cover, starting 2013, the minimum subsistence costs (a ratio of 101.6% in 2013 and 118.5% in 2015) and the minimum decent living costs only in 2015 (a

ratio of 112.9%). The rest of the period, neither the minimum decent living costs nor the minimum subsistence costs were exceeded by the income of these households. (For details, see Table 4.)



Table 4. Ratio of the income of households with 2 minimum wages to the minimum subsistence and minimum decent living costs (2001-2015)



Source: For 2001-2011, estimates by Mihăilescu (2012); for 2012-2015, own estimates based on extrapolation of the ICCV method

The analysis of the minimum subsistence / minimum decent living consumer basket relationship for the three categories of households with minimum-wage employees is another argument in favor of the feasibility of an increase in the minimum wage. For the most part of the analyzed period, the income of these households

was insufficient to cover at least the minimum subsistence costs and in no case a minimum decent living standard. The development and implementation of social/income policies by which the minimum wage could cover the minimum decent living consumer basket are absolutely necessary.

10. Econometric estimation of the minimum wage impact

In order to model the impact of the minimum wage, we considered the macroeconomic variables that act as mechanisms to adjust its effects – employment and labor, inflation, productivity – and a variable influenced by them, i.e. the average wage. The analysis aimed to estimate the nature and intensity of the connections between the variables and to answer to several relevant questions in the literature: does the minimum wage have a negative impact on total employment and on youth employment? Does inflation act as a minimum wage increase adjustment mechanism in Romania? How does the average wage respond to the shocks of the minimum wage? Does the minimum wage have a negative impact on the competitiveness of companies? The methodology used was based on the one proposed by Andreica et al. (2010).

For this purpose, we used the following variables:

gross minimum wage, gross average wage in the economy, total employment rate, total activity rate, youth employment rate (age 15-24), youth activity rate, work productivity index in the economy, consumer price index and industrial product price index. The data used have a quarterly frequency, from Q1 2001 to Q1 2016, and this period was chosen for reasons of availability of all the variables considered. The employment and activity rates were expressed as percentage of population in various age groups, the consumer price index and industrial product price index values in terms of percentage variations from quarter to quarter, the gross minimum wage and gross average wage in nominal terms (in the national currency) and the work productivity as the ratio of gross value added in the price of inputs to the total population employed in the economy.

The data sources were the TEMPO database of INSSE, EUROSTAT and the database of the Ministry of Labor, and the Eviews 7 software was used to model the impact of the minimum wage.

The reaction of the labor market to the changes in the minimum wage was analyzed using the notions of elasticity and impulse response to certain shocks equivalent to a standard deviation point. The methods used for this purpose included the multiple regression for five equations and the VAR model, which are similar in point of the validity conditions that their variables and residues must satisfy. Thus, the residues must be characterized by the absence of autocorrelation in errors, homoscedasticity and normalization of distribution. The presence of autocorrelation indicates the presence of a non-zero covariance between the errors in the regression equation and leads to the generation of an irrelevant model, due to the absence of certain significant explanatory variables and to the inadequate transformation of certain data series used. If the dispersion of the residual variable is the same for all observations of a data series, then it is homoscedastic. Otherwise, the effectiveness of the estimation of the regression equation parameters is significantly diminished. The normalization of error distribution is a mandatory condition for linear regression equations like those used in this study, estimated by the least square method. Another characteristic of the two estimation methods consists in the use of stationary data series, with observations oscillating around the average and constant series variation.

Data series stationarity analysis

Înainte de testarea econometrică a seriilor de date utilizate în cadrul celor două metodologii, am procedat la analiza prezenței sezonalityi respectivei variabile și, în cazul confirmării acesteia, la eliminarea cu ajutorul procedurii Tramo/Seats. În general, seriile de date specifice

used in the two methodologies, we proceeded to analyzing the presence of seasonality of the variables and, where the presence was confirmed, to eliminating it by the Tramo/Seats procedure. In general, the data series specific to the labor market have a seasonal component generated by the specific features of certain economic activities and by the existence of certain periods (e.g. certain legal holidays) that influence employment, unemployment, the gross average wage, the output and productivity. After eliminating the seasonality of the data series, we logarithmized the data series that were not expressed as percentage in order to make linear the relationships between variables and to interpret the estimated coefficients as elasticities. Thus, we logarithmized the minimum wage, gross average wage, work productivity, consumer price index and industrial product price index data series.

After this operation, we tested the stationarity of the variables used by the ADF statistic test to identify the presence of a unit root for them. The non-stationary data series do have such root and are characterized by the presence of a specific trend. The stationarity of a variable requires that its stochastic properties, i.e. mean, dispersion and covariance, be constant and not vary depending on time. Furthermore, a stationary variable tends to return to the mean value and fluctuate around it, while a non-stationary one has different mean values at various points in time.

In Table 5, we entered the probabilities obtained by applying the ADF test for the initial level $I(0)$, as well as for the first difference $I(1)$. The H_0 hypothesis means that stationarity is present and is rejected when the probability is below a chosen level of 1%.



Table 5. Results of application of the ADF stationarity test

	Probability of the initial level	Probability for the first difference	Conclusion on stationarity
Total employment rate	0.1226	0.0000	The series is transformed with the first difference – demployment.rate
Total activity rate	0.1227	0.0000	The series is transformed with the first difference – dactivity.rate
Youth employment rate (age 15-24)	0.0857	0.0000	The series is transformed with the first difference – dyouth.employment.rate
Total unemployment rate	0.1158	0.0000	The series is transformed with the first difference – dunemployment.rate
Youth activity rate (age 15-24)	0.2889	0.0000	The series is transformed with the first difference – dyouth.activity.rate
Minimum wage	0.8691	0.0000	The series is transformed with the first difference – dlnminimum.wage
Average wage	0.7007	0.0011	The series is transformed with the first difference – dlnaverage.wage
Work productivity	0.0000	0.0000	The series is used at the initial level – lnproductivity
Consumer price index	0.0018	Nu este cazul	The series is used at the initial level – lnCPI
Industrial Product Price Index	0.0000	Nu este cazul	The series is used at the initial level – lnIPP

Of the ten data series used, only three are stationary at the initial level: those of the two inflation indexes and the work productivity one. The demand deficit during the economic crisis and the internal and external deflation factors in the recent years contributed to the faster mitigation of the previous inflation shocks, so that the persisting inflation, which was common to Romania before 2008, declined.

Estimation of the multiple regression equations

Based on five equations, we used series of stationary data to estimate the impact of the minimum wage on the labor market, inflation and competitiveness by the OLS method. The first equation shows the response of total employment to the changes in the minimum wage and activity rate, while the second equation considers the same variables, but for the population aged 15 to 24, which is seen as one of the most vulnerable to the wage floor

rise. The third equation shows the sensitivity of the national-level average wage to variations in the minimum wage, unemployment rate and work

productivity. The fourth and fifth equations describe the extent to which the adjustment of the minimum wage effects is transferred to the final prices of consumer goods and to the production costs approximated by the producer price index, considered as a measure of competitiveness in the main tradable sector of the economy.

In order to assure that all the validity conditions for coefficients and equation residues are satisfied, we considered various lags of the exogenous variables, where the contemporary relationship was not significant, we applied the rules for selecting the best models of representation of the relationships between variables depending on the value of the adjusted R2 coefficient and of the Akaike information criterion, and we checked the conditions of econometric validity of residues, to obtain valid models. Thus, we estimated the probabilities of acceptance of null hypotheses for normalization of distribution (the Jarque-Bera test), for the absence of autocorrelation in errors (the Breusch-Godfrey test) and for the presence of homoscedasticity (the Breusch-Pagan-Godfrey test).



We also applied the CUSUM test to identify the stability of the estimated coefficients. This test considers the cumulative sum of recursive errors obtained by regression, which, in order to satisfy the stability condition, should be within the interval between two critical lines.

In table 6, we included the results obtained by estimating the five equations by the OLS method, the probabilities associated to the coefficients of the exogenous variables, the values for adjusted R² (the extent to which the variation of the dependent variable is explained by the exogenous variables with standard adjustment to avoid random

influences), the probability associated to the F test, whose null hypothesis is that all the parameters of the model are zero, as well as the probabilities associated to the conditions of distribution normalization, of presence of the homoscedasticity condition and of absence of autocorrelation in errors, for residues. Note that these hypotheses necessary for the validity of residues are accepted with a probability of at least 14.31%, i.e. above the established thresholds of 5% or 10%.

Table 6. Estimation of the minimum wage impact in Romania

Endogenous variables	1. employment.rate	2. dyouth.employment.rate	3. dlnaverage.wage	4. lnCPI	5. lnIPP
Coefficients of exogenous variables; [probability associated to the t-statistic test]	+0.04*constant [0.1330]	-0.03*constant [0.5886]	+0.29*constant [0.0002]	+0.00*constant [0.3772]	+0.31*constant [0.0000]
	+0.98* dactivity.rate [0.0000]	-0.12* dyouth.employment.rate (-1) [0.0144]	-0.52* dlnaverage.wage (-1)[0.0000]	+0.04* dlnminimum.wage (-3)[0.0039]	-0.03* Lnproductivity [0,0000]
	+1.87* dlnminimum.wage [0.0000]	+2.27* dlnminimum.wage [0.0274]	+0.15* dlnminimum.wage (-1)[0.0034]	+0.31* lnIPP [0.0000]	+0.05* dlnminimum.wage [0.0111]
	-2.18* dlnminimum.wage (-4)[0.0000]	-2.10* dlnminimum.wage (-4)[0.0177]	-0.02* dunemployment.rate [0.0091]	+0.28* lnIPP(-3) [0.0000]	-0.02* dlnminimum.wage (-3)[0.3011]
		+0.78* dyouth.activity.rate [0.0000]	+0.40* lnproductivity [0.0000]	-0.00* dunemployment.rate [0.0926]	
			-0.43* lnproductivity (-1) [0.0000]		
Adjusted R ²	0.955	0.865	0.590	0.753	0.701
F statistic probability	0.0000	0.0000	0.0000	0.0000	0.0000
H0 probability Normalization of distribution	0.186	0.171	0.854	0.480	0.153
H0 probability Absence of autocorrelation in errors	0.2839	0.5983	0,6197	0.7613	0.2266
H0 probability Homoscedasticity	0.3427	0.1431	0.2423	0.5381	0.3777
CUSUM test	Satisfied	Satisfied	Satisfied	Satisfied	Satisfied

According to the first equation, the increase in the workforce activity rate has a strong contemporary influence on the rise in the employment rate, which indicates that the labor supply surplus was almost entirely absorbed by the labor market during the analyzed period. The employment rate has an oscillating response to the shock generated by the increase of the minimum wage, which proves that the employers gradually adjust employment depending on the additional labor costs. Thus, the minimum wage has a positive contemporaneous influence on employment, which expanded by 1.87% as a result of the increase of the minimum wage by 1%, due to the incentives granted to the lower-skilled persons for entering the labor market. However, the employers make a correction in the rate of employment of over one year by 2.18%, resulting in an annual elasticity of about -0.3 of total employment depending on the minimum wage.

The reaction of youth employment has certain particular features, as shown by the analysis of the coefficients of exogenous variables in the second equation. Thus, youth employment has an autoregressive component with a negative impact, as proven by the fact that the persons aged 15 to 24 are a vulnerable category, with a low degree of stability once in the labor market. Secondly, the expansion of the active young population by 1% generates a lower integration of the youth in the labor market (only 0.78%) compared to total population, because of the long-term unemployment of the population aged 15 to 24. Thirdly, the response of youth employment is relatively higher to the change in the minimum wage, since this wage floor targets to a greater extent the inexperienced workers, which form the majority of this age category. The same gradual adjustment of the employment rate operates in the case of young persons, too, following the increase by 1% of the minimum wage, as it sees a contemporary rise by 2.27%, only to drop by 2.10% after one year. Therefore, the annual elasticity of youth employment to the minimum wage is 0.17%, proving a positive impact of the minimum wage on

this category of population considered as more vulnerable to the decisions of the government concerning the wage floor.

According to the third equation, about 60% of the average wage variation is shown by the exogenous variables of the regression, whose coefficients are entirely different from 0 for a significance threshold of 1%. An autoregressive component with a negative influence was estimated, proving the significant correction operated by companies to the average wage after one quarter. A minimum wage increase rate of 1% has a positive impact on the dynamics of the average wage at national level (+0.15%), proving the statistic effect of the rise in the lowest wages, as well as the increase of the income of certain employees who earned close to the minimum. Thus, the successive increases of the minimum wage also generated additional gains for other categories of employees, not only for those who were previously paid at that level. The variation in the unemployment rate has a negative impact on the average wage, according to the Phillips curve model, which states that, in periods of higher unemployment (above the natural rate), there is a certain pressure to reduce the average wage. The work productivity in the economy has a variable influence on the average wage, as the initial contemporary increase by 0.40% is corrected by a contraction by 0.43%, resulting in an elasticity of -0.03% after one quarter. Thus, work productivity is not an essential variable of the average wage dynamics, since it was also sensitive to other factors, e.g. the situation of the labor market and of the overall economy – the demand excess and labor deficit were followed by the economic crisis and a significant rise in unemployment in the 2009-2011 period. In this context, the dynamics of the gross average wage was superior to that of productivity in 2003-2007 (+11%), as well as in 2008-2016 (+8%).

The estimation of the fourth equation validates the adjustment of the minimum wage shock by an increase in the final prices of goods. However, the increase does not occur immediately, but after

three quarters and the elasticity is relatively low – only 0.04% additional inflation generated by a minimum wage 1% higher. Nevertheless, the general price index reacts to the increase in the industrial producer prices as a consequence of their contemporary shocks (+0.31%), as well as of their shocks after three quarters (+0.28%). Therefore, the companies do not immediately and fully transfer to the final prices the additional production costs generated by the higher prices of industrial goods. The unemployment rate does not explain the dynamics of inflation rate, as it is significant only above the threshold of 10%.

By the last equation, we aimed to test the impact of the minimum wage increase on the prices of industrial goods, as they are proxy of competitiveness of companies. If they are forced to purchase more expensive industrial goods, their efficiency will decline and they will be less able to face the external competition. Thus, a minimum wage increase of 1% is transferred to the production costs of industrial companies and consequently to the inflation of the goods in this sector at a rate of only 0.05%. Part of this increase is compensated by the rise in work efficiency, which has a negative impact on the mean production costs and on the price of these goods.

To conclude, the econometric testing of the five equations in the context of assuring the statistic validity of the coefficients obtained and of their residues led to the following results with regard to the impact of the minimum wage:

- the companies adjust the total employment level depending on the evolution of the minimum wage and the contemporary elasticity is lower than and opposite to the annual one; initially, the total employment rises as a result of the higher minimum wage
- youth employment reacts to a greater extent to minimum wage variations, and the contemporary elasticity is higher than the annual one; initially there is a rise in the

employment of population aged 15 to 24 as a result of a higher minimum wage

- the average wage raises as a result of the minimum wage increase, including as a consequence of the impact of certain positive externalities on the employees who previously earned close to the minimum
- companies do not immediately transfer to prices the additional wage costs generated by the minimum wage increase and the pass-through is relatively limited
- the increase in the minimum wage causes a minor decline in the economic competitiveness as a consequence of higher prices of industrial goods

VAR model estimation

The purpose of this analysis is to model the impact of the minimum wage on three variables – total employment rate, gross average wage and inflation rate – in a VAR (vector autoregression) model for 2000-2015. It allows us to estimate the response of the three variables to a shock of one standard unit of deviation in the minimum wage and the extent to which the variance decomposition of these variables depends on the minimum wage variance. From an econometric perspective, a VAR model enables the simultaneous analysis of the dynamics of multiple interdependent variables and the estimation of the response of the variables included in the model to a specific shock.

A p^{th} order VAR model can be written as in the following equation:

$$y_t = A_1 y_{t-1} + A_2 y_{t-2} + \dots + A_p y_{t-p} + e_t$$

where $y_t = (y_{1t}, y_{2t}, \dots, y_{nt})$ is an $n \times 1$ vector of the variables y , A_i represents the matrices of the $n \times n$ coefficients (for each $i = 1, \dots, p$), and $e_t = (e_{1t}, e_{2t}, \dots, e_{nt})$ is an $n \times 1$ vector of the non-observable error terms with mean zero and no serial correlation.

The four variables were used in stationary form in the VAR model. In order to create a valid VAR model with four variables, we selected the optimal



number of lags, analyzed the stability of the model, and applied the Granger causality test to identify the dependence relationships among variables and the properties of the residues of the model – normalization of distribution, absence of autocorrelation in errors and presence of

homoscedasticity. To select the optimal number of lags, we used the Akaike, Hannan-Quinn and Schwarz criteria, whose minimum values correspond to 4 lags an one lag, respectively, as shown in the table below:

Table 7. Optimal number of VAR model lags according to three selection criteria

Lag	Akaike	Schwarz	Hannan-Quinn
0	-8.744030	-8.604407	-8.689416
1	-9.531424	-8.833309*	-9.258353
2	-9.845375	-8.588768	-9.353847
3	-10.03528	-8.220182	-9.325295
4	-10.74529*	-8.371696	-9.816845*

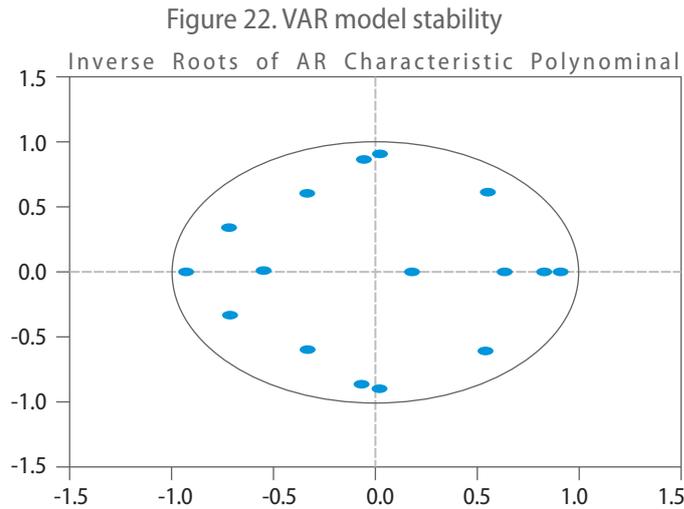
To choose the optimal lag, we used the lag exclusion test whose H0 hypothesis is that the coefficient of the selected lag is insignificantly different from zero. If the hypothesis is accepted (the associated probability is above 1%), that lag will be eliminated. Applying this test with the

Eviews 7 software, we note that the H0 hypothesis is rejected only for lag 4, but not for the first one. Therefore, the information provided by the selection criteria and by the lag exclusion test confirms the selection of a VAR model with 4 lags.

Table 8. Identification of the optimal number of lags of the VAR model

	dlnaverage.wage	Ln.inflation	dlnminimum.wage	demployment.rate	Joint
Lag 1	2.686626	2.362074	11.35039	8.391123	24.79914
	[0.611557]	[0.669492]	[0.022896]	[0.078257]	[0.073446]
Lag 2	5.558517	5.412469	2.729348	4.279540	18.15764
	[0.234633]	[0.247531]	[0.604089]	[0.369494]	[0.314747]
Lag 3	0.846436	7.937041	3.101362	13.00101	25.61363
	[0.932117]	[0.093912]	[0.541008]	[0.011271]	[0.059713]
Lag 4	27.22770	7.038918	17.83452	22.00553	69.72236
	[1.79e-05]	[0.133846]	[0.001329]	[0.000200]	[1.12e-08]
df	4	4	4	4	16

The VAR with four lags is stable, because all the inverse roots of the model are proper fractions, as shown in the figure below.



According to the Granger stability, if the prior values of variable X provide statistically significant information about future values of Y, then X is said to Granger-cause variable Y. The null hypothesis is that X does not Granger-cause Y, so that an associated probability below a threshold of 1% or 5% will result in its rejection. By applying the Granger causality as simultaneous influence of three of the lagged variables on the fourth, we obtained the following results:

- Inflation rate, minimum wage and employment rate with lags 1, 2, 3 and 4 do not influence together, in terms of Granger causality, the average wage; the acceptance probability is 57%;
- Average wage, minimum wage and employment rate with lags 1, 2, 3 and 4 influence together, in terms of Granger causality, the inflation rate; the probability of rejection of this hypothesis is 3.80%, i.e. below the 5% threshold;

- Average wage, employment rate and inflation rate with lags 1, 2, 3 and 4 influence together, in terms of Granger causality, the minimum wage; the probability of rejection of this hypothesis is 0%, i.e. below the 1% threshold;
- Average wage, minimum wage and inflation rate with lags 1, 2, 3 and 4 influence together, in terms of Granger causality, the employment rate; the probability of rejection of this hypothesis is 0%, i.e. below the 1% threshold.

The last set of conditions that a VAR model needs to satisfy refer to the econometric validity of the residue as a result of normal distribution, presence of homoscedasticity and absence of autocorrelation in errors. Table 9 shows the probabilities of validity of the residue of the VAR model with four variables and four lags. As the probabilities are above the significance threshold of 5%, the H0 hypotheses associated to the 3 tests are accepted, supporting the accuracy of the VAR model.

Table 9. Tests applicable to the VAR residue

	LM autocorrelation test H0 – no autocorrelation in errors for the selected lag	Normalization test H0 – the VAR residue has a normal distribution	Heteroscedasticity test H0 – no heteroscedasticity
Probabilities associated to the VAR residue specific tests	0.6714	0.1793	0.1067

To test the intensity of reaction of a variable to a minimum wage shock impulse of one standard unit of deviation, as well as the relative importance of that shock to the other three variables, we used the impulse response function and forecast error

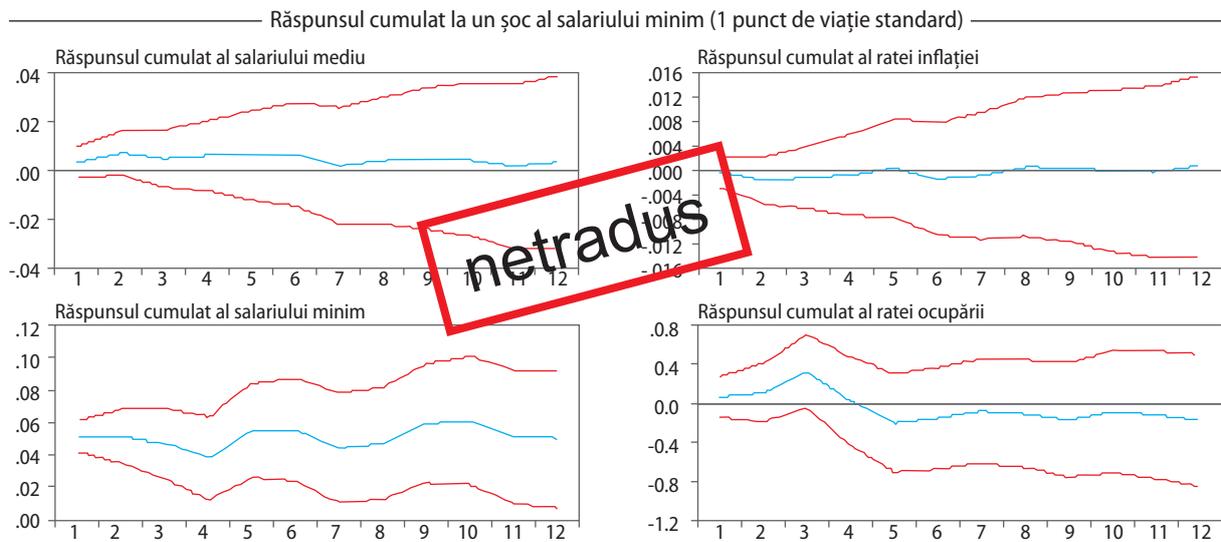
variance decomposition. An impulse of one standard unit of deviation of minimum wage causes a positive cumulative response of the average wage in the next three years, although low in intensity, particularly from the seventh quarter



(Figure 23). The impact on inflation is negligible, as the drop in inflation in the second quarter is compensated by the rise in prices in the next year. Of the analyzed variables, the employment rate is the most sensitive to a minimum wage shock, as it rises over the first three quarters up to a cumulative standard deviation of 0.32 points. The

pressure put by the additional wage costs on employment only arises in Q4 and Q5, but at higher intensity than before, resulting in a cumulative reduction of the standard deviation of employment rate by 0.17 points 12 quarters after the shock occurred.

Figure 23. Cumulative response to a minimum wage shock



As shown by the impulse response function, the minimum wage has the highest influence on the employment rate, so that 3 years after the minimum wage shock, it accounts for one fifth of the total employment variation (Table 10).

Therefore, we can say that, of the two minimum wage impact adjustment mechanisms included in this VAR model, i.e. employment and inflation, only the former is an active one, even though the employment response is not uniform.

Table 10. Importance of the minimum wage from the perspective of variance decomposition

Number of quarters from the minimum wage shock	Importance in the average wage variance	Importance in the inflation rate variance	Importance in the minimum wage variance	Importance in the employment rate variance
1	0	0	97.98	0.41
2	2.16	1.97	84.61	0.36
3	3.00	2.14	80.59	6.97
4	3.19	1.98	79.91	15.08
5	2.84	2.5	69.93	19.52
6	2.86	4.85	68.32	19.62
7	5.15	4.86	68.61	19.39
8	5.48	6.07	67.32	18.90
9	5.08	5.95	67.63	18.94
10	5.03	6.04	66.68	19.40
11	5.72	6.06	66.54	19.33
12	5.97	6.50	66.37	19.50

To conclude, the econometric testing of the VAR model led to the following results concerning the impact of the minimum wage:

- a shock of one standard unit of deviation of the minimum wage does not cause a significant deviation of the average wage and inflation above mean level;
- the increase in the minimum wage is adjusted by employment around one year after the shock;
- about 20% of the employment rate variation is accounted for by the dynamics of the minimum wage.

Public policy solutions related to the minimum wage

- Including the minimum wage in the set of public policy instruments required to achieve inclusive economic growth, assuming the empirically validated hypothesis that inequalities often originate in the labor market.
- Reverting to a minimum consumer basket calculated according to the law and published by the Government. The minimum consumer basket can be calculated by experts from the Quality of Life Research Institute (Romanian Academy) based on the normative analysis and can be published twice a year by the Government, according to a relevant law to be enacted. (The Government stopped publishing the minimum consumer basket in 2003.)
- Disconnecting the dynamics of the minimum wage from the elections cycle (government ideologies) by: establishing a formula to index-link the minimum wage to the minimum consumer basket (calculated by ICCV), inflation, work productivity – e.g. by annually indexing the gross minimum wage by 100% of the inflation rate plus 50% of the actual annual increase of the gross average wage... or By introducing in the Labor Code a gross minimum wage/gross average earnings ratio of at least 45%.
- Expanding tax progressiveness by raising the tax deductions for healthcare service subscriptions, educational vouchers for kindergarten and school, participation in private pension schemes, loans for education, home insurance, home rehabilitation, etc.
- To improve the effectiveness of the use of the minimum wage as a public policy instrument, we propose to combine it with other measures to be implemented for the purpose of mitigating inequality and poverty (expanding taxation progressiveness - even through the tax deductions mentioned above, subsidies, etc.).
- To maximize the effectiveness of the use of the minimum wage, we consider that the mix of public policies should be combined with other measures intended to stimulate the employment of the population groups that are the most affected by structural unemployment (young persons, single-parent families, families with many children, etc.). Thus, we propose the granting of tax breaks for hiring fresh graduates, incentives for employers, state aid schemes to subsidize the payment of wages to young graduates, subsidies for employment of apprentices, for converting internships into permanent employment contracts, subsidies to increase youth mobility, employment programs for young Roma as well as making functional the Youth Guarantee Program.
- In order to maximize the positive impact of the increase in the minimum wage on reducing undeclared labor we believe that urgent action should be taken to intensify the scrutiny of compliance in the sectors at higher risk of illegal
- Employment, enacting more severe regulations to sanction undeclared work, as well as setting up and interconnecting databases of employees with permanent or temporary employment contracts.

Referințe bibliografice

- Aaronson, D., French, E., Sorkin, I., (2016), The long run employment effects of the minimum wage: a putty clay perspective, published on VOX, CEPR's Portal, www.voxeu.org
- Abowd, J., M., Kramarz, F., Margolis, D., N., (2009), Minimum Wages and Employment in France and the United States, IZA Conference, http://www.iza.org/conference_files/EMW2009/abowd_j267.pdf
- Addison, J., T., Blackburn, M., L., Cotti, C., D., (2013), Minimum Wage Increases in a Recessionary Environment. Labour Economics, Volume 23, pp. 30-39, <http://www.sciencedirect.com/science/article/pii/S0927537113000171>
- Addison, J., T., Blackburn, M., L., Cotti, C., D., (2009), Do minimum wages raise employment? Evidence from the U.S. retail-trade sector?, Labour Economics 16 (4), 397–408, http://www.iza.org/conference_files/EMW2009/addison_j44.pdf
- Alatas, V., Cameron, L., (2003), The Impact of Minimum Wages on Employment in a Low Income Country: an Evaluation using the Difference-in-Differences Approach, Policy Research Working Paper Series No. 2985, The World Bank, <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.12.2312&rep=rep1&type=pdf>
- Andreica, M., Aparaschivei, L., Cristescu, A., Cataniciu, N. (2010), Models of the Minimum Wage Impact upon Employment, Wages and Prices: the Romanian Case, Recent Advances in Mathematics and Computers in Business, Economics, Biology and Chemistry, Proceedings of the 11th WSEAS Int. Conf. MCBE 2010, <http://www.wseas.us/e-library/conferences/2010/lasi/MCBEC/MCBEC-14.pdf>
- Antonie, M., D., Cristescu, A., Cataniciu, N., (2010), A Panel Data Analysis of the Connection between Employee Remuneration, Productivity and Minimum Wage in Romania, in Proc. of the 11th WSEAS Int. Conf. on Mathematics & Computers in Business & Economics, Iasi, Romania, pp. 134-140, <http://www.wseas.us/e-library/conferences/2010/lasi/MCBEC/MCBEC-19.pdf>
- Aparaschivei, L., Andreica, M. E., Cristescu, A., Cataniciu, N., (2011), The Romanian labour supply and demand: Analysis on sex and age sub-groups, International Journal of Mathematical Models and Methods in Applied Sciences, Issue 2, Volume 5, pp. 272-279, <http://www.naun.org/multimedia/NAUN/m3as/19-744.pdf>
- Author, D., Manning, A., Smith, C., (2014), The Contribution of the Minimum Wage to U.S. Wage Inequality over Three Decades: A Reassessment, NBER Working Paper No. 16533, <http://www.nber.org/papers/w16533>
- European Central Bank, (2015), Structural reforms across Euro Area, Economic Bulletin, https://www.ecb.europa.eu/pub/pdf/other/art01_eb201502.en.pdf
- Bank of Lithuania (2015), The Effect of Minimum Wage Increase on Macroeconomic Variables: Survey Results of Lithuanian Enterprises, Lithuania Economic Review, https://www.lb.lt/lithuanian_economic_review
- Belman, D., Wolfson, P., J., (2014), The New Minimum Wage Research. Employment Research 21 (2): 4-5, http://research.upjohn.org/cgi/viewcontent.cgi?article=1220&context=empl_research
- Bhorat, H., Kanbur, R., Stanwix, B., (2014), Estimating the impact of minimum wages on employment, wages and non-wage benefits: the case of agriculture in South Africa, Am J Agric Econ 96(5):1402–1419, <http://ajae.oxfordjournals.org/content/96/5/1402.short>
- Broecke, S., A. Forti, Vandeweyer, M., (2015), The Effect of Minimum Wages on Employment in Emerging Economies: A Literature Review, <http://nationalminimumwage.co.za/wpcontent/uploads/2015/09/0221-Effect-of-Minimum-Wages-on-Employment-in-EmergingEconomies-A-Literature-Review.pdf>
- Broecke, S., Forti, A., Vandeweyer, M., (2015), The Effect of Minimum Wages on Employment in Emerging Economies: A Literature Review, <http://nationalminimumwage.co.za/wpcontent/uploads/2015/09/0221-Effect-of-Minimum-Wages-on-Employment-in-EmergingEconomies-A-Literature-Review.pdf>
- Brown, Ch., Gilroy, C., Kohen, A. (1982), The Effect of the Minimum Wage on Employment and Unemployment, Journal of Economic Literature, 20(2), pp. 487-528, <http://www.nber.org/papers/w0846>
- Brown, Ch., Gilroy, C., Kohen, A. (1983), Time Series Evidence on the Effect of the Minimum Wage on Youth Employment and Unemployment, Journal of Human Resources, 18(1), pp. 3-31, https://www.jstor.org/stable/145654?seq=1#page_scan_tab_contents
- Enache, C., (2012), Unemployment Benefit, Minimum Wage and Average Salary Earnings in. Romania, Review of Economic and Business Studies, 5, 2, 85-96
- Filion, K., (2009), Fact Sheet for 2009 Minimum Wage Increase – Minimum Wage Issue Guide, http://www.epi.org/publication/mwig_fact_sheet/
- Dinu Marin, Socol Cristian, Socol (Niculescu) Aura Gabriela Economia Romaniei. O viziune asupra tranziției postcomuniste, Editura Economică, Bucharest, 2005
- International Monetary Fund (2016a), Cross Country Report on minimum wages. Selected Issues, no. 16/151, <https://www.imf.org/external/pubs/ft/scr/2016/cr16151.pdf>



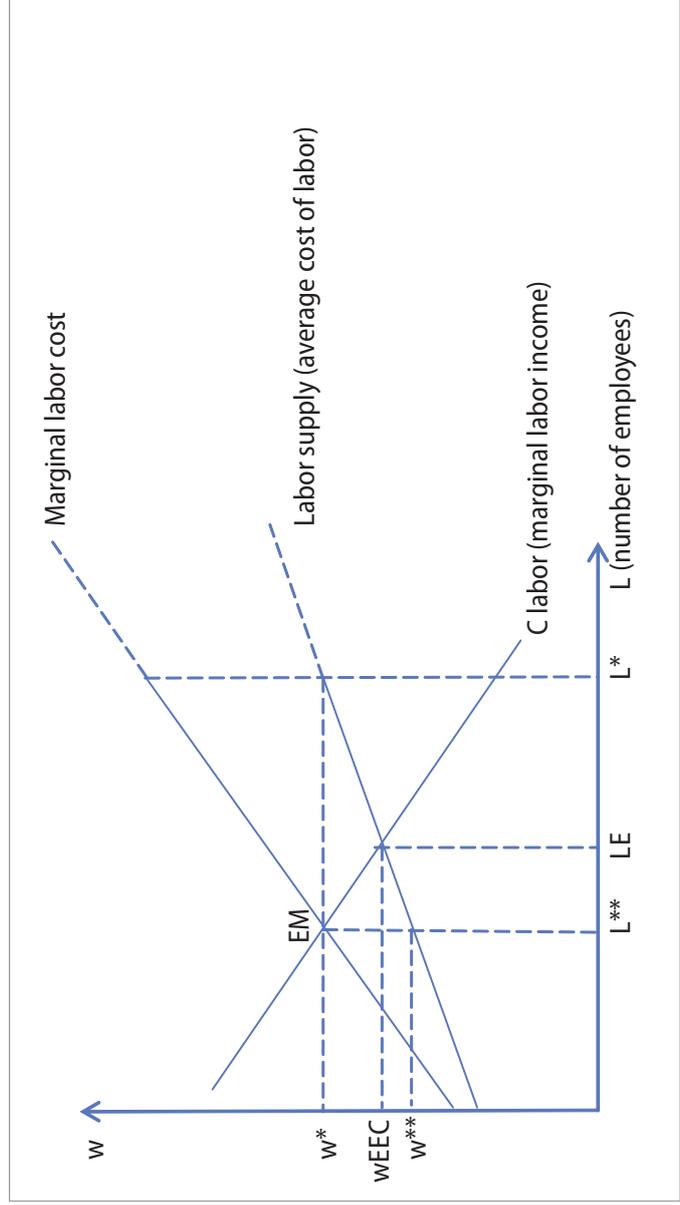
- International Monetary Fund (2016b), Country Report Romania, Selected Issues, no. 16/114, <https://www.imf.org/external/pubs/ft/scr/2016/cr16114.pdf>
- Georgiadis, A., (2013), Efficiency Wages and the Economic Effects of the Minimum Wage: Evidence from a Low-Wage Labour Market, Oxford Bulletin of Economics and Statistics, 75, 6, <http://onlinelibrary.wiley.com/doi/10.1111/j.1468-0084.2012.00713.x/abstract>
- Grimshaw, D., Cartwright, J., Keizer, A., Rubery, J., (2014), Coming Clean: Procurement and Contract Practices in Commercial Cleaning, Manchester: Equalities and Human Rights Commission, https://www.research.manchester.ac.uk/portal/files/32383575/full_text.pdf
- Harasztosi, P., Lindner, A., (2015), Who Pays for the minimum Wage?, Workshop, Chicago University, <http://faculty.chicagobooth.edu/workshops/micro/pdf/LindnerJMP.pdf>
- Herr, H., Kazandziska, M., (2011), Principles of minimum wage policy – Economics, institutions and recommendations, Global Labour University Working Paper No. 11, http://www.global-labour-university.org/fileadmin/GLU_Working_Papers/GLU_WP_No.11.pdf
- lordache, Ș., M. Militaru, Pandioniu, M., (2016), Jobless Recovery in Romania: the Role of Sticky Wages and Other Frictions—Firm-level Evidence from the WDN Survey, National Bank of Romania Occasional Papers No. 20, <http://www.bnr.ro/Occasional-papers-3217.aspx>
- Kuddo, A., (2009), Labor Laws in Eastern European and Central Asian Countries: Minimum Norms and Practices, The World Bank SP Discussion Paper No. 0920, Washington, DC, <http://siteresources.worldbank.org/SOCIALPROTECTION/Resources/SP-Discussion-papers/Labor-Market-DP/0920.pdf>
- Lemos, S., (2008), A Survey of the Effects of the Minimum Wage on Prices, Journal of Economic Surveys, vol. 22, no. 1, pp. 187-212, <http://onlinelibrary.wiley.com/doi/10.1111/j.1467-6419.2007.00532.x/abstract>
- Magruder, J., R., (2013), Can minimum wages cause a big push? Evidence from Indonesia, Journal of Development Economics, Vol. 100, pp. 48–62, <http://www.sciencedirect.com/science/article/pii/S0304387812000557>
- Maloney, W., Mendez, J., (2004), Measuring the Impact of Minimum Wages—Evidence from Latin America, in: Heckman, J. and C. Pages (eds.), Law and Employment: Lessons from Latin American and the Caribbean, University of Chicago Press <http://www.nber.org/chapters/c10068.pdf>
- Mărginean, S., Crețu, A.Ș., (2013), Effects of Raising Minimum Wage: Theory, Evidence and Future Challenges, Procedia Economics and Finance 6 (2013), pp. 96 – 102 Mihailescu, A., (2012), Coșul de consum al populației României, Editura Expert, Bucharest
- National Bank of Romania (2015), The Increase in the Minimum Gross Wage—Effects on the Labour Market, Inflation Report, May 2015, http://www.bnr.ro/files/d/Pubs_en/InflationReport/2015/IR_201505.pdf
- Neumark, D, Wascher, W., (2006), Minimum wages and employment: a review of evidence from the new minimum wage research, Working Paper 12663, National Bureau of Economic Research, Cambridge, <http://www.nber.org/papers/w12663.pdf>
- Neumark, D., Wascher, W., (2008), Minimum Wages. Cambridge, MA: The MIT Press
- Owens, M.,F., Kagel, J.,H., (2010), Minimum wage restrictions and employee effort in incomplete labor markets: An experimental investigation, Journal of Economic Behavior & Organization, 73, pp.317-326, <http://www.sciencedirect.com/science/article/pii/S0167268109002856>
- Pană, M.C., (2015), Minimum wage and business environment in Romania: an institutional perspective, International Conference "Recent Advances in Economic and Social Research", 13-14 May 2015, Bucharest, IPE Working Papers
- Rahman, J., Stepanyan, A., Yang, J., Zeng, L., (2015), Exports in a Tariff-Free Environment: What Structural Reforms Matter? Evidence from the European Union Single Market, IMF Working Paper No. 15/187, <https://www.imf.org/external/pubs/ft/wp/2015/wp15187.pdf>, <https://www.imf.org/external/pubs/ft/wp/2015/wp15187.pdf>
- Riley, R., Bondibene, C., R., (2015), Raising the Standard: Minimum Wages and Firm Productivity, National Institute of Economic and social Research and Centre for Macroeconomics, <http://www.niesr.ac.uk/sites/default/files/publications/Minimum%20wages%20and%20firm%20productivity%20NIESR%20DP%20449.pdf>
- Schaafsma, J., Walsh, W., (1983), Employment and Labour Supply Effects of the Minimum Wage: Some Pooled Time-Series Estimates from Canadian Provincial Data, Canadian Journal of Economics 16(1): 86-97.
- Schmitt, J., (2013), Why Does the Minimum Wage Have No Discernible Effect on Employment?, Center for Economic and Policy Research, <http://cepr.net/documents/publications/min-wage-2013-02.pdf>
- Socol Cristian, Socol Aura Gabriela, Marinas Marius, The Impact of Fiscal Consolidation in the European Development Countries, pp 147-174, in the collective volume Progress in Economic Research, No. 33, coordinated by Albert Tavidze, Nova Publishers, New York, 2015
- Sorkin, I., (2015), Are there long-run effects of the minimum wage?, Review of Economic Dynamics, 18(2), 306–333, <http://www.sciencedirect.com/science/article/pii/S1094202514000283>
- Șerban, A., Aceleanu, M., (2015), Minimum wage – labour market rigidity factor, Theoretical and Applied Economics, Volume XXII (2015), No. 2(603), Summer, pp. 171-182

Annex 1

The equilibrium of a monopsony in point of number of employees and offered wage is achieved when profit maximization is sought and the marginal labor cost equals the marginal labor income (labor demand depending on marginal work productivity) – the EM point in the chart below. For that point, the number of employees is L^{**} , and the wage is w^* . The monopsony will choose the employment L^* and the wage w^{**} , both lower than the equilibrium ones in a perfect competition labor market (EC). According to the labor supply line, w^{**} is the wage accepted by L^{**} workers, which will be paid to them by the company. The introduction of a minimum wage in a monopsony labor market can generate other effects than in a perfect competition market only if the minimum wage is higher than w^{**} , but at most equal to WE. For a minimum wage equal to WE, the marginal labor cost will be horizontal up to LE and will coincide with both the labor demand

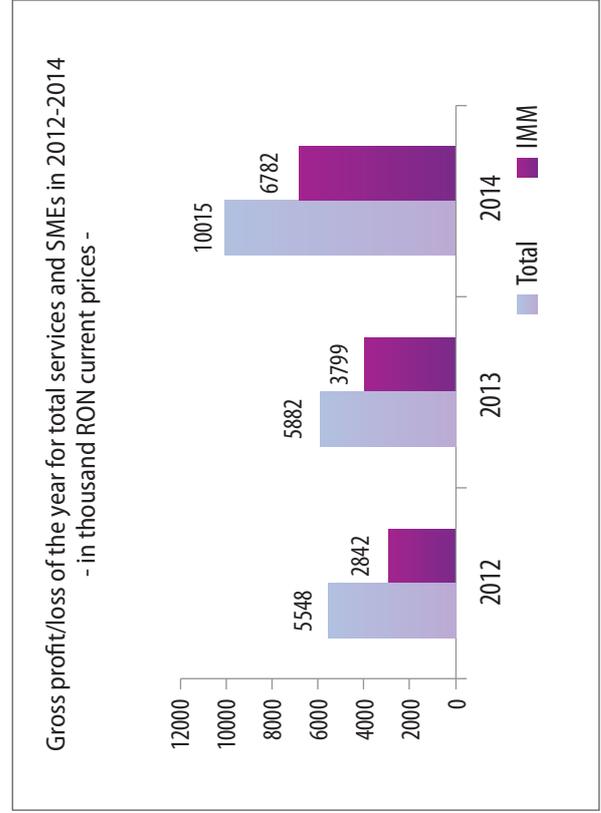
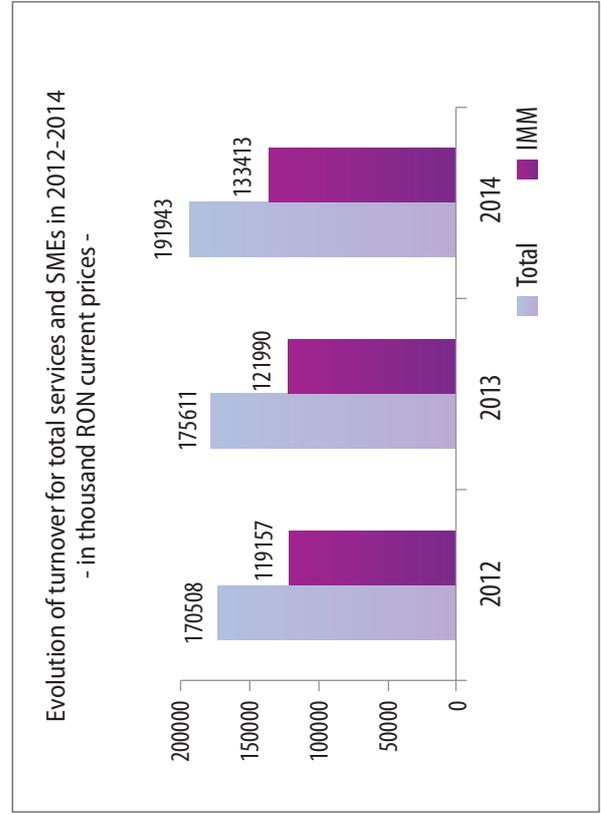
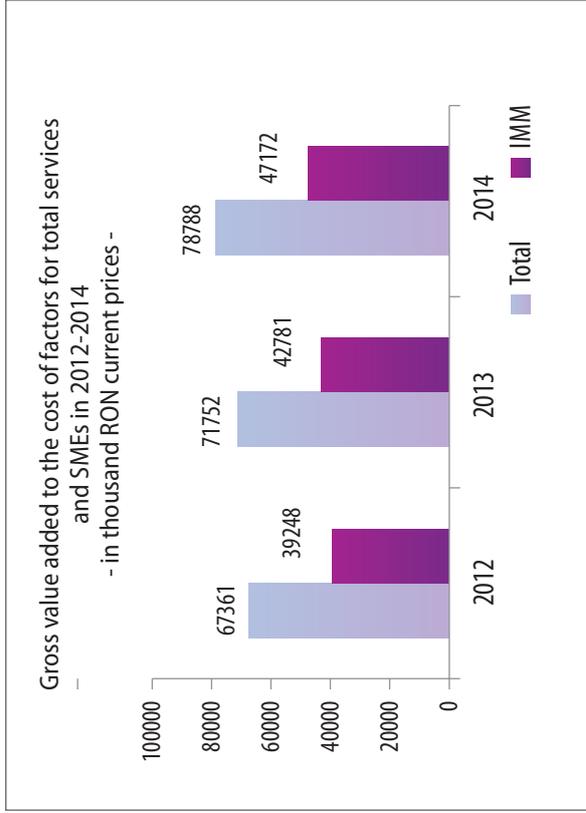
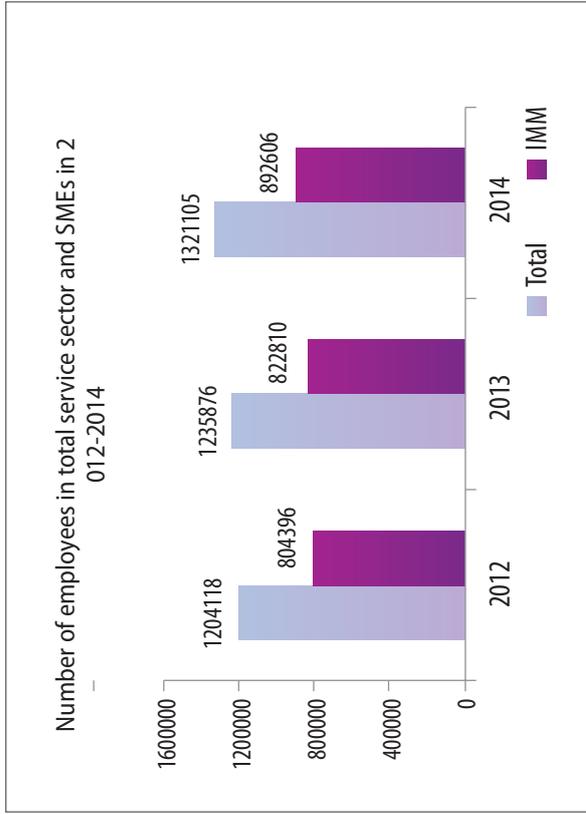
and the labor supply. In such case, the minimum wage results in an increase in income, as well as in employment, from L^{**} to LE at most. If the minimum wage exceeds the competitive equilibrium level and reaches, for instance, the w^* level, the company cannot pay wages below it and, as a result, it will employ additional workers up to L^* for the minimum wage and the marginal labor cost will have a horizontal section. Beyond L^* , the marginal cost will rise along the dotted line in Figure 2. In such case, the labor supply will correspond to the number of employees L^* , although the optimal labor demand from the profit perspective (EM, for which the horizontal marginal labor cost intersects the labor demand) is the one corresponding to L^{**} . In these circumstances, there will be L^*-L^{**} willing to get a job, but who cannot be hired for the minimum salary. As a consequence, the employment will contract like in a competition market.

Figure 2. Impact of the minimum wage on a monopsony labor market



Annex 2

Results and performance of services companies, 2012-2014



Source: INSSE, 2016

Annex 3

Evolution of the net income, minimum decent living income and minimum subsistence income for a household with 2 minimum wages and 2 children under 14

Year/October	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Net income of a household with 2 minimum wages and 2 children under 14	2856000	2856000	4830000	4830000	695	695	778	878	1022	888	982	1224	1302	1440	1738
Minimum decent living income for households with 2 employees and 2 children under 14	8576128	10381345	12035649	13321314	1469	1538	1642	1761	1879	2064	2131	2240	2276	2307	2269
Minimum subsistence income for households with 2 employees and 2 children under 14	6209054	7339862	8509501	9418502	1141	1194	1275	1368	1459	1713	1770	1861	1890	1916	1884
Ratio of 2 minimum wages and 2 child benefits to the minimum decent living income	33.3	27.5	40.1	36.3	47.3	45.2	47.4	49.9	54.4	43.0	46.1	54.6	57.2	62.4	76.6
Ratio of 2 minimum wages and 2 child benefits to the minimum subsistence income	46.0	38.9	56.8	51.3	60.9	58.2	61.0	64.2	70.0	51.8	55.5	65.8	68.9	75.1	92.2

Source: For 2001-2011, estimates by Mihăilescu (2012); for 2012-2015, own estimates based on extrapolation of the ICCV method

Evolution of the net income, minimum decent living income and minimum subsistence income for a household with 2 minimum wages and 1 child under 14

Year/October	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Net income of a household with 2 minimum wages and 1 child	2616000	2616000	4560000	4560000	671	671	754	854	980	846	940	988	1260	1398	1738
Minimum decent living income for households with 2 employees and 1 child	7192882	8706934	10094415	11172714	1232	1290	1377	1477	1576	1731	1787	1879	1908	1935	1902
Minimum subsistence income for households with 2 employees and 1 child	5207594	6156013	7137001	7899389	957	1001	1069	1147	1224	1437	1485	1561	1641	1725	1814
Ratio of 2 minimum wages and 1 child benefit to the minimum decent living income	36.4	30.0	45.2	40.8	54.5	52.0	54.8	57.8	62.2	48.9	52.6	52.6	66.0	72.3	91.4
Ratio of 2 minimum wages and 1 child benefit to the minimum subsistence income	50.2	42.5	63.9	57.7	70.1	67.0	70.5	74.5	80.1	58.9	63.3	63.3	76.8	81.0	95.8

Source: For 2001-2011, estimates by Mihăilescu (2012); for 2012-2015, own estimates based on extrapolation of the ICCV method

Evolution of the net income, minimum decent living income and minimum subsistence income for a household with 2 minimum wages

Year/October	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Net income of a household with 2 minimum wages	2436000	2436000	4350000	4350000	647	647	730	830	938	804	898	1140	1218	1356	1570
Minimum decent living income for households with 2 employees	5256337	6362760	7376688	8164676	900	943	1006	1079	1152	1265	1306	1373	1395	1414	1390
Minimum subsistence income for households with 2 employees	3805549	4498625	5215501	5772630	699	732	781	838	894	1050	1085	1141	1199	1261	1325
Ratio of 2 minimum wages to the minimum decent living income	46.3	38.3	59.0	53.3	71.9	68.6	72.6	76.9	81.4	63.6	68.8	83.0	87.3	95.9	112.9
Ratio of 2 minimum wages to the minimum subsistence income	64.0	54.1	83.4	75.4	92.6	88.4	93.5	99.0	104.9	76.6	82.8	99.9	101.6	107.6	118.5

Source: For 2001-2011, estimates by Mihăilescu (2012); for 2012-2015, own estimates based on extrapolation of the ICCV method



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