

Do Minimum Wage Changes Influence Employment?

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ABSTRACT – Greater number of foreign working studies does confirm the theoretical assumption that minimum wage increases negatively change the amount of employed people. Contrary to these, there is, however, a completely different persuasion on this issue among some economists. This article picks out minimum wage as an important part of employment research investigating two files; the number of working people aged 15 – 64 and all working labours.

KEY WORDS: working force, minimum wage, ageing index, labour productivity

Introduction

Although there are several factors (like economic growth, foreign investments, education of workers, average wage, living wage¹), effecting the number of employed persons, discussions are, however, held at the most about the relation between minimum wage² and employment just on when setting in new level of minimum wage. Among majority of employment and minimum wage empirical literature³ (e.g. Brown, Gilroy and Kohen 1981; Neumark and Wascher 1992; Card and Krueger 1994; Welch 1976; OECD 1998; Eriksson and Pytlikova 2004) there are papers testing the relationship between minimum wage and employment of teens and young generation, skilled workers (e.g. Brown, Gilroy and Kohen 1983; Ragan 1977).

Test results for minimum wage influences upon employment rest on existing theoretical models. There is a basic competitive model (neoclassical theory accepts that employment declines when minimum wage rises; if the level of minimum wage exceeds the market clearing wage, supply of labours increases while demand declines), followed by alternative – modified specifications. The basic competitive model posits a labour market with many identical companies and homogeneous workers (Zavodny 1998). It rests on the behaviour of a labour force so that the additional unit of labour takes the work only if wages are enhanced. Thus the value of the last unit of labour (marginal product) declines as labour increases. However, this approach (model) does not consider any differences as to ability, experience or knowledge of labour forces (Samson 2008).

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¹ Living wage: a wage which is enough to buy the necessary things in daily life (Longman Dictionary, 1978).

² Minimum wage: the lowest wage permitted by law, by a rule, or by agreement, for certain work (Longman Dictionary 1978).

³ In Slovakia there is a need of empirical research papers devoted to minimum wage and employment. For more information see e.g. Vokorokosová 2008; Barošová 2008; Eriksson and Pytlikova 2004.



On the contrary, alternative or sometimes called dynamic models⁴ (e.g. substitution model of labour force) focused on two types of labours: skilled and no skilled and compare the level of minimum wage with that of a market clearing wage⁵. Skilled and unskilled workers if being employed, one can suppose, that minimum wage changes increase the number of skilled workers employed while decrease the number of unskilled workers in the working process. Monopsony model – another alternative model denotes a single employer that, if requiring additional unit of labour has to increase the wage levels of all his workers.

The aim of this paper is to examine the impact of minimum wage changes upon the employment status of employed people regardless the age as well as of that aged 15 – 64. The paper proceeds as follows: section two provides a brief history of minimum wage relating to Slovakian legal environment. Section three puts details to empirical arrangement and the outcomes. Section four concludes.

History of minimum wage

Minimum wage was for the first time approved in New Zealand (1896) later in Australia (1899), followed by Great Britain (1909). In 1912 the state Massachusetts in the USA appointed the minimum wage to women and children work. Minimum wage was legally introduced in the USA in 1938, in France in 1950 and in Holland in 1968.

Within the EU setting the minimum wage is in the competence of individual economies. According to Eurostat and The European Foundation for the Improvement of Living and Working Conditions there are 20 countries which introduced some kind of national minimum wage (set legally or through collective bargaining). Six countries (Denmark, Finland, Germany, Austria, Italy, and Sweden) approved minimum-wage tariff settled in sector collective bargaining. e. g. Cyprus introduced the minimum wage for six selected professions (Barošová 2008).

Minimum wage in Slovakia

Minimum wage along with mechanism for its setting are in Slovakia defined in the Law 633/2007, Collection of Laws, on Minimum wage, involved in Law 354/2008, Collection of Laws, and in Law 460/2008, Collection of Laws⁶. Thus in Slovakia, according to the latest version of the Law, the minimum wage level is for the appropriate calendar year appointed by the government of the Slovak Republic. For individual sectors, it is, however, allowed to settle up a higher minimum wage level than that legally defined.

The sum of the minimum wage is adjusted owing to the economic and social conditions of two previous years coming just before the calendar year for which the level of minimum

⁴ Dynamic models do not consider negative impacts of minimum wage changes on employment due to e. g. substitution effects among workers regarding their qualification.

⁵ Market clearing wage is the result of an upward-sloping labour supply curve and a downward-sloping labour demand curve. The market labour supply curve is upward sloping; individual firms are however, facing a horizontal labour supply curve.

⁶ Introducing a new law on minimum wage the hitherto legislative regulations became void. The previous law set reduced rates towards selected groups of employees titled to lower rate of 50 % and 75 % from the minimum wage.



wage is to be determined. The sum of monthly minimum wage for the coming calendar year is adjusted according to the national average wage index (Law on Minimum Wage in Slovakia, current version).

Description of model and data

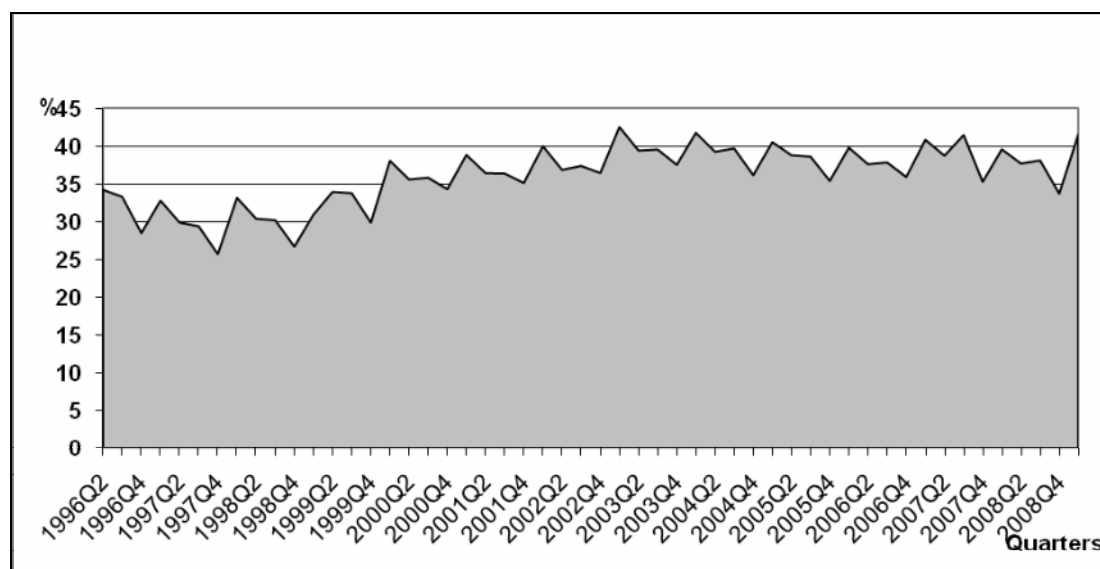
Models based upon time series usually apply for lagged variables (e. g. minimum wage) assuming that a certain time has to pass since the effects of minimum wage changes can occur (Brown, Gilroy and Kohen 1981). Lags are usually set empirically (Hatrák 2007).

Standard statistical model takes a form

$$Y_t = \sum_{i=1}^k \beta_i X_{it} + \gamma T + u_t \quad (1)$$

whereas Y_t is employment to population ratio, X_{it} stands for relevant variables e g. minimum wage, price index, unit labour costs, etc; T is a time variable, u_t is random error term, t stands for time, β_1, \dots, β_k are parameters, which ceteris paribus indicate relation between independent variables and dependent variable, γ points out relation between trend variable and employment. In this article the testing of effects of minimum wage⁷ (see values of Kaitz index on graph 1) for changes upon employment⁸ (see graph 2) rests on the standard statistical model (1) using quarterly data (1996 q2 – 2009q1) from the database of the Statistical Office of the Slovak Republic (SOSR).

Graph 1. Kaitz index



Reference: Graphical layout based upon SOSR data.

⁷ Variable Minimum wage is expressed as proportion of minimum wage to national average wage.

⁸ Employment denotes employment rate which is the ratio of the working labour force currently employed to the total population in given age. The Organization for Economic Co-operation and Development defines the employment rate as the percentage of the working age population (ages 15 to 64 in most OECD countries) who are currently employed.



Models (Model 1: Age groups together; Model 2: Ages 15 – 64) meet assumptions of classical regression. Variables are integrated of first order I (1). They are co integrated, that means, their linear combination is I (0), and it is stationary. Lags of exogenous variables were set empirically.

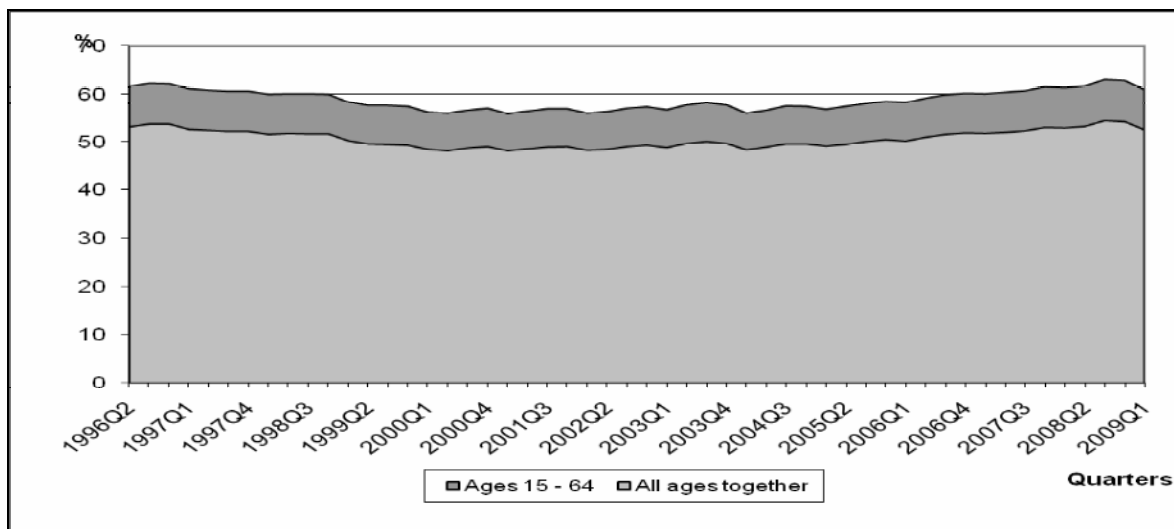
It is evident that the value of Kaitz index expressed as a share of minimum wage to average wage level in national economy under Slovak conditions moved from about 33 % at the beginning of the observed period to about 42 % in the first quarter of the year 2009. Value of the Kaitz index varies along with the level of average wage in national economy in corresponding quarter. The level of minimum wage is set forth in advance and remains unchanged for the entire year in Slovakia.

Regression (2) expresses the relation between minimum wage and employment of both of the investigated structures - files (one that encompasses all employed people; second that involves workers in the age 15 - 64) along with a control variable - labour productivity.

$$Y_t = \beta_0 + \beta_1 X1_{t-1} + \beta_2 X2_{t-1} + \beta_3 Y_{t-1} + u_t, \quad (2)$$

whereas Y_t is a time series expressing rate of employment of observed file; $X1_t$ is a share of minimum wage to average wage; $X2_t$ denotes labour productivity; $\beta_{0,1,2,3}$, express parameters; u_t denotes random error term. Tables 1, 2 present the results – values of coefficients.

Graph 2. Employment rate



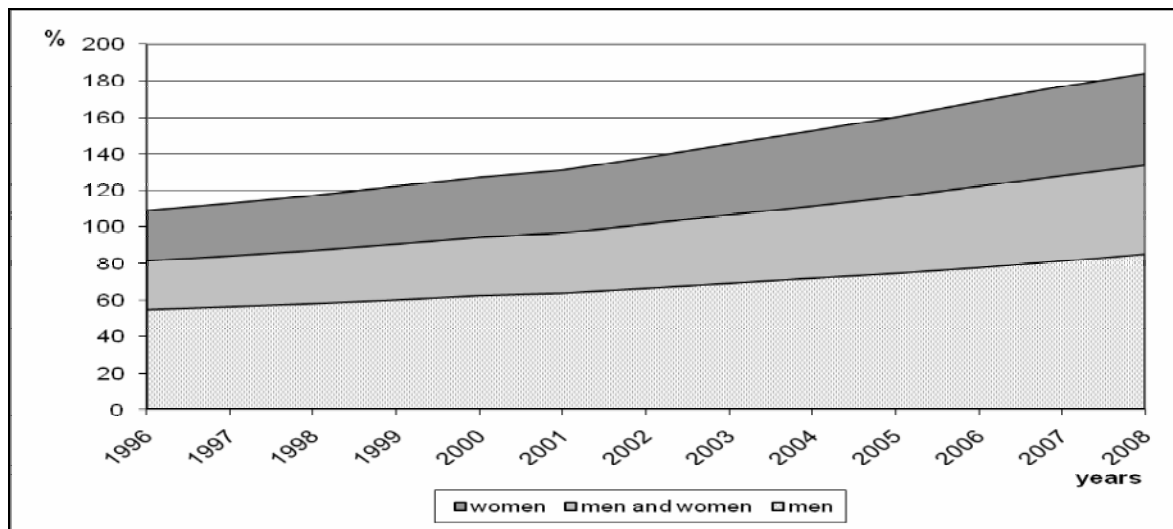
Reference: Graphical layout based upon SOSR data.

Employment rate of observed files seems to be quite stable although some changes occurred during 1998 and 2003. A disemployment between 1998 and 2001 was a result of reforms provided for e. g. public finances, taxes, social system and public administration. In the following period, there was an increasing demand for labour mainly in those companies absorbing foreign capital that flew e. g. to automobile industry and attendant establishments. Peculiar for 2001 was the increased number of economically active population year-on-year by 44 800 people. Year-on-year rose the employment by 22 000 people (Domonkos and



Pániková 2007). In addition to this one must also take into consideration the demographic changes in the economy. The share of inhabitants at the post productive age to that of pre productive age (see graph 3: Ageing index⁹ of inhabitants together; men; women) keeps rising.

Graph 3. Ageing index



Reference: Graphical layout based upon SOSR data.

The ageing of inhabitants tends to increase as the values of the ageing index becomes larger for all observed files (men and women; men; women) achieving the highest values for women category (its value changed from 108.92 % in 1996 to 184.21 % in 2008). From 2007 to 2008 the value of the index increased in the corresponding file (women) for about 7.31 percentage point.

Ageing index for men finished in 1996 at the value of 55.07 % while in 2008 at the value of 85.44 %. In 1996 the value of the ageing index in the category of men and women together obtained about 81 % while in 2008 it got about 134 %. So it seems that in 2008 there were about 134 inhabitants at the post productive age coming to 100 inhabitants at the pre productive age (0-14).

The number of inhabitants decreases in general, however, as death rate declines and the length of life becomes longer; there are more and more older people at the post productive age (over 65 years). This is, however, a general tendency also in other countries. This may result in the shortage of labours necessary for a certain type of economic sector (Puchá 2005). A possible solution might be the inflow of foreign labours which could reduce existing gap on the labour market.

⁹ Ageing index is calculated as the number of persons 60 years old or over per hundred persons under age 15. In Slovakia it takes following form: $Ai = \frac{65^{+}}{0-14} * 100$.



Table 1. Values of coefficients and standard errors. LS (Least Squares)

Variables	Model 1 (Age groups together: men and women)	Elasticity
Constant	-8.413664** (2.995541)	
MW_AW(-1)	0.144191** (0.028492)	0.102
ER(-1)	1.077487 (0.048238)	
PROD(-1)	-0.067289** (0.028022)	-0.047
R ²	0.931	
N number of observations	52	

Numbers in parentheses denote standard errors, R² – coefficient of determination.

**Significance at 5 %

Investigation results (see table 1) of minimum wage changes (expressed as a share of minimum wage - **MW** - to average wage – **AW** -) and their effects upon employment status (expressed as employment rate - **ER** - of men and women) did not confirm a negative relation between these two variables. There is a negative connection between employment and labour productivity – **PROD**. If the share of minimum wage to average wage changes by 1 %¹⁰, the employment rate increases by about 0.102 %. All variables are used in a lag form. Any changes in minimum wage/average wage or in labour productivity tend to take some time until their effects become evident. The lags of variables were set empirically (for one period of observation that is one quarter).

Table 2. Values of coefficients and standard errors. LS (Least Squares)

Variables	Model 2 (Age groups 15 – 64)	Elasticity
Constant	-9.997505 (3.552217)	
MW_AW(-1)	0.168097** (0.033406)	0.119
ER15_64(-1)	1.081321** (0.049301)	
PROD(-1)	-0.080012 (0.032629)	-0.056
R ²	0.929	
N number of observations	52	

Numbers in parentheses denote standard errors, R² – coefficient of determination.

** Significance at 5 %

¹⁰ Based upon calculations of arc elasticity which takes the following form: $\bar{E}_{Y/X} = \frac{dY}{dX} * \frac{\bar{X}}{\bar{Y}}$.



There is a positive relation between minimum wage changes and employment rate of labours aged 15 – 64 (see table 2). Like in previous model (model 1), a negative relation was proved among employment rate of corresponding file and labour productivity. A 1 % increase of minimum wage/average wage in national economy seems to increase the employment rate of the file under review by about 0.119 % while a 1 % increase of labour productivity tends to decline the employment rate of labours aged 15 – 64 by about 0.056 %.

Conclusion

Outcomes obtained in this paper do not confirm the theoretical assumption that minimum wage changes have disemployment effect. In both of the files observed (employment of men and women regardless age; employment of labours aged 15 – 64) the positive effect of minimum wage/average wage changes to employment status were found out. If economy is rising, minimum wage can be rising too. This in fact motivates people working even those voluntary unemployed (discouraged) ones. As there is a lack of empirical studies in Slovakia coping with minimum wage influences upon employment, this article may reduce the existing gap in this research and be useful for institutions having decision right about minimum wage settings. Pros and cons of minimum wage in economy are often discussed, but a certain level of minimum wage can protect domestic labour market from the outflow of domestic labours to foreign countries mainly in the neighbourhood where they can earn minimum wage higher than it is in their domestic country. It can even prevent the labour market from the inflow of a cheap labour from abroad. Nowadays it is not about abolishing the minimum wage in countries where it already exists, but it is often discussed in economies which still do not have any kind of guarantee of minimum earning. Beside other advantages it presents a country's interest to handle the issue of poverty and willingness to ensure a certain level of living also for those which earn the lowest amount of money. Since there are still different opinions on how the minimum wage changes effect employment, working papers relating to this issue in different countries are a good source of valuable information for all subjects involved in this matter.

References

- Barošová, M. 2008: Fungovanie a vývoj minimálnej mzdy v Slovenskej republike. *FÓRUM SOCIÁLNI POLITIKY* 5/2008.
- Brown, Ch. - Gilroy, C. - Kohen, A. 1981: Effects of the Minimum Wage on Employment and Unemployment. *Journal of Economic Literature*. Vol. XX.
- Brown, Ch. - Gilroy, C. - Kohen, A. 1983: Time-Series Evidence of the Effect of the Minimum Wage on Youth Employment, *Journal of Human Resources*. .
- Card, D. - Krueger, A. 1994: Minimum wages and employment: A case study of the fast-food industry in New Jersey and Pennsylvania. *American Economic Review*.
- Domonkos, T. – Pániková, L. 2007: Analýza a modelovanie dopytu po práci v podmienkach slovenskej ekonomiky. INFOSTAT, Bratislava.
- Eriksson, T. – Pytlikova, M. 2004: Firm-level Consequences of Large Minimum-wage Increases in the Czech and Slovak Republics. *Labour*, Vol. 18, No. 1.
- Hatrák, M. 2007: Ekonometria. Bratislava: Iura Edition.



- Neumark, D. – Wascher, W. 1992: Employment effects of Minimum and subminimum wages: Panel Data on State Minimum Wage Laws. *Industrial and Labour Relations Review*, Vol. 46, No. 1.
- OECD 1998: Statutory Minimum Wages, Employment and Poverty. OECD Employment Outlook.
- Puchá, N. 2005: Komparatívne a konkurenčné výhody v novej ekonomike. In: Zborník príspevkov zo 4. Medzinárodnej doktorandskej konferencie: *Ekonomické, politické a právne otázky medzinárodných vzťahov*. Ekonomická univerzita Bratislava, Fakulta Medzinárodných vzťahov.
- Ragan, J. 1977: Minimum wages and the youth labour market. *Review of Economics and Statistics* 59.
- Samson, Š. 2008: Dejiny ekonomických teórií – Ekonomické myslenie v predhistórii, klasická a neoklasická ekonómia. Košice: *Elfa*.
- Vokorokosová, R. 2008: Minimálna mzda a konkurencieschopnosť. Košice: *Elfa*.
- Welch, F. 1976: The minimum wage legislation in the United States. Evaluating the labour market effects of social programs, *Princeton University*.
- Zavodny, M. 1998: Why Minimum Wage Hikes May Not Reduce Employment. Federal Reserve Bank of Atlanta. *Economic Review*, Q2.
- Law on Minimum Wage in Slovakia (current version of Minimum Wage Law)
www.wikipedia.com
www.statistics.sk
- Longman Dictionary of Contemporary English, 1978.

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