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The Crowding out Effect on the Labor Market in Romania*

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Abstract. *Discrimination expresses any distinction, exclusion, restriction, preference or different treatment that disadvantages a person or group, in comparison with others in similar situations. The crowding out effect was first formulated by Bergmann (1974) and explains that an individual can obtain lower returns if he belongs to a branch dominated by the members of another group. The difference in pay between women and men is also reinforced by the segregation in the labor market, which may explain the crowding out effect.*

In this article we analyzed the level of segregation in the Romanian labor market starting from the workers professional status and their distribution by branch from 2003 to 2008. Crowding out effect was analyzed based on the gain function of the two groups (women and men).

Keywords: discrimination; wage; segregation; crowding; labor market.

JEL Codes: J01, J15, J16.
REL Codes: 12D, 12E, 12F, 12I, 12Z.

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1. Literature review

From the late nineteenth century many economists have analyzed the problem of discrimination in the labor market and especially the wage gap between women and men. Webb (1891) considers that women earn less than men, but not because they produce less but because they are usually underrated on the labor market. For Webb this inequality can be removed "through education". Fawcett (1892) believe that "most women want to gain additional training, allowing them access to a larger number of trades."

The wage gap between men and women in the labor market can be explained, starting from three reasons:

- the productivity difference and the human capital (Edgeworth, 1922, Mincer, 1974);
- women's choices regarding work;
- segregation in the labor market, which can be explained by the difference in mobility between women and men.

Segregation is the social separation of different classes, usually leading to social inequalities. The concept of segregation may acquire the same meaning as the concept of discrimination, denoting different practices which limits the access to labor for social groups. Among the factors that can lead to segregation are: the traits of labor demand and supply, the level of economic development, etc. Segregation can be horizontal, and in this case workers (female and male) are divided by sectors (primary, secondary and tertiary), and vertical, where employees are divided into professional categories and the educational level play an essential role.

The wage gap between women and men is also reinforced by the labor market segregation and their tendency to perform different labors. On one hand, men and women often predominate in various branches, on the other hand, in the same branch or business, women predominate in occupations less valued and less paid. Over 40% of women, according to the European Union Commission (2009), work in health, education and public administration. This figure represents twice the number of men in the same branches.

The concentration of women in certain branches determines a drop in wages. This phenomenon is known in literature as the "crowding out effect". The crowding effect term on the labor market has emerged for the first time in the US during the women's trade union protest between 1890 and 1925. In 1922 the British economist Edgeworth argued that the fact that women's wages are lower than men's because women work only in certain fields (in other words they tend to concentrate just in certain branches). Unions have thus excluded women from certain jobs, creating a surplus of female workers, which led to

lower wages for their work. This artificially distorted the labor market, leading to lower wages for some groups and higher wages for others. In 1971, Bergmann estimated that the integration of black male workers with the white male would have a negative impact on the white workers income and in 1974 he analyzed the concentration of female workers in certain occupations. Starting from this analysis he believed that occupational segregation by gender may be a major factor in wage inequality between sexes.

According to the European Union Commission (Wille, 2010), women tend to occupy jobs requiring a lower salary, and men better jobs with a higher salary. This affects the average wage, creating the crowding out effect: wages drop in branches reserved for women, because there are too many women for a limited number of jobs. The crowding explains that a female worker may get higher returns if she is employed in a branch dominated in number by individuals who do not belong to the same group.

2. Empirical analysis

To assess the impact of segregation on the labor market we calculated the Ducan index (ID) using the main professional categories: employees, employers, self-employed and unpaid family workers. This indicator can be defined as follows:

$$\text{ID}=\frac{1}{2}\sum_{i=1}^{n}\left|f_i - m_i\right|$$

where n denotes the total number of occupations considered, i denotes the professional category, f_i and m_i denotes the level of employment for each professional category (i) related to the total level of employment for females and males. Data used for this indicator are from the National Institute of Statistics.

Ducan index can range from 0, when workers of both sexes are equally distributed in relation to the occupational categories, and 1when there is a total segregation. In Table 1, the Ducan index has values closer to 0, which means that, in terms of professional status, there is no strong segregation on the Romanian labor market. There is a stronger differentiation between *self-employed,* a status mainly occupied by men, and *unpaid family worker,* in which women dominate. An analysis by activities (according to the CAEN classification) showed us an even smaller Ducan index (Annex 1).

Table 1

The Ducan index in relation to the employment status

	2009		2008		2007		2006	
	Man	Woman	Man	Woman	Man	Woman	Man	Woman
Employed	67%	68%	66%	67%	66%	67%	64%	65%
Employer	2%	1%	2%	1%	2%	1%	2%	1%
Self-employed	25%	13%	25%	13%	25%	12%	25%	13%
Unpaid family worker	6%	19%	6%	20%	7%	20%	8%	21%
Ducan Index	0.13		0.36		0.14		0.14	

Source: INS and own computing.

Starting from Sorensen (1990) and Bergmann (1974) studies we calculated the salary gap for different activities between women and men, the employment level by branch for the two groups to see which activities are dominated by men, respectively women and the difference in salary. Wage gap has been calculated using the formula proposed by C. Baudelot and A. Lebaupin (1979) and was calculated for 2003-2008 period for 40 activity branches.

$$e = \frac{SM - SF}{SM} 100 \quad (1)$$

where: SM denotes the salary of men and SF denotes the salary of women.

Throughout this period women were better paid than men in the following branches: *real estate and other services, construction and woodworking*. But these branches are dominated by men, which explains the crowding out effect formulated by Bergmann (1974).

To calculate the difference between female and male employment by branches, we used the following formula:

- for males:

$$E_{GOm} = \frac{GOmj}{GOm} \times 100 \quad (2)$$

where *j* denotes the branch, and *m* denotes the employment level among males for different branches;

- for females:

$$E_{GOf} = \frac{GOfj}{GOf} \times 100 \quad (3)$$

where *f* denotes the employment level among females for different branches.

Table 2 shows branches that, in terms of employment, are dominated by females and their salary gap. With few exceptions (year 2004 for the last six branches and the years 2007, 2008 for *public administration*) male workers have higher wages. We can say that women generally occupy positions in the labor market that does not require a very high level of qualification (nurses, shop assistants, etc.).

Table 2

The wage gap in branches dominated in terms of employment by women

Branch	2003	2004	2005	2006	2007	2008	Code
Food and beverages	18%	16%	19%	18%	20%	16%	6
Textiles	17%	11%	17%	14%	19%	16%	8
Clothing	13%	14%	10%	12%	16%	10%	9
Leather and footwear	9%	4%	5%	12%	11%	12%	10
Electrical Machinery	20%	14%	19%	24%	20%	19%	22
Commerce	0%	-21%	23%	25%	20%	15%	33
Hotels and restaurants	0%	-24%	15%	15%	14%	5%	34
Financial intermediation	0%	-31%	16%	21%	15%	21%	36
Public administration and defense	0%	-25%	4%	2%	-10%	-12%	38
Education	0%	-34%	13%	16%	19%	17%	39
Health and social care	0%	-28%	14%	18%	21%	11%	40

Source: INS and own computing.

Figure 1 shows that, generally, in sectors dominated by women, men's wages are smaller than in other branches (dominated by man), except for the "37" and "39" branches. This situation is maintained over the 2003-2008 period.

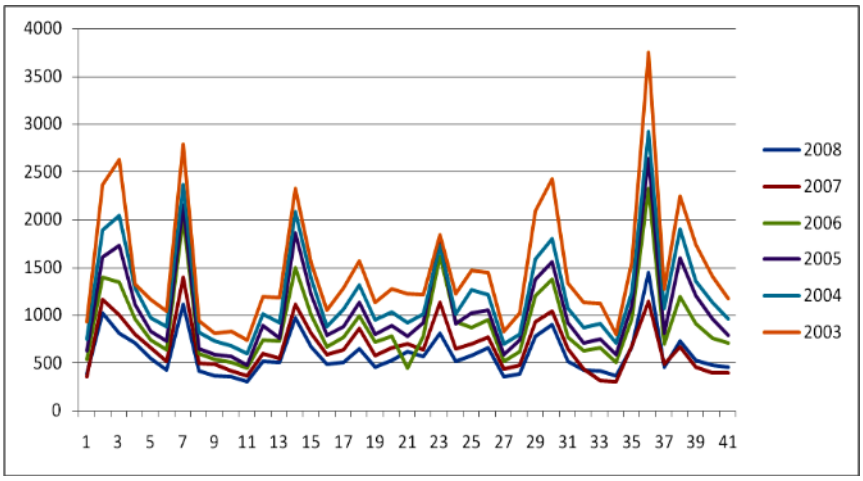

Figure 1. *Male wage by branches during 2003-2008*

Crowding out effect can be explained using the model proposed by Bergmann (1974) and Sorensen (1990). For this model we used panel data from 2003-2008 that was taken from the National Institute of Statistics. To explain the crowding effect we estimated the income function for the two groups (women and men):

$$\ln wi = \beta o + \beta 1 \times GO_i + \beta 2 \times X \quad (4)$$

where:

– i denotes the affiliation group and β the coefficients to be estimated;

– lnw denotes the nominal annual income by branches;

– GO_i denotes the employment level by branches;

– X denotes a dummy variable that takes the value 1 when males dominate a particular branch in terms of employment and 0 if otherwise.

$$\text{For women: } \ln w_f = \underset{\substack{[136.6]\\(0.06)}}{6.85} - \underset{\substack{[-2.32]\\(0.005)}}{0.023} \times GO_F - \underset{\substack{[2.61]\\(0.07)}}{0.182} \times X \quad (5)$$

$$\text{For men: } \ln w_m = \underset{\substack{[99.5]\\(0.04)}}{6.81} - \underset{\substack{[-4.18]\\(0.009)}}{0.021} \times GO_B + \underset{\substack{[-2.56]\\(0.05)}}{0.131} \times X \quad (6)$$

Both equations show a negative correlation between wage and employment level. The results are consistent with the economic theory, an increase of employment usually leading to a decrease of the average wage. Yet, the *employment level* corresponding coefficient is very low (econometric significant), indicating a strong wage rigidity in relation to employment. However, the differences between equations (5) and (6) are interesting in terms of the dominance effect. Thus, according to equation (5), in economic activities dominated by women, their wage tends to decline compared to the average (the associated dummy variable has a negative coefficient: – 0.182). According to equation (6), male wages tends to increase in branches dominated by men (the associated dummy variable has a positive coefficient: 0.131).

Based on the dummy coefficients from equation (5) and (6) the hypothesis formulated by Bergman (1974) is confirmed: a branch dominated by men leads to wage increases as opposed to branches dominated by women. The dummy variable coefficients show a homogeneous distribution by branches, a fact confirmed by the Ducan index presented above.

3. Conclusions

The Romanian labor market has a low level of segregation, which means that there is no branch dominated by either women or men. In sectors dominated by women, with the exceptions of *financial intermediation* and *public administration,* men receive lower wages than in other branches where they dominate.

Based on the two income functions analyses we observed rigidity of wages in relation to employment, which indicates a weak correlation between the two variables. This shows that changes in occupancy were not strong enough to alter the dynamics of the average wage. The dynamic of wages and the salary differentiation between different branches seems to be influenced by other factors (the power of unions and employers, labor productivity, etc.) rather than the level of employment. Crowding out effect occurs in the Romanian labor market, especially since there is a tendency to employ women and men in different fields and occupations.

Acknowledgment

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Annex 1

The Ducan Index

2003	2004	2005	2006	2007	2008	Activity	Code
0,03	0,02	0,03	0,02	0,02	0,02	Agriculture	1
0,03	0,02	0,03	0,02	0,02	0,02	Coal mining and preparation	2
0,04	0,04	0,04	0,03	0,03	0,03	Hydrocarbons extraction and ancillary services	3
0,01	0,01	0,01	0,01	0	0	Metalliferous ores quarrying and preparation	4
0,01	0,01	0,01	0,01	0,01	0,01	Other extractive activities	5
-0,02	-0,01	-0,02	-0,02	-0,02	-0,03	Food and beverages	6
0	0	0	0	0	0	Tobacco products	7
-0,06	-0,06	-0,05	-0,05	-0,05	-0,04	Textile products	8
-0,27	-0,27	-0,26	-0,25	-0,23	-0,21	Clothing articles	9
-0,07	-0,07	-0,07	-0,07	-0,07	-0,07	Leather goods and footwear	10
0,03	0,03	0,03	0,03	0,03	0,03	Wood and wooden products manufacturing	11
0	0	0	0	0	0	Pulp, paper and paper products	12
0	0	0	0	0	0	Publishing houses, polygraphy and recording	13
0	0	0	0	0	0	Crude oil processing, coal coking and nuclear	14
0	0,01	0,01	0	0,01	0,01	Chemical substances and products	15
0	0	0	0,01	0,01	0,01	Rubber and plastic products	16
0,01	0,02	0,02	0,02	0,02	0,02	Manufacturing of construction materials and other	17
0,04	0,04	0,03	0,04	0,03	0,03	Metallurgy	18
0,05	0,05	0,05	0,06	0,06	0,06	Metallic construction and metal products	19
0,06	0,05	0,05	0,05	0,05	0,04	Machinery and equipment	20
0	0	0	0	0	0	IT and office means	21
-0,01	-0,01	-0,02	-0,02	-0,03	-0,03	Electric machinery and appliances	22
0	0	0	0	0	0	Radio, TV and communications equipment	23
0	0	0	0	0	0	Medical, precision, optical and watchmaking	24
0,01	0,01	0,01	0,01	0,01	0,01	Means of road transport	25
0,04	0,04	0,04	0,04	0,04	0,04	Means of transport not included in road transport	26
0,02	0,02	0,01	0,01	0,01	0,01	Furniture and other industrial activities	27
0,01	0,01	0,01	0,01	0,01	0,01	Waste recovering	28
0,06	0,06	0,06	0,06	0,06	0,06	Electric and thermal energy, gas and hot water	29
0,04	0,04	0,05	0,05	0,05	0,04	Water catchment, treatment and distribution	30
0,02	0,02	0,02	0,02	0,02	0,01	Construction	31
0,02	0,1	0,1	0,1	0,11	0,12	Trade	32
-0,03	-0,04	-0,03	-0,03	-0,02	0	Hotels and restaurants	33
-0,01	-0,01	-0,01	-0,01	-0,01	-0,01	Transport, storage and communications	34
0,06	0,05	0,05	0,05	0,06	0,06	Financial intermediations	35
-0,01	-0,01	-0,01	-0,02	-0,02	-0,02	Financial, banking and other econmic services	36
0,02	0,02	0,02	0,03	0,03	0,04	Public administration and defence	37
-0,02	-0,02	-0,02	-0,02	-0,01	-0,01	Education	38
-0,08	-0,08	-0,07	-0,07	-0,07	-0,07	Health and social assistance	39
-0,08	-0,09	-0,09	-0,09	-0,09	-0,09	Ther activities of the national	40

Source: INS and own computing.