

# THE AGE-SPECIFIC RELATION BETWEEN FERTILITY AND FEMALE ECONOMIC ACTIVITY: EVIDENCE FROM SERBIA

Natalija Mirić<sup>1</sup>, Mirjana Devedžić<sup>2</sup>

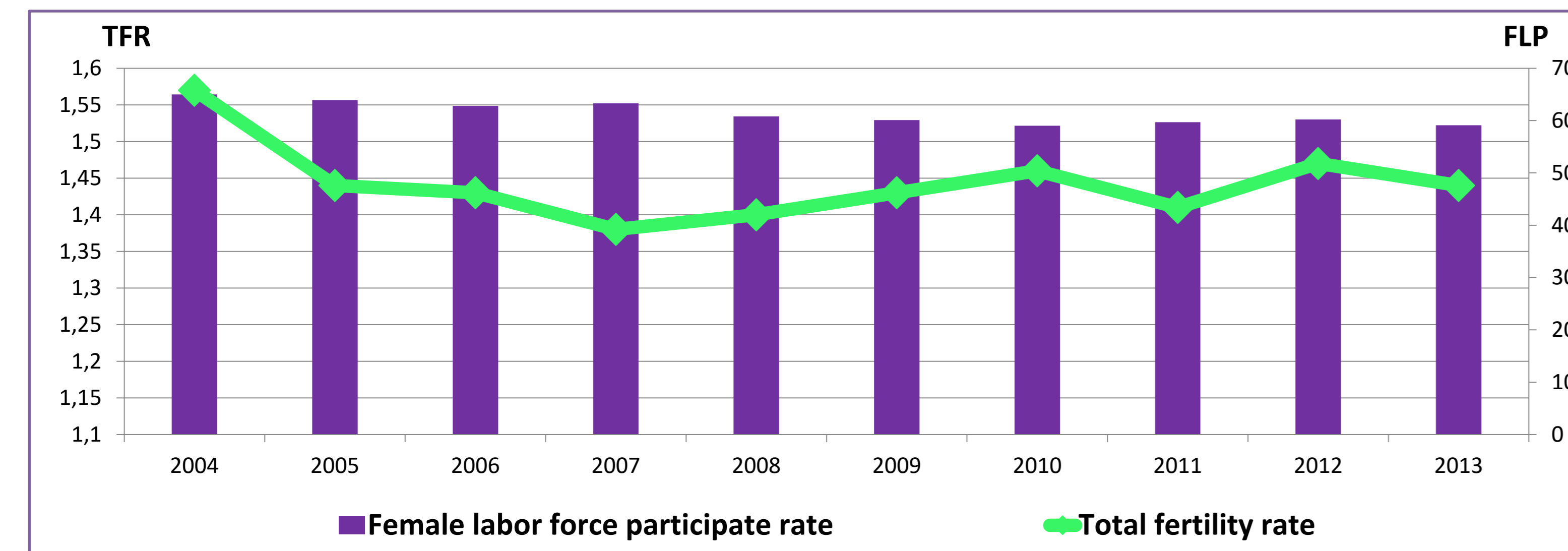
<sup>1</sup> University of Belgrade Faculty of Geography, [natalymiric@gmail.com](mailto:natalymiric@gmail.com); <sup>2</sup> University of Belgrade Faculty of Geography, [mdevedzic@gmail.com](mailto:mdevedzic@gmail.com)

## INTRODUCTION

An increase of female economic activity has been recognized as one of the important factors of fertility decline in the older literature (Becker 1960; Willis 1973, Butz and Ward 1979), i.e. female economic activity and fertility were negatively correlated. However, many empirical studies have shown that the sign of correlation has become positive since the '80s in Europe (Brewster and Rindfuss 2000; Ahn and Mira 2002), and the explanations of this change are different. Analysis of age-specific reproductive behavior and female economic activity contributes to more detailed study of this relation, which has been determined by different factors in different age groups of women. Brehm and Engelhardt (2015) explored age-specific correlation between these two components in the OECD countries and pointed to a completely different relation between fertility and economic activity in different age groups of women.

The aim of this paper is to show the relation between fertility and participation of women in reproductive span in the labor market in Serbia, and to answer the question whether to this end Serbia follows a pattern that is present in Europe. Given that the prime childbearing age is between 20 and 39 years, this paper focuses on examination of differences in the relation between these two components within this age (20-24, 25-29, 30-34, 35-39). Thus, the main objective of this paper is to highlight the age-specific relation between these two components.

**GRAPH 1:**  
Total fertility rate and female labor force participation (15-49) rate in Serbia between 2004 and 2013



## METHOD

We used two sources of data for this analysis: the Labour Force Survey and Demographic Statistics. Descriptive analysis was performed for the period between 2004 and 2013. The indicators used in this analysis are: total fertility rate (TFR), age-specific fertility rate, female labor force participation rate (FLP) and age-specific female labor force participation rate. The analysis was complemented by using correlation analysis that determined whether these two variables have moved in the same (positive correlation) or different direction (negative correlation). The absolute value of the correlation coefficient points to the strength of relationship between the observed variables: strong correlation  $|r| = 1$ , moderate correlations  $0.5 \leq |r| < 0.8$ , weak correlation  $0.2 \leq |r| < 0.5$ , negligible correlation  $0 < |r| < 0.2$ , no correlation  $|r| = 0$ .

## RESULTS

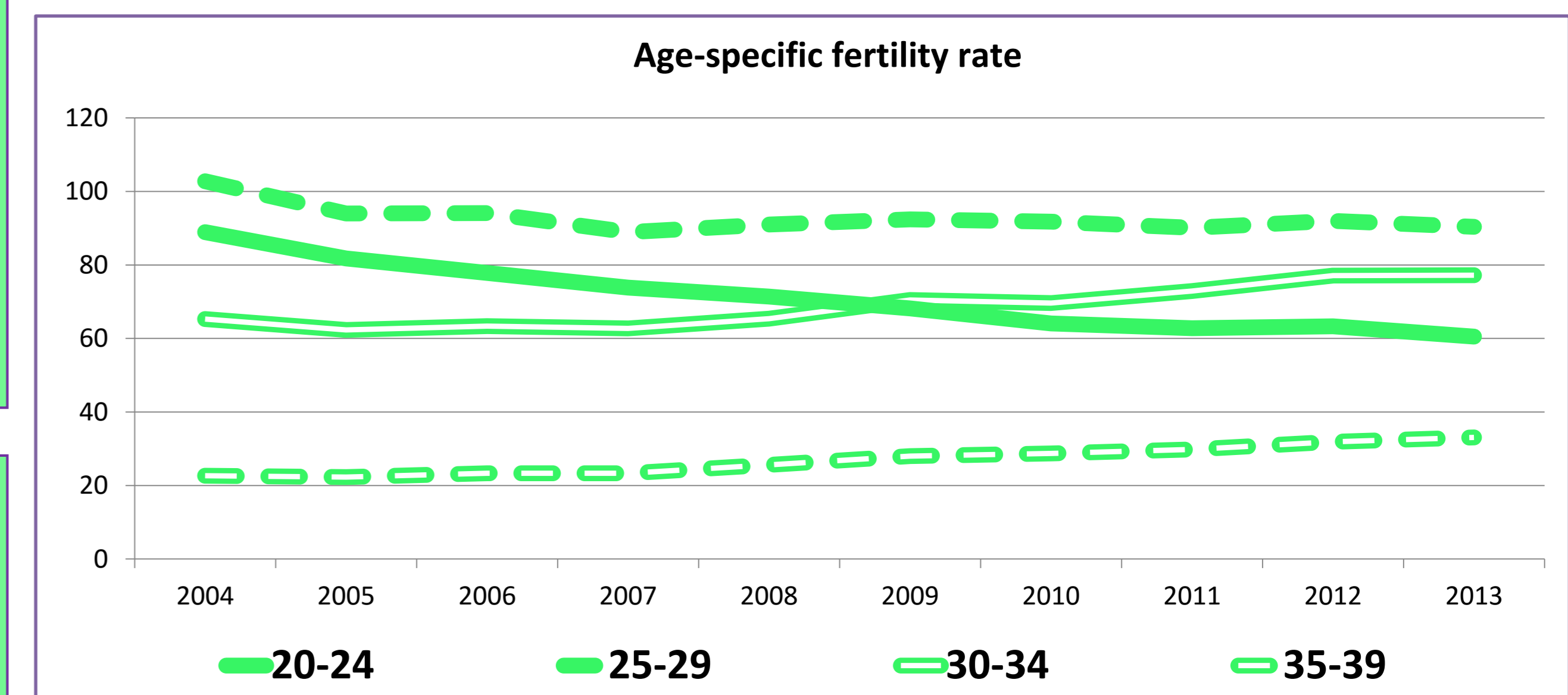
Serbia was characterized by very low and declining total fertility rate in the past decade, which was 25% below replacement level at the beginning of observed period, while the latest data show that TFR is 31% below replacement level (Graph 1). The problem of insufficient childbearing in Serbia has been followed by declining female labor force participation. Female labor force participation rate (women reproductive span) was fallen by 6 percentage points in the period 2004-2013, i.e. FLP was about 10% lower in 2013 compared to its value at the beginning of the observed period (Graph 1). Although the massive female participation on the labor market has been one of the main features of the economic structure of population in the postwar period in Serbia, which has been explained by change in the structure of the economy, by the expansion of education, as well as by the emancipation of women, however, a specific transition and economic crisis that have occurred in Serbia since the beginning of the 21st century caused a reduction of economic activity of women. It can be concluded that the total fertility rate and female labor force participation rate were moved in the same descending direction in the period between 2004 and 2013. The correlation coefficient points to weak positive correlation ( $r = 0.34$ ), which is reflected in the fact that the decreasing trend has been more pronounced for total fertility rate than female labor force participation rate (Table 1).

Different age groups of women have been characterized by completely different patterns of relationship between fertility and economic activity (Graph 2, 3). Young age groups of women, especially the youngest (20-24), have been characterized by the "declining pattern" of fertility and economic activity. Age-specific fertility rate of youngest women and their participation on the labor market have been fallen by 30% in the observed period. The correlation coefficient ( $r = 0.96$ ) indicates that the fertility and economic activity of women aged 20-24 are in strong positive correlation, i.e. these two variables were moved to the same descending direction and equal strength (Table 1). Also, women aged 25-29 have been characterized by the "declining pattern", which is less pronounced compared to women aged 20-24. More precisely, age-specific fertility rate of women aged 25-29 was decreased by 12%, while the age-specific female labor force participation rate of the same category of women was decreased by 4%, which was considerably smaller decline than among younger women. This is confirmed by the correlation coefficient ( $r = 0.43$ ) that indicates the relatively weak positive correlation between fertility and economic activity of women aged 25-29. Older women have been characterized by completely different patterns compared to young. On the one hand, women aged 30-34 have been characterized by the "combined (mixed) pattern", which means growth of fertility and decline of economic activity. Age-specific fertility rate of women aged 30-34 was increased by almost 20%, while their participation in the labor market was fallen by 10%, i.e. these two variables are negatively correlated ( $r = -0.56$ ). On the other hand, the "growing pattern" as a characteristic of the eldest women (35-39) means growth of fertility and stagnation of economic activity (with a slight increase at the end of the observed period). Age-specific fertility rate of women aged 35-39 was increased by 46%, while their participation in the labor market stagnated at the level of 80% with a slight increase for 1 percentage point between 2012 and 2013. Correlation coefficient (-0.35 points to negative weak correlation between fertility and economic activity of women aged 35-39 (Table 1).

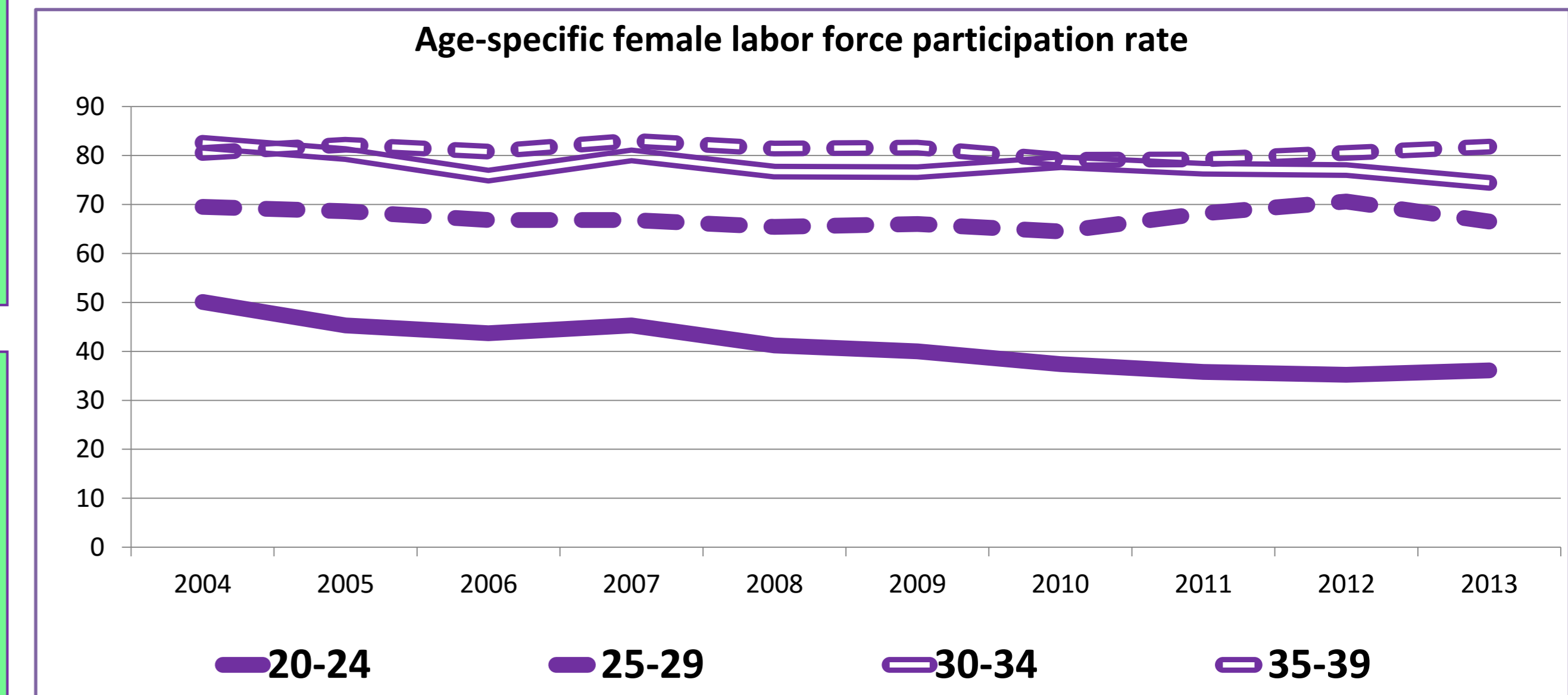
## References

- AHN, N. and MIRA, P. (2002). A Note on the Changing Relationship Between Fertility and Female Employment Rates in Developed Countries. *Journal of Population Economics* 15(4): 667-682.  
 BECKER, G.S. (1960). An Economic Analysis of Fertility. In: Roberts, G.B. (ed.). *Demographic and Economic Change in Developed Countries*. Princeton: Princeton University Press  
 BREHM, U. and ENGELHARDT, H. (2015). On the age-specific correlation between fertility and female employment: Heterogeneity over space and time in OECD countries. *Demographic Research* 32(23): 691-722.  
 BREWSTER, K.L. and RINDFUSS, R.R. (2000). Fertility and Women's Employment in Industrialized Nations. *Annual Review of Sociology* 26(1): 271-296.  
 BUTZ, W.P. and WARD, M.P. (1979). The Emergence of Countercyclical US Fertility. *American Economic Review* 69(3): 318-328.  
 WILLIS, R.J. (1973). A new Approach to the Economic Theory of Fertility Behavior. *Journal of Political Economy* 81(2): 14-64.

**GRAPH 2:**  
The development of age-specific fertility rates between 2004 and 2013



**GRAPH 3:**  
The development of age-specific female labor force participation rates between 2004 and 2013



**TABLE 1:**  
Correlations between age-specific fertility rates and age-specific female labor force participation rates between 2004 and 2013

Age groups	15-49	20-24	25-29	30-34	36-39
<b>Correlation coefficient</b>	<b>0,34</b>	<b>0,96</b>	<b>0,42</b>	<b>-0,56</b>	<b>-0,35</b>

## CONCLUSION

The analysis shows that in Serbia, as well as in European countries, there exists a positive correlation between fertility and female labor force participation. This result was expected, considering that the economic activity, in terms of providing employment and income, gains importance in terms of the unfavorable economic situation in Serbia. To this end, economic activity can be seen as a "precondition" for the realization of parenthood in Serbia. The analysis shows that 3 different patterns of the relation between fertility and economic activity according to age of women exist in Serbia: declining, combined (mixed) and growing. Overall, it can be concluded that these patterns reflect two processes: delay of childbearing and continuation of education. The patterns are largely determined by these two processes. Acquiring of higher levels of education among young women, on the one hand means their low participation in the labor market, whereas on the other side, "as a rule" it also means delay in childbearing. It is obvious that an increase of frequency of births among women older than 30 years, including the participation in the market, is greater and more stable compared to younger women.