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## The “Family 500+” programme and female labour force participation in Poland. Demographic and economic determinants

### INTRODUCTION

As with other countries, Poland is experiencing a low fertility rate, population ageing and, as a result, depopulation. In 2016, the government introduced a child cash benefit “Family 500+”. The programme aimed to increase the income of households, cut child upbringing costs and encourage fertility<sup>2</sup>. However, the cash transfers may decrease female economic activity, strengthen the labour supply shortage resulting from the adverse demographic changes, and it may impede the achievement of the programme’s aims, such as an increase in the income of households.

This paper investigates the impact of the child benefit “Family 500+” on female labour supply in Poland, taking into account the changes in the age structure of the female population and business cycle. Several Polish authors (Myck, 2016; Premik, 2017; Magda et al., 2018) have examined the impact of the “Family 500+” on labour supply in Poland. The early studies, however, have provided mixed results (see related literature) and risen methodology-related controversies. For instance, the Polish Ministry of Family, Labour and Social Policy (MRPiPS, 2018) questioned the results of the analysis by Magda *et al.* (2018), claiming that more factors than the cash transfers under the “Family 500+” programme determine female labour supply.

This paper uses a method that differs from the earlier Polish studies. To understand what forces drive labour supply, the effects of the demographic changes, the business cycle and the cash transfers on Labour Force Participation Rate (LFPR)

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<sup>2</sup> More details about the aims of the programme and the related dilemmas can be found in Gromada (2018).

were examined. The effect of the change in the age-structure of the population and the change in the economic activity of age-range subgroups activity on labour supply was studied using a counterfactual analysis. To identify the causes of female economic inactivity, a decomposition of the growth rate of economically inactive women into the inactivity types adopted by the Polish Labour Force Survey (LFS) was conducted. To capture the effect of the business cycle, the analysis investigated the stability of the relationship between the business cycle and labour supply using Ordinary Least Square (OLS) recursive regression.

The analysis focuses on the period from 2016q2, when the “Family 500+” programme was introduced, to 2018q4. Nonetheless, to better understand changes in female labour supply and its determinants, the study goes back to 2006. The analysis is based on quarterly data from LFS and GUS (Polish Central Statistical Office; CSO). The missing data on the labour market for 2012q2 are interpolated. The data on the number of women with tertiary education comes from the Eurostat database, the data on the number of births are taken from CSO *Statistical Bulletins*.

The paper is organised as follows: Section 2 presents related literature; Section 3 describes the evolution of the Polish family policy, particularly child benefits, and the effect of the child benefit “Family 500+” on the income of households and incentives to labour market activity; Section 4 analyses the time-evolution of female LFPR and explains how it was influenced by demographic processes and changes in the economic activity of age-range subgroups; Section 5 analyses the reasons for female inactivity adopted by the LFS; Section 6 examines cyclicity of female LFPR; Section 7 concludes the paper.

## RELATED LITERATURE

This paper refers to three groups of studies. The first group (e.g. Aaronson et al., 2006) addresses welfare benefits as one of labour supply determinants, along with demographic and business cycle-related factors. The second group analyses the impact of cash benefits provided within the family policy on female labour supply. The results of these studies are mixed. For instance, the report by Bastagli *et al.* (2016) summarising relevant studies for developing countries suggests that cash transfers have no significant effect on adult labour supply. In contrast, the study by Jaumotte (2013), analysing the impact of family policies in 17 Organisation for Economic Cooperation and Development (OECD) countries between 1985 and 1999, indicates a negative impact of child benefits on female labour supply.

Previous Polish analyses of the impact of the “Family 500+” child benefit on female labour supply also provided mixed evidence. According to Premik (2017), the transfers encouraged mothers with school-age children to be more economically active, contributed to a slow drop in the activity of mothers of the

youngest children and increased the economic activity of their fathers. In contrast, Magda *et al.* (2018) and Myck (2016) claim that the “Family 500+” child benefit decreases female labour supply, especially among less-educated women and in small towns.

A third group of papers investigates the impact of economic fluctuations on labour supply. Analyses show (e.g. Darby *et al.*, 1998; Van Zandweghe, 2012; Ozerkek, 2013) that female labour supply is more sensitive to economic fluctuations than male labour supply. Importantly, many researchers suggest that out-of-work income weakens the sensitivity of labour supply to economic fluctuations. For instance, Bredtmann, Otten and Rulff (2018) show that the “added worker effect” is weaker in countries where unemployment benefits are generous and the eligibility period is long. Lee and Parsanis (2014) found that the “discouraged worker effect” dominates in developed countries with access to non-wage incomes, while the “added worker effect” prevails in developing countries characterised by low social security and welfare support<sup>3</sup>.

#### FAMILY POLICY AND CASH BENEFITS

Over the past decade, Polish governments increased financial support for families with children and extended the paid parental leave. The evolution of Polish family policy was driven by population ageing and a low fertility rate<sup>4</sup>. This section briefly presents the evolution of child benefits in Poland in previous years, and the effect of the “Family 500+” child benefit on households’ income and incentives to labour market activity.

#### *EVOLUTION OF CHILD BENEFITS*

In 2006, a single payment of PLN 1000 was introduced, which was provided following childbirth (starting from 2013, eligibility depended on an income threshold). In 2014, the Large Family Card programme was adopted, granting various discounts (e.g. for train journeys) to families with at least three children. In 2015, tax credits beneficial for large families were introduced. In 2016, a parental benefit of PLN 1000 was enacted, to be paid for one year following childbirth to those (e.g. unemployed, students, farmers) who do not receive maternity benefits.

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<sup>3</sup> The “added worker effect” occurs when, for example, the woman starts a job to compensate for the earning losses because her partner has become unemployed, while the “discourage worker effect” occurs when the deterioration of labour market discourages people from active job searching and they drop out of the labour force.

<sup>4</sup> More details about Polish family policy can be found in Sobociński (2016).

In 2016, the “złoty for a złoty” rule was introduced to the family benefit. According to the rule, parents who exceed the income threshold do not lose the benefit but receive a proportionally lower benefit.

In 2016, the government introduced a means-tested child cash benefit, “Family 500+”. The programme provided a PLN 500 benefit per month for every second and subsequent child until the age of 18. The first child was eligible for the benefit if the income per family member did not exceed PLN 800 (PLN 1200 in the case of a disabled child). In July 2019, the income threshold for the first child was withdrawn, and, as a result, all children up to the age of 18 became eligible for the benefit. Importantly for economic activity, the income under the “Family 500+” programme is not taxed and it does not affect eligibility for other social welfare benefits.

In 2016, the “Pro-Life” programme was introduced to provide a one-off benefit payment of PLN 4,000 for families where a disabled child was born. In 2018, the “Good Start” programme was implemented – at the beginning of the school year, every schoolchild receives a single payment of PLN 300.

### *THE ROLE OF “FAMILY 500+” CHILD BENEFIT LEVEL AND DESIGN*

Economic theory suggests that cash transfers may affect labour supply in different ways. In a ‘textbook’ microeconomic model of labour supply, cash transfers may discourage labour market participation through the income effect; they cut the cost of leisure-time and increase demand for leisure-time. On the other hand, models taking into account child upbringing costs and treating payments for childcare services as a “tax” (e.g. Connelly, 1992), imply that cash benefits may increase female labour supply because they cut that “tax” and encourage the use of childcare services. In turn, empirical studies (e.g. Bastagli et al., 2016), suggest that the cash benefit level and design are important. For instance, relatively high cash transfers may decrease labour market participation, while short-term transfers may be neutral.

“Family 500+” is a large and costly programme (see Table 1). In 2016 and 2017, the programme covered 2.52 million families, and in 2018 2.38 million. The cost of the programme is estimated at PLN 17.1 billion in 2016, 23.2 billion in 2017 and 22.2 billion in 2018. As a result of the programme, welfare costs between 2015 and 2017 increased from about 1% to 2.4% of the GDP. Withdrawal of the income threshold increased the range and costs of the programme. In 2020, the costs of the “Family 500+” programme are expected to reach PLN 41.2 billion<sup>5</sup>.

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<sup>5</sup> *Polish State Budget Act 2020 Statement of grounds*. Warsaw, September 2019, chapter V, p. 44.

**Table 1. The “Family 500+” child benefit costs and coverage**

Year	2014	2015	2016 <sup>a</sup>	2017	2018
Share of social welfare in % GDP	1.1	1.0	2.1	2.4	.
Expenditures on “Family 500+” (in billion PLN)	.	.	17.1	23.2	22.2
The average number of families covered by “Family 500+” (in millions)	.	.	2.52	2.52	2.38
including ones with one child (in millions)			0.63	0.67	0.54
Number of children covered by the programme (in millions)	.	.	3.81	3.80	3.59

Note: (a) The programme covered the period from April to December.

Source: own study based on (GUS, *Concise Statistical Yearbook of Poland* – issues from the years 2015–2019 (Table 27); GUS, 2019, *Concise Statistical Yearbook of Poland 2019*, p. 156).

The effect of the income threshold for the first child on economic activity may be either neutral or negative. It may be neutral as the benefits are paid to the poorest and large families, who usually live in the countryside, work on farms, and additional income may not affect their economic activity. Large families and farming families are the main beneficiaries of the “Family 500+” programme. The average net household income per capita between 2015 and 2016 increased by 4.2%, and for households with 5 and more members by 9.4%. The average growth rate was 4.6% in the households of employees, and 13.7% in the households of farmers (see Table 2). This was accompanied by a decrease in income inequalities and poverty. According to GUS (2019a, p. 4; 2019b, p. 1), the Gini coefficient dropped from 0.332 to 0.298, and the indicator of absolute poverty from 6.5% 2015 to 4.3% in 2017<sup>6</sup>.

On the other hand, means-tested and relatively high transfers may motivate people to economic inactivity. The income threshold encourages lower-income parents to adjust their income to receive a benefit for the first child: either by not starting a job in order not to lose the benefit or by quitting their jobs to become eligible<sup>7</sup>. The benefits received under the programme were relatively high compared to the level of wage, and their significance grew with the number of children. Table 3 shows that a cash transfer for one child (PLN 500) represented about 33% of the minimum net wage and more than 15% of the average net wage in 2018<sup>8</sup>. Importantly, as reported by GUS (2018, p. 159), the majority of working

<sup>6</sup> More details about the impact of the “Family 500+” programme on income, poverty and inequalities can be found in Brzeziński and Najsztab (2017) and Chrzanowska and Landmesser (2018).

<sup>7</sup> Minister E. Rafalska admitted that the income adjustment occurred and contributed to an increase in the number of families eligible for the benefit when compared to the initial estimations (MRPiPS, 2017).

<sup>8</sup> As a comparison, Spain introduced transfers of EUR 100 per month for every child below the age of three. The amount represented 13% of the pay of a woman with primary education and 7.5% and 5.2% respectively of a woman with secondary and tertiary education (Sánchez-Mangas, Sánchez-Marco, 2008).

people in Poland are paid below or equal to the average wage – about 62% of men and 71% of women. According to GUS (2019a, pp. 9–10), the share of transfers made under the “Family 500+” programme in the average monthly disposable income per capita was 13.5% for households with children and 20% for families with at least three children.

**Table 2. The growth rate of average net disposable income (in %, 2014–2016)**

Year	By					
	Number of household members*			Socioeconomic group**		
	Total	5	6+	Total	Employees	Farmers
2014	3.5	4.2	3.7	3.5	3.9	-0.8
2015	2.8	6.0	4.8	3.1	4.3	0.7
2016	4.2	9.4	9.4	4.4	4.6	13.7

Note: \* average net annual disposable income per capita; \*\* average annual net disposable income per equivalent unit.

Source: own study based on data from GUS (2017), *Dochody i warunki życia ludności Polski [Income and living conditions of the Population of Poland]* (report from EU-SILC survey of 2015 and 2016), p. 137 and 140.

The cash transfers appear to be more important for female economic activity, because females are usually paid less compared with males, and are more involved in household duties. If they quit their jobs, the household’s income drop is relatively small, and it can be more easily replaced with a transfer. On the other hand, relatively high are the benefits of resigning for instance from institutional childcare.

**Table 3. The ratio of the “Family 500+” transfer to minimum net wage and average net wage (in %, 2016–2018)**

Year	Minimum net wage			Average net wage		
	2016	2017	2018	2016	2017	2018
Number of children						
1 child	36.9	34.3	32.7	17.4	16.4	15.3
2 children	73.8	68.5	65.4	34.8	32.9	30.7
3 children	110.6	102.8	98.0	52.2	49.3	46.0

Source: own study based on data from *Communications of the President of GUS on average pay in the national economy* and *Regulations of the Council of Ministers on minimum pay*.

The extension of paid parental leave may have been an additional factor stimulating economic inactivity. In 2009, the maternity leave was extended from 18 to 20 weeks, and the possibility of taking extra 6-week maternity leave was

provided (with a 100% wage compensation). In 2013, a parental leave of 26 weeks was introduced, to be taken after the maternity leave (with a 60% wage compensation, 80% if the decisions to take the maternity leave and the parental leave are made concurrently). A 1-week paternity leave was introduced in 2010, and in 2011 it was extended to 2 weeks (with a 100% wage compensation). In 2016, the extra 6-week maternity leave was combined with the parental leave, and it was extended to 32 weeks.

#### FEMALE LABOUR SUPPLY, CHANGES IN AGE STRUCTURE AND ECONOMIC ACTIVITY

This paper employs the Labour Force Participation Rate (LFPR) as a measure of the labour supply. The LFPR indicates the percentage of the population at a working-age who are economically active (working or being unemployed). The aggregate LFPR is influenced by the economic activity of age-range subgroups and the age structure of the population. For instance, the LFPR may be decreased if some people become economically inactive due to rising cash transfers or an increase in unemployment. On the other hand, the shifting of population composition towards people who are highly economically active may increase the LFPR. These relationships are described in the following equation:

$$LFPR_t = \sum_i s_t^i LFPR_t^i \quad (1)$$

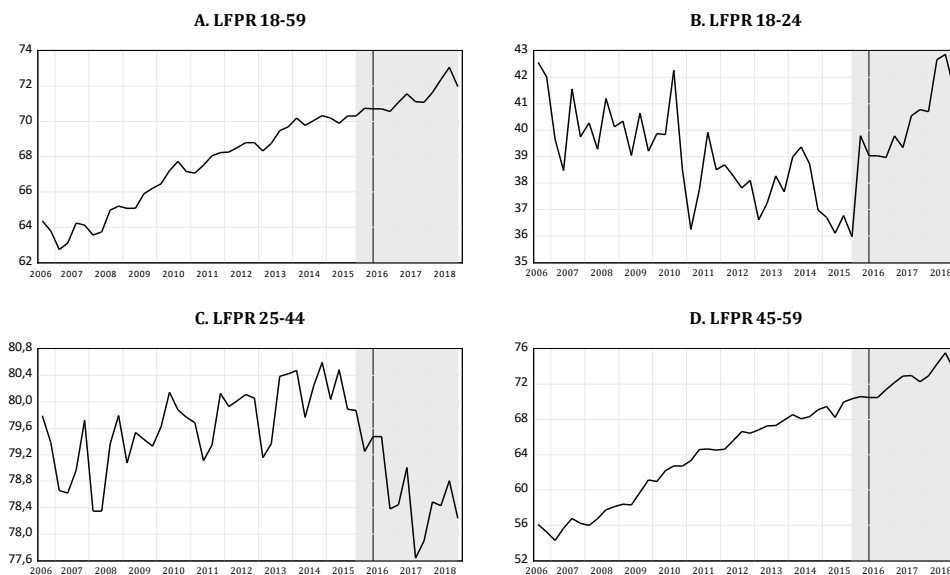
where  $LFPR$  is the aggregate Labour Force Participation Rate,  $LFPR^i$  refers to the Labour Force Participation Rate of the age group,  $s^i$  is the share of the group in the population,  $i$  is a group subscript,  $t$  is a time subscript.

This section presents the time-evolution of the female labour supply and relates this evolution to age-changes in the female population and changes in the economic activity of female age-range subgroups.

#### *LABOUR FORCE PARTICIPATION RATE AND AGE STRUCTURE*

The labour supply of working-age women (18–59 years old) increased between 2006 and 2018. This resulted from an increase in the share of women aged 25–44 with high labour force attachment, as well as increase LFPRs in the groups of women under the age of 25 and over the age of 45. In contrast, the LFPR drop in the group aged 25–44 decreased the aggregate female labour supply. Importantly, this drop started at the end of 2015 and coincided with the change of government and the promise of implementation of the “Family 500+” programme.

Figure 1 shows the time-evolution of the LFPRs in the four age-range subgroups: 18–59; 18–24; 25–44; 45–59. The division was made because age-range groups might differ with respect to cash transfers. The figure shows that the LFPR of women aged 18–59 increased from 63% to 73% between 2006q2 and 2018q4. During that time, the LFPR of women aged 45+, and, starting from 2015, also of women aged 18–24, increased. For women aged 25–44, the growth trend changed to a decreasing trend in 2015; since then this age group has been adversely affecting the aggregate LFPR.



**Figure 1. Female LFPR for selected age groups (in %, 2006q3–2018q4)**

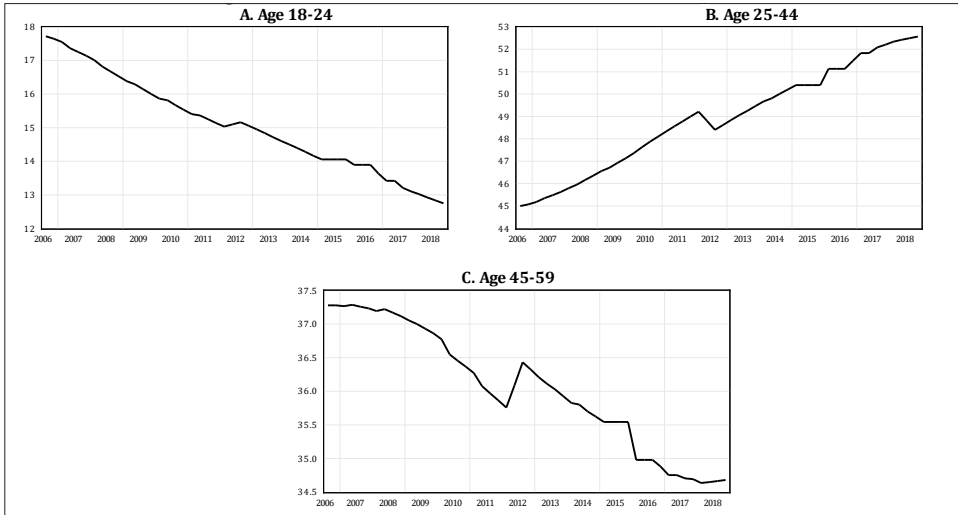
Note: the grey area covers the period of the new government in power; the vertical line indicates when the “Family 500+” was introduced.

Source: own study based on data from the LFS.

Figure 2 presents changes in the age structure of women aged 18–59 as divided into three groups: 18–24; 25–44; 45–59. This shows that changes in the demographic structure positively affected labour force participation. The share of highly economically active women aged 25–44 increased, and the share of women aged 18–24 and 45–59, characterised by lower labour force participation, decreased<sup>9</sup>.

<sup>9</sup> Table 1A in the Appendix presents the association between the age of women and their LFPR.





**Figure 2.** Share of selected age groups in the 18–59 population (in %, 2006q3–2018q4)

Source: own study based on data from the LFS.

### COUNTERFACTUAL ANALYSIS

A counterfactual analysis was used to explore the impact of changes in the age structure of the population and in the economic activity of female age-range subgroups on the LFPR of women aged 18–59 and 25–44. The analysis confirms that, starting from 2015, the LFPR of women aged 25–44 continued to drop because their economic activity decreased; if it were not for that drop, the labour supply of women aged 18–59 would have been higher.

Equation (1) is the starting point for the analysis. Assuming a constant age structure ( $s^i$ ) or labour force participation ( $LFPR^i$ ), as in the baseline period ( $t_0$ ), one may estimate counterfactual LFPRs:

$$LFPR_t^{t_0} = \sum_i s_{t_0}^i LFPR_t^i \quad (2)$$

and

$$LFPR_t^{t_0} = \sum_i s_t^i LFPR_{t_0}^i \quad (3)$$

The difference between the actual and counterfactual LFPR shows how far the changes in the age structure of the population or LFPRs of age-range subgroups influence labour supply. For example, the demographic change increases labour supply if the LFPR estimated with equation (2) is below the

actual LFPR. In contrast, change in the economic activity of age-range subgroups decreases labour supply if the LFPR calculated with equation (3) is above the actual LFPR.

Equations (2) and (3) are used to examine the impact of the changes in the group aged 25–44 on the LFPR of women aged 18–59 in the 2014–2018 period. The share of the 25–44 group or the LFPR was kept the same as in the subsequent quarters of 2013. Figure 3 presents the results in the left panel. Firstly, they confirm the positive impact of the growing share of the 25–44 group in the population on the aggregate labour supply. Since the counterfactual LFPR line based on fixed share is below the actual LFPR line, the actual LFPR of women aged 18–59 in 2018 would have been lower by 2.6 percentage points on average if the share of the 25–44 group had not increased.

Secondly, changes in economic activity of women aged 25–44 had a negative, though inconsiderable, impact on the aggregate labour supply of women. Since the counterfactual LFPR line based on fixed economic activity has remained above the actual LFPR line since 2015, in 2018, the LFPR in the group aged 18–59 would have been 0.7 percentage points higher on average if the economic activity of the group 25–44 had not decreased.

The counterfactual method was also used to explore the impact of demographic changes and changes in subgroups’ economic activity on the LFPR for women aged 25–44. It was assumed that the age structure or the LFPR for the age groups 25–29, 30–34, 35–39, 40–44 is the same as in subsequent quarters of 2013. The results are presented in the right panel in Figure 3. They confirm that the main cause underlying the LFPR drop for women aged 25–44 observed by the end of 2015 was a drop in economic activity. The actual LFPR line is well below the counterfactual line based on the fixed economic activity. In 2018, the actual LFPR in the 25–44 group was on average 1.6 percentage points lower than the counterfactual LFPR. At the same time, the demographic change slightly increased LFPR in the 25–44 group. In 2018, the actual LFPR was on average 0.3 percentage points higher than the counterfactual LFPR holding the shares fixed.

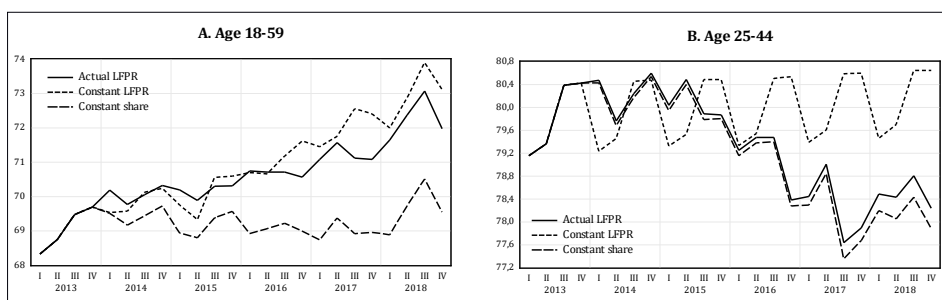


Figure 3. Female LFPR, actual and counterfactual (in %, 2014–2018)

Source: own study based on data from the LFS.

## REASONS FOR ECONOMIC INACTIVITY

The above analyses show that the economic activity of women aged 25–44 decreased after 2015. This poses the question: what are the factors behind this decline? According to the LFS, it may be related to such factors as discouragement caused by the inefficiency of job seeking, education and training, family and household responsibilities, retirement, illness and disability. This section explores which of the above causes led to the inactivity of women aged 25–44 over the period of 2016–2018. The analysis suggests that the main causes were “family and household responsibilities” (hereinafter “family responsibilities”<sup>10</sup>).

Table 4 presents the structure of the causes underlying the economic inactivity of women from 2016 to 2018 by age group: 15–64, 18–24, 25–34, 35–44, 45–54 and 55–64. The results show that the weight of particular factors depends on age. Women below the age of 25 were most frequently inactive due to education and training. The most important cause for the 25–44 group is family responsibilities – about 80% of women were inactive for this reason. Women aged 45+ leave the labour market mainly for health reasons or because they retire. The significance of “discouragement” caused by the inefficiency of job-seeking’ (hereinafter “discouragement”) was relatively low but it increased with age.

**Table 4. Reasons for women’s inactivity by age (in %, 2016–2018)**

Age	Discouragement	Education and training	Family and household responsibilities	Retirement	Illness and disability	Total
15–64	3.9	26.6	33.0	23.2	13.3	100
18–24	0.6	88.3	9.4	0.0	1.8	100
25–34	2.6	5.4	83.0	0.0	8.9	100
35–44	5.2	0.5	77.7	0.0	16.6	100
45–54	12.4	0.0	52.0	1.2	34.4	100
55–64	4.5	0.0	14.6	63.6	17.4	100

Note: quarterly average.

Source: own study based on LFS data.

To determine the role of particular causes, a decomposition of the growth rate of economically inactive women over 2016–2018 is conducted. The following formula is employed:

$$\Delta ie_t = \sum_1^n \Delta ie_t^i s_{t-1}^i \quad (4)$$

<sup>10</sup> The “family and household responsibilities” category includes taking care of children and of others who need it, or other personal or family reasons.

where  $\Delta i_e$  refers to the growth rate of economically inactive women,  $s$  is the share of the age-range subgroup of inactive women,  $i$  is the subscript of the inactive group by cause,  $t$  is the time subscript.

**Table 5. Decomposition of the growth rate of economically inactive women by reasons for inactivity (2016–2018)**

Age	Growth rate (in %)					
	Total	Discouragement	Education and training	Family and household responsibilities	Retirement	Illness and disability
15–64	-3.2	-21.6	-6.3	2.8	-0.3	-6.0
including:						
15–24	-1.8	-0.8	-6.2	0.0	0.0	0.1
25–34	0.3	-2.1	-0.1	1.6	0.0	-0.4
35–44	0.2	-4.3	0.0	1.5	0.0	0.2
45–54	-0.5	-5.7	0.0	0.2	0.0	-1.6
55–64	-1.4	-8.8	0.0	-0.5	-0.3	-4.3

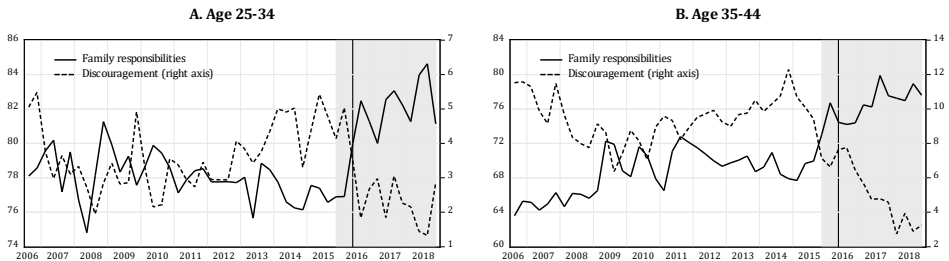
Note: quarterly average growth rate.

Source: own study based on LFS data.

Table 5 presents the results of the decomposition. This decomposition shows that the number of economically inactive women dropped in the 2016–2018 period, except for the 25–44 age group. The population of inactive women aged 15–64 decreased on average by 3.2% quarterly. On the other hand, the growth rate for women aged 25–34 and 35–44 was 0.3% and 0.2% respectively. The main underlying cause was “family responsibilities”. The average quarterly growth rate caused by family responsibilities in the 25–34 and 35–44 groups was 1.6% and 1.5% respectively. At the same time, the drop in the number of “discouraged” women was quite substantial (-2.1% and -4.3%). Those opposite trends suggest that shifting of the inactive composition may have caused the growth of the number of women inactive due to family responsibilities.

Figure 4 shows the time-evolution of the share of economically inactive women aged 25–34 and 35–44 changed between 2006q3 and 2018q4 due to family responsibilities and discouragement. The figure shows that the trends reversed in 2015. Until 2015, the share of women economically inactive by reason of family responsibilities continued to decrease, but in 2015 it started to grow. For discouragement, the trend changed from increasing to decreasing in 2015. For example, between 2012q3 and 2015q3, the share of women in the 25–34 group of the economically inactive by reason of family responsibilities fell by 1.2 percentage points, while between 2015q3 and 2018q4 it grew by 4.4 percentage points. For discouragement, it was 1.8 and -1.3 percentage points respectively.

Note that during the global financial crisis in the years 2008–2009, the share of women inactive by reason of family responsibilities also significantly increased. This suggests that the number of inactive women may have been related to economic fluctuations and changes in the institutional framework, such as the introduction of child cash transfers.



**Figure 4. Share of women economically inactive due to family responsibilities and discouragement in the groups aged 25–34 and 35–44 (in %, 2006q3–2018q4)**

Note: the share is calculated as the number of the inactive by cause divided by the number of inactive in the respective age group; the grey area covers the period of the new government in power, the vertical line indicates the point of time at which “Family 500+” was introduced.

Source: own study based on data from the LFS.

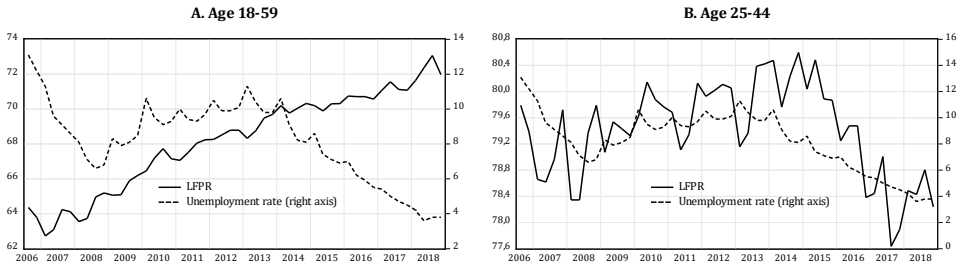
## CYCLICALITY OF FEMALE LABOUR FORCE PARTICIPATION

The business cycle shapes labour supply through the “discouraged worker effect” and the “added worker effect”. They may occur simultaneously and work in opposite directions. For instance, during an economic downturn, the “added worker effect” increases the labour supply; in contrast, the “discouraged worker effect” decreases the labour supply. The net effect depends on which of the effects prevails. This section investigates the impact of the economic fluctuations on the LFPR of women aged 25–44. The main findings suggest that after 2015, the LFPR drop for women aged 25–44 was not associated with the phase of the business cycle.

The analysis begins with a presentation of the time-evolution of the unemployment rate (an indicator of the business cycle<sup>11</sup>) and the LFPR of women aged 18–59 and 25–44 in 2006–2018. Figure 5 shows that over the period of 2013–2018 the economic situation was good, the unemployment rate fell from 10% in 2013 to 4% in 2018. Figure 5 also suggests that there was a mixed relationship between the unemployment rate and the LFPR for women aged 18–59. The LFPR

<sup>11</sup> The relationship between unemployment rate and LFPR plays a key role in understanding the

grew during both the increase and the decrease in the unemployment rate. In contrast, the Figure suggests a comovement of the LFPR of women aged 25–44 and the unemployment rate. However, it should be noted that the declining trend of the unemployment rate started around 2013, while the LFPR of women aged 25–44 started to decrease in 2015.



**Figure 5. Female LFPR and unemployment rate (in %, 2006q3–2018q4)**

Source: GUS and author’s calculations based on data from the LFS.

To investigate the relationship between economic fluctuations and the LFPR of women aged 25–44, this section also performs the OLS recursive regression (1 quarter = 1 step) to estimate two groups of models. In both groups, dependent variables are the LFPR, the share of women inactive by reason of family responsibilities (*fr*) and discouragement (*dc*) in inactive women aged 25–44. In the first group (equations 5a–c), the unemployment rate (*u*) was used as an explanatory variable, whereas in the second group (equations 6a–c), control variables (*v*) were also employed. The recursive regression procedure covers the period of 2006q3–2018q4, the period before and after implementation of child benefit “Family 500+”.

$$lfpr_t = \beta_0 + \beta_1 u_t + \varepsilon \tag{5a}$$

$$fr_t = \beta_0 + \beta_1 u_t + \varepsilon \tag{5b}$$

$$dc_t = \beta_0 + \beta_1 u_t + \varepsilon \tag{5c}$$

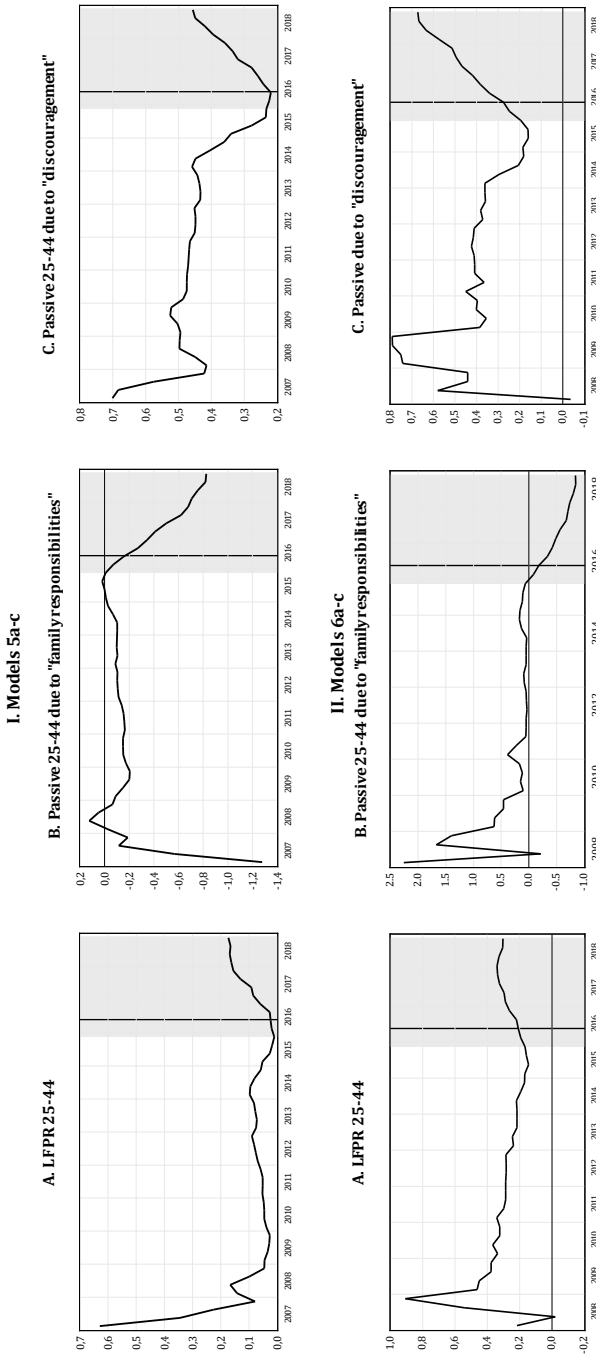
$$lfpr_t = \beta_0 + \beta_1 u_t + \beta_2 v_t + \varepsilon \tag{6a}$$

$$fr_t = \beta_0 + \beta_1 u_t + \beta_2 v_t + \varepsilon \tag{6b}$$

$$dc_t = \beta_0 + \beta_1 u_t + \beta_2 v + \varepsilon \tag{6c}$$

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impact of business cycle on labour supply, see e.g. Van Zandweghe (2012), Hornstein (2013), Erceg and Levin (2013), Fuchs and Weber (2017).



**Figure 6. OLS recursive regressions**

Note: the grey area covers the period of the new government in power; the vertical line indicates when "Family 500+" was introduced.

Source: own study based on data from GUS and LFS.

As the control variables the following were used: the number of children born (in thousands<sup>12</sup>), because childbirth usually leads to economic inactivity; the share of women with tertiary education in the 25–44 age group, because people with tertiary education are characterised by higher labour force participation; the share of women aged 25–34 in the 25–44 group, to account for the impact of changes in the age structure on labour force participation; the share of women under part-time contracts in the 25–44 group, because flexible forms of employment may encourage labour market activity.

Figure 6 presents the estimated parameters (Table 2A in the Appendix contains “static” coefficients). The results show the time-variability of elasticity of dependent variables with respect to the unemployment rate. They imply that at the turn of 2015 the relationships between the dependent variables and the unemployment rate were changed. For instance, the responsiveness of the LFPR increased, while the responsiveness of the share inactive by reason of “family responsibilities” decreased. Importantly, this was not associated with changes in the unemployment rate, because the unemployment rate continued to drop between 2013 and 2018. The breakdown coincided with the change of the Polish government, the confirmation of the promise to implement the “Family 500+” programme and its actual implementation.

## CONCLUSIONS

This paper investigated the impact of the child cash benefit “Family 500+” on female labour supply in Poland. The analysis suggests that “Family 500+” had a negative effect on female Labour Force Participation Rate. The LFPR in the working-age group (18–59) would have been higher if it had not been for the drop in the LFPR in the 25–44 group. The drop in the 25–44 group coincided with the introduction of “Family 500+”, and it was associated with the growing number of women who became economically inactive by reason of family responsibilities. Also, the introduction of the cash transfers changed the relationship between the LFPR, the share of women who were discouraged, inactive by reason of family responsibilities and the business cycle, even though the economic situation had not changed. This implies that the changes in the labour supply were determined by an institutional rather than a business cycle related factor. Nevertheless, it should be mentioned that the “Family 500+” programme had also positive consequences, such as a decrease in inequalities and poverty, which the Public Opinion Research Centre (CBOS, 2017) claims to be the reason for a broad social support for the programme.

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<sup>12</sup> Quarterly data were obtained by aggregation of the monthly data from the GUS *Statistical Bulletins*.



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## APPENDIX

**Table 1A. Female LFPR and age-based structure of the female group (in %, 2012q2–2018q4)\***

Age	18–59	18–24	25–34	35–44	45–59
LFPR	70.4	38.9	77.0	81.9	70.2
Share in the 18–59 group	100	14.0	25.5	25.2	35.4

Note: \* average values for the period from 2012q3 to 2018q4.

Source: own study based on data from the LFS.

**Table 2A. Results from OLS regression for models 5a–5c and 6a–6c (2006q3–2018q4)**

Variable	LFPR		Share of women inactive by reason of			
			family and household responsibilities		discouragement	
<i>const</i>	0.780*** (0.004)	0.491*** (0.059)	0.823*** (0.013)	1.137*** (0.177)	0.017*** (0.006)	-0.045 (0.089)
<i>u</i>	0.173*** (0.049)	0.303*** (0.066)	-0.826*** (0.140)	-0.841*** (0.202)	0.456*** (0.067)	0.673*** (0.126)
<i>edu</i>		0.235*** (0.050)		-0.255* (0.143)		0.156* (0.081)
<i>pt</i>		0.263** (0.127)		-1.5*** (0.362)		0.727*** (0.224)
<i>cb</i>		-0.00001 (0.000)		0.00036 (0.000)		-0.00034* (0.000)
<i>sh</i>		0.316*** (0.079)		-0.153 (0.237)		-0.123 (0.094)
N	50	50	50	50	50	50
R <sup>2</sup>	0.298	0.560	0.534	0.661	0.533	0.677

Note: standard error in brackets; \*\*\*/\*\*/\*/- *p*-value /0.01/0.05/0.10/ respectively.

Source: own study based on data from GUS and LFS.

Models (5a–5c and 6a–6c) were estimated using the OLS, with the Newey-West method used due to the random component autocorrelation. Where *u* is the unemployment rate, *edu* is the share of women with tertiary education in the population of women aged 25–44, *pt* is the share of women working part-time in the 25–44 population, *cb* is the number of children born, *sh* is the share of women aged 25–34 in the 25–44 group.

### Summary

The paper investigates the effect of child cash benefit "Family 500+" on the female labour supply in Poland, taking into account demographic and cyclical determinants. The study is based on the Labour Force Survey (LFS) and Polish Central Statistical Office quarterly data. The analyses cover the period of 2016–2018. The Labour Force Participation Rate (LFPR) is the measure of labour supply. The analysis uses a counterfactual method to determine the impact of demographic and behavioural changes on female labour supply. To identify the causes of the economic inactivity of women (adopted by LFS), decomposition of the growth rate of economically inactive women is applied. The effect of the business cycle on female labour supply is analysed using OLS recursive regression.

The study found that the LFPR of women aged 25–44 decreased after 2015. This was related to the cash transfers under the "Family 500+" programme and the increasing number of economically inactive women by reason of "family and household responsibilities". At the same time, changes in the demographic structure contributed positively to the LFPR of women aged 25–44, while the business cycle did not have a significant impact on it. OLS recursive regression showed that in the 25–44 age group, the introduction of "Family 500+" coincided with changes in the relationships between the LFPR, the percentage of the "discouraged", economically inactive women by reason of "family responsibilities" and the unemployment rate.

*Keywords:* child cash benefits, female labour supply, "Family 500+".

## **Program „Rodzina 500+” a aktywność zawodowa kobiet w Polsce. Uwarunkowania demograficzne i koniunkturalne**

### *Streszczenie*

Celem niniejszej pracy jest ocena znaczenia programu „Rodzina 500+” dla podaży pracy kobiet w Polsce, uwzględniając uwarunkowania demograficzne i koniunkturalne. W badaniu wykorzystano dane BAEL i GUS. Miarą podaży pracy jest współczynnik aktywności zawodowej. Analiza skupia się na latach 2016–2018. W badaniu zastosowano metodę kontrfaktyczną, aby określić znaczenie zmian w strukturze wiekowej i w aktywności zawodowej poszczególnych grup wiekowych dla podaży pracy kobiet. Przyczyny dezaktywizacji zawodowej kobiet zidentyfikowano dekomponując stopę wzrostu zawodowo biernych kobiet według rodzajów bierności wyróżnianych w BAEL. Znaczenie zmian w koniunkturze gospodarczej dla podaży pracy kobiet w latach 2006–2018 przeanalizowano za pomocą regresji rekursywnej.

Wyniki analizy wskazują, że program „Rodzina 500+” przyczynił się do spadku współczynnika aktywności zawodowej kobiet w wieku 25–44 lata. Spadek ten był skorelowany w czasie z transferami pieniężnymi na rzecz rodzin i dzieci w ramach programu „Rodzina 500+” oraz ze zwiększeniem liczby kobiet biernych zawodowo ze względu na „obowiązki rodzinne i związane z prowadzeniem domu”. W tym samym czasie zmiany w strukturze demograficznej sprzyjały większej aktywności zawodowej kobiet w wieku 25–44 lata, natomiast zmiany koniunkturalne nie wywierały na nią istotnego wpływu. Z regresji rekursywnej wynika, że w grupie kobiet w wieku 25–44 lata wprowadzenie programu „Rodzina 500+” zmieniło relacje między współczynnikiem aktywności zawodowej, odsetkiem kobiet „zniechęconych” i biernych ze względu na „obowiązki rodzinne” a stopą bezrobocia, choć nie zmienił się trend bezrobocia.

*Słowa kluczowe:* świadczenia pieniężne, podaż pracy kobiet, „Rodzina 500+”.