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The "family 500+" child
allowance and female
labour supply in Poland

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ECONOMICS DEPARTMENT

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By Iga Magda, Aneta Kielczewska and Nicola Brandt

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ABSTRACT/RÉSUMÉ

The “Family 500+” child allowance and female labour supply in Poland

In 2016 the Polish government introduced a large new child benefit, called “Family 500+”, with the aim to increase fertility from a low level and reduce child poverty. The benefit is universal for the second and every further child and means-tested for the first child. Increasing out-of-work income significantly, the transfer can reduce incentives to participate in the labour market. We study the impact of the new benefit on female labour supply, using Polish Labour Force Survey data. Based on a difference-in-differences methodology we find that the labour market participation rates of women with children decreased after the introduction of the benefit compared to childless women. The estimates suggest that by mid-2017 the labour force participation rate of mothers dropped by 2- 3 percentage points, depending on the estimation specification, as a result of the “Family 500+” benefit. The effect was higher among women with lower levels of education and living in small towns.

This Working Paper relates to the *2018 OECD Economic Survey of Poland* (www.oecd.org/eco/surveys/economic-survey-poland.htm).

JEL classification: E24; H53; I38; J13; J21; J22

Keywords: Poland, child allowance, social transfers, family policy, labour market participation

L'allocation familiale « Famille 500+ » et l'offre de travail des femmes en Pologne

En 2016, le gouvernement polonais a introduit de nouvelles allocations familiales importantes, appelées « Famille 500+ », dans le but d'augmenter la fécondité et de réduire la pauvreté infantile. L'allocation est universelle pour le deuxième enfant et tous les autres enfants, mais elle est soumise à une condition de ressources pour le premier enfant. En augmentant sensiblement le revenu hors travail, ce transfert peut réduire les incitations à participer au marché du travail. Nous étudions l'impact de cette nouvelle prestation sur l'offre de travail des femmes, en utilisant les données de l'enquête emploi polonaise. Sur la base de la méthode des différences de différences, nous constatons que les taux de participation au marché du travail des femmes ayant des enfants ont diminué après l'introduction de la prestation par rapport aux femmes sans enfants. Les estimations suggèrent qu'à la mi-2017, le taux d'activité des mères a chuté de 2 à 3 points de pourcentage, en fonction de la spécification de l'estimation, en raison de la prestation « Famille 500+ ». L'effet est plus marqué chez les femmes ayant un faible niveau d'éducation et vivant dans de petites villes.

Ce Document de travail se rapporte à l'*Étude économique de l'OCDE de la Pologne 2018* (<http://www.oecd.org/fr/economie/etude-economique-pologne.htm>)

Classification JEL: E24; H53, I38; J13; J21; J22

Mots clés : Pologne, allocations familiales, transferts sociaux, politique familiale, participation au marché du travail

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The “Family 500+” child allowance and female labour supply in Poland

By Iga Magda, Aneta Kielczewska and Nicola Brandt¹

Introduction

In 2016 the Polish government introduced a large new child benefit, called “Family 500+”, with the aim to increase fertility from a low level and reduce child poverty. The benefit is universal for the second and every further child and means-tested for the first child. This programme more than doubles fiscal support for families, making Poland one of the top spenders in the EU concerning cash transfers for families.

The transfer has materially reduced child poverty. This paper focusses on another aspect, studying the impact of the new benefit on female labour supply. The transfer increases out-of-work income significantly, especially for parents with several eligible children, reducing incentives to enter the labour market through an income effect. This holds particularly for lower-earning families. Furthermore, the benefit for the first child is fully withdrawn once family income rises above the eligibility ceiling. This can create an inactivity trap for singles or second-earners from low-earning families, as they would need to earn quite a high wage to make up for this loss.

We use Polish Labour Force Survey data for an early evaluation of the reform. Based on a difference-in-differences methodology we find that the labour market participation rates of women with children decreased significantly after the introduction of the benefit compared to childless women, who were not eligible for the benefit. Results imply that the labour force participation rate of mothers would have been 2-3 percentage points higher in the absence of the reform. The effect set in earlier for partnered women and within this group it was highest among those with lower levels of educational attainment and thus generally lower incomes.

This paper is organised as follows. To set the stage the following section describes family policies in Poland before and after the introduction of the 500+ benefit. Trends in female labour force participation before and just after the reform are highlighted thereafter. After a discussion of the literature on the labour market impact of child benefits the methodology of the statistical analysis and the data are described. Finally the results are discussed along with robustness tests. The final section concludes and indicates directions for future research.

Family policy background

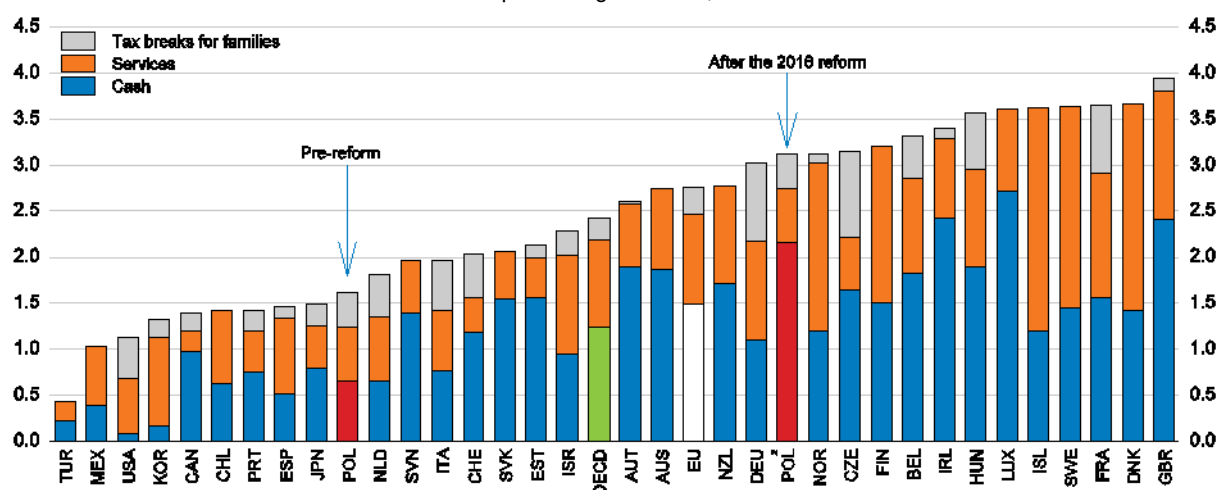
While fiscal support for families had been relatively modest overall in Poland, the “Family 500+” programme nearly doubled it compared to 2013, lifting it well above the OECD average to more than 3% of GDP (Figure 1). The Programme introduced an unconditional cash transfer of 500 PLN per month for every second and subsequent child under the age of 18. The benefit is also granted for the first child

1. This paper has been authored by Iga Magda and Aneta Kielczewska, both from the Institute of Structural Research (IBS) in Warsaw, and Nicola Brandt from the OECD. The paper benefitted greatly from comments and suggestions from Peter Jarrett, Pierre Guérin, Olivier Thévenon, Karolina Kozłowska, Cyrille Schwellnus, Piotr Lewandowski, Joanna Tyrowicz, Andrea Bassanini, Michał Zator and seminar participants at IBS and the OECD and from Sylvie Ricordeau for Secretarial assistance. This study is based on data from Polish Central Statistical Office (GUS), Labour Force Survey 2010-2017. GUS has no responsibility for the results and the conclusions, which are those of the authors. All errors are ours.

subject to an eligibility ceiling of net monthly per capita family income of 800 PLN, or 1 200 PLN if the child is disabled (MRPiPS, 2015). It is fully withdrawn once family income rises above this ceiling.

Figure 1. Poland's public support for families is now probably above the OECD average

As a percentage of GDP, 2013¹



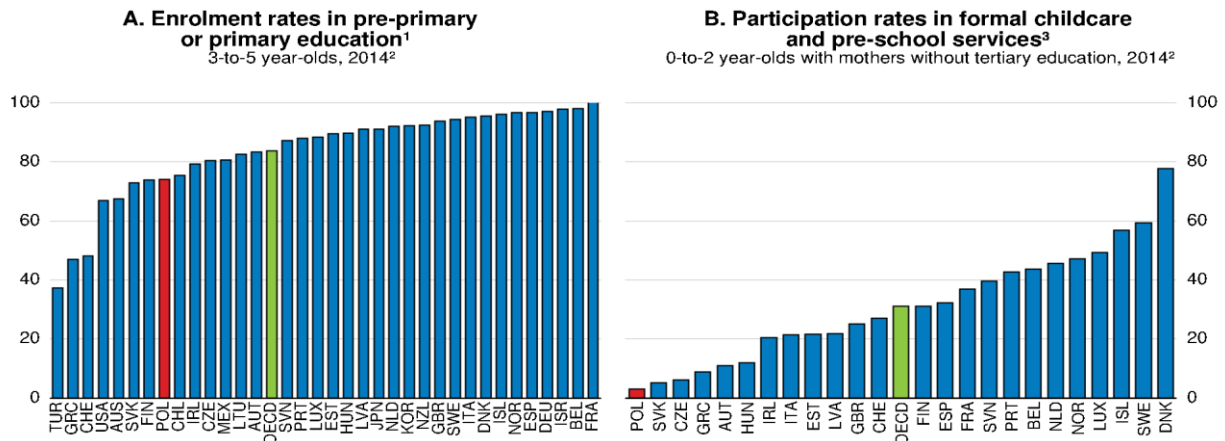
1. Or latest available year.

2. Poland's public spending on family benefits taking into account the 2016 reform of child benefits

Source: OECD (2017), OECD Family Database.

The “Family 500+” programme is a step change in terms of availability of cash benefits for families. Other means-tested family benefits and tax breaks continue to exist, and the “Family 500+” transfer does not affect the eligibility for these or any other benefits, as it is not considered as income for the purposes of establishing benefit eligibility. At end-2015 the average monthly family benefit per beneficiary varied between 89 and 129 PLN, merely a fraction of cash transfers that are now available for families with children eligible through the “Family 500+” benefit. Given that it is universal for second and further children, the 500+ also has a much wider coverage, benefitting 2.74 million families, so far, compared with 1.04 million families for the means-tested benefit (MRPiPS, 2016). The “Family 500+” benefit is worth a third of a net minimum wage in Poland. As a comparison, child benefits in Germany amount to just 12% of a minimum wage.

In contrast, public spending on childcare services remains relatively low (Figure 2), although Poland has made considerable efforts to improve coverage. A 2011 law shifted the management of crèches from the Minister of Health to the Minister of Social Affairs, while easing their setup and operation. The law also introduced new forms of early childcare (such as child clubs, “daily caregivers” and babysitters) and provided financial incentives for their development, mostly financed via European Union Structural Funds. The coverage of institutional childcare for children aged less than 3 doubled between 2011 and 2015 and increased by almost a quarter for children between 3 and 6 years old (GUS, 2015) with more than 80% of children participating in 2016 (Figure 2 shows 2014 numbers). Yet, coverage remains weak, in particular for the youngest children from families with lower educational attainment. Access to childcare is a particular problem in rural areas, and families often have to resort to private providers there, which can be prohibitively expensive for lower-earning families.

Figure 2. Use of formal childcare is low, especially for children of less-educated mothers

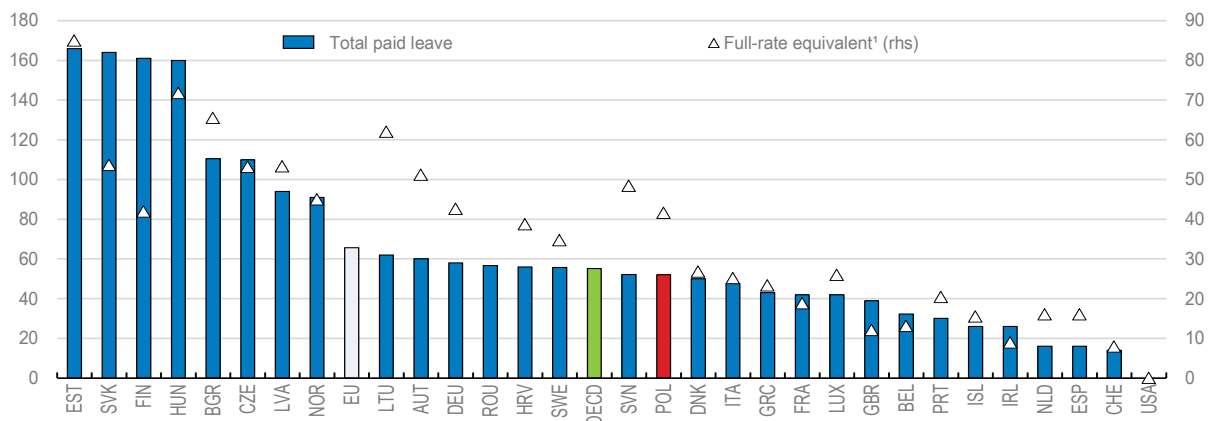
1. Potential mismatches between the enrolment data and the coverage of the population data (geographic coverage and/or the reference data used) may lead to overestimated or underestimated enrolment rates.
2. Or latest available year.
3. Data refer to children using centre-based services (e.g. nurseries or day-care centres and pre-schools, both public and private), organised family day-care, and care services provided by paid professional childminders, excluding those using unpaid informal services provided by relatives, friends or neighbours.

Source: OECD (2017), OECD Family Database.

The length of maternity and paid childcare leave in Poland is around the OECD average, although taking into account the benefit generosity the 41.6 weeks of full-time-equivalent leave are above the median among the EU and OECD countries. The great majority of paid leave can be shared with fathers, in principle, but less than 2% of parents on leave were men in 2014 according to data from the Social Insurance Institution. Independently of that there are two weeks of paternity leave after childbirth, which are non-transferrable, with a take-up rate of roughly 35%. On top of this, there is unpaid leave of 156 weeks, an OECD record. Parents on fixed-term contracts can take paid childcare leave under some circumstances but do not have the right to return to their workplace after that. Non-working women and those working in the agricultural sector are entitled to 12 monthly payments of PLN 1 000 (73% of the net minimum wage).

Figure 3. Total child-related paid leave in selected OECD countries, 2016

Total and full-rate equivalent paid leave available to mothers, in weeks



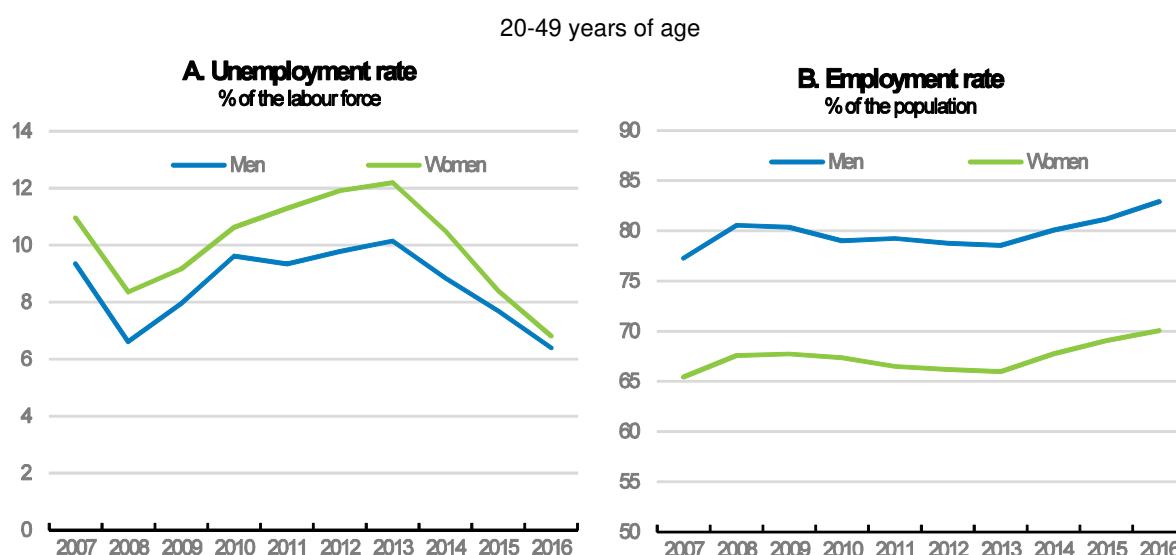
1. Length of the paid leave, in weeks, if it were paid at 100% of previous earnings.

Source: OECD (2018), OECD Family Database.

Labour market background

The labour market in Poland has recorded a substantial improvement since 2013. Employment has increased markedly, and the overall unemployment rate has fallen sharply, as it did for prime-aged individuals (Figure 4). The unemployment decrease has been steeper among women. As a result, female and male unemployment rates have converged quickly.

Figure 4. Unemployment and employment rates

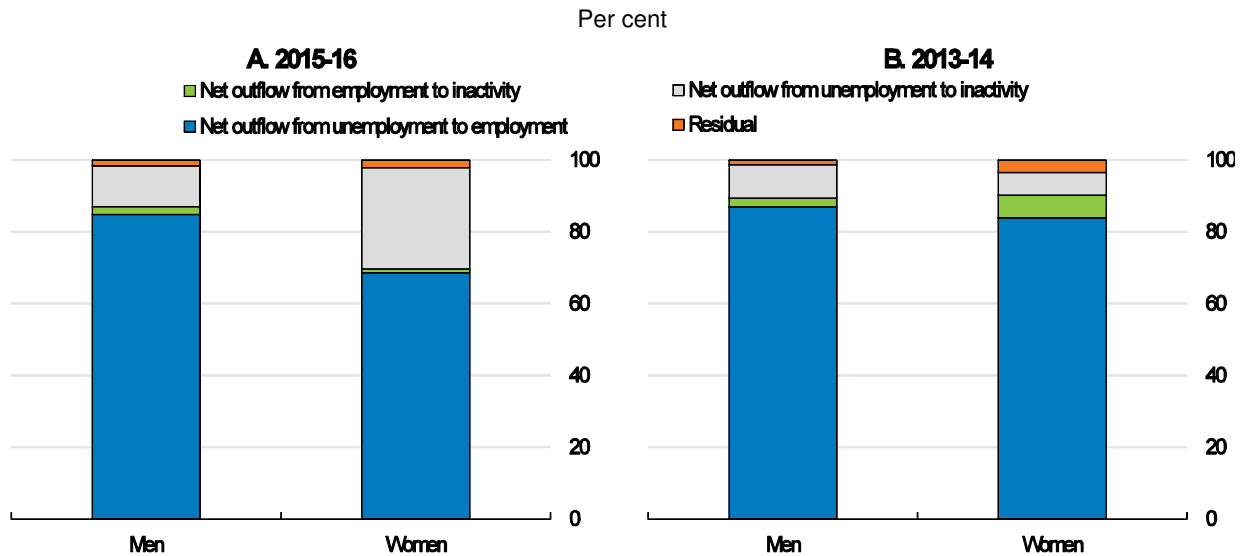


Source: Own calculations based on EU Labour Force Survey data

Increased labour market withdrawal among prime-aged women has contributed significantly to the recent drop in unemployment, while the pick-up in their employment growth was in line with that of men. This can be seen when comparing the decomposition of the fall in the unemployment rate between 2015 and 2016 for men and women (Figure 5, left Panel). For men, a high net flow from unemployment to employment drove 85% of the drop in unemployment rate, whereas it accounted for 69% of the overall fall in unemployment rate for women. A net outflow from unemployment to inactivity accounted for another 28% for women, compared to only 11% in the case of men. These gender gaps in labour market flows between 2015 and 2016 stand in contrast to the same flows two years earlier, which were more similar in size for men and women (Figure 5, right Panel).

One hypothesis would be that this bigger outflow from unemployment to inactivity for women was driven by the introduction of the family benefit. Indeed, out-of-work income has increased significantly for families thanks to the new child benefit. The fact that the benefit for the first child is withdrawn at once when per capita family income increases beyond the eligibility ceiling limits incentives for single mothers or second earners with children to work. An unemployed single mother of two taking up a job that pays the average wage would retain less than 20% of her earnings as a result of taxes and benefit withdrawal. Once taking childcare costs into account, which can be very high in the private sector - often the only available option, she would actually lose money.

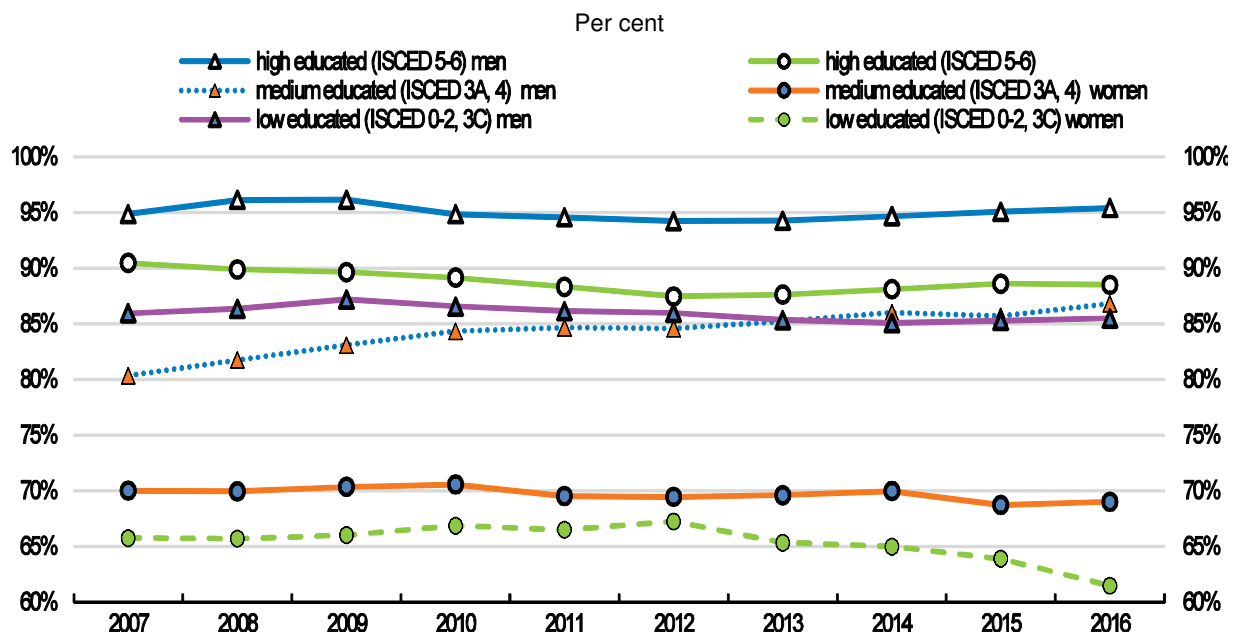
Figure 5. Decomposition of changes in the unemployment rate



Source: Own calculations based on EU Labour Force Survey data

The new child benefits may thus have reinforced a longer-standing trend of labour force participation among lower-skilled women in Poland to fall. Despite a strong labour market, participation among women has not increased in recent years, unlike that of men. This is because of a sharp fall in labour force participation among low-educated women, with less than upper-secondary education, from 2013 onwards. Participation rates of tertiary educated women increased between 2012 and 2015 but then decreased somewhat in 2016, the year the “Family 500+” benefit was introduced (Figure 6).

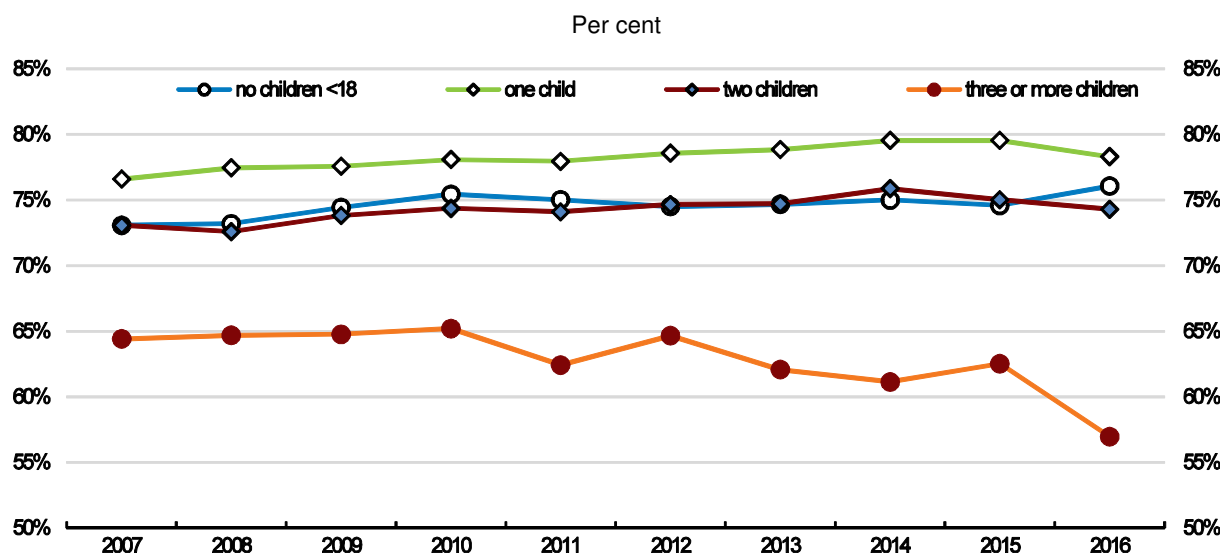
Figure 6. Labour force participation rates for men and women aged 20-49, by level of education



Source: Own calculations based on EU Labour Force Survey data

While the 2013–15 fall in female participation rates occurred mostly among women with three or more children, the 2016 decrease concerned all women with children, regardless of their number (Figure 7). At the same time activity rates of childless women increased.

Figure 7. Labour force participation rates of women aged 20-49, by number of children



Source: Own calculations based on EU Labour Force Survey data.

Our hypothesis is that different forces were acting after 2013, increasing the difference in labour force participation between women with different qualifications and varying numbers of children. The upturn on the labour market, rising wages - in particular the minimum wage - and improving childcare availability are likely to have attracted more women to the labour market. On the other hand, paid parental leave was lengthened in 2013 and extended to unemployed and inactive women for children born in 2016 and later. This may have had a negative impact on labour force participation rates, in particular of less educated women and those with larger families, as relatively long leave for several children in a row might have made it more difficult for them to return to the labour market. Making parental leave available to inactive and unemployed women would also have reduced incentives to return to work in between childbirths. The improving labour market performance and rising household incomes may have also acted as a disincentive to work for second earners, especially in places where childcare is still lacking. Introduction of the “Family 500+” benefit is likely to have reinforced the trend of decreasing participation among mothers.

The literature on the impact of child benefits

Child benefits may reduce labour supply through an income effect (Cahuc et al., 2014) and women with children tend to be more responsive to such transfers (Blundell, 1995). In fact, evidence from other countries suggests that there can be large negative effects of child benefits on female labour supply, which tend to be greater for women with lower skills (Jaumotte, 2003; Milligan and Stabile 2009; Haan and Wrohlich, 2011). Schirle (2015) analyses the introduction of the Universal Child Care Benefit (UCCB) in Canada in 2006 and the impact it had on the labour market. Using Canadian LFS Survey 2003-2009 she finds large and significant negative income effects of the UCCB on labour supply of mothers and fathers. The effects were stronger for low educated parents, though concerned better educated women as well. Among mothers, labour supply was decreased both at the extensive and intensive margin. Gonzalez (2013) uses a regression discontinuity framework to analyse the fertility and labour supply effects of a large universal one-time benefit introduced in 2007 in Spain. She finds a negative labour force participation effect a year after birth, which however disappears by the time the child is two. Scharle (2007) finds the

negative effect of cash benefits on female labour force participation to be higher in Central and Eastern European countries, which may be a reflection of lower income levels in these countries.

Using a discrete-choice labour-supply model and Polish Household Budget Survey data Myck (2016) finds that the “Family 500+” benefits could reduce labour supply in the long term by about 240 000 individuals. This effect is strongest for relatively low-educated mothers, particularly those living in small towns and villages.

Beyond its labour market impact several studies predicted that the “Family 500+” programme should reduce poverty substantially. Simulation-based estimates suggest it might reduce extreme poverty from 9 to 6% of the population (Goraus and Inchauste, 2016) and practically end it for children (Brzeziński and Najsztub, 2017). The at-risk-of-poverty rate – the share of people with less than 60% of mean disposable household income – could be reduced by 5 percentage points (European Commission, 2017). However, the data for 2016 suggest a much more modest decrease. The at-risk-of-poverty rate fell only slightly, while extreme poverty fell by 1.4 percentage points compared to 1 percentage point in 2015. Extreme poverty among children fell by more than 3 percentage points, though. Further progress is likely in 2017, as benefit disbursement started only in the summer of 2016.

Concerning the potential impact on the number of children per family, some research finds that generous family benefits can have a positive impact on fertility, although estimated effects differ widely and are low in some studies (Laroque and Salanié, 2014; Luci-Greulich and Thévenon, 2013; Riphahn and Wijnck, 2016). In the case of the Polish benefit it is clearly too early to evaluate any effects on fertility.

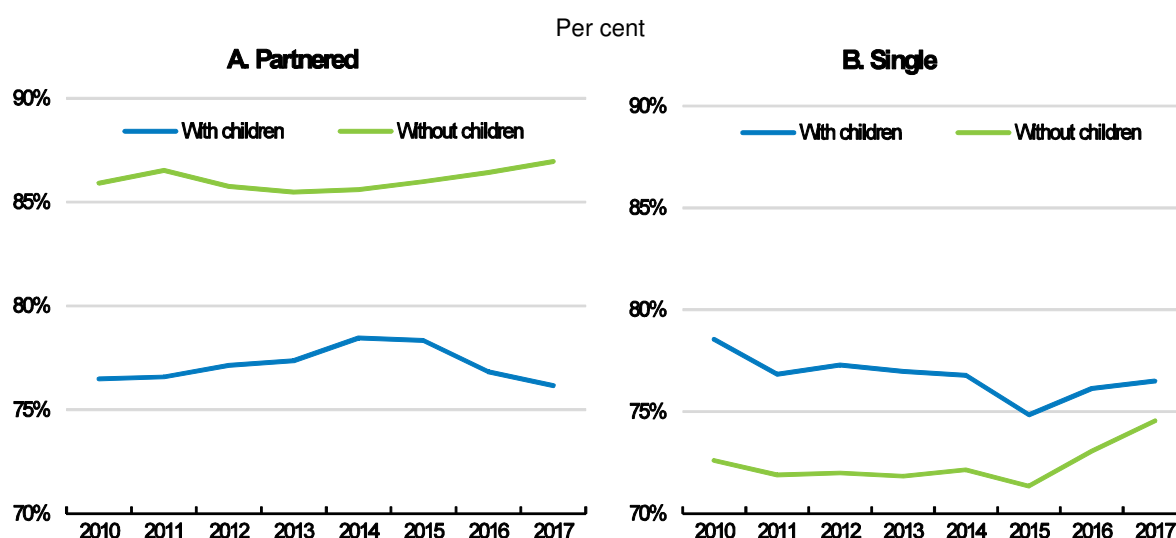
Methodology and data

We test the hypothesis that the implementation of the “Family 500+” programme led to a fall in labour force participation among mothers. To this end, we use a difference-in-differences approach (Angrist and Pischke, 2014; Lechner, 2011). To identify the effect of the introduction of the “Family 500+” benefit we compare changes in participation rates of women who are eligible for the transfer, as they have children - our treatment group, and of women who have no children and as such are not eligible - the control group. In the case of women with one child, many are not eligible to the benefit, because their income is too high. Yet, single women can in principle become eligible by withdrawing from the labour market or reducing their hours worked so that their income drops below the eligibility ceiling, as could some partnered women provided their partner’s income is low enough. It seems sensible to consider these women as part of the treatment, since the child benefit is potentially available to them and might thus influence their behaviour. This is less clear for women whose partner’s income is so high that they could not become eligible for the benefit even by withdrawing from the labour market. Assigning them to the treatment group should bias the estimated impact on participation downwards, as they cannot be reasonably expected to react to the benefit. This is why we also test some other specifications, which are discussed later. We test whether the difference in participation rates of the treatment and control group changes after the introduction of the “Family 500+” benefit. A key assumption of the methodology is that the treatment and the control group are similar enough so that changes in the outcome variable, labour market participation in the case of this study, are the same unless they are subject to a different “treatment”. If this assumption is correct, comparing changes in the participation rate following the introduction of the child benefit is a way to identify its effect.

As common in the literature we verify the validity of this “common trends assumption” via visual inspection of historical trends of our outcome variable, labour force participation (see e.g. Gebel and Voßemer, 2014; Centeno et al., 2009). Figure 8 shows that changes in participation rates for women with 1 or 2 children and those without children were indeed quite similar prior to the introduction of the child benefit in 2016, but started to diverge thereafter, in particular for women with partners. This makes us

confident that comparing these two groups allows us to identify the effect of the child benefits. Since the pre-reform trend of labour force participation rate of women with three and more children was quite different (see Figure 7) we consider that childless women are not sufficiently similar to them for a valid comparison. We therefore drop women with three or more children from our analysis. We further test the common trends in participation rates of women in the treated and control groups using placebo tests, described further below.

Figure 8. Labour force participation rates of women aged 20-49 by marital status and presence of children



Source: Own calculations based on EU Labour Force Survey data.

We use Polish Labour Force Survey data for years 2010-17, restricting the sample to women aged 20-49. The analyses are run separately for single and partnered women to account for differences in their labour force participation decisions, which are likely to be influenced by the presence of a partner. Partnered women are defined as women living with a spouse or cohabiting partner in the same household. We compare their activity rates before and after the second half of 2016, as municipal offices started transferring the “Family 500+” benefits as of the end of June 2016.

Table 1 compares descriptive statistics for the treatment and control group in 2016, distinguishing between single and partnered women. Not surprisingly, childless women are much younger, in particular among singles. Those childless single women are also already better educated and more likely to be still in education than single mothers. Among partnered women, there is a higher share of rural inhabitants in the treated group. Such differences in the treatment and control group are taken into account in our methodology by introducing the socio-economic variables displayed in Table 1 as controls.

We estimate the following equation:

$$A_{it} = \alpha + \beta X_{it} + \gamma T_i + \theta_{post} * T_i + \varepsilon_{it} \quad (1)$$

where A_{it} is a dummy variable indicating whether individual i is active in the labour market in period t . α is a constant, X_{it} is a vector containing a set of individual-specific characteristics detailed in Table 1. Unfortunately, income and wage variables cannot be included as controls, as these data are either unavailable (income) or too patchy (wages) in the Polish Labour Force Survey. T_i is a treatment group

variable, specifying whether the woman has children (treatment group) or not (control group), *post* is a dummy variable for the period following the second quarter of 2016 when the child benefit was introduced, or the post-treatment period, a ε_{it} is an error term and α , β , γ and θ are parameters to be estimated. We also introduce time-fixed effects to account for changes in labour market policies and the economic situation in general. As the benefit was announced only a few months before the introduction, it is safe to assume that it was not anticipated and women did not react before they actually received the money.

Table 1. Descriptive statistics for women aged 20-49 in 2016

Women with 1 or 2 children are the treated group, childless women are the control group

	Partnered women		Single women	
	Control	Treated	Control	Treated
Age: 20-29	24	18	61	23
Age: 30-39	20	51	20	45
Age: 40-49	56	31	19	32
Place of residence: city with more than 100 000 inhabitants	35	28	34	32
Place of residence: city with less than 100 000 inhabitants	30	31	27	34
Place of residence: rural area	35	42	39	34
Educational level: tertiary	40	45	44	32
Educational level: secondary	34	34	40	40
Educational level: basic vocational or lower	26	21	16	29
Student status	5	2	26	3
Labour market status of partner: employed	89	93	-	-
Labour market status of partner: unemployed	3	3	-	-
Labour market status of partner: inactive	8	4	-	-
Educational level of partner: tertiary	26	30	-	-
Educational level of partner: secondary	34	35	-	-
Educational level of partner: basic vocational or lower	39	36	-	-
Number of children: one (vs two)	-	53	-	71
Age of the youngest child: 0-1	-	17	-	10
Age of the youngest child: 2-3	-	16	-	13
Age of the youngest child: 4-6	-	20	-	20
Age of the youngest child: 7-12	-	29	-	35
Age of the youngest child: 13-17	-	17	-	22
Number of observations	10 302	24 334	12 437	4 840

We use the linear probability model to estimate equation (1). To overcome error-term heteroscedasticity, we compute robust standard errors. Additional estimates with the so-called placebo effects (that is treatment dummies for other periods prior to the introduction of the child benefit) are run to check the robustness of the results.

Results

The effect of child benefits on labour force participation

Table 2 reports the estimate of our main parameters of interest, γ , the group effect and θ , the treatment effect. Estimates of other coefficients are available from the authors upon request as are the placebo tests. The estimates imply that after adjusting for differences in the composition of two groups the labour force participation rate of childless women with a partner was almost 6 percentage points higher than for partnered women with one or two children over the estimation period. Following the introduction

of the child benefits this difference increased by 2.4 percentage points. The implication is that labour force participation among partnered mothers might have been 2.4 per cent higher in the absence of the child benefits. The treatment effect for single women is of the same order. Placebo tests for other periods than the one following the introduction of child benefits were insignificant in the large majority of cases.

Table 2. The effect of child benefits on labour force participation of mothers

Women aged 20-49 with 1 or 2 children		
	Partnered women [1]	Single [2]
Group effect (γ)	-0.059***	0.002
Treatment effect (θ)	-0.024***	0.024***
Observations	299 662	150 506
R-squared	0.116	0.277

Note: The coefficients of all covariates are available upon request. Robust standard errors. Significance levels: *** 0.01, **0.05, * 0.1.

To test whether the effect of the child benefit on female labour force participation changed over time, we also estimated equation 1, allowing for a different treatment effect in 2016 and 2017. Results presented in Table 3 show that the effect of the benefit on labour force participation actually strengthened in 2017 for both partnered and single women.

Table 3. The dynamics of the effect child benefits on labour force participation of mothers

(women aged 20-49 with 1 or 2 children)

	Partnered women [1]	Single [2]
Treatment effect in the 2nd half of 2016 (θ_{2016})	-0.017**	-0.014
Treatment effect in the 1st half of 2017 (θ_{2017})	-0.027***	-0.029**
Observations	299 662	150 506
R-squared	0.116	0.277

Note: The coefficients of all covariates are available upon request. Robust standard errors. Significance levels: *** 0.01, **0.05, * 0.1.

Testing for heterogeneous effects

We also test whether the impact of the “Family 500+” benefit on the labour force participation rate of women with children was heterogeneous across different groups of women. To verify this, we interact the group and post-period dummies and their combination with the socio-economic variables described in Table 1:

$$A_{it} = \alpha + \beta X_{it} + \gamma T_i + \delta T_i X + \theta Post * T_i + \mu Post * T_i X_{it} + \rho Post X + \varepsilon_{it} \quad (2)$$

where δ , μ and ρ are vectors of parameters to be estimated. μ in particular is a vector with a set of parameters capturing different treatment effects by socio-economic group.

For parsimony we test heterogeneity with a simple post-period dummy and run regressions separately for each socio-economic variable. The heterogeneous treatment effects for partnered women are displayed in Table 4. For single women we did not find treatment effects that differed significantly by socio-economic group.

Table 4. Heterogeneous treatment effects for partnered women

(Women with 1 or 2 children are the treated group, childless women are the control group)

Model with interactions for educational level (Educational level – base: tertiary)	
Treatment effect for tertiary education	-0.011*
Difference in treatment effect for secondary education	-0.018
Difference in treatment effect for basic vocational or lower education	-0.045***
Model with interactions for place of residence (Place of residence – base: city with more than 100 thousand inhabitants)	
Treatment effect for cities with more than 100 000 inhabitants	-0.005
Difference in treatment effect for cities with 20 000-100 000 inhabitants	-0.052***
Difference in treatment effect for cities with less than 20 000 inhabitants	-0.014
Difference in treatment effect for rural areas	-0.018
Model with interactions for age (Age – base: 30-39)	
Treatment effect for age 30-39	-0.007
Difference in treatment effect for age 20-29	-0.044***
Difference in treatment effect for age 40-49	-0.020
Model with interactions for number of children (Number of children – base: two)	
Treatment effect for mothers of two children	-0.027***
Difference in treatment effect for mothers of one child	0.006
Model with interactions for age of the youngest child (Age of the youngest child – base: 7-12)	
Treatment effect for mothers of children aged 7-12	-0.043***
Difference in treatment effect for mothers of children aged 0-1	0.070***
Difference in treatment effect for mothers of children aged 2-3	0.002
Difference in treatment effect for mothers of children aged 4-6	0.025**
Difference in treatment effect for mothers of children aged 13-17	0.009
Number of observations	299,662

Notes: The coefficients of all covariates and for single women are available upon request.

The estimates confirm that the effect of child benefits is strongest for women with the lowest levels of education, lending support to the idea that women with weak earnings are most likely to react to an increase in transfers, in particular when they can rely on the income of a partner. Women living in mid-sized towns seem to be most strongly affected, while the treatment effect is insignificant for others. The youngest age group seems to react most strongly to the introduction of child benefits, while the treatment effect for partnered women older than 30 is again insignificant. Whether women have one or two children does not seem to matter, but there are some differences depending on the age of the youngest child, with mothers whose youngest child was younger than 1 or between 4 and 6 reacting less strongly than others.

The estimate for mothers of children which are younger than 1 has to be interpreted with caution, though, as women on maternity leave are counted as employed.

Robustness tests

As a first robustness check we compare changes in participation rates among women with two children (treated group) to changes in participation rates among childless women, leaving out women with one child whose assignment to the proper group is more challenging. Table 5 summarizes the results, which are statistically significant and even stronger in size for single women than in the baseline.

Table 5. The effect of child benefits on labour force participation of mothers

Women aged 20-49 with 2 children

	Partnered women [1]	Single [2]
Treatment effect in the 2nd half of 2016 (θ_{2016})	-0.019**	-0.052***
Treatment effect in the 1st half of 2017 (θ_{2017})	-0.031***	-0.044**
Observations	184 220	130 600
R-squared	0.122	0.302

Note: The coefficients of all covariates are available upon request. Robust standard errors. Significance levels: *** 0.01, **0.05, * 0.1.

As a second robustness check testing the impact of the assignment of women with one child to the treatment and control group, we redefine these groups in a following way. We define the treatment group as women with two children and those with one child who declare receiving a social benefit in the form of family benefits or social assistance, as this implies eligibility for the 500+ benefit as well. The control group includes mothers with one child who do not report receipt of any social assistance benefits. Most of them will not be eligible for the 500+ transfer. This approach allows us to gauge differences in labour market behaviour across eligible and non-eligible mothers, rather than comparing mothers with childless women - an additional way to test the robustness of our results. However, because the eligibility ceiling for social assistance is lower than for the “Family 500 +” benefit, mothers with household income that falls between those two eligibility ceilings will be wrongly assigned to the control group. That said the two income ceilings are close and therefore the corresponding bias should be limited. According to our estimates based on Household Budget Survey data wrong assignment should concern around 12% of households with one child. We also make use of the time panel dimension of our data (available only as one-year transitions, though) and investigate the impact of the “Family 500+” benefit on labour market withdrawal, or the flow from activity to inactivity, rather than the level of activity, thus varying the outcome variable. In particular, we compare the flows from activity to inactivity between the 2nd and 3rd quarters of 2016 and between the 3rd and 4th quarters of 2016 to the same flows one year earlier.

To increase the comparability of individuals across the treated and control groups and lower the potential selection bias we employ a kernel propensity score matching technique (Blundell and Dias, 2009). We estimate for each individual the probability that she would be in the treatment group based on the socio-economic characteristics described in Table 1. This probability is referred to as the propensity score. For each treated subject, we derive a weighted average of all individuals in the control group with weights based on the distance of their propensity score to that of the treated individual. The highest weight is given to those with propensity scores closest to that of the treated unit. Once we weight the covariates based on the propensity score matching technique, the differences in means between the treatment and the

control group become statistically insignificant for all variables, substantially reducing the selection bias (Table 6).

Table 6. Balancing t-test of differences in means of covariates between the control and treated groups, 2015

	Raw			With weighted covariates		
	Control	Treated	Difference	Control	Treated	Difference
Unemployed (share among active)	0.057	0.084	0.027***	0.102	0.090	-0.012
Age: 20-24	0.023	0.010	-0.013***	0.011	0.011	0.000
Age: 25-29	0.118	0.068	-0.050***	0.072	0.073	0.001
Age: 30-34	0.212	0.230	0.018**	0.241	0.239	-0.002
Age: 35-39	0.218	0.366	0.149***	0.350	0.371	0.021
Age: 40-44	0.250	0.244	-0.006	0.240	0.226	-0.014
Age: 45-49	0.179	0.081	-0.098***	0.086	0.081	-0.005
Level of education: High	0.448	0.454	0.006	0.444	0.447	0.003
Level of education: Medium	0.345	0.338	-0.008	0.345	0.342	-0.003
Level of education: Low	0.206	0.208	0.002	0.211	0.211	0.000
Age of the youngest child: 0-3	0.190	0.236	0.046***	0.231	0.246	0.015
Age of the youngest child: 4-6	0.178	0.246	0.068***	0.244	0.241	-0.003
Age of the youngest child: 7-17	0.633	0.518	-0.114***	0.525	0.513	-0.012
Main source of household income: contract work	0.750	0.704	-0.046***	0.698	0.701	0.003
Main source of household income: own agricultural farm	0.070	0.085	0.015***	0.097	0.092	-0.005
Main source of household income: self-employment outside agriculture	0.117	0.135	0.018***	0.121	0.127	0.006
Main source of household income: other	0.063	0.076	0.013***	0.084	0.081	-0.004
Presence of the partner in the household	0.816	0.853	0.037***	0.844	0.853	0.010
Place of residence: large city	0.278	0.254	-0.024***	0.229	0.234	0.005
Place of residence: medium city	0.200	0.176	-0.024***	0.180	0.175	-0.005
Place of residence: small city	0.136	0.127	-0.009	0.135	0.137	0.001
Place of residence: rural area	0.386	0.444	0.057***	0.456	0.455	-0.001
Number of observations	3007	2309	-	3007	2309	-

The estimated group and treatment effects are displayed in Table 7. The treatment effect is positive and statistically significant. The results suggest that after the Family 500+ programme was introduced the gap in the quarterly withdrawal rate between the treated and control was 2.2 percentage points higher than it was a year earlier. This is a large effect, considering that the average withdrawal rates vary between 1 and 4 per cent. In the second half of 2016 the average quarterly withdrawal rate for the treated group was on average 3.9%. Our results imply that it would have been less than half of that. In absolute terms this suggests that on average 50 000-54 000 women withdrew from the labour market in the second half of 2016 due to the 500+ benefit. This is in line with the estimates obtained in the first part of our analysis.

Table 7. The impact of child benefits on labour market withdrawal rates

Results from a difference-in-differences estimation with kernel propensity score matching

Outcome: flow from activity to inactivity 2016 vs 2015	
Group effect (γ)	-0.006 (0.005)
Treatment effect (θ)	0.022*** (0.007)
Observations	10 310

As a last robustness check we use our baseline mode, but look at employment versus non-employment (unemployment or inactivity) as an outcome variable rather than at activity versus inactivity. Table 8 summarizes the results, which are similar and even a bit stronger than the results for inactivity.

Table 8. The effect of the introduction of child benefits on employment of mothers

(Women aged 20-49 with 1 or 2 children and its development over time)

	Partnered women [1]	Single [2]
Treatment effect in the 2nd half of 2016 (θ_{2016})	-0.020***	0.002
Treatment effect in the 1st half of 2017 (θ_{2017})	-0.029***	-0.036***
Observations	299 662	159 506
R-squared	0.116	0.277

Note: Robust standard errors. Significance levels: *** 0.01, **0.05, * 0.1

Conclusion

The results presented in this paper suggest that the recent introduction of child benefit in Poland had a significantly negative impact on labour force participation and employment of eligible mothers. This finding is robust to changing the precise outcome variable we look at, labour force participation, employment or labour market withdrawal, to different definitions of the treatment and the control groups in our difference-in-differences methodology and to different estimation approaches. While the assignment of women with one child to the treatment and the control groups is never perfect, some of our specifications are likely to assign too many, while others assign too few of these women to the treatment group. The fact that in all of these specifications the estimated effect is significant and sizeable suggests that we can be confident about our results. While women with three or more children are likely to react to the child benefit, as the income effect is particularly large in their case, we do not have a suitable control group for them. The fact that we drop women with three or more children from the sample for that reason probably biases our results downwards. Our estimated effects are sizeable implying that labour force participation and employment would have been between 2 ½ and 3 per cent higher by mid-2017 in the absence of the reform. Testing for heterogeneity across different groups reveals that the effects are strongest for the lowest-educated mothers.

Looking into the future it will be interesting to assess whether the effect strengthens further, as it did between 2016, when the benefit was introduced, and 2017 or whether effects level off. At a later stage it will also be interesting to assess whether fertility is influenced positively by the benefit, as intended by the

government. It will be challenging to identify the reform effect, though, as the booming economy, the general rise in incomes in Poland, the much improved labour market situation and better access to childcare services have all helped to make it easier for families to have more children.

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