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Research Article

Cash transfers and fertility: Evidence from Poland's Family 500+ Policy

Anna Bokun

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Anna Bokun[1]

Abstract

BACKGROUND
To increase the lowest fertility rate in the European Union in 2015, combat poverty, and invest in children's human capital, the Polish government launched a pronatalist cash transfer program in 2016.

OBJECTIVE
What are the short-term fertility effects of the Family 500+ cash transfer? Which groups of women responded to the cash transfer?

METHODS
Using the Polish Household Budget Survey (2010–2018), I estimate linear probability regression models to identify the effect of the cash transfer on the probability of a birth as a function of a woman's cash transfer eligibility, including heterogeneous effects by age, income, and education.

RESULTS
In the short term, the cash transfer is associated with an increased annual probability of overall births by 1.5 percentage points. Heterogeneity analyses reveal the cash transfer is associated with increased fertility for women aged 31–40 (0.7 to 1.8 percentage points), in contrast to decreased fertility for women aged 21–30 (2.2 to 2.6 percentage points) and women with higher household incomes (1 percentage point).

CONCLUSIONS
This analysis provides mixed evidence on the short-term efficacy of the cash transfer on fertility. Some demographic groups are more sensitive to the additional income, suggesting that the economic and social barriers to fertility are not equally distributed in the Polish population.

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CONTRIBUTION
Descriptive analyses of changing short-term fertility can facilitate timely adjustments to policies, identify emerging trends that may signal long-term patterns, and inform resource allocation.

1. Introduction

To increase the lowest fertility rate in the European Union (EU) in 2015, the Polish government launched a cash transfer program (OECD 2024). The policy's objectives were threefold: lift the birth rate, combat intergenerational child poverty, and invest in children's human capital. Announced in February 2016 and implemented in April 2016 by the national conservative Law and Justice Party, the quasi-universal Family 500+ cash transfer grandfathered in all families with two or more children to receive an untaxed, flat-rate, monthly cash transfer of 500 PLN (approximately $130 USD)[2] for each child under the age of 18. Families with low income and/or one disabled child also qualify.[3] The benefit – representing a significant shift in public support for families in Poland – is unique among cash transfer programs due to its relatively large size and wide eligibility.[4] Although the cash transfer was universally expanded in 2019 to include all children under the age of 18, this study exclusively focuses on the first-stage policy rollout in 2016, primarily affecting all families with two or more children.

What was the impetus for the cash transfer? "Lowest-low fertility" (a total fertility rate [TFR] of 1.3 or less) had famously spread across Central and Eastern Europe in the 1990s (Kohler, Billari, and Ortega 2002). Poland, in particular, experienced a dramatic fertility decline. In parallel to other OECD countries, the Polish TFR plunged from about 3 in 1960 to a historic low of 1.22 in 2003 (Figure 1). It then bounced up to 1.45 in 2017, before gradually declining in the late 2010s and early 2020s (Polish Statistical Office 2023a) (Figure 2).

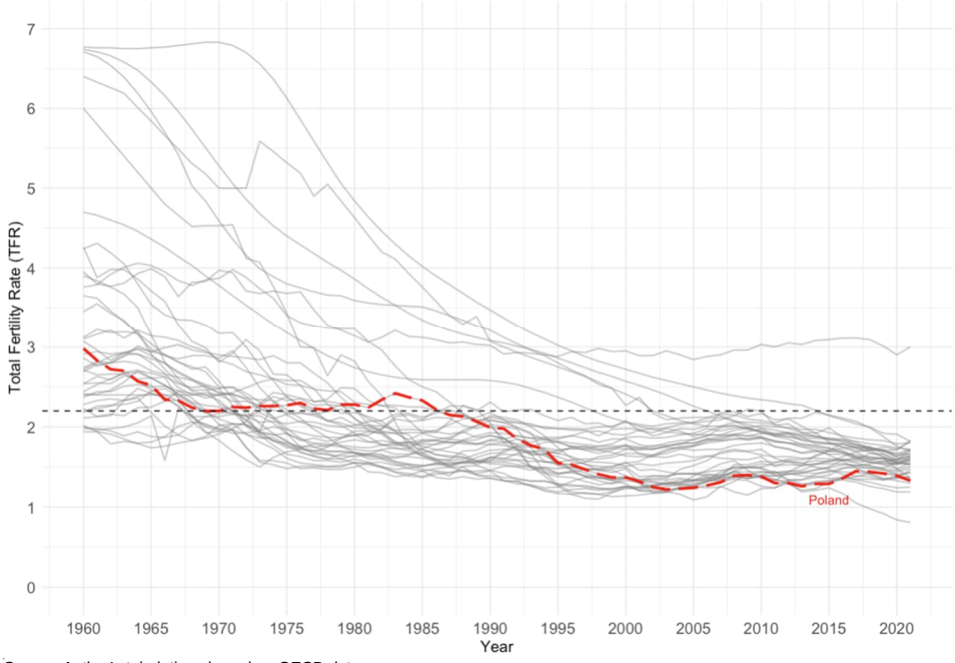
Lutz, Skirbek, and Testa (2006) argue that a "low-fertility trap" of self-reinforcing demographic, sociological, and economic mechanisms drives a downward spiral in births that is hard to reverse. According to demographers' calculations, lowest-low fertility will halve a stable population in 45 years and shrink the working-age population, stymieing

[2] During the period of research, the average PLN to USD exchange rate was $3.87 PLN = $1 USD. This applies to all monetary amounts and conversions mentioned in this study.
[3] One-child families earning less than 800 PLN (~$200) monthly per capita and/or less than 1,200 PLN (~$300) per capita for disabled children are also eligible for the cash transfer (Polish Ministry of Family and Social Policy 2021a).
[4] The cash transfer was introduced as part of a broader package of family benefit programs in 2016. However, the cash transfer was the flagship and largest economic policy innovation during this period.

economic growth and dynamism (Billari 2008). Fewer births, in tandem with population aging and increased life expectancy, shift the age distribution and result in labor market shortages and overburdened healthcare and pension systems (Bongaarts 2004).

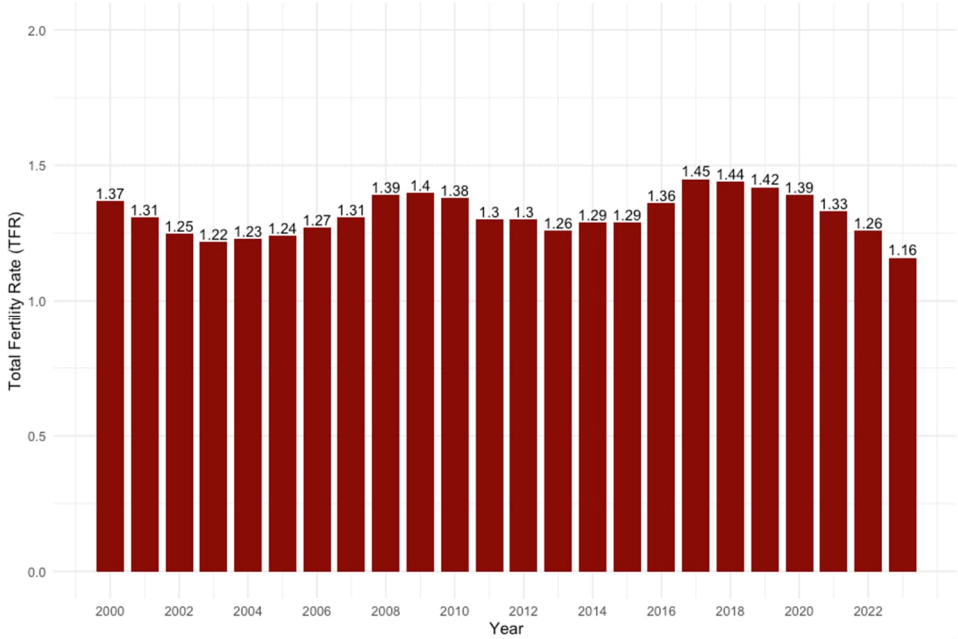
On the other hand, scholars question whether replacement-level fertility (TFR of 2.1 or higher) is optimal for today's postindustrial societies. Gietel-Basten and Scherbov (2019) 'correct the record' and argue that the weight demographers place on the replacement rate as a target is overstated and not practical when also considering migration and human capital. Apart from alleviating environmental concerns, low-fertility societies are generally highly educated and productive, needing fewer workers to oil the wheels of economic growth and maintain quality living standards (Striessnig and Lutz 2013; Lee et al. 2014; Kolasa 2021; Skirbekk 2022).

Figure 1: Declining fertility across the OECD (1960–2021)



Source: Author's tabulations based on OECD data.

Figure 2: Total fertility rate, Poland (2000–2023)



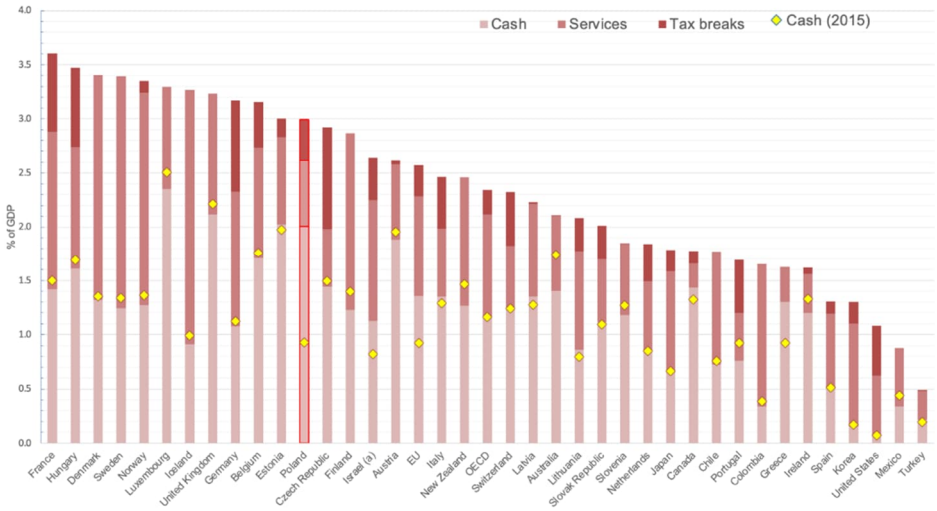
Source: Author's tabulations based on Polish Statistical Office data.

Over the last few decades, many European governments have designed family benefit programs with the explicit demographic goal of raising fertility. Between 1986 and 2015, the number of countries with pronatalist policies soared from 19 to 55 (Sobotka, Matysiak, and Brzozowska 2020). During this period, scholars have detected two main 'pro-family' policy trends (Korpi 2020). First, countries have introduced policies that help combine parenting and employment by supporting childcare, parental leave, and flexible work. A critical mass of scholars argue that the key driver of fertility today in advanced economies is the compatibility of family and career goals (McDonald 2000; Goldscheider, Bernhardt, and Lappegård 2015; Bergsvik, Fauske, and Hart 2021; Goldin 2021; Sikorska 2021; Doepke et al. 2023; Thomas et al. 2022). The Nordic and continental European countries have favored such reconciliation policies supporting working parents alongside robust family benefit programs.

Second, the expansion of cash transfers has become popular in Central and Eastern Europe. In 2016, Poland zeroed in on massively expanding a single policy; the share of cash transfers as public support for families doubled from 2015 to 2017, accounting for about 2% of GDP in 2017 (OECD 2020) (Figure 3). Although historically, Poland has

been one of the lowest spenders on family benefit programs in Europe (even declining spending between 2000 and 2010), from about 2010 onward this trend has reversed, and by 2019, Poland ascended to rank fourth in family benefits spending in the OECD, behind France, Sweden, and Luxembourg (OECD 2019a; Vanhuysse and Perek-Białas 2021). In fact, the Family 500+ cash transfer is the most expensive policy implemented by the Polish government in modern times (Suwada 2019).

Figure 3: Family benefits spending, OECD (2017)



Source: Author's tabulations based on OECD data.

In this study, I ask the following questions: (1) How effective is the Family 500+ cash transfer in increasing fertility? (2) Which groups of people are affected, more or less, by the cash transfer? I use microdata from the 2010–2018 waves of the Polish Household Budget Survey (PHBS), conducted by the Polish Statistical Office, and focus on a sample of childbearing-aged women: 16–45. Due to nonrandom eligibility and the universal nature of the cash transfer (i.e., all families with two or more children are eligible at the same time), constructing an appropriate control group is complicated, and there are limits to which quasi-experimental methods can be used. Thus, I rely on indirect estimation methods and estimate linear probability regression models that track changes in the annual probability of a birth as a function of a woman's cash transfer eligibility, plus a set of demographic controls. I also test for heterogeneous effects according to household income, age groups, and education.

To preview the main results, I find that the cash transfer is linked with an overall increase in the annual probability of having a child by 1.5 percentage points (95% CI [0.011, 0.019], $p = 0.000$). In the heterogeneity analysis, the cash transfer is associated with a 1.8 percentage point increase for women aged 31–35 ([0.008, 0.028], $p = 0.001$) and a marginally significant 0.7 percentage point increase for women aged 36–40 ([0.000, 0.014], $p = 0.052$). In contrast, younger women aged 26–30 observed a 2.6 percentage point decrease ([–0.042, –0.011], $p = 0.001$) and women aged 21–25 observed a marginally significant 2.2 percentage point decrease ([–0.043, 0.000], $p = 0.051$). Women with higher household incomes saw a 1.1 percentage point decrease in childbearing ([–0.018, –0.004], $p = 0.003$). The results by education level do not provide sufficient statistical evidence for a definitive relationship.

These findings are important and timely. While I find a small, positive, short-term fertility effect overall, some demographic groups are more sensitive to the additional income, suggesting that the economic barriers to fertility are not equally distributed in the population. Analyzing the extent to which Polish families face intersecting economic, social, and political barriers to fertility is an avenue of fruitful future research.

This study complements and extends two strands of the family demography literature. First, it enhances our understanding of cash transfers and fertility patterns in the context of a low-fertility, rich country. Since we are decades away from the current cohort of childbearing-aged women exiting their reproductive window, I am unable to analyze long-term fertility effects. Moreover, the evolving role of public support for families in Central and Eastern Europe – where plummeting births, rapid aging, and historically high (but decelerating) emigration rates have sparked demographic panic – is understudied but can enlighten debates in other countries grappling with similar demographic trends (Lutz and Gailey 2020; Sobotka and Fürnkranz-Prskawetz 2020; Okólski 2021). As the sixth largest economy by GDP in the EU in 2020, the 'Polish tiger' can offer valuable insights into the links between demographic pressures and public policy today (Eurostat 2021; Morawiecki 2018).

Second, I contribute to a mushrooming literature on whether cash transfers can attenuate fertility inequalities. As Cowan and Douds write: "Fertility inequality manifests in a number of ways, including having adequate access to contraception and abortion, being healthy enough to conceive and bear children, or having enough resources to bear and raise the number of children one desires" (Cowan and Douds 2022: 1004). According to data from the Generations and Gender Survey, only 35% of families in Poland achieve their short-term fertility goals, with widening disparities by gender and parity (Brzozowska and Mynarska 2018). Using in-depth interviews, Suwada (2019) argues parents in Poland are restricted by structural factors such as household gender inequality, low earnings trajectories, childcare costs, and a lack of affordable housing that determine their 'fields of possibility' for realizing fertility intentions. While the debate on how to

narrow the gap between desired and achieved fertility is far from conclusive, policymakers are evaluating whether offsetting the costs of raising children through cash transfers can potentially move the needle in the intended direction.

2.What do we know about cash transfers and fertility?

2.1 Theoretical expectations for low-fertility countries

It is well-known by now that income effects on fertility are not straightforward. How money, specifically in the form of cash transfers, affects reproductive decision-making is an important question. As sociologists and behavioral economists have shown, the "social reception of money is active, not passive" (Carruthers 2010). Money has a fungible quality; its utility and value is perceived differently by individuals, and people do not make financial nor reproductive decisions in a vacuum but a 'choice architecture' of institutions, public policies, and cultural forces (Thaler, Sunstein, and Balz 2010; Zelizer 2017).

A simple economic model of fertility predicts that the opportunity costs of raising children affect parental decisions. If we consider children a 'normal good,' then an increase in income might theoretically reduce the cost of children and raise fertility. At the same time, an increase in income might contribute to a fall in fertility, as parents develop a preference for more expensive human capital investments in education and extracurricular activities for each child (Becker 1960; Becker and Lewis 1973). The shadow cost of raising children – including indirect costs, opportunity costs, and reduced human capital, particularly for mothers – tends to increase as parents' income rises, since higher earners invest more in each child in absolute terms, even if it represents a smaller share of their total income compared to lower earners.

It is important to note that scholars have identified a 'new economics of fertility' theory for rich countries (Doepke et al. 2023). While prior research shows an inverse relationship between high-income countries and fertility, modest fertility increases have been documented across the OECD for the general population (Feyrer, Sacerdote, and Stern 2008; Myrskylä, Kohler, and Billari 2009; Myrskylä, Goldstein, and Cheng 2013; Esping-Andersen and Billari 2015). GDP per capita increases in high-income economies could be related to fertility increases not only because parents can afford to have children but also because these countries are more likely to invest in family policies that support fertility, such as parental leave and childcare subsidies (Luci-Greulich and Thévenon 2013; Murkowski 2021). While Western European countries experienced this reversal starting in the mid-1990s, Central and Eastern Europe experienced it about a decade later (Billingsley and Ferrarini 2011). These patterns raise questions about the importance of

economic conditions alongside the diffusion of gender egalitarian norms that shape and sway family benefit programs and, ultimately, fertility.

2.2 Postcommunist fertility transformations in Poland

2.2.1 Social and economic changes

Starting in the 1980s, the Polish TFR plummeted, accelerating with the transition from communism to market-driven competition in 1989. The number of annual births in Poland dropped by 40%, from 547,700 in 1990 to 331,511 in 2021 (Polish Statistical Office 2022a). Within a few years after the economic transition, Poland "moved from the group of high fertility countries to the group of lowest-low fertility" (Kotowska et al. 2008: 800).

The Polish fertility decline is explained by several interlinked factors; the economic crises spurred by the postcommunist transition (skyrocketing unemployment, inflation, and job insecurity); the second demographic transition and its cultural and ideational shifts; family policy changes over the last 25 years, including a reduction in family benefits in the early 2000s and their gradual recovery; a historic lack of policies that equitably distribute the cost of having children between parents; and "shifting priorities among more recent birth cohorts," a phenomenon encompassing changes in life goals for women balancing family, work, and education (Lesthaeghe 1995; Macura et al. 2000; Philipov 2002; Sobotka 2011; Mishtal 2012; Kearney, Levine, and Pardue 2022: 153).

Unpacking the Polish fertility decline warrants further investigation. Sobotka (2002) argues the "socialist greenhouse" of state support in the form of childcare and education subsidies, maternity leave, public housing, and limited labor market competition kept fertility rates artificially high in communist Poland, unlike Western Europe and North America.

Han and Brinton (2022) argue gender equity theory, popularized by McDonald, better explains fertility changes in Central and Eastern Europe than the second demographic transition. They reason the time squeeze that working mothers face by combining employment and domestic tasks – without generous family benefits and men's increased participation in the household[5] – hinders fertility and parity progression. Likewise, DeRose (2021) argues that while gender equity theory and religion are often seen at odds, they both can act as pronatalist forces; progressive gender attitudes promoting an equitable division of labor are most likely to encourage couples' fertility

[5] In Poland, fathers' involvement with childcare and housework has been shown to increase the likelihood of second-parity births and mothers' full-time employment, and fathers' contributions to housework are a stronger predictor of fertility than their childcare involvement (Fanelli and Profeta 2021).

(particularly parity progression), and religious families are more likely to achieve their fertility goals (Bein, Mynarska, and Gauthier 2021).

Ultimately, massive social spending cuts coupled with Durkheimian social anomie (i.e., the weakening of social bonds due to rapid social change) exacerbated the economic transition. Easterlin's theory of relative affluence can help explain how potential parents in postcommunist Poland were deterred from childbearing out of economic uncertainty about the future (Easterlin 1987). Building on this theory, Scheiring and colleagues (2020) stress the role of postcommunist firm privatization in catalyzing economic uncertainty, leading to reduced fertility. Strong fertility declines were also compounded by deteriorating employment prospects linked to the Great Recession (although Poland avoided a technical recession) (Matysiak, Sobotka, Vignoli 2021). At the same time, recent research on European employment and fertility complicates this relationship; since the 1970s, unemployed men – but not unemployed women – were less likely to have a child (Alderotti et al. 2021). Mishtal (2009) turns our attention to contemporary workforce policies, citing employment discrimination against pregnant women and mothers with young children as contributing to declining fertility.

2.2.2 Demographic changes

When considering the mechanisms of fertility decline in Poland, there is evidence to suggest the postcommunist period fertility decline was largely driven by quantum rather than tempo effects (Holzer-Żelażewska and Tymicki 2009). Sobotka, Lutz, and Philipov (2005) decompose the fertility decline into quantum, tempo, and age-structure effects, showing that up until the early 2000s, quantum effects played a major role. Billingsley (2010) enters the debate and calls attention to postponement as motivating the period fertility decline. Matysiak (2009) enriches this idea, highlighting how Polish women used an "employment first, then childbearing" postponement strategy to try and reconcile poor job prospects and fertility goals.

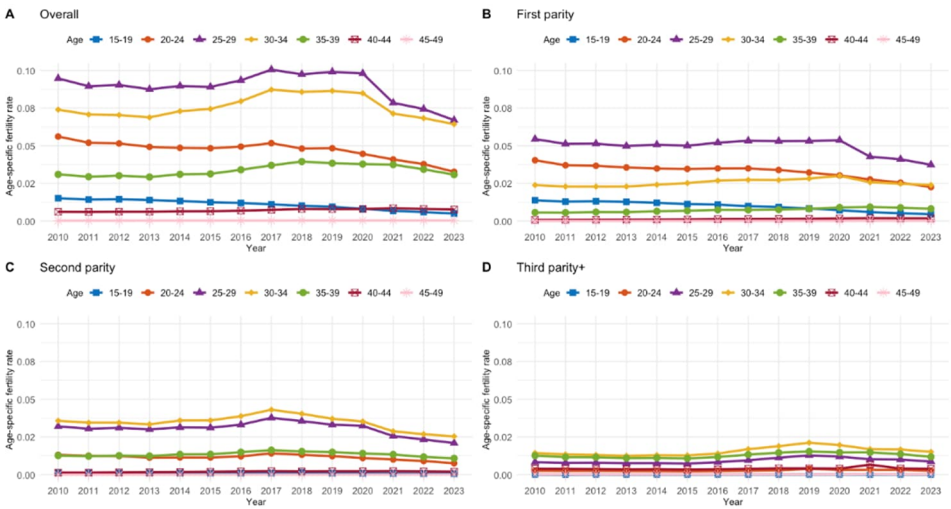
Several demographic indicators of fertility change are key to examine in the Polish context. The fertility decline was accompanied by the postponement of childbearing to higher ages (Walford and Kurek 2016). While historically, the distribution of births in Poland peaked in the 20–24 age group, since 2005, "the peak distribution has shifted to the 25–29 age group, with the 20–24 and the 30–34 year-olds roughly in second place" (Hoorens et al. 2011: 36).

The trend of older motherhood is also reflected in the age at first birth. The median age of first-time motherhood rose from 23.4 in 1980 to 28.7 in 2021, although mothers in Poland are younger relative to their EU peers (Pew Research Center 2018; Polish Statistical Office 2022b). The delay in Poland was more pronounced for urban women,

whose mean age at first birth soared to 29.4 in 2021, while that of rural women rose to 27.6 in 2021.

To shed light on which age groups are driving fertility changes, Figure 4 shows age-specific fertility rates (ASFRs) from 2010 to 2023 for different age groups. The main message is that for overall births, the last decade in Poland has ushered in an era of women aged 30–34 narrowing the ASFR gap with women aged 25–29, followed by a steep drop starting in 2020 for both of these groups (and concurrent but less severe drops for women aged 20–24 and 35–39). For first parities, the fertility gap has completely closed between women aged 20–24 and 30–34, who both have the second highest ASFRs after women aged 25–29 (whose ASFR has declined since 2020). For second parities, there was a slight increase in the ASFRs of women aged 25–29 and 30–34 in the mid-2010s, followed by a gradual decline from 2017 onward. And finally, third parity and higher births are relatively stable over time, except for a small increase in the late 2010s (peaking in 2019) for women aged 25–29, 30–34, and 35–39.

Figure 4: Age-specific fertility rates by birth order, Poland (2010-2023)



Source: Author's calculations based on Polish Statistical Office data.
Notes: 2018 data for births by parity and mother's age are unavailable from the Polish Statistical Office and the Human Fertility Database, so I use provisional estimates from Eurostat for this year only (Eurostat 2024). According to Eurostat researchers, the problem originated from new birth certificate templates introduced by the Polish Ministry of Health; a change in the notation for recording the number of children born to a mother led to significant challenges for physicians in accurately completing the forms.

No analysis of fertility is complete without describing the changes in the number and structure of childbearing-aged women in Poland since they directly affect the number

of births and the TFR. Between 2002 and 2023, the number of childbearing-aged women in Poland dropped by 17%, from 8,445,620 to 7,148,099 (Polish Statistical Office 2023b). Poland's age pyramid reveals slightly more men than women during women's childbearing years, yet starting from age 55 and older, this flips and women start outnumbering men (Polish Statistical Office 2023c).

The Polish fertility pattern has changed by parity as well. The completed fertility decline is strongly related to a decline in second- and higher-parity births (Beaujouan 2023). For instance, first births constituted 44% of live births in 2021, which was 3 percentage points more than in 1980 (OECD 2024). While almost half of women born in 1960 progressed from one parity to two, with each subsequent cohort it decreased; 40% of women born in 1965, 33% of women born in 1970, 28% of women born in 1975, and 24% of women born in 1980 went on to have a second child (Kotowska et al. 2008). Disaggregated by education, recent data indicates an East–West divide in Europe; college-educated (relative to non-college-educated) women in Western Europe have a higher likelihood of progressing to second-parity children, while college-educated women in Central and Eastern Europe have a lower likelihood (Impicciatore and Tomatis 2020).

As Beaujouan points out, it is important to "disentangle trends in earlier and later fertility in low-fertility countries, and also link them to completed fertility" (Beaujouan 2023: 43). In Poland, the completed cohort fertility dropped from 2.2 for women born in 1960 to 1.8 for women born in 1970 (OECD 2024). Emergent research on older parenthood since the 1990s finds that late first births increased the fastest in low-fertility countries, such as Poland, triggering a later-life fertility rebound (Beaujouan 2020). At the same time, the evidence to date suggests that later-life fertility increases rarely offset decreases in younger fertility, although patterns differ across Europe (Beaujouan 2023).

In terms of family structure, changes in Poland have largely followed other rich countries, including a post–World War II baby boom, marriage and childbearing postponement, a doubling of extramarital births (from 13.1% in 2001 to 26.7% in 2021), and the rising popularity of cohabitation and living-apart-together relationships, although these are all happening at lower rates than peer countries (Kotowska et al. 2008; Klich-Kluczewska 2012; Van Bavel and Reher 2013; Polish Statistical Office 2021b; Jarska and Ignaciuk 2022). One notable area of exception in contrast to their EU peers, is the dominant but waning Catholic Church in upholding conservative social policies that curtail reproductive and sexual minority rights (Grzebalska and Pető 2018).

2.3 The role of cash transfers in family policies

Policy levers do not all carry the same weight, and the demographic literature generally agrees that cash transfers have relatively small and positive overall fertility effects that are likely temporary in boosting birthrates (Gauthier 2007; Thévenon and Gauthier 2011; Luci-Greulich and Thévenon 2013; Brainerd 2014; Sobotka, Matysiak, and Brzozowska 2020; Bergsvik, Fauske, and Hart 2021; Hart et al. 2024). Therefore, scholars caution the fertility effects of cash transfers might be concentrated on birth timing (tempo) rather than on lifting the number of children (quantum). Moreover, the timing of cash transfers matters; cash transfers covering childhood, particularly under age 3, often tend to carry larger fertility effects than one-off benefits, such as those granted only around the time of childbirth (Luci-Greulich and Thévenon 2013).

While many studies take a microscope to cash transfers and fertility, it is difficult to compare, as they differ seriously in magnitude, demographic goal (or lack of), eligibility criteria, interactions with already existing systems of family benefits, frequency of payment, rollout date, and other factors. Although most advanced economies have cash transfer programs, their variability across time and place – with frequent adjustments – makes it difficult to tease out universal effectiveness (OECD 2019; World Bank 2019).

Cash transfers can be divided into two main groups: full universal cash transfers (e.g., Austria, Estonia, Finland, Germany, Poland [2019]) and quasi-universal cash transfers, usually restricted by income, age, parity, work requirements, or implemented in the short term (e.g., Belarus, Canada, Denmark, Norway, Poland [2016], Ukraine, United Kingdom) (UNICEF 2020). The Polish monthly cash transfer, amounting to about $283 (USD) in purchasing power parity (ppp), is closest in magnitude to Germany's monthly *kindergeld* benefit (about $257 ppp for each child aged under 18). Monthly cash transfer programs in Austria ($156 ppp), United Kingdom ($130 ppp), Denmark ($128 ppp), Finland ($108 ppp), Estonia ($103 ppp), and Norway ($100 ppp) are similar in magnitude and eligibility requirements as well (UNICEF 2020).

In terms of the literature on similar cash transfers and fertility, studies from Germany, with supporting evidence from Israel, suggest a small positive fertility effect, although heterogeneous effects vary. A 1996 German reform that greatly increased cash benefits finds positive fertility effects for high earners transitioning to second births, but negative effects on first births among the lower educated (Riphahn and Wiynck 2017). A 2006 reform in the East German state of Thuingia finds positive effects for higher-parity births (Gathmann and Sass 2018). Also in Germany, Haan and Wrohlich (2011) find strong fertility increases to child benefit changes; a hypothetical benefit increase of 20% would result in a fertility increase of 4.6%. A pair of studies on Israeli cash transfers show fertility increases, particularly for poorer households (Cohen, Dehejia, and Romanov 2013), and positive effects ranging from 1.9%–9%, varying by income, ethnic, religious, and age groups (Cohen, Dehejia, and Romanov 2007).

Within Central and Eastern Europe, a 1% increase in Hungarian child benefits boosted total fertility by 0.2% (Gábos, Gál, and Kézdi 2009). A recently introduced Hungarian cash transfer increased third-order births among the least educated (Spéder, Murinkó, and Oláh 2020). Evidence from Russia on the 1981 maternal benefits expansion (Malkova 2018), and a 2007 'maternity capital' benefit for second- and higher-parity children show long-run fertility increases (Słonimczyk and Yurko 2014). Corroborating these results, Chirkova's working paper on an increase in Russian child benefits shows a 2.2 percentage point increase in the probability of having a second child, mostly driven by less-educated women (Chirkova 2013).

Studies from Norway, Canada, France, and South Korea also report mostly positive fertility effects. In Norway, mothers eligible for the 1998 cash transfer accelerated birth timing (Aassve and Lappegård 2009; 2010), although later work shows a pattern of slower parity progression and lower short-term fertility that may be mediated by already existing family benefits, such as paid parental leave (Andersen, Drange, and Lappegård 2018). A cash transfer in Quebec, Canada, resulted in a substantial fertility increase of up to 25% for families with newborns who were eligible for the full subsidy (Milligan 2005). A French cash transfer is associated with raising total fertility by 0.3 percentage points (Salanie and Laroque 2008). In a new study on a South Korean cash transfer, Kim (2023) shows that a 10% increase in a cash transfer raised birth rates by 0.6%, 0.3%, and 0.4% for first, second, and third births, respectively.

2.4 The Family 500+ cash transfer

In an era of rising populism, the Family 500+ cash transfer symbolizes a curious mix of left-wing progressive economic policy, tied with right-wing pronatalism[6] (Cook, Iarskaia-Smirnova, and Kozlov 2023). In comparison to peer countries, the Polish cash transfer is one of the boldest in scope and magnitude, grandfathering in all families with two or more children and low-income or disabled one-child families. In 2018, for instance, over half of children under 18 (52%) received the monthly cash transfer, benefiting about 2.3 million families (Polish Statistical Office 2019). The benefit is granted to all families, irrespective of parental marital status. Patchwork families, legal guardians, single and cohabiting parents, foster parents, and foreigners all qualify.[7]

[6] Mateusz Morawiecki, the former Prime Minister of Poland (2017–2023), said: "In Germany, billions of euros are spent on support for immigrants, but here these billions of złotys are spent on Polish families. This is a revolutionary socio-demographic project, and we are proud of it" (Walker 2020).

[7] Patchwork families refer to couples that have a child(ren) from previous relationships and have re-partnered. Families with children who are married, living in an institution such as a juvenile detention center, or receiving child-support benefits for their own children are ineligible (Wrocław.pl 2018). Divorced single parents are eligible only once alimony has been awarded (Hagemejer 2018). Additionally, there is an avenue for Polish

Importantly, the amount of the cash transfer is a relatively high fraction of the Polish gross minimum wage (about 25% in 2016), in comparison to Germany's *kindergeld* benefit, which amounts to about 13% of the German gross minimum wage in 2016 (Eurostat 2021a). Broken out by family structure and earnings, in 2018, single-parent, single-earner, two-child families in Poland received family benefits worth 36% of average, full-time, gross earnings (the highest amount in the OECD) and 11% for two-parent, two-earner, two-child families (the fourth highest amount in the OECD) (OECD 2022a). The value is even higher when examining family benefits for parities three and higher. Two-parent, two-earner, four-children families received benefits worth 50% of average, full-time, gross earnings, and similar families with three children received 20% (OECD 2022a).

To date, the empirical evidence on the Family 500+ cash transfer and fertility is scarce but growing. In sum, the research reports a positive association that substantially weakens over time (Błaszczyk and Sawicka 2018; Ruzik-Sierdzińska 2018; Śmigielska 2020; Milewska and Błażejczyk 2022). For example, Paradysz (2022) triangulates three demographic methods (forecasting, synthetic cohort analysis, and comparing fertility rates before and after) to find a positive link between the cash transfer and fertility that weakens after 2017. Stone (2020) descriptively tracks short-term trends in crude birth rates (CBRs), finding the CBR increased by 10% after the introduction of the cash transfer, before falling in 2019 (but still 6% higher than before the cash transfer). Other research shows births increased by 13%–15% in late 2016 and early 2017, but started declining in 2018 (Wiśniewska, Musiał, and Świecka 2017). Most recently, Gromadzki (2024) shows a positive impact of the cash transfer on less affluent families.

Other studies analyzing the Family 500+ cash transfer have concentrated on different demographic outcomes. Scholars report a decrease in female labor force participation, suggesting a cash transfer-induced change in the household division of labor (Golinowska and Sowa-Kofta 2017; Magda, Kiełczewska, and Brandt 2018; Myck and Trziński 2019; Bartosik 2023). Additionally, there is evidence the cash transfer pushed single women earners, as well as second earners in one-child families, out of the workforce; the authors' estimate a 75% childcare subsidy would be necessary to counteract the income losses of such nonworking adults (Bargu and Morgandi 2018). Relatedly, Premik (2022) finds that the cash transfer discouraged previously unemployed mothers from employment, but the opposite occurred for previously unemployed fathers, who increased their labor supply, implying the cash transfer may have reinforced a traditional household division of labor.

families living abroad in other EU countries to receive the cash transfer (contingent they are not drawing from more than one country's pot of public benefits). There are also reciprocal, bilateral agreements between Poland, Canada, the United States, South Korea, Moldova, and Ukraine, permitting foreigners residing in Poland to claim the cash transfer (Careers in Poland 2020). Finally, the cash transfer is not included in income calculations when determining eligibility for other social services (Polish Ministry of Family and Social Policy 2021b).

The cash transfer is associated with reducing income inequality and child poverty, spurring consumerism, and alleviating household debt (Goraus-Tanska and Inchauste 2016; Brzeziński and Najsztub 2017; Szarfenberg 2017; Wiśniewska, Musiał, and Świecka 2017; Turkowska-Kucharska 2018; Jędrzejczak and Pekasiewicz 2020; Paradowski, Wolszczak-Derlacz, and Sierminska 2020; Rae 2020; Wilk 2020; Milovanska-Farrington 2022; Cook, Iarskaia-Smirnova, and Kozlov 2023; Gromadzki 2023). Simulating the effects of a fertility increase, economists report initially negative and gradually positive fiscal effects as children age and start participating in the workforce (Makarski, Tyrowicz, and Malec 2019).

Social support for maintaining the cash transfer is high, although it has slightly weakened over time (80% in 2016, 77% in 2017, and 73% in 2021) (CBOS 2021). A study on attitudes toward the cash transfer, drawn from online debates, reveals that conversations center on the perceived 'deservingness of parents,' not children, as the recipients of the cash transfer (Michoń 2021). Similarly, a round of 2017 interviews reveals the mixed opinions of middle-class parents, with some expressing concern poor parents with big families will squander the income, and others perceiving it as a redistribution mechanism reducing inequality (Suwada 2021). Szelewa (2022) asks childless Poles about family policies and finds that they strongly support benefits to families with children but are critical of direct interventions like the cash transfer. A survey of Polish immigrants in the United Kingdom reveals that the cash transfer has had a limited impact in enticing them to return to Poland (Isański et al. 2021).

In sum, Płomien's 'good policy–bad outcome' dichotomy cautions that cash transfers have the power to simultaneously generate positive effects on poverty and fertility (albeit mostly short term for fertility) and potentially negative long-term implications for women's economic autonomy (by reducing female labor force participation rates and encouraging male-breadwinner-style families) (Płomien 2019). Against a backdrop of increased interest in evaluating the pronatalist policies of family benefit programs, this demographic study is a timely addition.

3. Methodology

3.1 Data

I use restricted microdata from the 2010–2018 waves of the Polish Household Budget Survey (PHBS), prepared and made available by the Polish Statistical Office. The PHBS is a nationally representative, monthly, rotating, repeated cross-sectional survey dating in its current form from 1993 to the present. The advantages of the PHBS are twofold. First, the PHBS includes demographic microdata on family relationships, sex, age, education,

marital status, employment, income, citizenship, and geography at the household and individual levels. Second, the PHBS allows for the reconstruction of family structures and, in effect, fertility histories for each woman. In a typical round, about 38,000 households from all 16 regions are interviewed, which amounts to about a 0.1 % sample of the population (Polish Statistical Office 2019). The survey is weighted to the 2011 National Census. For more details, documentation of the PHBS sampling methodology is publicly available (Polish Statistical Office 2019).

3.2 Analytic sample construction

Since the PHBS, like most household surveys, does not contain a direct indicator for births, I impute births by reconstructing each woman's fertility history from the household roster. I link mothers to their children in the household using the following procedure. I first identify the mothers and children in each household. I define mothers by filtering for sex (female), age (16–45), and relationship to the household head (head, spouse, or partner).[8] Children are defined by their relationship to the household head (children) and age (17 or younger). Since children leave their birth households in increasing proportions when they age into young adulthood, I use 17 years or younger to reasonably ensure they are young enough to be coresidential with their mothers. In Poland, only about 1% of children under the age of 18 in 2018 did not live with their parents (Eurostat 2018). Overall, Polish youth leave the family nest relatively late (at the age of 28 on average) (Eurostat 2018a; Pustulka, Sarnowska, and Buler 2021).

Second, I organize the dataset into a panel with each mother repeated for each of the previous 17 years; thus, I have 18 observations where each mother is linked to her children in the household. I drop all households without mothers, and I keep households with more than one mother since about 30% of Polish households are considered complex (i.e., include extended family, multiple generations, stepchildren from previous relationships, and other combinations of family members) (Haan and Myck 2012; Ala-Karvia et al. 2019).

The data is further limited to Polish nationals, or women born in Poland, to limit heterogeneous fertility cultures. Limiting the sample to nationals reduces any bias that can stem from access to different resources and cultural norms (Cygan-Rehm 2014;

[8] The partner designation was first introduced in the 2018 PHBS. Since I count anyone who is a (1) childbearing-aged female and (2) a household head/spouse/partner as a mother, in effect, I include mothers who are single, married, in a relationship but unmarried, or plausibly in a same-sex couple, but this has little impact on the sample size (<1% of the analytic sample are same-sex couples).

Klimek 2017).[9] I include cohabiting women,[10] and I do not restrict the sample to married women or women whose children are all linked to the same father (to minimize the effect of union dissolution on fertility) since the cash transfer is granted irrespective of living arrangement, marital, or paternity status.

Overall, the analytic sample of childbearing-aged women and their time-variant, birth-ordered fertility histories contains 87,006 unique women, with repeated observations over time (87,006 × 18 = 1,566,108 observations). I restrict the sample from 2010 to 2018 to ensure clean identification of the policy effect since the cash transfer was expanded in 2019 to include all children. Table 1 reports summary sample statistics. To assess the consistency and representativeness of the analytic sample and reconstructed birth histories, in Table A-1, I compare birth distributions in the PHBS to population statistics from official census data from the Polish Statistical Office's Demographic Database (Baza Demograficzna). Overall, the PHBS data is consistently close to the official population statistics over time.

Table 1: Analytic sample descriptive statistics

Characteristics of childbearing-aged women	Analytic sample (mean or %)
Age	34.67 (6.71)
Number of children	1.08
Household size	3.6
Labor force participation rate	65%
Highest education level:	
Primary	6%
Secondary (reference category)	53%
Postsecondary	41%
Median monthly household income (net)*	$5,184 (PLN) (8,251) $1,192 (USD) (1,898)
Married	76%
Rural	40%
Disability	3%
Number of unique women (*n*)	87,006
Observations (*N*)	1,566,108

Sources: Author's calculations from the Polish Household Budget Survey (PHBS).
Notes: SEs are in parentheses. * Adjusted for inflation (baseline year is 2018).

[9] Including non-Polish nationals would have virtually no impact on the analytic sample: 99% of the analytic sample is comprised of Polish nationals, tracking population statistics showing 98% of the Polish population are nationals (Polish Statistical Office 2021a).

[10] I conduct a sensitivity analysis by reestimating the baseline specification regression model with three different categorizations of cohabiting couples, estimated separately: (1) including cohabitors with the married, (2) cohabitors alone, and (3) including cohabitors with singles (the baseline model). The results, presented in Table A-4 in the Appendix, are consistent across the different categorizations.

3.3 Empirical strategy

Since there is no way of observing both what happens to a woman who receives the cash transfer and what happens to the same woman who does not receive it, social scientists use quasi-experimental statistical techniques to exploit nonrandom but plausibly exogenous variation to estimate a causal effect. However, the lack of a comparable control group in this study complicates causally isolating the effect of the cash transfer.

Theoretically, there should be two similar groups of eligible families (i.e., with two or more children – one group who got the cash transfer and the other group who did not), but the fact that the 2016 Family 500+ cash transfer is universal for all families with two or more children, with everyone eligible receiving the same amount of the cash transfer, muddies the possibility of comparing fertility changes between a before and after period in one group of eligible and one group of ineligible families, disqualifying the use of a difference-in-differences design.[11] Also, as Premik (2022) points out, eligibility for the cash transfer is not random since it is based on the number of children in a household, which is also not random and could be the result of household optimization (Rosenzweig and Shultz 1985).

While several other demographic studies use older birth cohorts as control groups to study fertility (see Comolli 2017; Lazzari, Reimondos, and Gray 2023), I do not use this strategy. In just the last decade before the cash transfer was introduced, Poland underwent several major economic changes, such as a 40% increase in GDP per capita, as well as dramatic social and cultural shifts (see Gromada 2023; World Bank 2023). In this context of rapidly changing circumstances, birth cohorts would significantly differ from each other, making them less comparable. Crucially for this study, the demographic composition of the population has changed. For instance, an aging population over the last decade (e.g., the share of retirement-age adults has increased by 5 percentage points to 18.6%) alongside changing migration flows (e.g., the number of immigrants to Poland from the EU has tripled from 24,000 to 67,000) could confound analysis (Polish Statistical Office 2019; Polish Statistical Office 2022c).

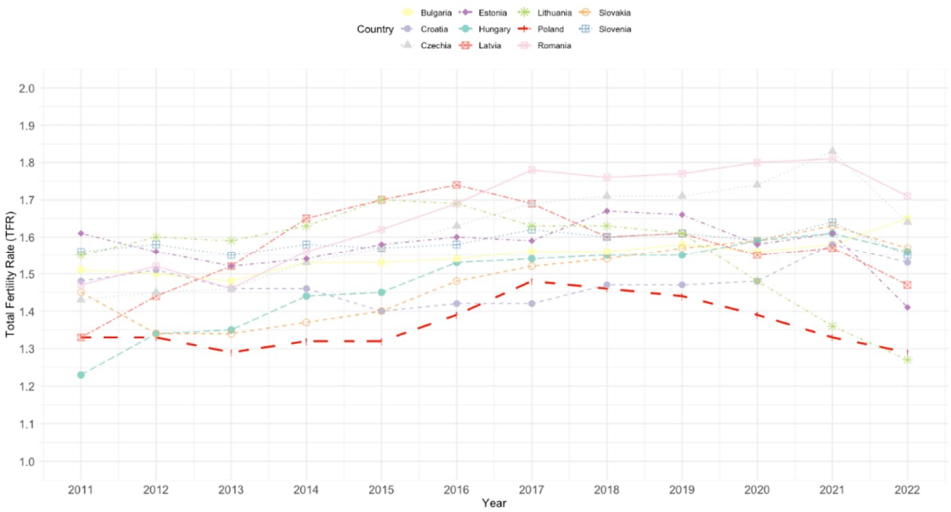
Similarly, a regression discontinuity design would not be appropriate. While it is true there is a cutoff of two or more children, having two or more children is very different from having zero or one child and would thus violate the assumption that the two groups on either side of the cutoff are characteristically similar, randomly fall on either side of the cutoff, and differ only in the treatment. For example, the decision to go from no children to one child is fundamentally different from higher-order children. A first birth is less elastic to financial incentives but more sensitive to factors such as the subjective well-being and marital satisfaction of new parents (Bauer and Kneip 2014; Margolis and

[11] See Andersen, Drange, and Lappegård's study on a cash transfer and fertility in Norway for a similar set of methodological limitations (2018).

Myrskylä 2015; Glass, Simon, and Andersson 2016). I also do not use a regression discontinuity in time design, which uses time as the running variable, due to recently raised bias concerns, including time-varying treatment effects, autoregression, and treatment selection (see Hausman and Rapson 2018).

Likewise, since the cash transfer applied equally to the entire country at the same time, the synthetic control method is not applicable; I cannot use different regions within Poland to create a 'synthetic Poland' control with similar pretreatment characteristics to the treatment group. Pooling data from similar but untreated European countries is not feasible either since most countries have different TFR trends (see Figure 5). More importantly, they are constantly updating their family benefit systems, which violates the assumption that the control group would not have experienced any significant family policy changes in the pre-intervention period.

Figure 5: The total fertility rate in Central and Eastern Europe (2011–2022)



Source: Author's tabulations based on Eurostat data.

Therefore, I estimate linear probability models (LPMs) that track changes in the yearly probability of a birth as a function of a woman's cash transfer eligibility. I do not use year fixed effects as they run the risk of overcontrolling the models and absorbing much of the impact of the cash transfer from 2016 onward for parities one and higher. Additionally, since the period of analyses is relatively short, it is preferable to use time-

varying covariates in lieu of year fixed effects to account for confounding factors and to increase the precision of the estimates.

At the same time, there are well-known issues with LPMs and binary dependent variables. LPMs are commonly critiqued for unbounded predicted probabilities outside of a 0–1 interval as well as non-normal and heteroskedastic errors. To address this, I use heteroskedastic robust standard errors in all regressions. Other approaches (including nonlinear models such as the logit and probit) have often been used with binary dependent variables. However, scholars have shown that the LPM provides less biased treatment effects on binary outcomes and is simpler to interpret than competing statistical strategies (i.e., reflects the effects of the cash transfer eligibility in terms of a percentage point change in the annual probability of childbearing versus odds ratios) (Wooldridge 2010; Chatla and Shmueli 2016). Over the last decade, the LPM has been consistently used in studies to evaluate fertility outcomes (La Ferrara, Chong, and Duryea 2012; Cohen, Dehejia, and Romanov 2013; Hazan and Zoabi 2015; Dake et al. 2018; Andersen, Drange, and Lappegård 2018; Okun and Stecklov 2021).

3.4 Measures

The dependent variable is the probability of a birth in year *t* (1 = woman gave birth in year *t* [2010–2018]; 0 = no birth).[12] It captures whether the mother has a child under the age of 1 living in the household (if there is a child aged 0, I consider this a recent birth).[13] Approximately 5.5% of the childbearing-aged women in the sample had a newborn and of this group, the parity distribution by age group is as follows: 2% were to women under the age of 20, 46% were to women ages 20–29, 49% were to women ages 30–39, and 3% were to women 40 and older.

I also generate binary variables for *family500*, or the year in which a birth is eligible for the cash transfer (2016 and later = 1, all other = 0) and women's *previous parity* (one or more previous births = 1, all other = 0). To indicate whether a woman's next birth was eligible for the cash transfer, I interact *previous parity* with *family500.* This is the main variable of interest.[14]

[12] I follow the demographic literature and do not use the total fertility rate (TFR) nor the general fertility rate because they are sensitive to changes in the age composition of the population.

[13] For the year 2018, the PHBS provides only individuals' ages. Thus, for the 2018 survey respondents, I roughly compute their date of birth by subtracting their age from the PHBS survey date. While this can generate some noise, it is not a major concern since it would potentially misassign birthdates by a maximum of one year, and the direction of misassignment is plausibly random and not related or correlated with any relevant variables.

[14] Women eligible for the cash transfer may include families that do not actually receive the cash transfer. However, that group is likely to be very small because entry costs are low (e.g., a simple paper or online application submitted annually) and the program was actively promoted. Since the program is universal for

Demographic covariates include continuous age, age squared, and stock of children. Adding age and its square allows me to more accurately model relationships that may be nonlinear (e.g., since fertility is age-dependent, the effect of age could be positive until women exit their reproductive years and negative thereafter). Using the stock of children variable lets me control for differential fertility patterns by already existing parity. To control for the role of education, I include a categorical highest education earned variable (1 = primary, 2 = secondary [reference category], and 3 = postsecondary). To control for the role of income, I include a continuous, logged, 2018 inflation-adjusted net household income variable. To control for the effects of marriage and rural residence, I add a binary marital status (1 = married or widowed, 0 = single, divorced, or separated) and rural status variables (1 = rural, 0 = other).

3.5 Model specification

I estimate the overall change in short-term fertility with the following LPM:

$$y_{it}\,(birth) = X_{it}\,\beta + \delta\,(previous\ parity \times family500) + \varepsilon_{ijt},$$

where the probability of a *birth* (y_{it}) is equal to 1 if a woman *i* gives birth in year *t* (2010–2018). The eligibility interaction term between *previous parity* and *family500* indicates if the woman's next birth was eligible for the cash transfer. X_{it} is a matrix of individual and household controls including age, age squared, stock of children, household income, education, marital status, and rural status. $\boldsymbol{\varepsilon}$ is the error term. Since LPMs are prone to heteroskedasticity, I compute robust standard errors to account for this.

Next, I test for heterogeneous effects by estimating interactions between the eligibility variable (*previous parity* × *family500*) and education to assess the effects of the cash transfer along the human capital spectrum.[15] I also do this for the eligibility variable (*previous parity* × *family500*) and household income to determine how income moderates the association between parenthood and economic status. Household income and women's education were chosen because they represent reliable proxies for a mother's opportunity costs of childbearing. In the below equation, *previous parity* × *family500* × x_{ij} captures the heterogeneous effect, with x_{ij} being either income or education.

families with two or more children, income information is collected only from one-child families. As a result, the take-up rate is high.

[15] In a robustness test, I address concerns of the endogeneity of women's education and fertility, or in other words, the possibility that women with different levels of education may differ in unobserved ways that also affect their fertility, by using the education of the household head in the regressions. The estimates of the association between the cash transfer and fertility are virtually unchanged (results available upon request).

$$y_{it}\,(birth) = X_{it}\,\beta + \delta\,(previous\ parity_{it} \times family500_{it} \times x_{it}) + \varepsilon_{ijt}$$

Finally, I test whether the cash transfer leads to different fertility outcomes depending on a woman's age by splitting the analytic sample into six 5-year age groups. I estimate the baseline model on the following age groups: 16–20, 21–25, 26–30, 31–35, 36–40, and 41–45.

While fertility rates for women under 20 and over 40 tend to be low in advanced economies, studying these women can offer a more comprehensive view of fertility dynamics in Poland. A pronatalist cash transfer policy can influence nonnormative life course behavior, such as young women considering starting families earlier, as well as older women considering late pregnancies in response to the policy and reflecting broader trends (since about 2008, the proportion of births to mothers aged over 40 has tripled in Poland) (Eurostat 2021c). As long-standing research suggests, childbearing is a complex decision where time and resources are allocated differently depending on the life course (Huinink and Kohli 2014).

3.6 Identification challenges

Estimating how an exogenous income boost, like the Family 500+ cash transfer, might be associated with fertility is challenging. The main obstacle is presenting a credible counterfactual: What would have been the number of births in Poland without the cash transfer? While other cash transfer policies may have income and work requirements or date cutoffs, the Polish cash transfer is universal for all eligible families. In effect, there should be no issues of program selection since all families with two or more children under the age of 18 become eligible at the same time and are not restricted by any other requirements.[16]

I will briefly address two challenges to the identification strategy. First, there is a possibility that families anticipated the cash transfer and adjusted their fertility. This can cloud model specification and bias estimates. However, this is an unlikely event for several reasons.

The cash transfer was introduced in February 2016 and implemented in April 2016.[17] It would be surprising to see families decide and be able to conceive – or choose not to have an abortion – in that two-month window. The literature agrees it is rare for parents

[16] It is possible that one-child families who are low income may have reduced their labor supply in order to qualify for the cash transfer's income requirements. Testing this would require more data.

[17] As Premik (2022) observes, the first payment should have been distributed to all eligible families in April 2016, but a number of households received the cash transfer with a few months' delay. Still, the short window of time between introduction and enactment precludes meaningful anticipatory effects.

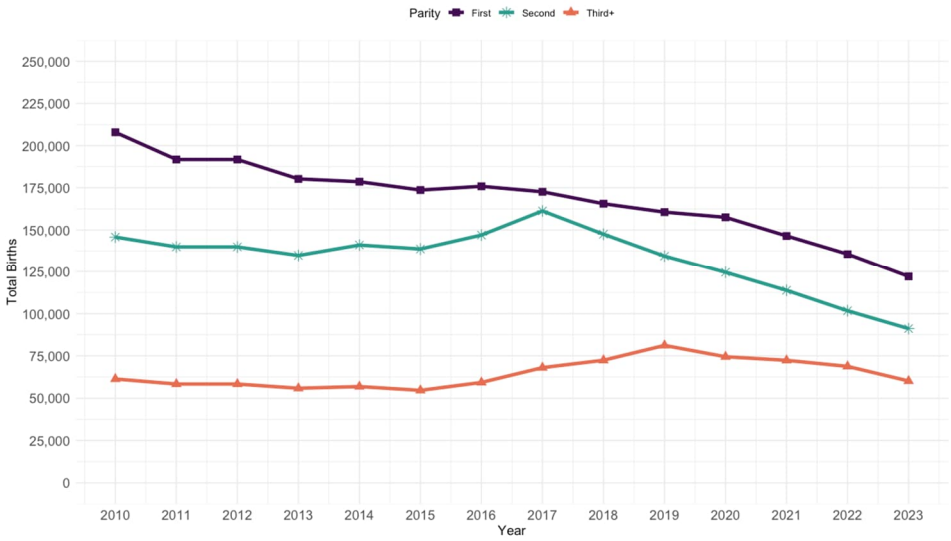
to react to pronatalist policies immediately (Słonimczyk and Yurko 2014; Riphahn and Wiynck 2017; Carneiro et al. 2020, 2022).

On the other hand, is it possible that couples waited to have children to benefit from the 2019 expansion, which made the cash transfer universal for all children? This is unlikely. After the 2016 policy was passed, opposition political parties consistently highlighted the high fiscal costs of the cash transfer, and thus, its future was uncertain and constantly questioned in the public forum. While social support for maintaining the cash transfer was high, social support does not necessarily translate to guaranteed policy expansion (CBOS 2021). Given this context and Poles' consistently low levels of trust in the government, it seems unlikely that Polish families would adjust their fertility in anticipation of a policy extension (OECD 2022b).

Additionally, an anticipation effect would manifest in a spike in second- and higher-parity births in early 2017 and lower abortion rates in 2016 (Słonimczyk and Yurko 2014). While the data shows an increase in second- and higher-parity births, Figure 6 illustrates this measure has been increasing since 2015, or before the 2016 cash transfer was introduced, raising questions about causality. Legal abortions increased by about 1% from 2016 to 2019, and the number of illegal abortions might be higher due to restrictive abortion laws (Eurostat 2021b; Hussein et al. 2018). In the unlikely event of an anticipatory effect, this analysis would underestimate the link between the cash transfer and fertility since it would inadvertently overestimate the pre-cash-transfer fertility and thus deflate the difference before and after the cash transfer in fertility.

The second challenge is the introduction of programs contemporaneous with the cash transfer that might be confounding factors. For instance, the 2016 suite of reforms included consumer discounts for families with three or more children, guaranteed pensions for parents with four or more children, and small education and childcare subsidies. These changes impact the opportunity costs of children and the resource constraints of parents. At the same time, the cash transfer is by far the most robust of the basket of policy goods. Poland's family benefits system shifted from giving relatively equal weight to cash transfers, tax breaks, and services to favoring cash transfers by a large margin, quadrupling the amount of money flowing to families in the form of direct cash between 2010 and 2017. Additionally, all other existing social safety net programs, such as parental leave, were unchanged. As it stands, I assume that the cash transfer was the central policy innovation in Poland during the period of analysis.

Figure 6: Total births by birth order, Poland (2010–2023)



Source: Author's tabulations based on Polish Statistical Office data.

4. Main results

Table 2 shows the LPM regression results, estimating the relationship between the Family 500+ cash transfer and fertility. The baseline specification shows that the cash transfer eligibility interaction is associated with a 1.5 percentage point increase in the annual probability of having a child (95% CI [0.011, 0.019], p = 0.000). Since I control for several individual and household characteristics, the increase in the probability of births should not reflect changes in observable control measures or the age composition of the population. Findings from stepwise regressions (Table A-2) provide clarity on the covariates that contribute to explaining the variation in the dependent variable. The models show that all covariates significantly predict the association between cash transfer eligibility and the probability of having a child. The results are robust to logit regression models but not further discussed in the text (Table A-3).

Table 2: LPM regression results: Family 500+ cash transfer and fertility

Coefficients	Estimates	95% Confidence interval (CI)	*P*-value
Cash transfer eligibility	0.015 (.002)	.011, .019	.000
Age	0.018 (.000)	.018, .019	.000
Age^2	0.000 (.000)	.000, .000	.000
Stock of children	–0.107 (.001)	–.108, –.106	.000
Education			
Primary	0.007 (.001)	.006, .008	.000
Secondary (reference)	---	---	---
Postsecondary	0.001 (.000)	.001, .002	.000
Household income (logged)	0.002 (.000)	.002, .002	.000
Marital status	0.011 (.000)	.011, .012	.000
Rural residence	0.001 (.000)	.001, .002	.000
N		1,566,108	
n		87,006	

Notes: Clustered robust standard errors (in parentheses). Dependent variable = 1 if probability of giving birth in year *t*.

Table 3 introduces an interaction term between cash transfer eligibility and education. The confidence intervals and *p*-values do not provide sufficient statistical evidence for a conclusive relationship. Table 4 introduces an interaction term between cash transfer eligibility and household income. Here, I find that eligibility for the cash transfer for a woman with a higher household income is associated with a decreased annual probability of having a child by 1.1 percentage points (95% CI [–0.018, –0.004], $p = 0.003$).

Finally, Table 5 examines heterogeneity by different age groups. Women aged 21–25 observe a marginally significant 2.2. percentage point decrease in the annual probability of childbearing (95% CI [–0.043, 0.000], $p = 0.051$). Women aged 26–30 see a decrease of 2.6 percentage points in the annual probability of childbearing (95% CI [–0.042, –0.011], $p = 0.001$), in contrast to a 1.8 percentage point increase for women aged 31–35 (95% CI [0.008, 0.028], $p = 0.001$) and a marginally significant 0.7 percentage point increase for women aged 36–40 (95% CI [0.000, 0.014], $p = 0.052$).

Table 3: LPM regression results: heterogeneous effects, education

Coefficients	Estimates	95% Confidence interval (CI)	*P*-value
Cash transfer eligibility × primary education(high school)	0.002 (.009)	–.017, .021	.835
Cash transfer eligibility × secondary education (some college) [reference category]	---	---	---
Cash transfer eligibility × postsecondary education (bachelor's degree)	–0.002 (.003)	–.009, .006	.704
Age	0.019 (.000)	.018, .019	.000
Age^2	0.000 (.000)	.000, .000	.000
Stock of children	–0.107 (.001)	–.108, –.106	.000
Household income (logged)	0.002 (.000)	.001, .002	.000
Marital status	0.010 (.000)	.009, .010	.000
Rural residence	0.002 (.000)	.001, .002	.000
N		1,566,108	
n		87,006	

Notes: Clustered robust standard errors (in parentheses). Dependent variable = 1 if probability of giving birth in year *t*.

Table 4: LPM regression results: heterogeneous effects, income

Coefficients	Estimates	95% Confidence interval (CI)	*P*-value
Cash transfer eligibility × household income	–0.011 (.003)	–.018, –.004	.003
Age	0.019 (.000)	.018, .019	.000
Age^2	0.000 (.000)	.000, .000	.000
Stock of children	–0.107 (.001)	–.109, –.106	.000
Education			
Primary	0.010 (.001)	.009, .011	.000
Secondary (reference)	---	---	---
Postsecondary	0.002 (.000)	.001, .002	.000
Marital status	0.010 (.000)	.009, .010	.000
Rural residence	0.002 (.000)	.001, .002	.000
N		1,566,108	
n		87,006	

Notes: Clustered robust standard errors (in parentheses). Dependent variable = 1 if probability of giving birth in year *t*.

Table 5: LPM regression results: heterogeneous effects, age groups

Coefficients	(1) 16–20	(2) 21–25	(3) 26–30	(4) 31–35	(5) 36–40	(6) 41–45
Cash transfer eligibility	–0.029 (.027) CI: –.069, .011 *p* = .155	–0.022 (.011) CI: –.043, .000 *p* = .051	–0.026 (.007) CI: –.042, –.011 *p* = .001	0.018 (.005) CI: .008, .028 *p* = .001	0.007 (.003) CI: .000, .014 *p* = .052	0.002 (0.002) CI: –.002, .006 *p* = .395
Age	–0.070 (.008) CI: –.087, –.054 *p* = .000	0.016 (.012) CI: –.008, .041 *p* = .189	0.157 (.014) CI: .129, .184 *p* = .000	0.126 (.013) CI: .101, .152 *p* = .000	0.092 (.013) CI: .066, .119 *p* = .000	0.028* (0.014) CI: -.002, .058 *p* = .071
Age^2	0.003 (.000) CI: .002, .003 *p* = .000	0.000 (.000) CI: .000, .001 *p* = .131	–0.002 (.000) CI: –.003, –.002 *p* = .000	–0.002 (.000) CI: –.002, –.001 *p* = .000	–0.001 (.000) CI: –.001, –.001 *p* = .000	0.000 (0.000) CI: .001, .000 *p* = .111
Stock of children	–0.056 (.003) CI: –.059, –.052 *p* = .000	–0.173 (.004) CI: –.177, –.169 *p* = .000	–0.293 (.004) CI: –.296, –.289 *p* = .000	–0.531 (.004) CI: –.538, –.524 *p* = .000	–0.550 (0.004) CI: .555, –.545 *p* = .000	–0.604*** (0.021) CI: –.613, –.595 *p* = .000
Education						
Primary	0.040 (0.002) CI: .035, .044 *p* = .000	–0.001 (.002) CI: –.006, .004 *p* = .696	0.005 (.002) CI: .001, .009 *p* = .010	0.011 (.002) CI: .007, .014 *p* = .000	0.005 (.002) CI: .002, .008 *p* = .004	0.001 (.001) CI: –.002, .004 *p* = .524
Secondary (reference)	---	---	---	---	---	---
Postsecondary	–0.032 (.001) CI: –.035, –.030 *p* = .000	–0.029 (.001) CI: –.032, –.027 *p* = .000	0.013 (.001) CI: .011, .015 *p* = .000	0.015 (.001) CI: .013, .017 *p* = .000	0.004 (.001) CI: .002, .006 *p* = .000	0.000 (.001) CI: –.001, .002 *p* = .723
Household income (logged)	0.001 (.001) CI: –.001, .002 *p* = .634	0.003 (.001) CI: .001, .005 *p* = .004	0.012 (.001) CI: .010, .014 *p* = .000	0.010 (.001) CI: 0.008, 0.012 *p* = .000	0.004 (.001) CI: .003, .006 *p* = .000	0.001 (.001) CI: .000, 0.002 *p* = .156
Marital status	0.017 (.001) CI: .014, .019 *p* = .000	0.037 (.001) CI: .034, .039 *p* = .000	0.034 (.001) CI: .032, .036 *p* = .000	0.014 (.001) CI: .012, .017 *p* = .000	0.002 (.001) CI: –.000, .004 *p* = .119	0.000 (.001) CI: –.003, .001 *p* = .501
Rural residence	0.007 (.001) CI: .005, .009 *p* = .000	0.017 (.001) CI: .014, .019 *p* = .000	0.002 (.001) CI: .000, .004 *p* = .020	–0.003 (.001) CI: –.005, –.001 *p* = .000	–0.002 (.001) CI: –.004, –.0003 *p* = .020	0.000 (.001) CI: –.001, .002 *p* = .909
Observations	225,515	311,230	346,518	271,030	41,730	63,941

Notes: CI = 95% confidence interval; *p* = *p*-value. Clustered robust standard errors (in parentheses). Dependent variable = 1 if probability of giving birth in year *t*.

5. Discussion

The main results are in line with the relevant literature on similar cash transfer policies: a relatively small, positive association with short-term overall fertility, although heterogeneous effects are mixed and vary widely (Gauthier 2007; Cohen, Dehejia, and Romanov 2007, 2013; Salanie and Laroque 2008; Gábos, Gál, and Kézdi 2009; Chirkova 2013; Słonimczyk and Yurko 2014; Błaszczyk and Sawicka 2018; Malkova 2018; Ruzik-Sierdzińska 2018; Śmigielska 2020; Spéder, Murinkó, and Oláh 2020; Yonzan, Timilsina, and Kelly 2020; Cowan and Douds 2022; Kim 2023; Milewska and Błażejczyk 2022; Paradysz 2022; Gromadzki 2024).

These regressions provide a useful starting point to unpack the heterogeneity in response to the cash transfer. First, why did women with higher household incomes respond less to the cash transfer? The results reflect mainstream economic theory, which consistently documents a negative link between income and fertility, and predicts that when income grows, parents tend to reduce the number of children they have in favor of investing in their human capital development (Becker 1960; Becker and Lewis 1973; Borg 1989; Docquier 2004; Jones, Schoonbroodt, and Tertilt 2008). The cash transfer might have reinforced the quality-quantity tradeoff, reducing overall fertility for higher earning families. Raising children requires a lot of time and resources. Higher-income women are more likely to delay or reduce fertility since the financial benefits of the cash transfer may not adequately compensate for the income and career progression they would lose by having children. As Kalwij (2010) describes, cash transfers can offset the direct costs of children but not the opportunity costs, which he argues have become more important determinants of fertility, as the demand for policies that ease combining paid work and family obligations has grown.

Another issue, as Premik (2022) underlines, is whether families see the cash transfer as a permanent, long-run increase in their income or a temporary stimulus. Previous research shows that Central and Eastern Europeans in particular see economic uncertainty as a fertility depressant (Hoem 2008). Although the Polish government pledged the cash transfer is here to stay (and made it universal in 2019), of OECD countries, Poland reported the third lowest level of trust in the government (26% in 2021) (OECD 2022b). In effect, it could be that women who were already planning to have children but were uncertain of how long the cash transfer would last or whether the eligibility requirements would change accelerated their fertility, but did not alter the overall number of children they would have (i.e., a tempo effect).

Another explanation maintains that people tend to evaluate child-raising costs and living standards using a cross-national comparative lens, which contributes to the low-fertility trap. In highly migratory contexts, like Poland, potential parents might not assess living standard changes as "improvements relative to the past, but inadequate relative to

what could be obtained elsewhere," and compare the resources they have at their disposal to raise children in Poland to resources in Western or Northern Europe (Marczak, Sigle, and Coast 2018: 24). In this way, although living standards have greatly improved in Poland over the last two decades, relative perceptions of disadvantage compared to wealthier countries may inform childbearing decision-making and suppress fertility.

Next, the heterogeneity analyses by age reveals that women aged 31–40 see a fertility increase, in contrast to a decrease for women aged 21–30. These results mirror the literature. Cohen and colleagues (2007) find the strongest fertility effects on Israeli women aged 35–40 and 40–45. Studying the Alaska Permanent Fund Dividend, Yonzan and colleagues (2020) find that women aged 35–44 had the largest fertility increase. Cowan and Doud's analysis of the same program in Alaska reports positive fertility effects for women 25 and older (Cowan and Doud 2022). While other studies find the impact of a cash transfer on fertility decreases with age (Kim 2017; González and Trommlerová 2021), it is worth discussing these findings in light of slight increases in the period TFR in Europe and a rise in fertility among older European women for first and second births (Bongaarts and Sobotka 2012; Luci-Greulich and Thévenon 2013; Burkimsher 2015; Sobotka and Beaujouan 2018; Beaujouan 2020). Considering the emergent research on a late-fertility rebound among older parents – particularly in Poland – the results in this study lend some credence to that hypothesis.

Another takeaway concerning age is that it is unsurprising that younger women (aged 21–30) are less likely to respond to the cash transfer. On the one hand, it could be that the cash transfer, with its pro-natal intent, signals that "childbearing is valued and supported," in effect, providing psychological comfort that encourages strategic family planning, counterintuitively resulting in delayed fertility as women wait for the most advantageous time to have children (Hart et al. 2024: 25). As social scientists have richly documented, continuing education, marriage and childbearing postponement, and late retirement are all life course transitions that contribute to later childbearing patterns today (Mortimer and Shanahan 2003; Ní Bhrolcháin and Beaujouan 2012; Rybińska 2014; Beaujouan 2020). On the other hand, as Botev points out, "parity-targeted incentives seeking to compel higher fertility could be perceived as controlling and undermine" the cash transfer's pronatalism, especially among younger women (Botev 2015:1).

The heterogeneity analysis by education is inconclusive to guide policy. Recent scholarship carefully probes the relationship between education and fertility as a key indirect determinant of fertility, cautioning that education can only partially explain fertility: The authors challenge the use of education as a predictor of fertility trends since education can proxy for historical transformations and transitions that are difficult to measure, is prone to model misspecification, and "can be mistakenly attributed to the causal influence of just one factor" (Tropf and Mandemakers 2017: 88). For example, the effects of education on fertility commonly mask a tempo effect since higher-educated

women tend to start childbearing later in life, and therefore, accelerate second- and higher-parity childbearing (Klesment et al. 2014; Impicciatore and Tomatis 2020). In sum, the relationship between education and fertility is complex, with significant variation across Europe (Vasireddy et al. 2022).

6. Limitations

Before concluding, I will address several caveats. First, the birth variable does not capture fertility intentions (only live births) since the PHBS data does not include miscarriages, stillbirths, or other conditions that result in fetal death. However, the infant mortality rate is very low in Poland, so this is unlikely to bias estimates (Polish Statistical Office 2023d).

Second, I do not consider migration. As it currently stands, Poland is experiencing both decelerating emigration and large-scale immigration, exacerbated by Russia's invasion of Ukraine in 2022 (Duszczyk and Kaczmarczyk 2022). As Kreyenfeld and Konietzka warn, "incomplete reporting of migration can affect statistics on the entire female population of reproductive age" (Kreyenfeld and Konietzka 2017: 23). Additionally, selection into emigration and nonreturn could bias estimates of who is most likely to respond to pronatalist cash transfers (Marczak, Sigle, and Coast 2018).

Third, this study examines only childbearing-aged women, based on the assumption that couples share similar socioeconomic characteristics and fertility goals. However, research shows couple dynamics matter for the transition to parenthood: Couples often diverge in their childbearing intentions, and the effects tend to be parity-specific (Voas 2003; Testa, Cavalli, and Rosina 2014; Nitsche et al. 2018). More detailed data will be needed for a couple-level analyses of the association between cash transfers and fertility in future research.

Fourth, the results of this study have limited external generalizability and apply in a specific national context. Women's employment greatly shapes this context. Thus, I briefly reflect on women's employment in Poland as a key mediating factor through which the cash transfer might influence fertility decisions. In Poland, working-age women work slightly less than their EU peers (about 65%, compared to the EU average of 68%), although there is a history of high female labor force participation and economic integration during the communist era. Who works less today? Lower-educated women, women living in rural areas, and crucially for this study, mothers of two or more children (Magda 2020). Employment conditions such as limited availability of part-time jobs, inflexible work arrangements, and the social disapproval of working mothers all contribute to the constrained fertility choices of Polish women today (Bird and Rieker 2008; Sikorska 2021; Osiewalska and Matysiak 2024).

On the other hand, Polish working women are not less likely to have children than the unemployed, even when there is weak support for combining paid labor and family life. Matysiak and Vignoli (2013) suggest that country-specific factors can explain the employment–fertility puzzle in Central and Eastern Europe, such as the long-standing social norm of women's paid labor with roots in the communist era. The rising instability of men's employment may also serve as an economic incentive for women to participate in the labor market (2013).

Moreover, the traditionally observed negative association between women's employment and fertility is evolving, with many rich countries now showing a positive link which cannot be fully explained by country-specific factors (Oshio 2019). This shift is attributed to higher female labor force participation, which has transformed the socio-institutional context to support gender equality and family-friendly policies, making it easier to combine work and family life (Tatarczak and Janik 2023). For example, public spending on families increases once the female labor force participation reaches 50%–60% (Oshio 2019). In sum, the relationship between cash transfers and fertility in countries with varying female labor force profiles can greatly differ.

And finally, due to the short time window of the data, I cannot disentangle the mechanisms behind the short-term fertility increase, including revealing aspects of fertility dynamics such as completed fertility, shifts in birth timing, and birth spacing. Procurement of this data requires an extended process, but future analyses could lengthen the observation window into the 2020s.

7. Conclusion

The question at the heart of this study asks: What is the association between the Family 500+ cash transfer and fertility in Poland, and which groups of women are affected, more or less, by the cash transfer? The results are mixed. I find that in the short term, the cash transfer is associated with an increased annual probability of overall births by 1.5 percentage points. Heterogeneity analyses reveal that the cash transfer is associated with increased fertility for women aged 31–40 (ranging from 0.7 to 1.8 percentage points), in contrast to a decrease for younger women aged 21–30 (ranging from 2.2 to 2.6 percentage points). Women with higher household incomes observe a 1 percentage point decreased probability of having a child.

It is important to highlight that the results are not causal since there are limits to which quasi-experimental methods can be used to evaluate the effects of a policy that is implemented universally to everyone eligible. Even without the strength of a causal argument, many stakeholders, including policymakers and the public, are eager to learn what a pronatalist cash transfer can and cannot do to change fertility and for whom.

Detailed assessments of changing short-term fertility are essential to help plan for a range of policies limited not only to family support but also education, healthcare, labor markets, and pensions. Descriptive analyses can facilitate timely adjustments to policies, identify emerging trends that may signal long-term patterns, and inform resource allocation.

Demographers argue that fertility decisions are not just a "statistical shadow of the past," but that individuals act according to their "imagined futures embedded in social elements," institutions, and other social forces (Vignoli et al. 2020: 2). Declining fertility rates in advanced economies have inspired many hypotheses, including economic uncertainty, the soaring costs of raising children, partnership and childbearing postponement, advances in women's education and workforce participation, and shifting life priorities. An insightful analysis by Vignoli and colleagues (2020) urges scholars to pay attention to the "building blocks" of personal narratives – shaped by cultural, social, and institutional environments – to generate a more robust understanding of the push-and-pull factors playing into today's fertility decisions.[18] I advocate for future research, especially qualitative, on the characteristics of the women who change their fertility behavior in response to a policy and how their specific contexts shape them.

Taken together, this study provides insights into the relationship between a pronatalist cash transfer program and short-term fertility. While not causal, the results have important policy implications since there is a general tendency to increase spending on families against the backdrop of declining fertility. Poland's neighbors have followed suit and expanded family benefits to support families and boost fertility. In 2019, Lithuania introduced a universal and monthly child benefit to tackle child poverty and lift fertility (European Commission 2019). Also in 2019, Hungary implemented generous tax breaks and interest-free housing loans for young couples (BBC 2019). In 2020, Russia's parliament pledged to expand their "maternity capital" benefit to include newborns (BBC 2020). Presidents Alexander Lukashenko of Belarus and Recep Tayyip Erdoğan of Turkey are urging women to have three or more children as "acts of patriotism" (Sobotka, Matysiak, and Brzozowska 2020; Dildar 2022).

Whether these programs accomplish what they set out to do is an open question, and this study's generalizability to other countries may be limited, given social, economic, and cultural differences. Nevertheless, pronatalist cash transfers can be politically advantageous. Short-term fertility bumps can create the appearance of more sustained effectiveness. For instance, Meardi and Guardiancich argue that the Family 500+ cash transfer is an attractive social policy mix that "has the potential to meet both material and cultural needs of a broader electorate while remaining compatible with the ideological preferences" of more conservative party supporters (Meardi and Guardiancich 2022:

[18] The authors also inspire future avenues of research – particularly qualitative – related to the "agents of socialization" (parents, peers, and the media) in the role of generating fertility narratives (Vignoli et al. 2020).

132). Indeed, recent research shows that the cash transfer is associated with an increase in the voting share for the populist ruling party (Law and Justice) of about 2 percentage points (Gromadzki, Sałach, and Brzeziński 2024). I encourage future research on the mechanisms underlying fertility changes in Poland, as well as analyses on how these short-term fertility patterns translate to cohort and long-term fertility rates.

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References

Aassve, A. and Lappegård, T. (2009). Childcare cash benefits and fertility timing in Norway. *European Journal of Population* 25(1): 67–88. doi:10.1007/s10680-008-9158-6.

Aassve, A. and Lappegård, T. (2010). Cash-benefit policy and childbearing decisions in Norway. *Marriage and Family Review* 46(3): 149–169. doi:10.1080/01494929.2010.490094.

Ala-Karvia, U., Hozer-Koćmiel, M., Misiak-Kwit, S., and Staszko, B. (2019). Is Poland becoming Nordic? Changing trends in household structures in Poland and Finland with the emphasis on people living alone. *Statistics in Transition New Series* 19(4): 725–742. doi:10.21307/stattrans-2018-038.

Alderotti, G., Vignoli, D., Baccini, M., Matysiak, A. (2021). Employment instability and fertility in Europe: A meta-analysis. *Demography* 58(3): 871–900. doi:10.1215/00703370-9164737.

Andersen, S.N., Drange, N., and Lappegård, T. (2018). Can a cash transfer to families change fertility behaviour? *Demographic Research* 38(33): 897–928. doi:10.4054/DemRes.2018.38.33.

Bargu, A. and Morgandi, M. (2018). Can mothers afford to work in Poland: Labor supply incentives of social benefits and childcare costs. Washington, DC: World Bank. doi:10.1596/1813-9450-8295.

Bartosik, K. (2023). The Family 500+ benefit and changes in female employment in Poland. *Central European Economic Journal* 10(57): 23–34. doi:10.2478/ceej-2023-0002.

Bauer, G. and Kneip, T. (2014). Dyadic fertility decisions in a life course perspective. *Advances in Life Course Research* (21): 87–100. doi:10.1016/j.alcr.2013.11.003.

BBC (2019). Hungary mums-of-four to pay no income tax [electronic resource]. London: BBC News. https://www.bbc.com/news/world-europe-47192612.

BBC (2020). Russia's Putin seeks to stimulate birth rate [electronic resource]. London: BBC News. https://www.bbc.com/news/world-europe-51120165.

Beaujouan E. (2020). Latest-late fertility? Decline and resurgence of late parenthood across the low-fertility countries. *Population and Development Review* 46(2): 219–247. doi:10.1111/padr.12334.

Beaujouan, E. (2023). Delayed fertility as a driver of fertility decline? In: Schoen, R. (ed.). *The demography of transforming families, the springer series on demographic methods and population analysis*. Cham: Springer International Publishing: 41–63. doi:10.1007/978-3-031-29666-6_4.

Becker, G. (1960). *An economic analysis of fertility. Demographic and economic change in developed countries*. New York: Columbia University Press.

Becker, G. and Lewis, H.G. (1973). On the interaction between the quantity and quality of children. *Journal of Political Economy* 81(2): S279–288. doi:10.1086/260166.

Bein, C., Mynarska, M., and Gauthier, A.H. (2021). Do costs and benefits of children matter for religious people? Perceived consequences of parenthood and fertility intentions in Poland. *Journal of Biosocial Science* 53(3): 419–435. doi:10.1017/S0021932020000280.

Bergsvik, J., Fauske, A., and Hart, R.K. (2021). Can policies stall the fertility fall? A systematic review of the (quasi-) experimental literature. *Population and Development Review* 47(4): 913–64. doi:10.1111/padr.12431.

Billari, F.C. (2008). Lowest-low fertility in Europe: Exploring the causes and finding some surprises. *The Japanese Journal of Population* 6(1): 2–18.

Billingsley, S. (2010). The post-communist fertility puzzle. *Population Research and Policy Review* 29(2): 193–231. doi:10.1007/s11113-009-9136-7.

Billingsley, S. and Ferrarini, T. (2011). Family policies and fertility intentions across new and old welfare democracies. (SPaDE working paper 2011: 10). Stockholm: Stockholm University Linnaeus Center on Social Policy and Family Dynamics in Europe.

Bird, C.E. and Rieker P.P. (2008). Constrained choice: Why are some women and men able to create and maintain healthy lifestyles, while others are not*?* Santa Monica: RAND Corporation. doi:10.7249/RB9339.

Błaszczyk, A. and Sawicka, J. (2018). Wpływ programu 500 plus na ewolucję demograficzną polskiego społeczeństwa. *Gospodarka w Praktyce i Teorii* 53(4): 7–25. doi:10.18778/1429-3730.53.01.

Bongaarts, J. (2004). Population aging and the rising cost of public pensions. *Population and Development Review* 30(1):1–23. doi:10.1111/j.1728-4457.2004.00001.x.

Bongaarts, J. and Sobotka, T. (2012). A demographic explanation for the recent rise in European fertility. *Population and Development Review* 38(1): 83–120. doi:10.1111/j.1728-4457.2012.00473.x.

Borg, M.O. (1989). The income–fertility relationship: Effect of the net price of a child. *Demography* 26(2): 301–310. doi:10.2307/2061527.

Botev, N. (2015). Could pronatalist policies discourage childbearing? *Population and Development Review* 41(2): 301–314. doi:10.1111/j.1728-4457.2015.00048.x.

Brainerd, E. (2014). Can government policies reverse undesirable declines in fertility? Bonn: IZA World of Labor. doi:10.15185/izawol.23.

Brzeziński, M. and Najsztub, M. (2017). The impact of 'Family 500+' programme on household incomes, poverty and inequality. *Polityka Społeczna* 44(1): 16–25.

Brzozowska, Z. and Mynarska, M. (2018). Short-term fertility intentions and their realization in Poland. *Studia Demograficzne* 2(174): 25–36. doi:10.33119/SD.2018.2.2.

Burkimsher, M. (2015). Europe-wide fertility trends since the 1990s: turning the corner from declining first birth rates. *Demographic Research* 32(21): 621–656. doi:10.4054/DemRes.2015.32.21.

Careers in Poland (2020). Family 500+ programme – are foreigners eligible? Warsaw: Careers in Poland [electronic resource]. https://www.careersinpoland.com/article/arrival-and-stay/500-for-foreigners.

Carneiro, P., Kraftman, L., Giacomo, M., Moore, L., Rasul, I., and Scott, M. (2020). The impacts of a multifaceted pre-natal intervention on human capital accumulation in early life. Bonn: IZA – Institute of Labor Economics (Working Paper Series). doi:10.2139/ssrn.3751848.

Carneiro, P., Kraftman, L., Rasul, I. and Scott, M. (2022). Accelerating birth timing to access cash transfers? Evidence from households in extreme poverty. Cambridge: The Abdul Latif Jameel Poverty Action Lab (J-PAL) (Working Paper Series).

Carruthers, B.G. (2010). The meanings of money: a sociological perspective. *Theoretical Inquiries in Law* 11(1): 51–74. doi:10.2202/1565-3404.1236.

CBOS Public Opinion Research Center (2021). Family 500 plus program after 5 years of operation [electronic resource]. Warsaw: CBOS Public Opinion Research Center. https://www.cbos.pl/PL/publikacje/public_opinion/2021/03_2021.pdf.

Chatla, S. and Shmueli, G. (2016). Linear probability models (lpm) and big data: The good, the bad, and the ugly. (Indian School of Business Research Paper Series; WP: 2353841). Rochester: Social Science Research Network. doi:10.2139/ssrn.2353841.

Chirkova, S. (2013). Do pro-natalist policies reverse depopulation in Russia? (SOLE Working Paper Series). Alexandria: The Society of Labor Economists.

Cohen, A., Dehejia, R., and Romanov, D. (2007). Do financial incentives affect fertility? (NBER Working Paper Series; w13700). Cambridge: National Bureau of Economic Research. doi:10.3386/w13700.

Cohen, A., Dehejia, R., and Romanov, D. (2013). Financial incentives and fertility. *Review of Economics and Statistics* 95(1): 1–20. doi:10.1162/REST_a_00342.

Comolli, C.L. (2017). The fertility response to the great recession in Europe and the United States: Structural economic conditions and perceived economic uncertainty. *Demographic Research* 36(51): 1549–1600. doi:10.4054/DemRes.2017.36.51.

Cook, L.J., Iarskaia-Smirnova, E.R., and Kozlov, V.A. (2023). Trying to reverse demographic decline: Pro-natalist and family policies in Russia, Poland and Hungary. *Social Policy and Society* 22(2): 355–375. doi:10.1017/S1474746422000628.

Cowan, S.K. and Douds, K.W. (2022). Examining the effects of a universal cash transfer on fertility. *Social Forces* 101(2): 1003–1030. doi:10.1093/sf/soac013.

Cygan-Rehm, K. (2014). Immigrant fertility in Germany: The role of culture. *Journal of Contextual Economics – Schmollers Jahrbuch* 134(3): 305–340. doi:10.3790/schm.134.3.305.

Dake, F., Natali, L., Angeles, G., Hoop, J., Handa, S., and Peterman, A. (2018). Cash transfers, early marriage, and fertility in Malawi and Zambia. *Studies in Family Planning* 49(4): 295–317. doi:10.1111/sifp.12073.

DeRose, L.F. (2021). Gender equity, religion, and fertility in Europe and North America. *Population and Development Review* 47(1): 41–55. doi:10.1111/padr.12373.

Dildar, Y. (2022). The effect of pronatalist rhetoric on women's fertility preferences in Turkey. *Population and Development Review* 48(2): 579–612. doi:10.1111/padr.12466.

Docquier, F. (2004). Income distribution, non-convexities and the fertility–income relationship. *Economica* 71(282): 261–273. doi:10.1111/j.0013-0427.2004.00369.x.

Doepke, M., Hannusch, A., Kindermann, F., and Tertilt, M. (2023). The economics of fertility: A new era. In: Lundberg, S. and Voena, A. (eds.). *Handbook of the*

economics of the family. Amsterdam: Elsevier: 151–254. doi:10.1016/bs.hefam.2023.01.003.

Duszczyk, M. and Kaczmarczyk, P. (2022). The war in Ukraine and migration to Poland: Outlook and challenges. *Intereconomics* 57(3): 164–170. doi:10.1007/s10272-022-1053-6.

Easterlin, R.A. (1987). *Birth and fortune: The impact of numbers on personal welfare*. Chicago: University of Chicago Press.

Esping-Andersen, G. and Billari, F.C. (2015). Re-theorizing family demographics. *Population and Development Review* 41(1): 1–31. doi:10.1111/j.1728-4457.2015.00024.x.

European Commission (2018). Measures to fight demographic decline in Hungary. (ESPN Flash Report 2018/19). Brussels: European Commission.

European Commission (2019). Lithuania introduces a universal child benefit to tackle child poverty. (ESPN Flash Report 2019/06). Brussels: European Commission.

Eurostat (2018). Share of children (aged less than 18) living with their parents by type of household [electronic resource]. Brussels: European Commission (Eurostat Data Browser). https://ec.europa.eu/eurostat/databrowser/view/ilc_lvps20__custom_9191400/default/table?lang=en.

Eurostat (2018a). Estimated average age of young people leaving the parental household by sex [electronic resource]. Brussels: European Commission (Eurostat Data Browser). https://ec.europa.eu/eurostat/databrowser/view/yth_demo_030__custom_9191374/default/table?lang=en.

Eurostat (2021). Which EU countries had the highest GDP in 2020? [electronic resource]. Brussels: European Commission. https://ec.europa.eu/eurostat/web/products-eurostat-news/-/ddn-20211220-1.

Eurostat (2021a). Monthly minimum wages – bi-annual data [electronic resource]. Brussels: European Commission (Eurostat Data Browser). https://ec.europa.eu/eurostat/databrowser/view/earn_mw_cur/default/table?lang=en.

Eurostat (2021b). Legally induced abortions by mothers' age [electronic resource]. Brussels: European Commission. https://data.europa.eu/data/datasets/cn0jccs1kjlrcbjybhuxzq?locale=en.

Eurostat (2021c). Live births from mothers aged 40 and over [electronic resource]. Brussels: European Commission. https://ec.europa.eu/eurostat/cache/digpub/demography_2021/bloc-2b.html.

Eurostat (2024). Live births by mother's age and birth order [electronic resource]. Brussels: European Commission (Eurostat Data Browser). https://ec.europa.eu/eurostat/databrowser/view/demo_fordagec__custom_11307526/default/table?lang=en.

Fanelli, E. and Profeta, P. (2021). Fathers' involvement in the family, fertility, and maternal employment: Evidence from Central and Eastern Europe. *Demography* 58(5): 1931–1954. doi:10.1215/00703370-9411306.

Feyrer, J., Sacerdote, B., and Stern, A.D. (2008). Will the stork return to Europe and Japan? Understanding fertility within developed nations. *Journal of Economic Perspectives* 22(3): 3–22. doi:10.1257/jep.22.3.3.

Gábos, A., Gál, R.I., and Kézdi, G. (2009). The effects of child-related benefits and pensions on fertility by birth order: A test on Hungarian data. *Population Studies* 63(3): 215–231. doi:10.1080/00324720903215293.

Gathmann, C. and Sass, B. (2018). Taxing childcare: Effects on childcare choices, family labor supply, and children. *Journal of Labor Economics* 36(3): 665–709. doi:10.1086/696143.

Gauthier, A.H. (2007). The impact of family policies on fertility in industrialized countries: A review of the literature. *Population Research and Policy Review* 26(3): 323–346. doi:10.1007/s11113-007-9033-x.

Gietel-Basten, S. and Scherbov, S. (2019). Is half the world's population really below 'replacement-rate'? *PLOS ONE* 14(12): e0224985. doi:10.1371/journal.pone.0224985.

Glass, J., Simon, R.W., and Andersson, M.A. (2016). Parenthood and happiness: Effects of work-family reconciliation policies in 22 OECD countries. *American Journal of Sociology* 122(3): 886–929. doi:10.1086/688892.

Goldin, C.D. (2021). *Career and family: Women's century-long journey toward equity*. Princeton: Princeton University Press. doi:10.1515/9780691226736.

Goldscheider, F., Bernhardt, E., and Lappegård, T. (2015). The gender revolution: A framework for understanding changing family and demographic behavior. *Population and Development Review* 41(2): 207–239. doi:10.1111/j.1728-4457.2015.00045.x.

Golinowska, S. and Sowa-Kofta, A. (2017). Combating poverty through family cash benefits. On the first results of the programme 'Family 500+' in Poland. *Polityka Społeczna* 44(1): 7–13.

González, L. and Trommlerová, S.K. (2021). Cash transfers and fertility: How the introduction and cancellation of a child benefit affected births and abortions. *Journal of Human Resources* 58(3): 783–818. doi:10.3368/jhr.59.1.0220-10725R2.

Goraus-Tanska, K. and Inchauste, G. (2016). The distributional impact of taxes and transfers in Poland. (World Bank Policy Research Working Paper 7787). Rochester: Social Science Research Network. doi:10.1596/1813-9450-7787.

Gromada, A. (2023). Poland has changed beyond recognition – and so has its place in Europe's pecking order. London: The Guardian. https://www.theguardian.com/commentisfree/2023/apr/25/poland-change-europe-high-achievers-country.

Gromadzki, J. (2023). Labor supply effects of a universal cash transfer. (IZA Discussion Paper 16186). Rochester: Social Science Research Network. doi:10.2139/ssrn.4464600.

Gromadzki, J. (2024). *Universal child benefits and child poverty: accounting for fertility and labor supply adjustments*. Paper presented at the Interdisciplinary Centre for Labour Market and Family Dynamics (LabFam) Seminar, University of Warsaw, Poland, March 19, 2024. https://www.youtube.com/watch?v=D7fToWPOFZU&t=1s.

Gromadzki, J., Sałach, K., and Brzeziński, M. (2024). When populists deliver on their promises: The electoral effects of a large cash transfer programme in Poland. *Economica* 91(361): 320–345. doi:10.1111/ecca.12505.

Grzebalska, W. and Pető, A. (2018). The gendered modus operandi of the illiberal transformation in Hungary and Poland. *Women's Studies International Forum* 68: 164–172. doi:10.1016/j.wsif.2017.12.001.

Haan, P. and Myck, M. (2012). Multi-family households in a labour supply model: A calibration method with application to Poland. *Applied Economics* 44(22): 2907–2919. doi:10.1080/00036846.2011.568402.

Haan, P. and Wrohlich, K. (2011). Can child care policy encourage employment and fertility? Evidence from a structural model. *Labour Economics* 18(4): 498–512. doi:10.1016/j.labeco.2010.12.008.

Hagemejer, K. (2018). Is the "500+" child benefit programme over generous? Polish social protection expenditure on benefits and services for families with children compared with other member countries of the EU and OECD. *Polityka Społeczna* 2017(1): 1–7.

Han, S.W. and Brinton, M.C. (2022). Theories of postindustrial fertility decline: An empirical examination. *Population and Development Review* 48(2): 303–330. doi:10.1111/padr.12490.

Hart, R., Bergsvik, J., Fauske, A., and Kim, W. (2024). Causal analysis of policy effects on fertility. In: Zimmermann, K.F. (ed.): *Handbook of labor, human resources and population economics*. Cham: Springer International Publishing: 1–25. doi:10.1007/978-3-319-57365-6_451-1.

Hausman, C. and Rapson, D.S. (2018). Regression discontinuity in time: Considerations for empirical applications. *Annual Review of Resource Economics* 10(1): 533–552. doi:10.1146/annurev-resource-121517-033306.

Hazan, M. and Zoabi, H. (2015). Do highly educated women choose smaller families? *The Economic Journal* 125(587): 1191–1226. doi:10.1111/ecoj.12148.

Hoem, J.M. (2008). The impact of public policies on European fertility. *Demographic Research* 19(10): 249–260. doi:10.4054/DemRes.2008.19.10.

Holzer-Żelażewska, D. and Tymicki, K. (2009). Cohort and period fertility of Polish women, 1945–2008. *Studia Demograficzne* 1(155): 48–69.

Hoorens, S., Clift, J., Staetsky, L., Janta, B., Diepeveen, S., Jones, M.M., and Grant, J. (2011). Low fertility in Europe: Is there still reason to worry? Santa Monica: RAND Corporation: 35–44. doi:10.1037/e525782012-001.

Huinink, J. and Kohli, M. (2014). A life-course approach to fertility. *Demographic Research* 30(45): 1293–1326. doi:10.4054/DemRes.2014.30.45.

Hussein, J., Cottingham, J., Nowicka, W., and Kismodi, E. (2018). Abortion in Poland: Politics, progression and regression. *Reproductive Health Matters* 26(52): 11–14. doi:10.1080/09688080.2018.1467361.

Impicciatore, R. and Tomatis, F. (2020). The nexus between education and fertility in six European countries. *Genus* 76(1): 35. doi:10.1186/s41118-020-00104-4.

Isański, J., Michalski, M., Szwarc, K., and Seredyńska-Abou Eid, R. (2021). Fertility potential and child benefits questioned: Polish migration in the UK and changes of family policies in Poland. *Migration Letters* 18(4): 381–399. doi:10.33182/ml.v18i4.1165.

Jarska, N. and Ignaciuk, A. (2022). Marriage, gender and demographic change: managing fertility in state-socialist Poland. *Slavic Review* 81(1): 142–162. doi:10.1017/slr.2022.85.

Jędrzejczak, A. and Pekasiewicz, D. (2020). Changes in income distribution for different family types in Poland. *International Advances in Economic Research* 26(2): 135–146. doi:10.1007/s11294-020-09785-1.

Jones, L.E., Schoonbroodt, A., and Tertilt, M. (2008). Fertility theories: Can they explain the negative fertility-income relationship? (NBER Working Paper Series; w14266). Cambridge: National Bureau of Economic Research. doi:10.3386/w14266.

Kalwij, A. (2010). The impact of family policy expenditure on fertility in Western Europe. *Demography* 47(2): 503–519. doi:10.1353/dem.0.0104.

Kearney, M.S., Levine, P.B., and Pardue, L. (2022). The puzzle of falling U.S. birth rates since the Great Recession. *Journal of Economic Perspectives* 36(1): 151–176. doi:10.1257/jep.36.1.151.

Kim, E.H. (2017). Division of domestic labour and lowest-low fertility in South Korea. *Demographic Research* 37(24): 743–768. doi:10.4054/DemRes.2017.37.24.

Kim, W. (2023). Baby bonus, fertility, and missing women. Rochester: Social Science Research Network (SSRN Working Paper Series). doi:10.2139/ssrn.3704188.

Klesment, M., Puur, A., Rahnu, L., and Sakkeus, L. (2014). Varying association between education and second births in Europe: Comparative analysis based on the EU-SILC data. *Demographic Research* 31(27): 813–860. doi:10.4054/DemRes.2014.31.27.

Klich-Kluczewska, B. (2012). *Making up for the losses of war: Reproduction politics in post-war Poland*. Osnabrück: fibre Verlag.

Klimek, Ł. (2017). Migration and fertility: Polish migrant families in Ireland and non-migrant families in Poland: A comparison of fertility plans and behaviour. *Central and Eastern European Migration Review* 6(2): 5–30.

Kohler, H.P., Billari, F.C., and Ortega, J.A. (2002). The emergence of lowest-low fertility in Europe during the 1990s. *Population and Development Review* 28(4): 641–680. doi:10.1111/j.1728-4457.2002.00641.x.

Kolasa, A. (2021). Macroeconomic consequences of the demographic and educational changes in Poland after 1990. *Macroeconomic Dynamics* 25(8): 1993–2036. doi:10.1017/S1365100519000944.

Korpi, W. (2000). Faces of inequality: Gender, class, and patterns of inequalities in different types of welfare states. *Social Politics: International Studies in Gender, State and Society* 7(2): 127–191. doi:10.1093/sp/7.2.127.

Kotowska, I.E., Jóźwiak, J., Matysiak, A., and Baranowska-Rataj, A. (2008). Poland: Fertility decline as a response to profound societal and labour market changes? *Demographic Research* S7(22): 795–854. doi:10.4054/DemRes.2008.19.22.

Kreyenfeld, M. and Konietzka, D. (2017). *Childlessness in Europe: Contexts, causes, and consequences*. Cham: Springer International Publishing. doi:10.1007/978-3-319-44667-7.

La Ferrara, E., Chong, A., and Duryea, S. (2012). Soap operas and fertility: Evidence from Brazil. *American Economic Journal: Applied Economics* 4(4): 1–31. doi:10.1257/app.4.4.1.

Lazzari, E., Reimondos, A., and Gray, E. (2023). Did the COVID-19 pandemic affect fertility desires in Australia? Understanding why people changed their attitudes towards having a first or additional child. *Population and Development Review* 50(S1): 243–276. doi:10.1111/padr.12549.

Lee, R., Mason, A., and members of the NTA Network (2014). Is low fertility really a problem? Population aging, dependency, and consumption. *Science* 346(6206): 229–234. doi:10.1126/science.1250542.

Lesthaeghe, R. (1995). The second demographic transition in western countries: An interpretation. In: Mason, K.O. and Jensen, A.M. (eds.). *Gender and family change in industrialized countries*. Oxford: Clarendon: 17–62. doi:10.1093/oso/9780198289708.003.0002.

Luci-Greulich, A. and Thévenon, O. (2013). The impact of family policies on fertility trends in developed countries. *European Journal of Population* 29(4): 387–416. doi:10.1007/s10680-013-9295-4.

Lutz, W. and Gailey, N. (2020). Depopulation as a policy challenge in the context of global demographic trends. (Human Development Series). Istanbul: UNFPA EECA.

Lutz, W., Skirbekk, V., and Testa, M.R. (2006). The low-fertility trap hypothesis: Forces that may lead to further postponement and fewer births in Europe. *Vienna Yearbook of Population Research* 4: 167–192. doi:10.1553/populationyearbook2006s167.

Macura, M., Kadri, A., Mochizaki-Sternberg, Y., and Garcia, J.L. (2000). Fertility decline in the transition economies, 1989–1998: Economic and social factors revisited. *Economic Survey of Europe* 1: 189–205.

Magda, I. (2020). Increasing female labour force participation in Poland. (IBS Policy Paper 01/2020). Warsaw: Institute for Structural Research.

Magda, I., Kiełczewska, A., and Brandt, N. (2018). The 'Family 500+' child allowance and female labour supply in Poland. (IBS Working Paper 01/2018). Warsaw: Institute for Structural Research.

Makarski, K., Tyrowicz, J., and Malec, M. (2019). Fiscal and welfare effects of raised fertility in Poland: Overlapping generations model estimates. *Population and Development Review* 45(4): 795–818. doi:10.1111/padr.12297.

Malkova, O. (2018). Can maternity benefits have long-term effects on childbearing? Evidence from Soviet Russia. *The Review of Economics and Statistics* 100(4): 691–703. doi:10.1162/rest_a_00713.

Marczak, J., Sigle, W., and Coast, E. (2018). When the grass is greener: Fertility decisions in a cross-national context. *Population Studies* 72(2): 201–216. doi:10.1080/00324728.2018.1439181.

Margolis, R. and Myrskylä, M. (2015). Parental well-being surrounding first birth as a determinant of further parity progression. *Demography* 52(4): 1147–1166. doi:10.1007/s13524-015-0413-2.

Matysiak, A. (2009). Employment first, then childbearing: Women's strategy in post-socialist Poland. *Population Studies* 63(3): 253–276. doi:10.1080/00324720903151100.

Matysiak, A. and Vignoli, D. (2013). Diverse effects of women's employment on fertility: Insights from Italy and Poland. *European Journal of Population* 29(3): 273–302. doi:10.1007/s10680-013-9287-4.

Matysiak, A., Sobotka, T., and Vignoli, D. (2021). The great recession and fertility in Europe: A sub-national analysis. *European Journal of Population* 37(1): 29–64. doi:10.1007/s10680-020-09556-y.

McDonald, P. (2000). Gender equity in theories of fertility transition. *Population and Development Review* 26(3): 427–439. doi:10.1111/j.1728-4457.2000.00427.x.

Meardi, G. and Guardiancich, I. (2022). Back to the familialist future: The rise of social policy for ruling populist radical right parties in Italy and Poland. *West European Politics* 45(1): 129–153. doi:10.1080/01402382.2021.1916720.

Michoń, P. (2021). Deservingness for 'Family 500 +' benefit in Poland: Qualitative study of internet debates. *Social Indicators Research* 157: 203–223. doi:10.1007/s11205-021-02655-1.

Milewska, A. and Błażejczyk, D. (2022). Poland's 'Family 500+' program as an opportunity to solve the problems of family and demographic policy. *Zeszyty Naukowe SGGW, Polityki Europejskie, Finanse i Marketing* 27(76): 58–67. doi:10.22630/PEFIM.2022.27.76.5.

Milligan, K. (2005). Subsidizing the stork: New evidence on tax incentives and fertility. *The Review of Economics and Statistics* 87(3): 539–555. doi:10.1162/0034653054638382.

Milovanska-Farrington, S. (2022). The effect of child benefits on financial difficulties and spending habits: Evidence from Poland's *Family 500+* program. *International Economics and Economic Policy* 19: 719–739. doi:10.1007/s10368-022-00534-9.

Mishtal, J. (2012). Irrational non-reproduction? the 'dying nation' and the postsocialist logics of declining motherhood in Poland. *Anthropology and Medicine* 19(2): 153–169. doi:10.1080/13648470.2012.675048.

Mishtal, J.Z. (2009). Understanding low fertility in Poland: Demographic consequences of gendered discrimination in employment and post-socialist neoliberal restructuring. *Demographic Research* 21(20): 599–626. doi:10.4054/DemRes.2009.21.20.

Morawiecki, M. (2018). Meet the polish tiger. *The Wall Street Journal*. New York: The Wall Street Journal. https://www.wsj.com/articles/meet-the-polish-tiger-1538329241.

Mortimer, J.T. and Shanahan, M. (2003). *Handbook of the life course*. New York: Springer. doi:10.1007/b100507.

Murkowski, R. (2021). Selected socio-economic factors co-occurring with high fertility rate in the OECD countries. *Operations Research and Decisions* 31(3): 89–108. doi:10.37190/ord210305.

Myck, M. and Trziński, K. (2019). From partial to full universality: The Family 500+ programme in Poland and its labour supply implications. Munich: ifo Institut – Leibniz-Institut für Wirtschaftsforschung an der Universität München. *ifo DICE Report* 17(03): 36–44.

Myrskylä, M., Goldstein, J.R., and Cheng, Y.A. (2013). New cohort fertility forecasts for the developed world: Rises, falls, and reversals. *Population and Development Review* 39(1): 31–56. doi:10.1111/j.1728-4457.2013.00572.x.

Myrskylä, M., Kohler, H.P., and Billari, F.C. (2009). Advances in development reverse fertility declines. *Nature* 460(7256): 741–743. doi:10.1038/nature08230.

Ní Bhrolcháin, M. and Beaujouan, É. (2012). Fertility postponement is largely due to rising educational enrollment. *Population Studies* 66(3): 311–327. doi:10.1080/00324728.2012.697569.

Nitsche, N., Matysiak, A., Bavel, J.V., and Vignoli, D. (2018). Partners' educational pairings and fertility across Europe. *Demography* 55(4): 1195–1232. doi:10.1007/s13524-018-0681-8.

OECD (2019). Public policies for families and children (PF) [electronic resource]. Paris: The Organisation for Economic Co-operation and Development (OECD Family Database). http://www.oecd.org/els/family/database.htm.

OECD (2019a). PF1.1: Public spending on family benefits [electronic resource]. Paris: The Organisation for Economic Co-operation and Development (OECD Family Database). https://www.oecd.org/content/dam/oecd/en/data/datasets/family-database/pf1_1_public_spending_on_family_benefits.pdf.

OECD (2020). Family benefits public spending [electronic resource]. Paris: The Organisation for Economic Co-operation and Development (OECD Data Indicators). https://data.oecd.org/socialexp/family-benefits-public-spending.htm.

OECD (2022a). PF1.3 Family cash benefits [electronic resource]. Paris: The Organisation for Economic Co-operation and Development (OECD Family Database). https://www.oecd.org/els/soc/PF1_3_Family_Cash_Benefits.pdf

OECD (2022b). Trust in government [electronic resource]. Paris: The Organisation for Economic Co-operation and Development (OECD Data Indicators). https://data.oecd.org/gga/trust-in-government.htm.

OECD (2024). SF2.1 Fertility rates. [electronic resource]. Paris: The Organisation for Economic Co-operation and Development (OECD Data Indicators). https://www.oecd.org/els/soc/SF_2_1_Fertility_rates.xlsx.

Okólski, M. (2021). The migration transition in Poland. *Central and Eastern European Migration Review* 10(2): 151–169.

Okun, B.S. and Stecklov, G. (2021). The impact of grandparental death on the fertility of adult children. *Demography* 58(3): 847–870. doi:10.1215/00703370-9015536.

Oshio, T. (2019). Is a positive association between female employment and fertility still spurious in developed countries? *Demographic Research* 41(45): 1277–1288. doi:10.4054/DemRes.2019.41.45.

Osiewalska, B. and Matysiak, A. (2024). Two sides of a coin: The relationship between work autonomy and childbearing. (WP 2/2024 [438]). Warsaw: Interdisciplinary Centre for Labour Market and Family Dynamics (LabFam) at the University of Warsaw.

Paradowski, P.R., Wolszczak-Derlacz, J., and Sierminska, E. (2020). Inequality, poverty and child benefits: Evidence from a natural experiment. (LIS Working papers 799). Esch-sur-Alzette/Belval: LIS Cross-National Data Center in Luxembourg.

Paradysz, J. (2022). Metody badania efektywności programu Rodzina 500+. In: Michalski, M.A. (ed.). *Rodzina – wyzwania na XXI wiek*. Warsaw: Polish Statistical Office. https://kd.stat.gov.pl/images/publikacje/06_kd_rodzina_wyzwania_na_xxi_wiek.pdf.

Pew Research Center (2018). U.S. women are postponing motherhood, but not as much as those in most other developed nations [electronic resource]. Washington, DC: Pew Research Center. https://www.pewresearch.org/short-reads/2018/06/28/u-s-women-are-postponing-motherhood-but-not-as-much-as-those-in-most-other-developed-nations/.

Philipov, D. (2002). Fertility in times of discontinuous societal change: the case of Central and Eastern Europe. (MPIDR Working Paper; WP 2002-024). Rostock: Max Planck Institute for Demographic Research. doi:10.4054/MPIDR-WP-2002-024.

Płomien, A. (2019). Gender inequality by design: does successful implementation of childcare policy deliver gender-just outcomes? *Policy and Society* 38(4): 643–662. doi:10.1080/14494035.2019.1617513.

Polish Ministry of Family and Social Policy (2021a). Family 500+ [electronic resource]. Warsaw: Polish Ministry of Family and Social Policy. https://www.gov.pl/web/family/family-500.

Polish Ministry of Family and Social Policy (2021b). Najważniejsze informacje o rządowym programie „Rodzina 500+" [electronic resource]. Warsaw: Polish Ministry of Family and Social Policy https://www.gov.pl/web/rodzina/najwazniejsze-informacje-o-programie-rodzina-502.

Polish Statistical Office (2019). Household budget survey in 2018 [electronic resource]. Warsaw: Polish Statistical Office. https://stat.gov.pl/en/topics/living-conditions/living-conditions/household-budget-survey-in-2018,2,13.html.

Polish Statistical Office (2021a). Stan i struktura demograficzno-społeczna i ekonomiczna ludności Polski w świetle wyników NSP 2021 [electronic resource]. Warsaw: Polish Statistical Office. https://stat.gov.pl/spisy-powszechne/nsp-2021/nsp-2021-wyniki-ostateczne/stan-i-struktura-demograficzno-spoleczna-i-ekonomiczna-ludnosci-polski-w-swietle-wynikow-nsp-2021,6,2.html).

Polish Statistical Office (2021b). Percentage of illegitimate live births [electronic resource]. Warsaw: Polish Statistical Office (Knowledge Databases). https://dbw.stat.gov.pl/en/baza-danych.

Polish Statistical Office (2022a). Live births. [electronic resource]. Warsaw: Polish Statistical Office (Knowledge Databases). https://dbw.stat.gov.pl/en/dashboard/21.

Polish Statistical Office (2022b). Median age of first-time mothers. [electronic resource]. Warsaw: Polish Statistical Office (Knowledge Databases). https://dbw.stat.gov.pl/en/dashboard/21.

Polish Statistical Office (2022c). Demographic situation in Poland up to 2022. [electronic resource]. Warsaw: Polish Statistical Office. https://stat.gov.pl/download/gfx/portalinformacyjny/en/defaultaktualnosci/3286/13/3/1/demographic_situation_in_poland_up_to_2022.pdf.

Polish Statistical Office (2023a). Demography – total fertility rate [electronic resource]. Warsaw: Polish Statistical Office (Knowledge Databases). https://dbw.stat.gov.pl/en/dashboard/21.

Polish Statistical Office (2023b). 2023 – 05 – Ludność według płci, wieku, województw i Powiatów [electronic resource]. Warsaw: Polish Statistical Office (Demographic Database). https://demografia.stat.gov.pl/BazaDemografia/Tables.aspx.

Polish Statistical Office (2023c). Structure of population age by sex [electronic resource]. Warsaw: Polish Statistical Office (Knowledge Databases). https://dbw.stat.gov.pl/en/dashboard/21.

Polish Statistical Office (2023d). Infant death [electronic resource]. Warsaw: Polish Statistical Office (Knowledge Databases). https://stat.gov.pl/en/topics/population/population/infant-death,9,1.html.

Posit team (2024). RStudio: Integrated development environment for R. Boston, MA: Posit Software, PBC. http://www.posit.co/.

Premik, F. (2022). Evaluating Poland's Family 500+ child support programme. *Gospodarka Narodowa. The Polish Journal of Economics* 310(2): 1–19. doi:10.33119/GN/149193.

Pustulka, P., Sarnowska, J., and Buler, M. (2021). Resources and pace of leaving home among young adults in Poland. *Journal of Youth Studies* 25(7): 1–17. doi:10.1080/13676261.2021.1925638.

Rae, G. (2020). In the Polish mirror. *New Left Review* (124): 89–104.

Riphahn, R.T. and Wiynck, F. (2017). Fertility effects of child benefits. *Journal of Population Economics* 30(4): 1135–1184. doi:10.1007/s00148-017-0647-y.

Rosenzweig, M.R. and Schultz, T.P. (1985). The supply and demand of births and their life-cycle consequences. *American Economic Review* 75: 992–1015.

Ruzik-Sierdzińska, A. (2018). Krótkookresowe skutki programu Rodzina 500+. *Studia z Polityki Publicznej* 5(1(17)): 63–75. doi:10.33119/KSzPP.2018.1.4.

Rybińska, A. (2014). Motherhood after the age of 35 in Poland. *Studia Demograficzne* 1(165): 7–28. doi:10.33119/SD.2014.1.1.

Salanie, B. and Laroque, G. (2008). Does fertility respond to financial incentives? (CESifo Working Paper Series 2339). Rochester: Social Science Research Network. doi:10.2139/ssrn.1157260.

Scheiring, G., Bryant, H., Irdam, D., Azarova, A., Fodor, E., Stuckler, D., Esping-Andersen, G., and King, L. (2020). Privatization and the postsocialist fertility decline. Rochester: Social Science Research Network. doi:10.31235/osf.io/xahsz.

Sikorska, M. (2021). Is it possible to increase the fertility rate in Poland? (IBS Policy Paper). Warsaw: Institute for Structural Research.

Skirbekk, V. (2022). *Decline and prosper! Changing global birth rates and the advantages of fewer children*. Cham: Palgrave Macmillan. doi:10.1007/978-3-030-91611-4.

Słonimczyk, F. and Yurko, A. (2014). Assessing the impact of the maternity capital policy in Russia. *Labour Economics* 30: 265–281. doi:10.1016/j.labeco.2014.03.004.

Śmigielska, D. (2020). Realizacja i skutki programu „Rodzina 500+" w Polsce. *Myśl Ekonomiczna i Polityczna* 2020(2): 56–77. doi:10.26399/meip.2(69).2020.11/d.smigielska.

Sobotka, T. (2002). Ten years of rapid fertility changes in the European post-communist countries. (Working Paper Series 02–1, July 2002). Groningen: Population Research Centre.

Sobotka, T. (2011). Fertility in Central and Eastern Europe after 1989: Collapse and gradual recovery. *Historical Social Research/Historische Sozialforschung* 36(2(136)): 246–296.

Sobotka, T. and Beaujouan, E. (2018). Late motherhood in low-fertility countries: Reproductive intentions, trends and consequences. In: Stoop, D. (ed.). *Preventing age related fertility loss.* Cham: Springer International Publishing: 11–29. doi:10.1007/978-3-319-14857-1_2.

Sobotka, T. and Fürnkranz-Prskawetz, A. (2020). Demographic change in Central, Eastern and Southeastern Europe: Trends, determinants and challenges. In: Holzmann, R., Ritzberger-Grünwald, D., and Schuberth, H. (eds.). *30 years of transition in Europe.* Cheltenham: Edward Elgar: 196–222. doi:10.4337/9781839109508.00027.

Sobotka, T., Lutz, W., and Philipov, D. (2005). Missing births': Decomposing the declining number of births in Europe into tempo, quantum, and age structure effects. (European Demographic Research Papers; WP 2). Vienna: Vienna Institute of Demography.

Sobotka, T., Matysiak, A., and Brzozowska, Z. (2020). Policy responses to low fertility. (Working Paper 1). New York: United Nations Population Fund (UNFPA).

Spéder, Z., Murinkó, L., and Oláh, L.S. (2020). Cash support vs. tax incentives: The differential impact of policy interventions on third births in contemporary Hungary. *Population Studies* 74(1): 39–54. doi:10.1080/00324728.2019.1694165.

Stone, L. (2020). Pro-natal policies work, but they come with a hefty price tag. Charlottesville: Institute for Family Studies (IFS). https://ifstudies.org/blog/pro-natal-policies-work-but-they-come-with-a-hefty-price-tag.

Striessnig, E. and Lutz, W. (2013). Can below-replacement fertility be desirable? *Empirica* 40(3): 409–425. doi:10.1007/s10663-013-9213-3.

Suwada, K. (2019). Agency in parents' fertility behaviours – Gaps in the Polish family policy system. *Social Policy and Administration* 53(7): 1108–1120. doi:10.1111/spol.12507.

Suwada, K. (2021). Genderizing consequences of family policies in Poland in 2010s: A sociological perspective. *Society Register* 5(4): 41–60. doi:10.14746/sr.2021.5.4.03.

Szarfenberg, R. (2017). Wpływ świadczenia wychowawczego (500+) na ubóstwo na podstawie mikrosymulacji. *Polityka Społeczna* 4: 1–6.

Szelewa, D. (2022). When family policy doesn't work: Motives and welfare attitudes among childfree persons in Poland. *Social Inclusion* 10(3): 194–205. doi:10.17645/si.v10i3.5504.

Tatarczak, A. and Janik, G. (2023). Demographic challenges in Poland understanding low fertility. *Econometrics* 27(4): 1–14. doi:10.15611/eada.2023.4.01.

Testa, M.R., Cavalli, L., and Rosina, A. (2014). The effect of couple disagreement about child-timing intentions: A parity-specific approach. *Population and Development Review* 40(1): 31–53. doi:10.1111/j.1728-4457.2014.00649.x.

Thaler, R.H., Sunstein, C.R., and Balz, J.P. (2010). Choice Architecture (SSRN Scholarly Paper 1583509). doi:10.2139/ssrn.1583509.

Thévenon, O. and Gauthier, A.H. (2011). Family policies in developed countries: A 'fertility-booster' with side-effects. *Community, Work and Family* 14(2): 197–216. doi:10.1080/13668803.2011.571400.

Thomas, J., Rowe, F., Williamson, P., and Lin, E.S. (2022). The effect of leave policies on increasing fertility: A systematic review. *Humanities and Social Sciences Communications* 9(1): 1–16. doi:10.1057/s41599-022-01270-w.

Tropf, F.C. and Mandemakers, J.J. (2017). Is the association between education and fertility postponement causal? The role of family background factors. *Demography* 54(1): 71–91. doi:10.1007/s13524-016-0531-5.

Turkowska-Kucharska, W. (2018). Efekty rządowego programu „Rodzina 500 plus" dla rodzin i aktywności zawodowej kobiet. *Rocznik Lubuski* 44(1): 217–232.

UNICEF (2020). Universal child benefits. policy issues and options. London: Overseas Development Institute and New York: United Nations Children's Fund (UNICEF). https://www.unicef.org/media/72916/file/UCB-ODI-UNICEF-Report-2020.pdf.

Van Bavel, J. and Reher, D.S. (2013). The baby boom and its causes: What we know and what we need to know. *Population and Development Review* 39(2): 257–288. doi:10.1111/j.1728-4457.2013.00591.x.

Vanhuysse, P. and Perek-Białas, J. (2021). The political demography of missed opportunity: Populations and policies in a younger but faster-ageing East Central Europe, 1990–2040. In: Goerres, A. and Vanhuysse, P. (eds.). *Global political demography: The politics of population change*. Cham: Palgrave Macmillan: 373–399. doi:10.1007/978-3-030-73065-9_15.

Vasireddy, S., Berrington, A., Kuang, B., and Kulu, H. (2022). Education and fertility in Europe in the last decade: A review of the literature. (Working Paper 103). Southampton: Centre for Population Change (CPC). http://www.cpc.ac.uk/docs/WP_103_Education_and_Fertility_in_Europe_.pdf.

Vignoli, D., Guetto, R., Bazzani, G., Pirani, E., and Minello, A. (2020). A reflection on economic uncertainty and fertility in Europe: the narrative framework. *Genus* 76(1): 28. doi:10.1186/s41118-020-00094-3.

Voas, D. (2003). Conflicting preferences: A reason fertility tends to be too high or too low. *Population and Development Review* 29(4): 627–646. doi:10.1111/j.1728-4457.2003.00627.x.

Walford, N. and Kurek, S. (2016). Outworking of the second demographic transition: National trends and regional patterns of fertility change in Poland, and England and Wales, 2002–2012. *Population, Space and Place* 22(6): 508–525. doi:10.1002/psp.1936.

Walker, S. (2020). 'Baby machines': Eastern Europe's answer to depopulation [electronic resource]. London: The Guardian. https://www.theguardian.com/world/2020/mar/04/baby-bonuses-fit-the-nationalist-agenda-but-do-they-work.

Wilk, S. (2020). The role of family policy in solving demographic problems: Study of the Polish program Family 500+. *European Journal of Sustainable Development* 9(4): 84–84. doi:10.14207/ejsd.2020.v9n4p84.

Wiśniewska, A., Musiał, M., and Świecka, B. (2017). The program "Family 500 plus" implications for household finance in Poland. *CBU International Conference Proceedings* 5: 490–494. doi:10.12955/cbup.v5.972.

Wooldridge, J.M. (2010). *Econometric analysis of cross section and panel data*. Cambridge: MIT Press.

World Bank (2019). Family policies [electronic resource]. (National Development Strategy Croatia 2030 Policy Note). Washington, DC: The World Bank. https://thedocs.worldbank.org/en/doc/493091604345691272-0080022020/original/5.Familiypolicies.pdf.

World Bank (2023). GDP per capita (current US$) – Poland [electronic resource]. Washington, DC: The World Bank. https://data.worldbank.org/indicator/NY.GDP.PCAP.CD?end=2016&locations=PL&most_recent_value_desc=false&start=2006).

Wrocław.pl. (2018). Family 500+ program for foreigners [electronic resource]. Wrocław: Wrocław.pl. https://www.wroclaw.pl/en/family-500program-for-foreingers.

Yonzan, N., Timilsina, L., and Kelly, I.R. (2020). Economic incentives surrounding fertility: Evidence from Alaska's permanent fund dividend. *Economics and Human Biology* 52: 101334. doi:10.1016/j.ehb.2023.101334.

Zelizer, V.A. (2017). *The social meaning of money: pin money, paychecks, poor relief, and other currencies*. Princeton: Princeton University Press. doi:10.1515/9780691237008.

Appendix

Table A-1: Birth distributions comparison

Population Statistics (PS) vs. Polish Household Budget Survey (PHBS)						
	Birth Order					
	1		2		3	
Year	*PS*	*PHBS*	*PS*	*PHBS*	*PS*	*PHBS*
2010	50.10%	47.03%	35.12%	39.25%	9.95%	10.26%
2011	49.17%	46.46%	35.87%	40.13%	10.18%	9.92%
2012	48.71%	45.12%	36.30%	40.95%	10.26%	10.27%
2013	48.60%	44.57%	36.34%	38.87%	10.42%	12.17%
2014	47.44%	39.53%	37.46%	44.44%	10.55%	12.70%
2015	47.03%	45.48%	37.55%	38.91%	10.57%	10.80%
2016	46.01%	43.26%	38.45%	39.16%	11.12%	12.80%
2017	42.95%	39.20%	40.12%	41.88%	12.43%	15.41%
*2018	42.65%	42.20%	37.99%	37.28%	13.99%	16.47%

Notes: Population Statistics refers to official census data, drawn from the Polish Statistical Office's Demographic Database (Baza Demograficzna).

Table A-2: Stepwise LPM regression results: Family 500+ cash transfer and fertility

Coefficients	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**
Cash transfer eligibility	–0.030 (.002)	–0.021 (.002)	0.015 (.002)	0.015 (.002)	0.015 (.002)	0.015 (.002)	0.015 (.002)
	CI:–.034, –.026	CI:–.025, .018	CI:.011, .019	CI:.011, .019	CI:.011, .019	CI:.011, .019	CI:.011, .019
	p = .000	*p* = .000	*p* = .000	*p* = .000	*p* = .000	*p* = .000	*p* = .000
Age	0.004 (.000)	0.020 (.000)	0.018 (.000)	0.018 (.000)	0.018 (.000)	0.018 (.000)	0.018 (.000)
Age^2		0.000 (.000)	0.000 (.000)	0.000 (.000)	0.000 (.000)	0.000 (.000)	0.000 (.000)
Stock of children			–0.107 (.000)	–0.107 (.000)	–0.107 (.000)	–0.107 (.000)	–0.107 (.000)
Education							
Primary				0.006 (.000)	0.007 (.000)	0.007 (.000)	0.007 (.000)
Secondary (reference)				---	---	---	---
Postsecondary				0.001 (.000)	0.000 (.000)	0.001 (.000)	0.001 (.000)
Household income (logged)					0.004 (.000)	0.002 (.000)	0.002 (.000)
Marital status						0.012 (.000)	0.011 (.000)
Rural residence							0.001 (.000)
n				87,006			

Notes: CI = 95% confidence interval; *p* = *p*-value. Clustered robust standard errors (in parentheses). Dependent variable = 1 if probability of giving birth in year *t*.

Table A-3: Logit regression results: Family 500+ cash transfer and fertility

Coefficients	Estimates
Cash transfer eligibility	0.017 (.003) CI: .011, .019 *p* = .000
Age	0.028 (.000)
Age^2	0.000 (.000)
Stock of children	0.000 (.002)
Education	
Primary	0.018 (.001)
Secondary (reference)	---
Postsecondary	–0.013 (.000)
Household income (logged)	0.005 (.000)
Marital status	0.032 (.000)
Rural residence	0.006 (.000)
n	87,006

Notes: CI = 95% confidence interval; *p* = *p*-value. Results are presented as marginal effects for comparability with the linear probability model regressions. Clustered robust standard errors (in parentheses). Dependent variable = 1 if probability of giving birth in year *t*.

Table A-4: LPM regression results: Family 500+ cash transfer and fertility, with different categorizations of marital status as a covariate

Coefficients	**(1)** **Cohabit with married**	**(2)** **Cohabit alone**	**(3)** **Cohabit with singles** (baseline approach)
Cash transfer eligibility	0.015 (.002) CI: .011, .019 *p* = .000	0.015 (.002) CI: .011, .019 *p* = .000	0.015 (.002) CI: .011, .019 *p* = .000
Age	0.018 (.000)	0.018 (.000)	0.018 (.000)
Age^2	0.000 (.000)	0.000 (.000)	0.000 (.000)
Stock of children	–0.107 (.000)	–0.107 (.000)	–0.107 (.000)
Highest education level			
Primary	0.007 (.000)	0.007 (.001)	0.007 (.001)
Secondary (reference)	---	---	---
Postsecondary	0.001 (.000)	0.001 (.000)	0.001 (.000)
Household income (logged)	0.002 (.000)	0.004 (.000)	0.002 (.000)
Marital status	0.012 (.000)	–0.004 (.000)	0.011 (.000)
Rural residence	0.002 (.000)	0.002 (.000)	0.001 (.000)
n		87,006	

Notes: CI = 95% confidence interval; *p* = *p*-value. Clustered robust standard errors (in parentheses). Dependent variable = 1 if probability of giving birth in year *t*.