

Can Family Policies Influence the Transition to Parenthood in Turbulent Times?

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Work in progress!! Do not quote!

1. Introduction, the basic question of our research

Given the current trends and levels of fertility in developed countries, it is not surprising that the possibility and necessity of policy interventions is being raised and debated, and it is no coincidence that the effectiveness of policy interventions is becoming a research issue. In Europe and Asia, most developed countries have been characterised by declining fertility in the last decade, with fertility levels far below reproduction (Sobotka, .Fürnkranz 2020. Boydele et al., 2023). Lowest-low fertility is no longer a feature of the southern European countries and the former socialist countries, following the rapid transition from early to late childbearing, but also of highly developed Asian societies. The perplexity is compounded by the fact that the recent fertility decline is particularly marked in the Nordic countries, which have been considered by both demographers and social policy-makers as exemplary in terms of solidarity, gender equality and universal provision for children (Comolli et al. ...). It is therefore not surprising that the possibility, necessity and effectiveness of social policy intervention is being raised and debated.

We are also interested in the effectiveness and consequences of policy interventions. In this research, we seek to answer the question of the impact of policy changes on becoming parent, having the first child. We believe that Hungary is particularly well suited to investigate the effectiveness of family policy interventions for a number of reasons. First, because of the long history of socio-political interventions targeting fertility. Four decades ago, in 1985, fertility levels below the replacement reproduction level led to the introduction of the 24-month paid childcare leave, which is still in force today, following the Swedish model. This measure, which is based on the principle of "opportunity cost", was introduced in the communist era to alleviate the conflict between family and work. Second, Hungary is also interesting because family policy measures have undergone a number of profound changes in the three decades we study (1985-2016), as will be discussed in detail later. Thirdly, by international comparison, Hungary has spent and continues to spend substantial amounts on family allowances to reduce the cost of children. By international comparison, in 2015, according to SNIP data, Hungary had the highest amount of cash family allowances relative to average wages, at almost 20 percent of average wages. Fourthly, Hungary has undergone a pervasive social transformation since 1989-91, which has changed all aspects of everyday life, including the conditions for having children. Hungary, as well the other post-communist countries moved from a hierarchical redistributive economy based on state ownership to a market-integrated economy based on private ownership. The monolithic one-party system and power structure is being replaced by a

competitive political structure based on choice. Countries are returning from socialism to capitalism through a deep economic recession. Fifthly, a new pattern of family formation is spreading in parallel with the transformation. Cohabitation has become more common, childbearing has been postponed to a later age, and a fertility transition has taken place (Sobotka 2000, Spéder, Kapitány 2014). The new circumstances obviously played a role in triggering and accelerating the fertility pattern shift, but we assume that the process of pattern change is partly autonomous, as it took place in all former socialist countries, although they cannot be called uniform in terms of the transition, and their economic and social system (cf. Bohle, Greskovics 2010, Add LIT!)

While frequent and deep changes in the institutional framework of family policy are "ideal" for analysing the impact of measures, the parallel processes of economic transformation, institutional rebuilding as well fertility pattern change seem at first sight to be exceptionally unfavourable for analyse of the effectiveness of family policy measures. Is it expected that the introduction of any family policy measure can have an impact in times of 'turbulence', when all circumstances of life are changing? The deep economic recession, the contraction of the labour market, the transformation of the institutional system and privatisation do not seem to be favourable conditions for the impact of any policy measure. Or maybe the causality is the other way round: the role of welfare policies is precisely to protect the individual from social risks, i.e. to provide stability for the individual in times of risk. If this is the case, then the introduction of family policy measures, or even their transformation, should have an impact on the fertility behaviour of the individuals concerned. Our earlier analysis of the risk of having a third child shows that fertility measures and even some welfare measures have a positive effect and may have fertility "side effects" (Spéder et al. 2020), but is this true for becoming a parent, a life-course milestone that is more of a lifestyle change than having a third child? After all, by becoming a parent, have we taken an irreversible decision, are we entering an unknown territory? In times of particular turbulence, at least according to risk researchers (Rodin 2014), it seems rational to wait until a time of stability surrounds us before taking this decision, to postpone parenthood.

What makes our analysis both difficult and exciting is that we have to "identify" the impact or ineffectiveness of family policy decisions in a macro context where a myriad of other events are taking place in parallel. A key question is whether we can find macro-level indicators that can be used to 'disentangle' the flows associated with family policy, economic changes and other changes (NiBrochlain, Dyson 2010, Kreyenfeld 2021).

In our modelling, we identify three macro level conditions when examining the risk of becoming a parent. Our interest focuses on well-defined policy periods, which we intend to measure the impact of policy regimes. We control for economic conditions by female employment rate and inflation. We include fertility pattern change as a diffusion process with the estimated mean age of becoming a parent. Finally, we control for compositional effects in the population over time, such as the expression of educational attainment, by including individual factors in the model.

In interpreting a given period as an indicator of family policy measures, it is assumed that if the risk (probability) of having a first child in a given period increases or decreases significantly, taking into account control factors, then this change is *due to the policy measures introduced, due to the new policy package*. We are aware that this assumption is not unproblematic, as a number of other events or confounding factors that occurred during the period may also affect the risk of births (cf. Milligan 2005, Kreyenfeld 2021). However, there is a strong argument for maintaining this

assumption, as if the subsidies introduced (or abolished) during the period under study are of major importance, there is good reason to link the change in childbearing practices to them. We are encouraged in our approach by the fact that others have successfully used this analytical exercise to explore family policy effects (Hoem 1993; Hoem, Prskawetz, Neyer 2001; Oláh 2003; Aassve, Billari, Spéder 2006, Kreyenfeld 2021,).

So, if some family policy effects can be captured in the circumstances briefly outlined above, there is good reason to believe that the effects could be detected in less turbulent times and in other countries. Of course, and especially when it comes to institutions, we cannot ignore the concept of path dependence, that the institutional structure of the present is influenced by the institutional structure of the past. In this case, the results will be less generalizable, but still instructive.

Our analysis follows the following logic. First of all, we review the literature that helps to clarify the macro-level effects, including the effectiveness of family policy measures, notably cash benefits and parental leave. We then describe the family policy changes in Hungary over the 30 years under review and formulate hypotheses on the expected effects and consequences. As part of the analytical strategy, we present the data and the characteristics of our event-history analysis. This is followed by a presentation of the results and a discussion of the findings.

2. The impact of social circumstances on childbearing behaviour: a literature review

On the effectiveness of family policies

(THIS SECTION WILL BE EXTENDED)

Although the study of the fertility effects of family policy measures is not new (Demény 1987) and has been on the agenda continuously, such analyses seem to have increased in recent times. A clear sign of this growing interest is that, although there have been systematic studies in the past (Gauthier 2007), there has been a proliferation of such studies in recent years (Sobotka et al., 2019, Bergswick et al 2020, Gray et al., 2021) A significant change is that while earlier analyses summarising international comparisons emphasised the limited and contradictory results of fertility effects, Gauthier (2007), recent summaries based on country studies highlight the impact of the measures introduced (Bergswick et al 2020).

The richness of the relevant literature justifies defining our review according to our research question: we focus on the fertility consequences of family allowances (cash benefits and tax reliefs) and parental leave subsidised by flat rate and earnings-related lump sums. (Consequently, we do not deal with child care, housing, health care or artificial insemination.) We also limit ourselves to looking at the effectiveness of individual country family policy measures, and do not deal with international comparisons. Preference will be given to analyses that take into account the heterogeneity of society, the fact that different groups may respond differently to a given measure. Finally, taking into account the pitfalls about the effectiveness of social policy measures (Hoem 2008, Bergswick et al, 2020, Kreyenfeld 2021), we consider here the problem of confounding factors, reversed causality, we focus on analyses that are classified as 'quasi-experimental' analyses (Bergswick et al. 2020), and those event history analyses that can take into account that cause precedes effect in time (NiBrochlain, Dyson 2007), although we are aware that the possibility of drawing false conclusions cannot be excluded here either.

(Cash benefits)

Cash grants are intended to reduce the direct costs of raising children. The analyses cover three forms: regular (usually monthly), one-off (usually at birth) and large grants, and grants through the tax system.

Universal cash subsidies, even at low levels, directly reduce the cost of having children, but Bergswick argues that their effect is short-term and temporary (im. 951). In Norway, a substantial increase in the family allowance (child benefit) increased the risk of becoming a parent, primarily among young people in cohabiting relationships (Gallpway, Hart 2015). In Germany, a substantial increase had, surprisingly, no effect on low-income earners, but did have an effect on the birth of a second child among higher-income earners. In Hungary, Gábos et al. (2009) examined the impact of direct cash subsidies and tax incentives on TFR and concluded that there is a positive relationship between their real value and fertility trends (Gábos et al. (2009)).

There are several analyses of the fertility effectiveness of *one-off*, *large* lump-sum subsidies linked to births introduced for direct pronatalist purposes. The Allowance for Newborn Babies (ANB), introduced in Quebec, Canada, as a pronatalist measure, provided a unique opportunity to measure the impact, as the fertility trends in Quebec were comparable to those in other Canadian territories that had not introduced ANB. This programme was a one-off for the first and second child, and a multiple-off for the third, and provided an order of magnitude higher benefit to those who had or raised the child. Milligan's (2005) analysis found that the ANB particularly encouraged the birth of third children, while Malek et al. 2019 found that the program also increased the odds of having a first child and found that middle-income earners responded most strongly to the program.

The 'baby bonus', which was introduced in Australia and has become popular elsewhere, has led to an increase in fertility, especially among lower income earners (Drago et al. 2011; Sinclair et al. 2012). Parr and Guest (2011), however, point out that the increase in fertility may be a consequence of favourable circumstances (economic growth).

In contrast, the "baby bonus" type of maternal capital introduced in Russia, which was specifically designed to increase fertility and was a very substantial financial subsidy Slomzynski and Yurko 2014, Zakharov (2024) argue that it had mainly a timing effect (bringing forward births) and had a minimal quantum effect.

(Tax benefits)

Measures introduced in France in the period 1978-82, such as the increase in *direct cash* grants and *tax credits*, have had an impact on parenthood (first child) and the risk of having a third child, according to research by Larague-Saliné (2008). According to Breton et al. (2005), who studied the evolution of the parity progression ratio, the impact of the measures was to increase the probability of having a third child.

A mixed (contradictory) picture of the impact of the *tax credit* emerges when interpreting the fertility consequences of the Working Family Tax Credit for children in the UK from 1999 onwards who have earned income but have essentially lower incomes and can claim it. While Brewster et al. (2009) find an increase in fertility among low-income two-earner families after the measure, Ohinata (200) finds no fertility effect for two-earner families and at most a timing effect.

An analysis of the consequences of the introduction of the tax credit in Spain also reports only very limited increases in fertility (Azmat, González 2009).

(Maternity leave, parental/childcare leave¹ and during the period)

The basic function of parental leave is to allow you to combine work and having children. Three features are highlighted: firstly, it allows parents to care for their children during this period; secondly, benefits (usually) compensate for lost earnings; and thirdly, it ensures a return to work (guarantee). While the job guarantee is widely used and its positive role is universally accepted, there is considerable variation between countries in the length of leave and the level of compensation. Furthermore, there is no consensus on their impact on fertility. It is hypothesised that *not-too-long* leave and *high compensation for loss of earnings* help both childbearing plans and return to the labour market (D'Addio, D'Ercole 2005; Matysiak, Szalma 2014), as the opportunity cost of having children is low.

The case of Austria is instructive, where in 1990 the relatively high (40% of net female earnings) fixed-rate parental leave was increased from one to two years. Both Lalive, Zweimüller (2009) and Hoem et al. (2011) conclude that extending paid childcare leave by one year increased the propensity to have children: in the first study the finding refers to the birth of the 'next child', in the study by Hoem et al. (2011) to the probability of having a third child. In contrast, the relevant analysis by Št'asná and Sobotka (2009) classifies the effect as a transitory, timing effect. Lalive and Zweimüller also point out that longer paid leave and longer job security may have had an incentive effect separately.

Several Scandinavian countries have also introduced a cash benefit as a substitute for nursery care (home-cash-for-care benefit), which is available to those who do not use nursery care (in kind) but care for and raise their children at home. This can be seen as a kind of extension of classical parental leave. In Finland, the introduction of an extension and remuneration of home childcare has been shown to increase the probability of having a third child (Vikat 2004). Aassve and Lappegard (2009) find similar results for Norway; those who stay at home longer are more likely to have children again.

Analyses in the former socialist countries also show effects. Andorka observed that the introduction of paid parental leave in Hungary increased the fertility of women with higher education (Andorka 1996). Based on modelling, Kapitány finds that the introduction of the earnings-related childcare allowance in 1985 increased the number of births by about 7 per cent between 1986 and 1997, and although there may be a timing effect for some of the births, there is certainly a fertility increase in the older cohorts (Kapitány 2008).

Matysiak and Szalma (2014) show that unlike Poland, where paid parental leave is short (6 months), in Hungary, where it is much longer (36 months), the probability of having a second child is higher. And studies by Gerber and Perelli-Harris (2012) suggest that in Russia, parental leave has played a crucial role in the birth of second children during a period of 'turbulent' social change, as it has significantly mitigated the costs of social transition for those who have children.

¹ The term parental leave, which is widely used in international literature, is hardly used in Hungarian literature, and is replaced by *gyed* or *gyes*. Thus, in Hungary, the type of benefit (earnings-related *gyed* and fixed amount *gyes*) is used to refer to this early period of child-rearing. However, if you are an employed person, you are formally on unpaid leave for parents with young children, and if you have not previously been employed, you receive a financial benefit, which also entitles you to health care.

(Heterogeneity)

We agree with Thévenon and Gauthier who suggest that the researchers' *assumption that* the behaviour of the population under study *is homogeneous rather than heterogeneous* may hinder the exploration of effects. The validity of this approach is supported by the fact that the extension of parental leave in Austria was associated with higher fertility growth among lower income groups (Lalive, Zweimüller 2009). In Norway, lower income earners were more likely to take advantage of the extension of paid leave and were more likely to have a second or third child (Aassve, Lappegard 2009). The French analysis does not explicitly address the differential impact of the policy, but assumes that all groups were affected equally. Australian studies show that the baby bonus tends to encourage lower income groups to have more children (Drago et al. 2011). In contrast, in Quebec, an ANB similar to the baby bonus tended to increase fertility in higher income groups (Milligan 2005). Against this background, however, we consider it particularly relevant to systematically examine the extent to which a given intervention is a homogeneous incentive and the extent to which the motivation of different social groups may differ when examining individual family support measures.

Economic environment

(THIS SECTION WILL BE LARGELY EXTENDED)

There are many analyses that show the impact of the macroeconomic environment on fertility. In particular, the impact of the economic recession on fertility has been the subject of many analyses over the last decade (Goldstein et al., 2013). Comolli, 2017 also shows that other social and economic indicators, such as the consumption sensitivity index, have an influence on productivity developments. The economy obviously has links with other subsystems of society, such as the political subsystem, but it can be assumed that economic dynamics have a more or less independent impact. (TO BE EXTENDED!)

(It is worth pointing out here the results of Kohler's analysis that the impact of certain indicators on fertility differs at the macro and micro level (Kohler, Kohler 2002).

Diffusion of new behavioural patterns (postponement) as an independent mechanism

The idea of diffusion has long played a crucial role in explaining changes in demographic behaviour. Many demographers (Montgomery, Casterline 1996, Caldwell 2001, Kohler 2001) have suggested that interpersonal information flows, social learning, pattern following as elements of the diffusion process play a key role in demographic behaviour change, for example in the spread of contraceptive use or the practice of having fewer children. The description of diffusion can already be found in Simmel's work as the diffusion of fashion (Simmel 1906), but from the demographic and economics literature, Rogers' (1983) concept of diffusion of innovation is taken as a reference. According to his concept, innovations - whether it is the smartphone, cohabitation as the first relationship, or the need to have equal rights for women - spread slowly at first, as they are only adopted by a handful of visionaries. Then the pace of spread accelerates as the majority of those concerned join in, and finally

slows down again as only a hard core of resistance remains. This description results in the S-shaped spread pattern familiar in the diffusion of technological innovation, described by Rogers (1983). The above concept of diffusion has been developed for product innovation processes, but it can be used to describe the process of diffusion and purchase of new products in the consumer market from introduction to saturation. The theory has also been used to capture processes outside the economic sphere, for example in describing the spread of educational attainment, the spread of certain new ideas such as the idea of gender equality (Fischer 1978, Fischer, Hout 2006, Pampel 2011), and, as already mentioned, the spread of contraceptives in demography, and the spread of new demographic behaviours in general (Casterline 2001, Caldwell 2001, Kohler 2001).

Kohler and colleagues see *the* fertility of Southern Europe and Eastern Europe's lowest-low fertility at the turn of the millennium in the *diffusion of delayed* childbearing, or in other words the spread of late childbearing (Kohler et al. 2002). In presenting the concept, they elaborate on the role of school expansion in triggering the spread of late childbearing, while attributing a crucial role to the influence and pattern shifting of the process through interactions, with its acceleration and subsequent slowing and saturation. During the "postponement transition", society shifts from an early fertility pattern to a late fertility pattern. This is inevitably associated with a temporary decline in fertility and, as is well known, since recuperation is incomplete in many countries, the new pattern implies lower fertility levels.

The key question for our modelling is whether we accept that the spread of late childbearing is an autonomous process, that the diffusion process is mostly a process independent of politics and economics. That is, that it takes place even in the absence or otherwise of policy interventions, and that the new pattern of behaviour is not a consequence of policy interventions. Moreover, it would have taken place even if the evolution of economic performance, the fluctuation of performance, had been smaller or larger. Another key question is whether we accept that the diffusion process can be described by an S-shaped curve.

Accepting the above, late childbearing can be seen as a separate phenomenon at the macro level, in the context of policy interventions, and can be described by an indicator related to the average age of women having their first child. Accepting that the curve describes an S-shape, following the practice of others (Fischer, Hout 2006), we can form a macro indicator of diffusion by fitting a logistic curve (Specifically, we considered the evolution of the average age at first childbearing as the indicator describing the spread of late childbearing, but the values of the logistic function that best fits the process were considered as the indicator that regresses the independent flow.) We are convinced that, if we accept that there is a diffusion process in the spread of the pattern of late childbearing, it is essential that this is represented by an independent (instrumental?) indicator, and that the impact of social policy interventions is interpreted in a way that takes into account both the autonomy of the functioning of the economy and the autonomy of the mechanism of the spread of the pattern of late childbearing.²

² If we use the raw MAFB data, we get similar results. We have also performed a modelling where the estimated MAFB is not an independent macro variable, but we relate the micro variable of age to the value of the MAFB at any given time (relative age). The results of this modelling are presented in the Appendix and our results would vary only minimally.

3. Nodes of the Hungarian family support system and its restructuring and impact on parenthood (hypotheses)

An outline of the initial situation of the family policy institutional system is essential for the analysis of family policy change. Although all measures can influence childbearing behaviour, following the ideas of Neyer and Andersson (Neyer and Andersson 2007), we need to identify which measures or packages of measures are considered *milestones* or nodes and which are institutional solutions that can be seen as modifications or 'fine-tuning' of specific programmes.³ In this work, we consider a change to be a milestone if a) the basic principles of the programmes, the criteria for access have changed, if b) there has been a major reallocation of funding between programmes, and if c) a particular measure has become 'visible', 'tangible', has crossed the 'stimulus threshold' of the people concerned, and the change is 'plastic' and easily understood by those affected. Obviously, these may differ in part in the case of parenthood and having a third child, because the programmes differ in part according to the number of children, but also because those without children and those with children are differently informed about the programmes. Our disaggregation is therefore based on whether or not access (emerged or became dominant through change) is a factor in the changes. We have divided the three decades between 1985 and 2015 into five periods with four family policy packages.

(I. Extensive support during the late socialist time, 1985–1994)

The main element of the family policy instrument is the monthly family allowance until the child reaches adulthood, which used to be linked to employment but has been a subjective right since April 1990. A *lump-sum maternity allowance* is payable on the birth of a child and a childcare allowance (gyes) for three years. Employed and insured persons can take parental leave until the child is three years old and then *unpaid leave*.⁴ The insured receive *benefits* at the rate of earnings for 24 months after the birth of the child.⁵ The law and established practice ensure that the mother can return to her previous job (guarantee) after the expiry of the parental benefit (unpaid leave), or possibly earlier. The government has also supported family formation and child-rearing through various *housing subsidy schemes* (social pol, soft loans), *benefits in kind* (effectively free nurseries, kindergartens, public education) and *price supplements*. The first freely elected government (1990–1994) maintained and extended the above institutional programmes established during the socialist period. As a welfare measure, it extended parental leave for large families, subsidised at a flat-rate (up to the age of eight for the youngest child), but was unable to maintain the value of the benefits because of accelerating inflation.

H0a) The risk of having children when attending school is well below average in all periods.

H0b) Women without work have a higher risk of having children than women with work (motherhood as an alternative role)

³ The institutional system has been the subject of numerous studies, as it has a long history, is constantly changing and has become increasingly complex over the last half century (Andorka 1987; Miltényi 1971; Andorka, Tóth 1992; Tomka 2003; Gábos 2005; Ignits, Kapitány 2006; Makay 2015, 2017; Spéder 2015, Darvas-Szikra 2017).

⁴ This is also available to the father after the child turns 1. These details are not covered here.

⁵ In the first period after birth (1–6 months), the mother is entitled to maternity benefit (tyás, today csed) with 100% compensation, in the following period (7–24 months) the mother is entitled to *childcare allowance (gyed)* (70% compensation of earnings), after that (25–36 months) the mother/parent is entitled to a fixed amount of childcare benefit (gyes), regardless of earnings.

(Austerity package, ('Bokros package'): means-tested family allowances, 1995–1998)

The first radical institutional reform was introduced in 1995 as part of the "Bokros package".⁶ In 1995, the family policy system was radically transformed. Paid parental leave, which had hitherto been based essentially on employment (contributions), was abolished, and family allowances and paid childcare allowance (up to the age of 3) were subject to an income test (means test).⁷ However, maternity leave paid during maternity leave (24 weeks) was retained.⁸

H1a) In policy period 2, the probability of becoming a parent will be significantly lower than in the preceding baseline period.

H1b) The dominance of the means-testing principle means that the situation of those with lower education does not worsen, while that of those with middle and higher education worsens.

H1c) Women without work have a better risk of having children than women with work (motherhood as an alternative role)

(III. The first period of the tax credit: the reintroduction of universal family support and the introduction of the family tax credit, 1999–2002)

The second Conservative government (1998-2002) both restored the family support system of the first Conservative government and introduced a system of benefits based on income taxation. Income-tested access was abolished and fixed parental allowances (family allowances, child benefit) became *universal*. *Earnings replacement* allowance (gyed) for insured persons is reintroduced. A new feature and a new principle of entitlement is the introduction of a much more generous *family tax credit* for children, linked to the number of children. This family policy regime is essentially identified with the *tax credit*. This is justified as the family support system introduces a different distribution principle from the previous one, linked to tax/ income generating capacity and redistributing income among taxpayers according to the number of children and the burden of support. At the same time, the bulk of family support expenditure at this time continued to finance traditional benefits (family allowances, child support, child benefit).

H2a) As a result of the 'reintroduction' of the former institutions, the chances of becoming a parent will be higher than under the 'Bokros package'.

H2b) The restoration of earnings-related benefits will improve the risk of becoming a parent, in particular for middle- and high-skilled workers.

(IV. Turn to universalism (2002-2010)

A significant change has taken place in the area of tax benefits. The number of children and the size of their income were tightly restricted; only those with 3 or more children or less than a certain income could claim them. Access to family allowances remained a principle based on the right to benefit and on employment. It is worth emphasising *universality*, because in 2006 the amount of the basic family allowance doubled.

⁶ Of course, in the presentation of this section and beyond, we cannot go into all the substantive programmes and changes, as others have done and we have done in our other analyses (Ignits, Kapitány 2007, Makay 2015, Spéder 2015). For example, Makay, describing the situation in 2014, counted 22 family policy programmes (Makay 2015). In our analysis by number of children, we will further specify the family support programmes relevant to our analysis.

⁷ Except for those with 3 or more children, who continued to receive the family allowance as a taxable person.

⁸ Its value has been reduced to 70% of previous earnings.

H3a) Due to the dominance of the “universality” principle, the chances of becoming a parent are improved for lower and partly middle-skilled workers and for non-employed workers.

H3b) Cutting family tax credits reduces the chances of employed middle and high earners becoming parents.

(V. The dominance of tax relief (2010–)

With the change of government, the new government has restored the family support system, which was at the top of its political priorities, “as scheduled” (by raising the parental leave period to three years again) and reintroducing the family tax benefits it had previously introduced. Subsequently, further substantial changes were introduced from 2014. The main aim of these changes is to better reconcile work and family, i.e. the demands of employment and family responsibilities. Allowing people to work while receiving family allowances (“extra childcare allowance”) provides a clear financial incentive to return to the labour market as soon as possible.

H4a) The ‘roll-back’ of the family tax credit increases the chances of employed middle and high earners becoming parents.

Table 1: A summary of the policy periods and our hypotheses

Policy periods	Main changes and features	Our hypotheses
Jan 1985 – Dec 1991	Pre-transition, pre-crisis: extensive, universal and wage-related family supports	(baseline)
Jan 1992 – May 1995	Post-transition crisis: mass unemployment, economic insecurity, relative weakening of family policy (inflation, devaluation)	
Jun 1995 – Dec 1998	Austerity measures (“Bokros Package”): only income tested allowances	Decreased hazard for the employed, especially the secondary and tertiary educated
Jan 1999 – Apr 2002	Introducing tax relief: universality, wage-related child-rearing support reintroduced, tax relief for families with children	Reversal, increase for the secondary and tertiary educated, the employed
May 2002 – Apr 2010	Turn to universal access and support: tax relief abolished, flat-rate family allowance doubled, dominance of universality	Increased hazard for the low (and lower secondary) educated
May 2010 – Jul 2016	Strengthening tax relief: towards the dominance of tax relief for families with children	Increased hazard for the employed, mainly tertiary and secondary educated

4. Data and methods

Data and sample selection

For the analyses we rely on an event history database created from the Hungarian Generations and Gender Survey (known as the ‘Turning Points of the Life-Course Panel Survey’; see Vikat et al. 2007; Murinkó and Spéder 2016). The first wave of the survey took place in 2001 and the fifth in 2016–17. We used all five waves of the survey, which includes monthly information on respondents’ family life course trajectories.

Our working sample includes women and men who participated in at least two waves. Practically, it means the inclusion of those original panel members (joined in the first wave in 2001) who also

participated in the second wave and those new panel members (refreshment sample added in the fourth wave in 2012) who also participated in the fifth wave. This is important because questions on employment and education history were only asked when respondents were interviewed for the second time.

We dropped original panel members who only participated in wave 1 and new sample members who only participated in wave 4 (4190 deleted); respondents with no information on the month of the first birth (8 deleted); respondents whose first child was born before the age of 16 (because our employment and education histories start at age 16) (148 deleted); respondents with missing information on covariates (9 deleted); and respondents with missing, incomplete or inconsistent partnership histories (21 deleted). In total our analytical sample includes 8 759 respondents (about half of them are women and half are men) (*Table 2*).

Table 2: Number of cases in the working sample

	<i>Women</i>	<i>Men</i>	<i>Total</i>
Persons	4 327	4 432	8 759
Time at risk (person-months)	481 697	627 348	1 109 045
Events/ failures (1 st births)	3 052	2 460	5 512

Dependent variable

We use event history analysis (piecewise constant proportional hazard models). Our dependent variable is the start of pregnancy leading to the first live birth (i.e. the date of the first birth minus nine months).

The risk period, measured in months, starts at the 16th birthday of the respondent or on 1 January 1985, whichever happened later (left censoring), and ends on the 40th birthday of women and at the 45th birthday of men⁹. Observations are censored at the date of the last interview minus nine months or when respondents started to live together with an adopted child¹⁰, whichever happened first.

Thus, 5 512 first children were born during the observation period (*Table 2*).

Duration is expressed as the age of the respondent in years (16–20, 20–24, 25–29, 30–34, 35+) (*Table 3*).

Table 3: Distribution of exposure time for the duration variable (%)

	<i>Women</i>	<i>Men</i>	<i>Total</i>
<i>Age</i>			
16–20	33.4	25.3	28.8
20–24	34.5	31.3	32.7
25–29	18.3	20.8	19.7
30–34	8.8	11.8	10.5
35+	5.0	10.8	8.3
<i>Total</i>	100.0	100.0	100.0

⁹ In our working sample only 13 women and 66 men had their first child when they were aged above 40; only 2 men had a first child when aged above 45. Setting a lower limit for men would not change the results.

¹⁰ Only 7 first children were adopted in our sample.

Independent variables

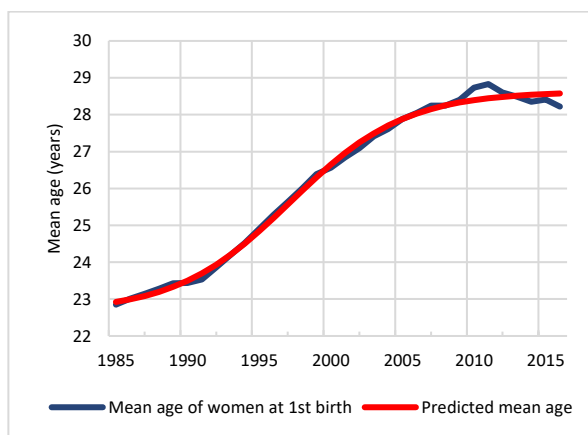
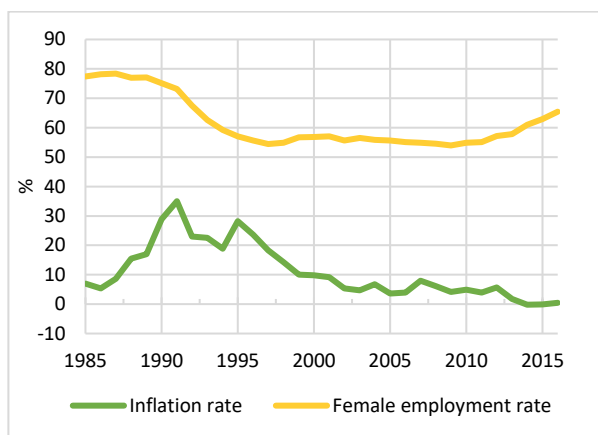
Macro-level time-varying covariates:

- *Policy periods*: This is the main variable of interest. Our analysis covers the period between 1985 and 2016, and six policy periods are differentiated based on policy measures related to first births (see *Section 3* and *Table 1*).
- *Inflation rate*: consumer price index, percentage change from previous year, values lagged by 1 year (source: Hungarian National Bank)
- *Female employment rate*: all employed women related to the female source of the labour force; annual harmonized data, expressed in percentage. Working age population is defined as those aged between 15 and the legal age of pension. For women, the upper age limit was set at 54 until 1996, 55 between 1997 and 1999, 56 between 2000 and 2001, 57 between 2002 and 2003, 58 between 2004 and 2005 and 59 from 2006. Source of the labour force is calculated as working age population + economically active out of working age population. Data is based on HCSO labour statistics (till 1991) and Labour force surveys (from 1992); source: KSH (2006).
- *Predicted mean age of women at 1st birth*: logistic growth curve with four parameters fitted to data on mean age at first birth for women; source: authors' calculation based on HCSO demographic yearbooks.

Table 4: Values of the macro-level covariates by calendar year

	<i>Inflation rate, lagged by 1 year</i>	<i>Female employment rate</i>	<i>Mean age at first birth (women)</i>	<i>Predicted mean age at first birth (women)</i>
1985	8.3	77.4	22.9	22.9
1986	7.0	78.2	23.0	23.0
1987	5.3	78.4	23.1	23.1
1988	8.6	77.0	23.3	23.2
1989	15.5	77.1	23.4	23.3
1990	17.0	75.1	23.4	23.5
1991	28.9	73.2	23.5	23.7
1992	35.0	67.5	23.9	23.9
1993	23.0	62.6	24.2	24.2
1994	22.5	59.3	24.5	24.5
1995	18.8	57.1	24.9	24.8
1996	28.2	55.6	25.3	25.2
1997	23.6	54.5	25.6	25.6
1998	18.3	54.9	26.0	25.9
1999	14.3	56.7	26.4	26.3
2000	10.0	56.9	26.6	26.6
2001	9.8	57.0	26.8	27.0
2002	9.2	55.6	27.1	27.2
2003	5.3	56.5	27.4	27.5
2004	4.7	55.9	27.6	27.7
2005	6.8	55.6	27.9	27.9
2006	3.6	55.1	28.1	28.0
2007	3.9	54.9	28.3	28.2
2008	8.0	54.6	28.3	28.3
2009	6.1	54.0	28.4	28.3
2010	4.2	54.9	28.7	28.4
2011	4.9	55.1	28.8	28.4
2012	3.9	57.1	28.6	28.5

2013	5.7	57.9	28.5	28.5
2014	1.7	60.9	28.4	28.5
2015	-0.2	63.0	28.4	28.6
2016	-0.1	65.4	28.2	28.6



We control for the following individual-level fixed covariates:

- Sex
- Birth cohort: 1940–1954, 1955–1964, 1965–1969, 1970–1974, 1975–1979, 1980–1984, 1985–1989, 1990–1994¹¹
- Ethnicity: roma, non-roma (based on self-identified primary or secondary ethnicity or interviewer's evaluation)
- Number of siblings (the number of children born to the respondent's biological mother –1): 0, 1, 2+
- Religiosity: follows the teaching of the church, other (including people religious in their own way, not religious, doesn't know)
- Highest level of education of parents (of the parent who had the highest education): primary education or less, vocational training school or secondary education, tertiary education

¹¹ Due to how the event history file is set up, the first cohort whose whole fertile period (aged between 16 and 40/45) is included in the analysis was born in 1964. Respondents born before 1964 are included in the working sample only if they were childless after Jan 1985. This is why we have fewer respondents from earlier cohorts.

Table 5: Distribution of time-constant covariates by sex (%)

	Women	Men	Total
<i>Sex</i>			
women	–	–	49.3
men	–	–	50.7
<i>Birth cohort</i>			
1940–1954	2.5	3.7	3.1
1955–1964	7.6	13.1	10.4
1965–1974	37.4	33.5	35.4
1975–1984	41.7	39.1	40.4
1985–1994	10.8	10.6	10.7
<i>Ethnicity</i>			
non-roma	95.0	95.0	95.0
roma	5.0	5.0	5.0
<i>Number of siblings</i>			
0	11.8	11.5	11.6
1	51.9	51.8	51.9
2 or more	36.3	36.7	36.5
<i>Religiosity</i>			
follows the teaching of the church	13.2	9.8	11.5
other answer	86.8	90.2	88.5
<i>Education of parents</i>			
primary or less	21.7	25.8	23.8
vocational/secondary	57.7	54.9	56.3
tertiary	20.6	19.3	19.9
<i>Total</i>	100.0	100.0	100.0

Individual-level time-varying covariates in the models:

- Partnership status: married, cohabiting, does not live with partner
- Combined activity status, educational attainment and sex:
 1. works (employed or self-employed) + primary education or less
 2. works + vocational training school (“szakmunkásképző”) or secondary education (“szakközépiskola”, “gimnázium”)¹²
 3. works + tertiary education
 4. full-time student (if respondents study and also work in any way, they are classified as employed)
 5. does not work (including homemakers, unemployed and other inactive people) + women¹³
 6. does not work + men

¹² Initially we differentiated between these two education categories in our models but they proved to be very similar.

¹³ We could not differentiate out-of-employment spells by education level due to low cell sizes. Almost all of these spells involved people with at most primary education.

Table 6: Distribution of exposure time for the dynamic covariates (%)

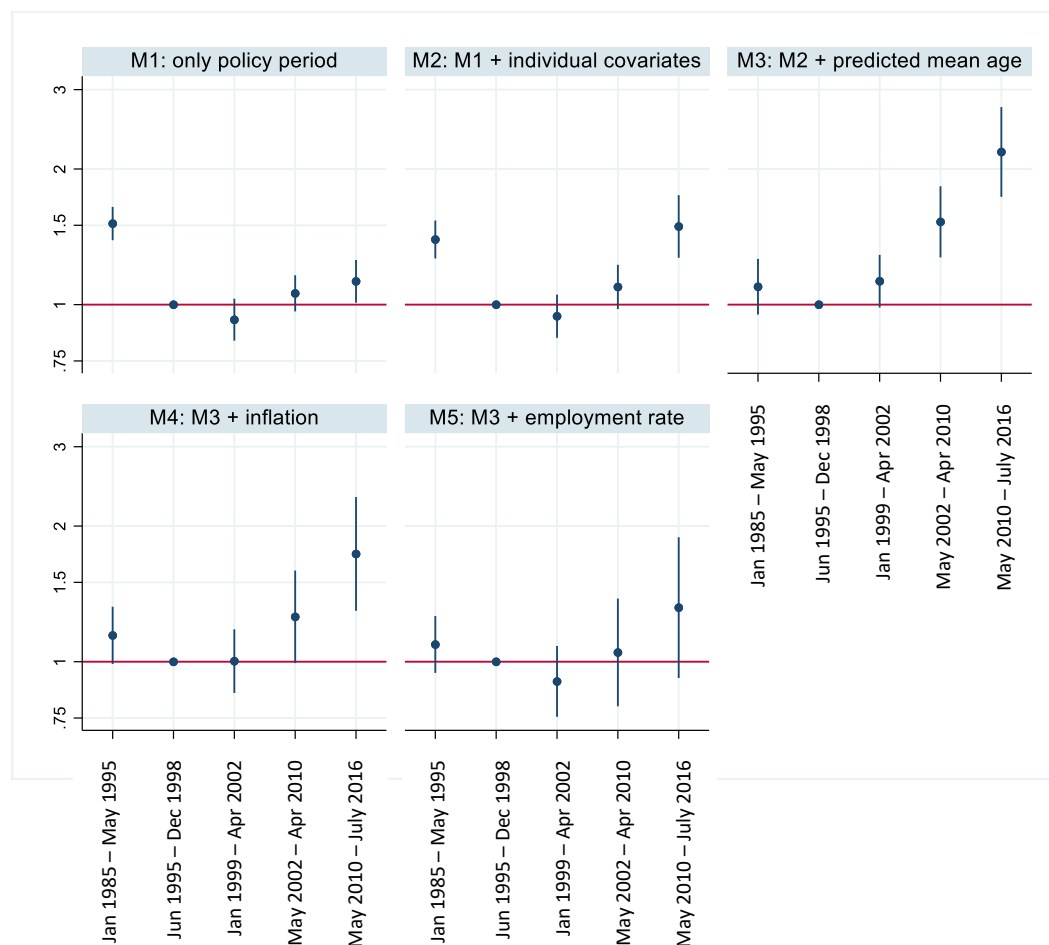
	Women	Men	Total
<i>Partnership status</i>			
does not live with partner	74.1	82.0	78.6
cohabiting	14.1	10.4	12.0
married	11.8	7.6	9.4
<i>Activity status & highest level of educational attainment</i>			
works & primary	8.0	12.4	10.5
works & vocational or secondary	39.6	50.1	45.6
works & tertiary	17.6	10.8	13.7
full-time student	30.0	20.0	24.3
does not work & woman	4.8	–	2.1
does not work & man	–	6.7	3.8
<i>Policy period</i>			
Jan 1985 – May 1995	32.9	31.5	32.1
Jun 1995 – Dec 1998	15.6	15.0	15.2
Jan 1999 – Apr 2002	15.3	15.0	15.1
May 2002 – Apr 2010	25.7	26.2	26.0
May 2010 – July 2016	10.5	12.3	11.6
<i>Total</i>	100.0	100.0	100.0

5. Results

In presenting the results, we focus on the interpretation of the impact of policy periods, using the austerity period (the second period) as the reference point in each model (*Figure 1*). During these time, family benefits were available to those with less than a given income, based on an income test. If we include only the policy periods in our models (M1 in *Figure 1*), we find that the risk of becoming a parent do not differ between the three middle periods and was lower than in the first period, when the institutions that characterised the end of socialism were still in place. This somewhat lopsided u-shape corresponds to the curve describing the evolution of the total fertility rate.

After controlling for individual variables in the model (M2, *Figure 1*), i.e. after controlling for composition effects, the hazards of becoming a parent in the first 10-year period and the last 6-year period are clearly higher than in the 15-year period between 1995 and 2010, which is spanned by the two periods.

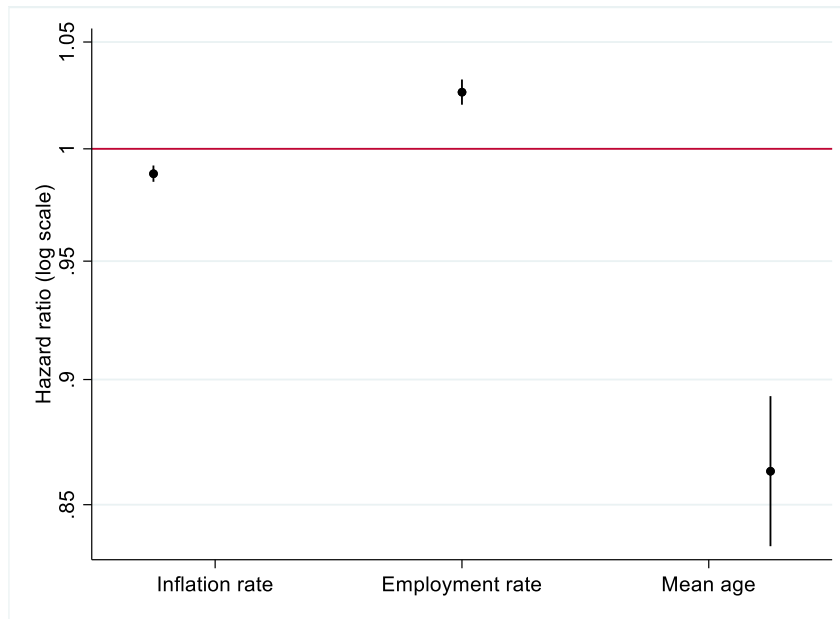
Figure 1: The impact of policy periods in different models



Note: Hazard ratios (on log scale) and 95% confidence intervals from piecewise constant proportional hazard models.

Before examining to what extent our models including macroeconomic factors modify the impact of family policy regimes, let us examine whether each contextual circumstance has an effect on parenthood per se. Each of the three models in *Figure 2* include one of the three contextual variables and the individual variables are always controlled. The risk of becoming a parent is significantly affected by all three macro variables. Inflation has a negative effect and the female employment rate a positive effect. The lower the inflation and the higher the employment, the higher the probability of becoming a parent. The estimated average age of women at the time of their first child has a negative effect on parental cut-off. Since the latter is a monotonically increasing function, we conclude that the probability of becoming a parent decreases with increasing average age.

Figure 2: Macro-level structural effects



Notes: Hazard ratios (on log scale) and 95% confidence intervals from piecewise constant proportional hazard models. Separate models for each macro-level variable. Individual-level covariates are controlled.

As indicated in the introduction and in the discussion of theoretical approximations, we consider the estimated MAFB as a control indicator. It is an indicator to express and measure the diffusion of late childbearing. We are interested in, whether, when this variable controls for the spread of late childbearing, the effect of each period (policy package) on parenthood is modified. Model M3 (*Figure 1*) shows a slightly different picture from the previous ones in terms of the effect of each period. According to this model, the odds of becoming a parent in the first two periods are not significantly different. In the third period, the period of reintroduction of extended family benefits, the propensity to become a parent increases compared to the reference period. The increase continues in the subsequent period of universality and in the fifth period of the return to the dominance of tax credits. However, this model does not yet include indicators of changes in the economic environment.

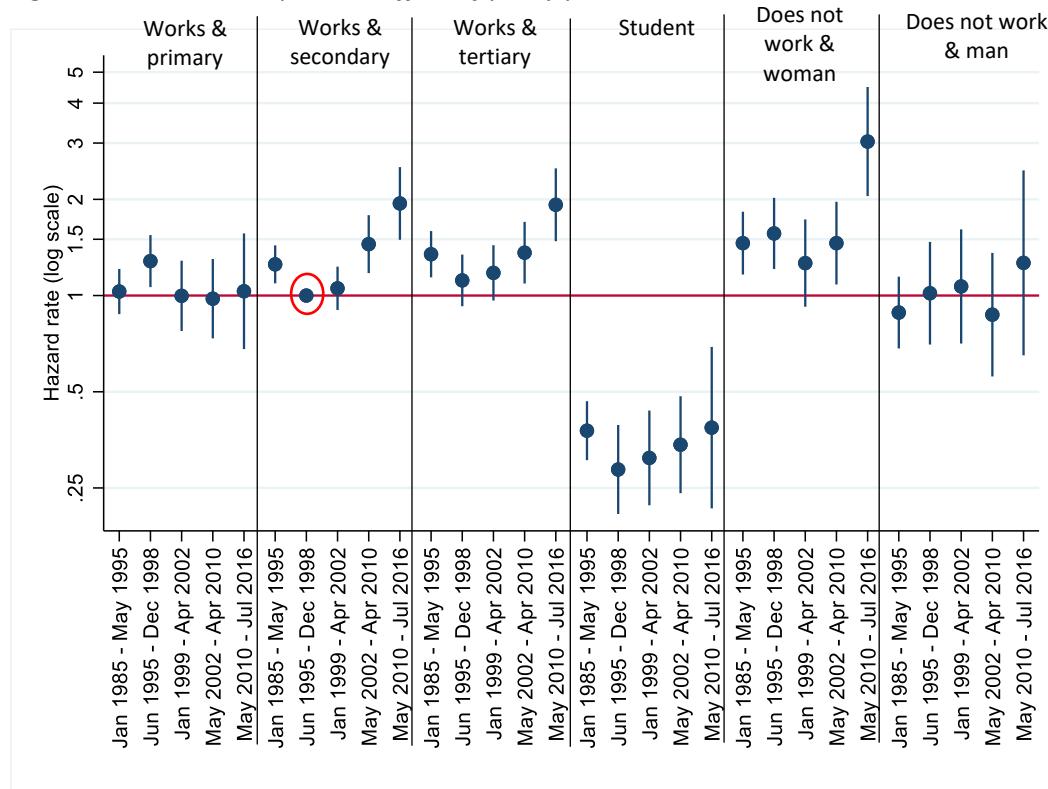
Thus, our two models including the development of the economic environment (M4 and M5, *Figure 1*) include both a macro-level indicator of the spread of late childbearing and the effect of a macroeconomic indicator. The two macroeconomic factors, inflation rate and employment rate significantly affect parenthood, just like in models in *Figure 2*. The direction of policy period effects is as before, but there is a difference in the reliability of the effects. When inflation is used (M4), each policy period differs significantly from the reference period, but in the case of the model including the employment rate (M5), the risk of becoming a parent does not differ significantly between periods. In the light of the above, different conclusions can be drawn for the policy packages. According to the inflation model, the risk of becoming a parent is significantly after 2002 (during periods 4 and 5) than in the reference period. Furthermore, the probability of becoming a parent was higher in the first period, when the institutional system at the end of socialism was still intact. Overall, therefore, the odds of becoming a parent were significantly higher in these three periods compared to the reference period.

In our model with the employment rate (M5), however, the odds of becoming a parent are the same as in the reference period. In this case, we have to conclude that economic circumstances have such a strong influence on the odds of having children that family policy interventions cannot add or subtract anything from this.

In the theoretical introduction, we explained in detail that modern society is heterogeneous and that some measures may present different opportunities and constraints for different groups in society, and that some measures may motivate them in different ways (as we did in our previous analysis, Spéder 2020). In the case of the event-history analysis we use, both retrospectively retrievable time-invariant characteristics and time-varying social characteristics provide an opportunity to examine whether different groups are affected differently by social policy changes. After reviewing several alternative options, we have arrived at a group-defining solution that takes into account gender, educational attainment and economic activity. By combining the values of each of the 18 categories ($2 \times 3 \times 3$) of group variables that could be constructed on this basis, we arrived at a group variable with six values. We thus disaggregated the employed by education but not by gender. We also did not disaggregate by gender those who were in school. However, we used a gender distinction for those not in employment, but due to the low number of items, they could not be further disaggregated by education (most of them have low education).

By combining the resulting group variable with the five policy periods, we arrived at a set of thirty categories that allowed us to include interaction effects. Of course, we still include the individual variables that were previously included in the model, the macro variable of predicted mean age and, in a separate model, the female employment rate and the inflation rate, which are both indicators of economic conditions. Our focus is on the results of our model that includes the employment rate *on the* probability of becoming a parent of an employed woman with a secondary education during the austerity period in the *reference category*. In comparison, we can examine the probability of becoming a parent in different social groups in each period and within a given period by social group (Figure 3).

Figure 3: The status-dependent effect of policy periods



Notes: Hazard ratios (on log scale) and 95% confidence intervals from piecewise constant proportional hazard models. Individual-level covariates, female employment rate and predicted MAFB are controlled. Red circle indicates the reference category.

Let's first mention the groups whose behaviour differs from the reference group (indicated by a red circle in Figure 3). People enrolled in schools have a far below average risk of becoming parents, in line with the ideas and research findings in the literature. Their fertility behaviour has not been significantly affected by the different family policy regimes and they are also unaffected by economic changes. There are meaningful differences between non-working women and men, although they are not always significant. Non-working men's chances of having a child are low and hardly time-varying, while non-working women's are slightly higher, but only rise in the latter period. In fact, we can conclude that they are also less sensitive to the above family policy regimes and changing institutions.

Among those in employment, we see significant differences both by educational attainment and by policy period. The effect of periods is particularly strong among those with secondary education. Among them, the time of Austerity has clearly reduced the chances of becoming a parent, and the universal benefit system and then the tax credit dominance have clearly increased them. The direction of the effects is similar among those with tertiary education, although the differences within the group are not significant across all periods. Only the last period, the period of dominance of tax credits (period 5), differs significantly from the period of low fertility risks between 1995 and 2000. Finally, it appears that there is little differentiation between periods and policy packages among low-skilled workers. However, by comparing the risks of primary and secondary educated people with jobs in the first two periods, we find that while in the period of extensive family support (period 1), the chances of becoming a parent did not differ between them, in the period of austerity (period 2), the risks of low educated people are significantly higher than those of medium educated

people. This group was not affected by austerity, but the secondary educated were, and hence risk differences emerged.

All this suggests that family policy packages indeed have but a differential impact on entering parenthood. These results hold when taking into account the evolution of economic performance and employment rates.

(Regarding the role of family policy regimes in influencing the risk of becoming a parent, a very similar result is obtained when economic conditions are represented by the inflation rate rather than the employment rate).

As a sensitivity analysis, we modelled the effect of postponement transition differently. Instead of including a macro variable of (predicted) age at first birth, we constructed a dynamic (individual-level) duration variable in which the actual age of the respondent is compared to the mean age at first birth in the given calendar year. The difference between the respondent's age and the typical age at first birth is categorized into four groups: early, about average, late or very late. Results regarding macroeconomic and policy effects do not differ considerably from the ones presented here. (Results will be made available as an appendix to the paper.)

6. Discussion

(WORK IN PROGRESS; discussion of hypotheses, conclusions. limitations)

The macro-economic environment does matter:

lower inflation and higher employment increased the probability of becoming a parent
the growing probability becoming parents after 2010 may have been partly due to favorable economic conditions, especially the increasing employment rate

Family policies do have effects but *status-dependent*

(Second period) The radical turn to means testing affected the hazard to parenthood positively among working people with primary education and negatively among working people with secondary and higher education

(Third period) Reintroducing universal measures and introducing of tax-relief did not have an (immediate) reversal effect

(Fourth period) Strengthening universality and increase the real value of support increase the hazard among working people with secondary or tertiary education and non-employed women

(Fifth period) Increasing support in form of tax relief (tax incentives) increase the hazard among working people with secondary or tertiary education

Specific behaviors remain:

No parenthood if participation in education

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