Mapineq

Explorative analysis of the short- and longer-term effects of economic conditions at labor market entry on leaving the parental home and family formation

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Executive summary

This report examines the lasting spillover effects of labor market conditions at entry on union formation (marriage/cohabitation), leaving the parental home (becoming independent) and fertility. Using EU-LFS data, we analyze entry cohorts from 2001 to 2011 from 103 European regions (NUTS1). We focus on regions because they are closer to individuals' actual labor markets than the national level. We also explore the moderating role of family-related contextual factors at the macro level (e.g., family policies, childcare infrastructure, and gender employment attitudes) that may influence the costs of parenthood. Our analyses show:

1. The effects of poor labor market conditions at entry on union formation, fertility, and leaving the parental home 5 to 10 years later vary by intersectional groups of gender and education:
   - Poor entry labor market conditions are associated with a higher likelihood of having at least two children among women with a lower secondary degree.
   - In contrast, they are associated with a lower likelihood of becoming mothers and having at least two children among women with a tertiary degree.
   - They have no impact on whether men and women with a lower secondary degree leave the parental home and live with a partner, but they do negatively affect the likelihood among men and especially women with a tertiary degree.
2. Concerning the moderating role of family-related contextual factors at the country level, we only find that higher levels of childcare enrollment and infrastructure are positively associated with union formation and fertility five to ten years later among individuals with a tertiary degree.

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Abbreviations

AME Average marginal effects
ECEC Early Childhood Education and Care
ESS European Social Survey
EU-LFS EU-Labour Force Survey
EVS European Values Survey
ISCED International Standard Classification of Education
NUTS Nomenclature of Territorial Units for Statistics
OLS Ordinary least squares
PP Percentage points
SD Standard deviation
WVS World Values Survey

ISO codes of countries included

Austria – AT – AUT
Belgium – BE – BEL
Bulgaria – BG – BGR
Croatia – HR – HRV
Cyprus – CY – CYP
Czech Republic – CZ – CZE
Denmark – DK – DNK
Estonia – EE – EST
Finland – FI – FIN
France – FR – FRA
Germany – DE – DEU
Greece – GR – GRC
Hungary – HU – HUN
Iceland – IS – ISL
Ireland – IE – IRL
Italy – IT – ITA
Latvia – LV – LVA
Lithuania – LT – LTU
Luxembourg – LU – LUX
Malta – MT – MLT
Netherlands – NL – NLD
Norway – NO – NOR
Poland – PL – POL
Portugal – PT – PRT
Romania – RO – ROU
Slovakia – SK – SVK
Spain – ES – ESP
Sweden – SE – SWE
Switzerland – CH – CHE
United Kingdom – GB – GBR

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Content

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Tables

Figures

Main Part

Appendix

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Explorative analysis of the short- and longer-term effects of economic conditions at labor market entry on leaving the parental home and family formation

This report examines the lasting effects of labor market conditions on union formation, fertility, and leaving the parental home. Using EU-LFS data, we analyze entry cohorts from 2001 to 2011 from 103 European regions. We focus on regions because they are closer to individuals' actual labor markets than the national level and also explore the role of family-related contextual factors that may influence the costs of parenthood.

When unemployment rates are higher, less-educated women have a higher probability of having at least two children 7 years later, while parenthood of men is largely unaffected by entry conditions.

When unemployment rates are higher, tertiary-educated young adults (particularly women) have a lower probability of leaving the parental home and having children.

Family-related policies (at the country level) tend not to impact the long-term consequences of poorer initial labor market conditions on these family-related transitions.

1. Introduction

Since the global financial crisis hit most high-income countries in 2007/2008, there has been renewed interest in how high unemployment and growing labor market uncertainties affect later career outcomes. However, relatively little research has examined how labor market conditions at the time of labor market entry impact non-labor market outcomes, such as household formation and fertility. Standard economic models of the family suggest that labor market attainment is an important determinant of marriage market opportunities, as well as the costs and benefits of having children (Becker 1973). Factors affecting labor market success, such as economic conditions at the time of entry, may

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persistently affect these family-related outcomes (Maclean et al. 2016). Empirical research at the aggregate level indicates a negative relationship between youth employment insecurity and leaving the parental home among young adults (Becker et al. 2010). Similarly, it suggests a procyclical relationship between fertility behavior and economic growth, meaning that periods of economic depression are characterized by decreasing fertility rates (Goldstein et al. 2013).

The question of whether the effects of poor (macro-)economic conditions on family formation and fertility persist or if potential delays swiftly recover once the economic conditions improve has received relatively little attention. Most studies on fertility effects of initial labor market conditions conceptualize these effects as fertility postponement, assuming a "compensatory" increase in fertility later on (Sobotka et al. 2011). However, the findings of Maclean et al. (2016) suggest that the influence of initial labor market conditions on marriage and fertility outcomes may well persist over a longer period of time.

While the Mapineq D4.2 report focuses on the short to long-term *labor market consequences* of entering the labor market in difficult times (König et al. 2025), **this report examines the extent to which poor initial labor market conditions also have spillover effects on *family-related outcomes* (such as leaving the parental home, family formation, and fertility), and whether these effects persist in the long term.**

Research on leaving the parental home and family formation has examined individual trigger events, parental characteristics, housing market circumstances, and changes in individual socioeconomic status. This research generally finds that children are more likely to leave the parental home and form independent households when they get married, have children, and – related to our study – start working (Billari et al. 2001; Mulder/Wagner 1993). Although research on the role of regional labor market conditions for family formation is yet limited, these research findings suggest that weak labor markets at entry may have longer-term family-related consequences due to higher risks of non-employment or concerns about job security. Using data from the U.S. Panel Study of Income Dynamics (PSID) from 1975 to 2009, Lee and Painter (2013) find that higher unemployment rates and periods of recessions indeed increased the likelihood that young adults delay leaving their parents' home well into their thirties.

Poorer economic conditions at labor market entry may also affect fertility decisions because they negatively impact individuals' labor market situation, including lower income, temporary contract, or unemployment. This can lead to a sudden and unexpected deterioration of individuals' economic conditions relative to their aspirations and expectations (Sobotka et al. 2011). However, poor economic conditions may also influence fertility behavior by altering perceptions of economic (in)stability, i.e., by creating widespread uncertainty even among those whose labor market and economic situations are not directly affected (Hofmann/Hohmeyer 2013; Tausig/Fenwick 1999).

The limited existing research on the effects of economic downturns on leaving the parental home, marriage/cohabitation and fertility has produced mixed results. Most empirical work supports the notion that poor macroeconomic conditions at labor market entry tend to delay family formation (Becker et al. 2010; Lee/Painter 2013; Martínez Mazza 2020) and postpone parenthood, at least in the short run (Comolli 2017; Comolli/Bernardi 2015;

Goldstein et al. 2013). Conversely, other studies indicate that the Great Recession increased fertility (Caltabiano et al. 2017), had no effect (Schwandt/von Wachter 2019), or found differing or even opposing effects by gender (Hofmann/Hohmeyer 2016; Maclean et al. 2016), age (Neels et al. 2013), or educational attainment (Harknett/Kuperberg 2011).

The aim of this report is to expand the limited research on **the extent and persistence of the impact of labor market conditions at entry on family formation and fertility up to 10 years later**. Using EU-LFS data, we examine entry cohorts from 2001 to 2011 in 103 European regions (NUTS1), which are closer to individuals' actual labor markets than the national level. Furthermore, we explore whether macro-level contextual factors (family-related policies, childcare infrastructure, and gender employment attitudes) moderate the impact of poor initial labor market conditions on family-related transitions into adulthood.

2. Theoretical background

2.1. Family-related consequences of entering the labor market in poor economic conditions

We are interested in family-related consequences of the regional labor market conditions at the time of entry. Importantly, this report is on **effects at the cohort-aggregate level**, which is conceptually distinct from the question of how individual-level economic hardship affects and individual's likelihood of leaving the parental home and entering parenthood. Even though poor regional economic conditions imply a relatively higher risk for individuals to suffer from unemployment, low income, temporary contracts and other labor market issues, the effects of regional conditions do not stop there. Poor regional labor market conditions at entry may also lead to widespread uncertainty, even among individuals whose labor market situation is not immediately affected. Our cohort-level analysis captures this as well.

According to economic models, the optimal timing of transitions into adulthood – such as leaving the parental home, getting married or cohabiting, and having children – follows from utility-maximizing decisions of young adults (Hotz et al. 1997). Gustafson (2001) distinguishes two main motives explaining the **timing of a first birth**: consumption smoothing and career planning. Prospective parents are thought to decide to have children when their income is high enough to allow them to maintain their standard of living during the child-rearing years. The career planning motive, on the other hand, is rooted in the concept of opportunity costs, i.e., individuals decide to become parents when doing so minimizes the negative impact on their careers (Hofmann/Hohmeyer 2016). These costs consist of two main parts: first, the direct foregone wages from time spent out of the labor force; and, second, human capital loss and its effects on career progression and lifetime earnings (Gustafsson 2001).

In what ways do macroeconomic conditions affect these motives? Poor labor market conditions at entry imply lower wages and higher uncertainty regarding future income and employment. Thus, the consumption smoothing motive would predict delayed childbearing, following from high regional unemployment at the time of labor market entry.

However, this may be offset by shifts in opportunity costs: foregone earnings due to career interruptions are lower during periods of poor macroeconomic conditions. This suggests that entering parenthood earlier may be beneficial. Similarly, human capital loss and wage progression might be lower and slower, respectively, during poor labor market conditions (Hofmann/Hohmeyer 2016). Therefore, the overall effect of poor initial labor market conditions at entry on entering parenthood is ambiguous.

Theoretical argument about **leaving the parental home** are somewhat easier. One possible explanation for staying with their parents for longer when initial labor market conditions are unfavorable is that (the risk of) a lower income may prevent one from affording to rent an apartment and establish an independent household (Martínez Mazza 2020).

2.2. Heterogeneous family-related consequences by gender and education

Since poor labor market conditions tend to be linked to lower income, the consumption smoothing motive would predict delayed entry into parenthood across educational levels. However, individuals with higher levels of education may be affected to a lesser extent by the adverse effects of poor macroeconomic conditions on income and employment because education provides them with a certain degree of protection.

Concerning gender differences, a large majority of women interrupt work after giving birth, and the division of labor within households is often unequal between men and women because of the male breadwinner model. Thus, the career planning motive disproportionately concerns women. For women, the foregone earnings (opportunity costs) of time spent outside the labor force tend to be lower during poor economic conditions, which may result in a faster entry into motherhood. Moreover, especially highly educated women entering in times of high unemployment likely experience lower foregone earnings of time spent outside the labor force due to childbirth compared to women who enter during periods of low unemployment.

Additionally, the "uncertainty reduction hypothesis" (Friedman et al. 1994) posits that **union formation** (marriage or cohabitation) and **having children** may be strategies to reduce uncertainty. These strategies can serve as role alternatives, such as becoming/being "a mother" instead of being unemployed, in times of economic uncertainty. For women, in particular, these strategies may be a way to respond to unfavorable employment prospects by choosing the "alternative career" of being a housewife (Bolano/Vignoli 2021). Furthermore, the chances of less-educated women finding well-paid jobs deteriorate sharply in contexts of increasing unemployment. For these women, reducing their labor market attachment and becoming mothers may be an attractive alternative to low-wage work or unemployment.

For men, it is reasonable to expect that poor initial labor market conditions lead to a delay in leaving the parental household and entering parenthood. These effects should be more pronounced for less-educated men. Since maternity and parental leave allowances usually do not fully compensate for foregone earnings, men's breadwinning capacity often remains important for couples' childbearing decisions. Furthermore, unemployment, low income, and employment instability tend to **make men less attractive marriage and long-term partnership candidates** (Sobotka et al. 2011).

2.3. Moderation by macro-level family-related contexts

Macro-level contexts related to family formation, such as family policies and childcare support infrastructure, **may moderate (mitigate or exacerbate) the impact of entering the labor market in times of higher unemployment on household and family formation**. This could occur by altering the course or the consequences of the macroeconomic condition itself or by affecting the opportunity costs of parenthood. Concerning negative consequences of poorer initial labor market conditions on fertility, higher in-kind family benefits, such as subsidized childcare, parental leave conditions, and direct support for child-related expenses, can lower the costs of having a child. Thus, when family support policies are lacking, poor initial labor market conditions may exert a stronger influence on family-related transitions.

Additionally, accessible and affordable external childcare allows parents, particularly mothers, to better balance employment and family obligations, thereby reducing the opportunity costs of having children. Thus, direct policies such as childcare infrastructure may exacerbate differences based on initial labor market conditions. In other words, those who start out with better labor market conditions may be more likely to have children when childcare facilities are more available, despite the higher opportunity costs.

3. Data and Methods

3.1. European Union Labour Force Survey (EU-LFS) 2001–2021 and sample construction

Our analysis uses cross-sectional individual-level data from the EU-LFS. The EU-LFS provides rich annual information on individuals' working lives for up to 31 European countries over a long period of time starting in 1983. Importantly, the EU-LFS allows the identification of respondents' regional location at the NUTS1 level (i.e., regions with populations between 3 and 7 million inhabitants). This is essential for us to maximize variation in macro-economic conditions at a level closer to individuals' actual labor markets than the national level.

Macroeconomic conditions at labor market entry are assigned using a question about the year when the respondents obtained their highest level of education. Since we are interested in the longer-term effects on family-related transitions 5 to 10 years after entry, the analytic sample constructed from a given EU-LFS survey year *t* includes everyone who reported completing their highest level of education between *t-10* and *t-5*. Because we do not observe respondents' regional location at labor market entry, we have to rely on individuals' current regional location to assign initial regional macroeconomic conditions. Consequently, one important limitation of our approach, and one faced by many studies (e.g., Schwandt/von Wachter 2019), is endogenous migration: if people migrate into other regions that are less affected by unemployment after obtaining their highest education, we erroneously assign them the better labor market conditions in their new regions of residence. The implied mismeasurement of initial labor market conditions would lead to attenuation bias.

We exclude all observations that indicate that they were in formal education at the time of the interview (when we measure the outcome) and who indicate that they have never worked before. This is to reduce the risk of including individuals who are still in the process of attaining their highest level of education five or more years later. This still leaves us vulnerable to including individuals who entered the labor market, worked for a bit, and later returned to education. We further restrict the sample to individuals who were no younger than 14 and no older than 30 at the time they reached their highest level of education and to NUTS1 entry cohorts for which we can observe family-related outcomes 5, 6, 7, 8, 9, and 10 years later.

The family-related outcomes of interest are first collected in the EU-LFS in 2006. Given these restrictions, we limit our period of analyses to regional labor market entry cohorts from 2001 (5 years before outcomes were first measured) to 2011 (10 years before outcomes were last measured).

To test if family-related country-level context factors moderate any effects of initial labor market conditions on family formation and parenthood later on, we combine the EU-LFS data with country-level data from other sources: To measure a country's family support, we use the OECD measure of public spending on in-kind family benefits. For a measure of childcare enrollment and infrastructure, we use Eurostat data on children enrolled in ECEC (Eurostat 2025). Finally, to measure family-related attitudes at the country-level, we combine data on conservative gender employment attitudes from the joint European Values Survey and World Values Survey 2017-2022 dataset (EVS 2022; Haerpfer et al. 2024), complemented with 2016 information from the 8th round of the European Social Survey in case of countries with missing information in the EVS/WVS dataset (European Social Survey ERIC 2017).

3.2. Variables

We use four **dependent variables**, measured 5 to 10 years after labor market entry. We use two outcomes to analyze effects of poor initial labor market conditions on childbearing/parenthood. **Having child(ren)** is coded as 0 for individuals who did not have a biological child and as 1 for those with at least one biological child at the time of the interview. **Having at least two children** is coded as 1 for individuals living with at least two children under the age of 15 in the same household at the time of the interview, and as 0 otherwise. The other two outcome variables are leaving the parental home and union formation. **Living with parent(s)** is coded as 1 if the respondent shares a household with at least one parent, and as 0 otherwise. We aim to observe respondents who still live with at least one parent. However, this may also include respondents who previously moved out of their parents' home but later returned, as well as respondents to whom a parent has moved in up to the time of the survey, for example, due to a need for care. Since our sample is restricted to young adults 5 to 10 years after entering the labor market, we assume that these cases will account for only a small percentage of young people living with their parents. **Living with a partner** is coded as 1 if the respondent shares a household with their partner at the time of the interview and as 0 otherwise.

We operationalize regional economic conditions at labor market entry through the regional (NUTS1) unemployment rate. We generate this measure from our individual-level data by

calculating the number of unemployed working age (15-64) individuals as a share of the labor force.

We use a set of additional variables at the individual, regional, and national level. At the individual level, we also measure respondents' gender (male/female), age, and educational attainment (three levels based on ISCED: low (ISCED 0-2), medium (ISCED 3-4), and high (ISCED 5-6). Individuals' regional location is defined by NUTS1 regions. Where NUTS1 information is not available (the Netherlands, Romania) or for smaller countries (Croatia, Cyprus, Czech Republic, Denmark, Estonia, Iceland, Ireland, Latvia, Lithuania, Luxembourg, Malta, Norway, Slovakia, and Switzerland) consisting of only one NUTS1 region, we use the country as the regional location. We use the EU-LFS microdata to construct further regional-level variables to capture industry structures. Following Carroll and Mayer (1986; see also, Heisig et al. 2019), we use occupational information from employed respondents to calculate the size of six different labor market segments for each region. The six segments measure the number of employees as the share of those employed in (1) traditional primary, (2) large-scale engineering, (3) competitive, (4) small competitive, (5) bureaucratic, and (6) professional jobs.

We use three variables to measure family-related country-level context factors: **Family benefits (in-kind)** is based on the OECD measure on public spending on in-kind family benefits. Since spending also depends on the number of eligible persons and households, we standardize this by dividing it by the country-level fertility rate in a given year. **Children in early childhood education and care (ECEC)** measures the share of children under the age of 3 that is enrolled in ECEC with at least one hour per week, The measure of **gender employment attitudes** is based on country-level aggregates of the survey item asking respondents how much they agree to the following statement (5-point scale): "When jobs are scarce, men should have more right to a job than women". Unlike our measure for in-kind family benefits which is measured annually, the national-level information on children in ECEC and gender employment attitudes is only measured once during the observation period: Information on children in ECEC is obtained for 2015 and information on gender employment attitudes is obtained for 2018 (2016 if information stems from ESS).

3.3. Descriptive statistics of the analytical sample

Our analytical sample consists of 2,194,055 individuals from 103 NUTS1 regions and 30 countries who have entered the labor market between 2001 and 2011. We observe their family-related outcomes between 2006 and 2021 (see Table 1). Pooling across European regions and years, around 42% of the sample still lived with their parents 5 to 10 years after entering the labor market, while 44% lived with their partner. About one third of the sample had at least one biological child 5 to 10 years after entering the labor market, and 14% had already two or more children under the age of 15 living in their household. Significant differences between labor market entry cohorts in the share of young adults having children even before entering the labor market could bias our results. However, this is the case for only 1% of respondents in our analytical sample, so we believe that this is negligible and have not included the variable in any of our analytical models. The average age measured at time of the outcomes is 28 years, ranging from 19 to 40 years. In terms of educational attainment, 12% of the respondents have only lower

secondary education, 51% have upper secondary education, and 37% have obtained a tertiary degree.

Table 2 presents **descriptive statistics of the four outcomes** differentiated by intersectional groups of gender and education. It reveals substantial differences in family formation and parenthood between groups. While the average age of women and men – within educational strata – is very similar, the share of men still living with their parents is notably higher, and conversely, the share of men living with a partner is notably lower. These differences are most pronounced among those with only lower secondary education, who are also the youngest educational strata in our sample on average. The share of women who have already entered parenthood, as well as the share of women who have at least two children, is consistently higher than the share of men with the same level of education. These gender differences in parenthood are particularly pronounced among those with lower and upper secondary education and are somewhat smaller among those with tertiary education. For both women and men, the likelihood of moving out of the parental household and the likelihood of living with a partner clearly increases with education. One has to bear in mind, though, that these numbers are not age-adjusted, meaning that at least partly, they reflect the group-level differences in age.

The **average regional unemployment rate at labor market entry**, our treatment of interest, is 9%. Importantly, it shows considerable variation, ranging from 1% to 29% (see Table 1).

Table 1. Descriptive statistics of the analytical sample

	N	Mean	SD	[Min, Max]
a) Individual level (at labor market outcome year)				
Family-related outcome variables				
Having child(ren)	2,194,055	0.31	0.46	[0, 1]
Having at least two children	2,194,055	0.14	0.35	[0, 1]
Living with parent(s)	2,194,055	0.42	0.49	[0, 1]
Living with a partner	2,194,055	0.44	0.50	[0, 1]
Heterogenous-factor and control variables				
Having a child before labor market entry	2,194,055	0.01	0.10	[0, 1]
Women	2,194,055	0.50	0.50	[0, 1]
Highest education level				
Lower secondary	2,194,055	0.12	0.32	[0, 1]
Upper secondary	2,194,055	0.51	0.50	[0, 1]
Tertiary	2,194,055	0.37	0.48	[0, 1]
Age	2,194,055	27.99	4.22	[19, 40]
b) Regional/NUTS1 level (at labor market entry year)				
Unemployment rate	2,194,055	0.09	0.05	[0.01, 0.29]
Labor market segments				
Traditional primary	2,194,055	0.08	0.08	[0, 0.45]
Large-scale engineering	2,194,055	0.28	0.06	[0.06, 0.41]
Competitive	2,194,055	0.14	0.04	[0.05, 0.29]
Small competitive	2,194,055	0.24	0.04	[0.11, 0.45]
Bureaucratic	2,194,055	0.10	0.03	[0.04, 0.3]
Professional	2,194,055	0.17	0.05	[0.07, 0.41]
c) Country level				
In-kind family benefit spending (at labor market entry year)	1,989,283	0.31	0.15	[0, 0.87]
% of children (age 0-2) in ECEC (2015)	2,194,055	29.35	17.15	[1.4, 92.6]
Conservative gender employment attitudes (2018)	2,178,283	2.34	0.46	[1.31, 3.11]

Table 2. Descriptive statistics of outcome variables by gender and education

Outcomes	Women			Men		
	Lower secondary	Upper secondary	Tertiary	Lower secondary	Upper secondary	Tertiary
Living with parent(s) (%)	46	39	22	72	58	27
Living with a partner (%)	41	48	63	17	28	55
Having child(ren) (%)	42	38	47	11	15	34
Having at least 2 children (%)	22	16	21	10	7	15
Mean age	*23.4*	*26.7*	*31.4*	*23.2*	*26.5*	*31.7*
N	*105,572*	*510,812*	*472,381*	*152,494*	*617,982*	*334,814*

Notes: Sample includes 103 regions from 30 countries.

3.4. Analytical strategy

Our analyses consist of two main parts. **First**, we examine whether regional labor market conditions (i.e., regional unemployment rates) at labor market entry affect **young adults' likelihood of leaving the parental home and family formation** in the short to long term **(5 to 10 years after labor market entry)**, and how these effects vary by gender and education. **Second**, we explore whether the effects of regional unemployment at labor market entry are **moderated by family-related contextual factors** at the country level. These factors include public spending on in-kind family benefits, the share of children aged 0-2 enrolled in early childhood education and care (ECEC), and conservative gender employment attitudes. Through this examination, we explore whether the potential family-related consequences of poor labor market conditions differ depending on a country's family-related policies, childcare infrastructure, and gender attitudes.

Effects of initial labor market conditions on leaving parental home and family formation

To examine the labor market effects of poor regional labor market conditions at labor market entry on leaving the parental home and union/family formation, we estimate a series of multivariate OLS regressions. We regress the four outcomes (having children, having at least two children, living with parent/s, and living with a partner) on a set of independent variables that are decomposed into between- and within-components prior to the analyses (see below). For each outcome, we estimate a series of OLS regressions according to time since labor market entry (5, 6, 7, 8, 9, and 10 years) to examine the existence and persistence of consequences of entering the labor market during poorer economic conditions.

In **model M1**, we add individual- and regional-level variables to the initial unemployment rate that would otherwise confound our estimates. At the regional level, we control for employment shares in different labor market segments. At the individual level, we control for age, gender, and educational attainment. Due to the retrospective approach (required by the use of the EU-LFS for our research questions), we cannot observe any individual-level characteristics at the time of labor market entry. However, it can be assumed that gender is time-invariant, that changes in educational attainment are limited due to our definition of labor market entry (see Section 3.1), and that age at labor market entry can be defined with certainty.

In model M2, we add the level of regional unemployment at the time when the outcome is measured. Previous research on the long-term consequences of a recession at labor market entry has often omitted controlling for unemployment rate trajectories following

the initial shock. This research has conceptualized the effect of the initial unemployment rate as consisting of its own direct effect plus the weighted effect of subsequent correlated unemployment rates (Oreopoulos et al. 2012; Schwandt/von Wachter 2019). The resulting coefficient estimates are supposed to capture the effect of labor market entry in times of poor conditions, given "the regular subsequent evolution of the local labor market conditions" (Schwandt/von Wachter 2019, p. 168). However, since we are interested in genuine longer-term effects of initial conditions, it is important to adjust for the regional unemployment rates when measuring the dependent variables. This ensures that we are not spuriously attributing effects of subsequent family formation outcomes to the *state* of the regional labor market at entry. Even if poor labor market conditions were followed by a regular aftermath (i.e., typical business cycle dynamics), not adjusting for current unemployment would be problematic in the context of our study, as it could lead to both an over- and underestimation of effects, depending on how initial unemployment typically correlates with unemployment rates 5 to 10 years later. Similar to Mapineq Deliverable 4.2 (König et al. 2025), **model M2**, which includes both the regional unemployment rate at labor market entry and at the time the dependent variables are measured, serves as **our main specification**. Further subsample analyses, as well as models that include interaction terms with macro-level context variables, are based on this specification.

We estimate two additional models identical to M1, except for the additional control of individual-level non-employment (**model M3**) and parenthood (the binary indicator of having a child, **model M4**) at the time when the outcome is measured. While adjusting for the regional unemployment rate at both labor market entry and 5 to 10 years later (M2) accounts for a potential confounding factor, the individual-level indicators of non-employment and parenthood can be considered potential mediators when examining the relationship between initial labor market conditions and the respective outcome variables. This analytical step addresses the question of whether an effect of poor initial labor market conditions on the likelihood of respondents living with their parent(s) or a partner can partly be explained by an individual's non-employment or parenthood status 5 to 10 years after labor market entry.

To examine the overall magnitude and persistence of the effects of poor initial labor market conditions on family-related outcomes, we estimate analyses using data pooled across social groups, and to identify heterogeneous effects, we estimate the same specification (without controls for gender and education) separately for men and women, stratified by highest educational attainment.

We decompose all right-hand-side variables into three distinct components as follows:

$$x_{r,t} = x_{.t} + x_{r.} + x'_{r,t} \qquad (1)$$

where the index r denotes regions and t denotes years. The annual mean component $x_{.t} = \bar{x}_t - \bar{x}$ captures Europe-wide annual trends (i.e., annual deviation from the grand mean). The *regional mean component* $x_{r.}$ simply equals the NUTS1 averages over time ($x_{r.} = \bar{x}_r$), while the *within-region component*, calculated as the difference between the variable's original value minus the two aforementioned components ($x'_{r,t} = x_{r,t} - (\bar{x}_t - \bar{x}) - \bar{x}_r$), captures year-to-year within-region variation net of Europe-wide trends. Individual-level covariates (e.g., age, gender, education) are decomposed in the same way as regional-

level covariates, the only difference being that the within-region components of individual-level variables vary even within NUTS1 years.

The resulting regression equation (in matrix form) looks as follows:

$$Y = \alpha + X_{.t}\beta + X_{r.}\gamma + X'_{rt}\theta + \varepsilon, \quad (2)$$

where Y is the n x 1 vector of family-related outcomes and $X_{.t}, X_{r.}$, and X'_{rt} are n x k dimensional matrices of the independent variables' annual mean, regional mean, and within-region components, respectively. Finally, β, γ, and θ are the corresponding k x 1 vectors of regression parameters, and ε is the error term. The standard errors are clustered at the country level.

Regarding the regression coefficient estimates for the effect of an increase in the within-region unemployment component, our decomposition approach closely resembles an OLS regression including region (NUTS1) and year fixed effects in that the focal component is also limited to within-region variation and thus accounts for unobserved, time-invariant confounding at the regional and/or national level as well as aggregate time trends. However, unlike with fixed effects, our approach allows us to also estimate between-effects and is more flexible regarding the introduction of interaction terms (see analyses of macro-level context variables below).

3.4.1. Moderating role of macro-level context variables

We repeat the analyses outlined above (main specification M2), this time including interaction terms between the decomposed regional unemployment rate components and the **family-related country-level context variables: public spending on in-kind family benefits, the share of children aged 0-2 in ECEC, and conservative gender employment attitudes** (see Table 2 above). Here, we estimate models that include within-between interactions, in which within-region variation in initial unemployment is interacted with z-standardized levels of family related macro-level contexts. However, unlike in the analyses in Mapineq deliverable 4.2 (König et al. 2025), we cannot estimate additional models including within-within interactions due to data limitations: two of the three macro-level contexts – the share of children aged 0-2 in ECEC and conservative gender employment attitudes – are not observed annually over the observation period. Instead, they were observed once and merged to the EU-LFS data; hence, there is no within-region variation in the macro-level contexts over time.

Furthermore, adjusting for the "current" level of the macro-level family-related context variables in addition to its value "at labor market entry" is not possible due to data restriction. Assuming that (differences in) childcare infrastructure and usage, as well as gender employment attitudes, are somewhat stable over time, we believe that these models may still provide valuable insights. Only in the models examining the moderating role of public spending on family benefits, we can adjust for changes in family benefit spending that occur between labor market entry and the year of the survey.

4. Results

The results are presented as follows: First, we present the results of the analyses examining the impact of entering the labor market under poorer economic conditions on leaving the parental home and family formation. These analyses are pooled across social groups and differentiated by intersectional groups of gender and education. Second, we present the results regarding the moderating role of macro-level family-related contextual factors (see Section 3), again pooled across social groups and by educational attainment.

4.1. Effects of initial labor market conditions on leaving the parental home and family formation 5 to 10 years later

Figure 1 shows the estimated effects of an increase in the regional unemployment rate at labor market entry on the likelihood of having children (Panel a), having at least two children (Panel b), living with parents (Panel c), and living with a partner (Panel d). The change in the regional unemployment rate at entry ("treatment") and the four outcome variables are both constrained to range between 0 and 1, meaning that a coefficient estimate of 1 would imply that a 1 percentage points (pp) increase in the within-region unemployment rate at labor market entry increases the risk of still living with the parents 5 to 10 years later by 1 pp. For reference, the average year-to-year variation in unemployment within regions (i.e., the standard deviation of the within-region component) is 2.5 pp.

Figure 1 presents the coefficient estimates based on the four models (see Section 3.4). Model M2 (our main specification) adjusts for changes in the regional unemployment rate between labor market entry and the time the outcomes were measured, along with the full set of control variables at the individual and regional level. We find rather small effects of initial labor market conditions on parenthood. Except for 9 and 10 years after labor market entry, all coefficient estimates regarding **having children** are negative; however, the effect sizes are rather small, ranging from -0.1 pp (after 7 years) to 0.03 pp (after 10 years). Furthermore, most estimates clearly fail to reach statistical significance; the only exception is 5 years after entry (p-value = 0.1). Moreover, pooled across social groups, we find no long-term effect of initial labor market conditions on **having at least two children**. All coefficients are very close to zero and statistically insignificant.

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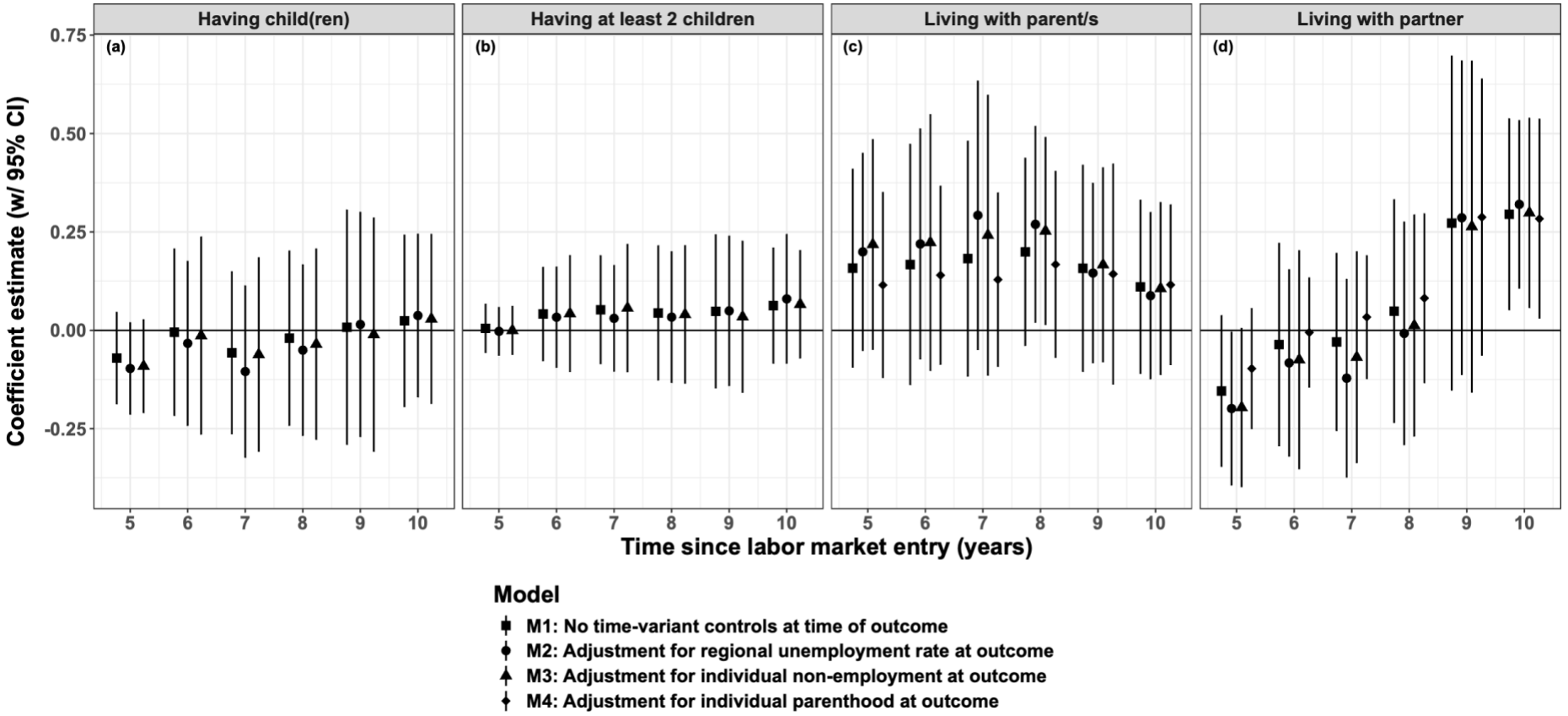
Figure 1. Effects of within-region variation in unemployment rate at labor market entry on leaving the parental home and family formation 5 to 10 years later (pooled across groups)



Notes: Effect of regional labor market conditions at entry on labor market outcomes 5 to 10 years later for different regression model specifications. All models control for respondents age, gender, and educational attainment and regional shifts in labor market composition (economic activities, NACE). Source: EU-LFS, authors' calculations.

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The patterns regarding leaving the parental household and living with a partner are clearer. All coefficient estimates regarding **living with parents** are positive, though small in size, indicating that an increase in the regional unemployment at entry is associated with a higher share of young adults still living with their parents 5 to 10 years later. While most estimates fail to reach statistical significance, the statistically significant coefficient 8 years after entry implies that a one-standard-deviation (SD) increase in the within-region unemployment component leads to an increase in the likelihood of living with the parental household by 0.68 pp (or 2% relative to the mean).

The results regarding **living with a partner** in Panel d (Figure 1) complement the patterns of leaving the parental home, although with even smaller coefficient estimates. A one SD increase in within-region unemployment at labor market entry is only associated with a statistically significant 0.5 pp decrease in the share of young adults living with their partners 5 years later (or 1.1% decrease relative to the mean)[1]. The corresponding coefficient estimates for the years 6 to 8 remain negative but are close to zero and insignificant.

Comparing the coefficient estimates of model M2 with those of model **M3**, which accounts for **individual-level non-employment** instead of regional unemployment at the time of the survey, shows hardly any difference in the coefficients for all outcomes. If high regional unemployment at entry primarily affected family-related outcomes because more people in these regions faced more employment issues, one would expect the estimated effects of initial regional unemployment to become significantly smaller once non-employment at the individual level is controlled for. However, Figure 1 shows that this is clearly not the case. This suggests that the small effects of initial regional unemployment on family-related outcomes 5 to 10 years later are not caused by ongoing employment difficulties, but rather by broader perceptions of economic uncertainty associated with entering the labor market in poor labor market conditions. However, this seems to occur only to a very limited extent, given that the initial regional unemployment effects are small and mostly insignificant.

The comparison of **M1** and **M4** shows an interesting difference in terms of the share of young adults still living with their parents or living with a partner 5 to 10 years after entry: A clear pattern of attenuation emerges when **adjusting for parenthood** (having at least one child) at the time when the information on living with parents/partner was measured. The increased share of young adults still living with their parents and the decreased share living with a partner, caused by poor initial conditions, seems to be partly mediated by effects on fertility behavior.

4.1.1. Gender-education differences in family-related consequences of poor initial labor market conditions

Figure 2 shows the results based on model M2 (our main specification) for the subsamples defined by gender and education. The figure sheds light on the potentially heterogeneous impact of regional unemployment at labor market entry on the four family-related outcomes. The results provide three important insights: First, **the fertility-related outcomes**

[1] $0.27 * 2.5/44 = 0.011$.

of men are largely unaffected by the regional labor market conditions at entry. We find no clear pattern of shorter- to longer-term effects for any of the three educational groups.

Second, the **fertility effects for women vary by the level of education**. Among women with only lower secondary education, if anything, the results suggest a positive effect on parenthood, i.e., women become mothers earlier when labor market conditions at entry are poor. The corresponding coefficient estimates regarding having at least one child are mostly positive but insignificant. In contrast, the coefficient estimates regarding having at least two children 6 to 7 years later are more pronounced and statistically significant. For instance, the likelihood among less-educated women of having at least two children 6 years after labor market entry increases by 2.2 pp per one SD increase in the within-region unemployment component at entry (this equals an 12.1% increase relative to the subgroup mean[2]). We find rather small and mostly insignificant effects of labor market conditions at entry on parenthood among women with upper secondary education. If anything, we find that women with upper secondary education who entered the labor market in poor conditions have slightly *fewer* children. We find more substantial negative effects on fertility among women with tertiary education: Nearly all coefficients for both parenthood outcomes are negative, and the effects tend to be more pronounced 5 to 7 years than 8 to 10 years after labor market entry. Our results suggest that a one SD increase in within-region unemployment at entry leads to a 1.4 pp decrease in the share of tertiary-educated mothers 7 years later (which equals a 3.2% decrease relative to the subgroup mean[3]). Similarly, but to a lesser extent, a one SD increase in within-region unemployment leads to a 0.63 pp decrease in the share of tertiary educated women with at least two children 7 years later (or 3.4% decrease relative to the subgroup mean[4]).

Third, we find that the **effects of initial labor market conditions on leaving the parental home and living with a partner vary by the level of education**. Among men and women with lower secondary education, we find no effect on the likelihood of leaving the parental home or living with a partner. Among those with upper secondary education, poor labor market conditions at entry seem to increase the share of young adults still living with their parents, although most coefficient estimates do not reach statistical significance. Again, the strongest (though still rather small) effects regarding living with parents and living with a partner are found among those with a tertiary degree, particularly among tertiary-educated women: A one SD increase in the within-region unemployment leads to a 1.4 pp increase in the share of tertiary-educated women still living with their parents 7 years later (or a 6.5% increase relative to the subgroup mean[5]). Conversely, there is a negative effect on the share of tertiary-educated women living with a partner 7 years after labor market entry by -1.5 pp (or -2.3% relative to the subgroup mean[6]).

[2] $0.87 * 2.5/18 = 0.121$.
[3] $-0.58 * 2.5/45 = -0.032$.
[4] $-0.26 * 2.5/19 = -0.034$.
[5] $0.57 * 2.5/22 = 0.065$.
[6] $-0.59 * 2.5/63 = -0.023$.

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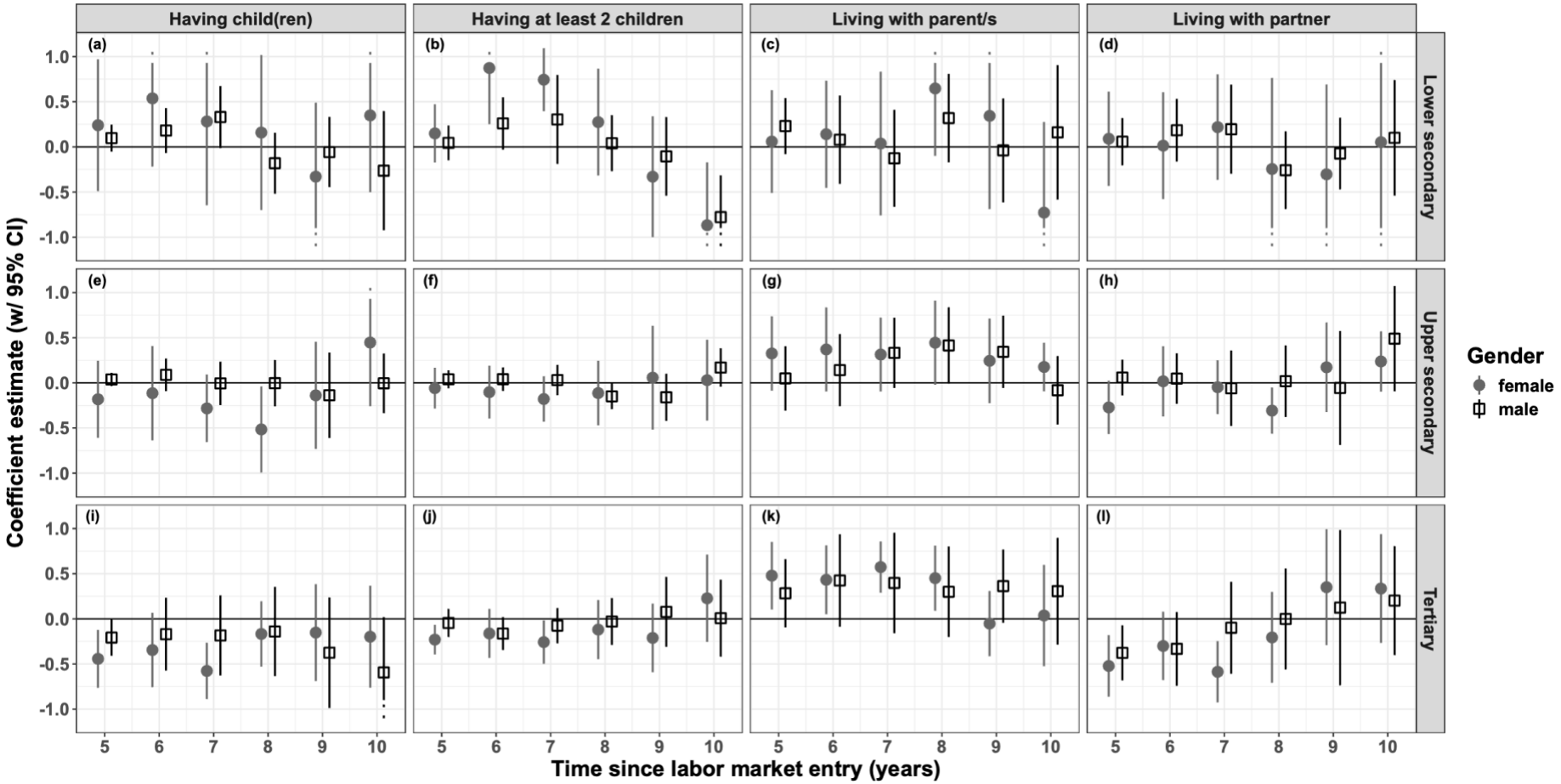
Figure 2. Effect of within-region variation in unemployment rate at labor market entry on leaving parental home and family formation 5 to 10 years later for men and women by education



Notes: Effect of labor market conditions at entry on family-related outcomes 5 to 10 years later adjusting for current regional unemployment rates. All subsample analyses control for respondents age and regional shifts in labor market composition (economic activities, NACE). Source: EU-LFS, authors' calculations.

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4.2. Moderation by macro-level family-related contexts

To examine the moderating role of three family-related contextual variables (public spending on in-kind family benefits, the share of children aged 0-2 in ECEC, and gender employment attitudes, all at the country level), we estimated a series of models that include (within-between) interactions between the decomposed components of regional unemployment at labor market entry (our "treatment") and the level of these contextual variables at labor market entry.

Based on these models, we present the results on the role of family-related contexts in terms of **conditional average marginal effects**. That is, we present the average marginal effect of a one-unit (1 pp) increase in the regional unemployment at entry on having children, having at least two children, living with parents, or living with a partner, conditional on the level of the respective family-related contextual variable being one standard deviation (SD) below or above the grand mean (pooled across countries). Consequently, the point estimates and 95% confidence intervals in the Figures 3–6 can be interpreted as subgroup marginal effects. **Solid-marked** estimates indicate significant differences, while **hollow-marked** estimates indicate insignificant differences. Figure 3 shows the results based on the full sample of young adults (i.e., pooled across social groups), while Figures 4–6 shows the results based on subsamples defined by the level of education.

One general insight that can be drawn from Figure 3 is that the three family-related contextual factors do not seem to play a very important role for the short- to long-term effects of poor initial labor market conditions on family-related outcomes. Overall, we find very few (consistent) patterns of effect moderation.

The results regarding the level of **public spending on in-kind family benefits** (normalized by the country-level fertility rate) reveal two insights. First, the effects of poor initial labor market conditions seem to be less influential for the likelihood of living in the parental household 5 to 7 years later when public spending on family-related benefits is higher (Figure 3, Panel c). Second, higher family benefits appear to mitigate the impact of poor initial labor market conditions on living with a partner compared to countries with low public spending on family benefits (Figure 3, Panel d).

Regarding **childcare enrollment and infrastructure**, none of the estimated interaction effects in Figure 3 are statistically significant, and no clear patterns of effect moderation are evident based on the pooled sample. However, educational subsample analyses (Figure 5) reveal an interesting result. Among tertiary-educated individuals only, childcare enrollment and infrastructure does seem to play a significant role for the relationship between labor market conditions at entry and living with a partner 5 to 10 years later among tertiary-educated individuals (Figure 5, Panel l). For them, poor initial labor market conditions seem to have a negative long-term effect on living with a partner if childcare enrollment is low, but a positive effect if ECEC enrollment of young children is high.

Of course, public spending on in-kind family benefits and childcare infrastructure do not directly affect union formation, but rather indirectly. Since living with partners is associated with having children, the effect seems to be that under better childcare conditions, young

parents are more likely to live independently (instead of with their parents), even if labor market (career) opportunities are poorer.

Finally, we find no evidence of a moderating role of the level of **conservative gender employment attitudes** (Figure 6). The differences between marginal effects conditional on relatively low vs. relatively high levels of conservative gender employment attitudes are minor and mostly statistically insignificant.

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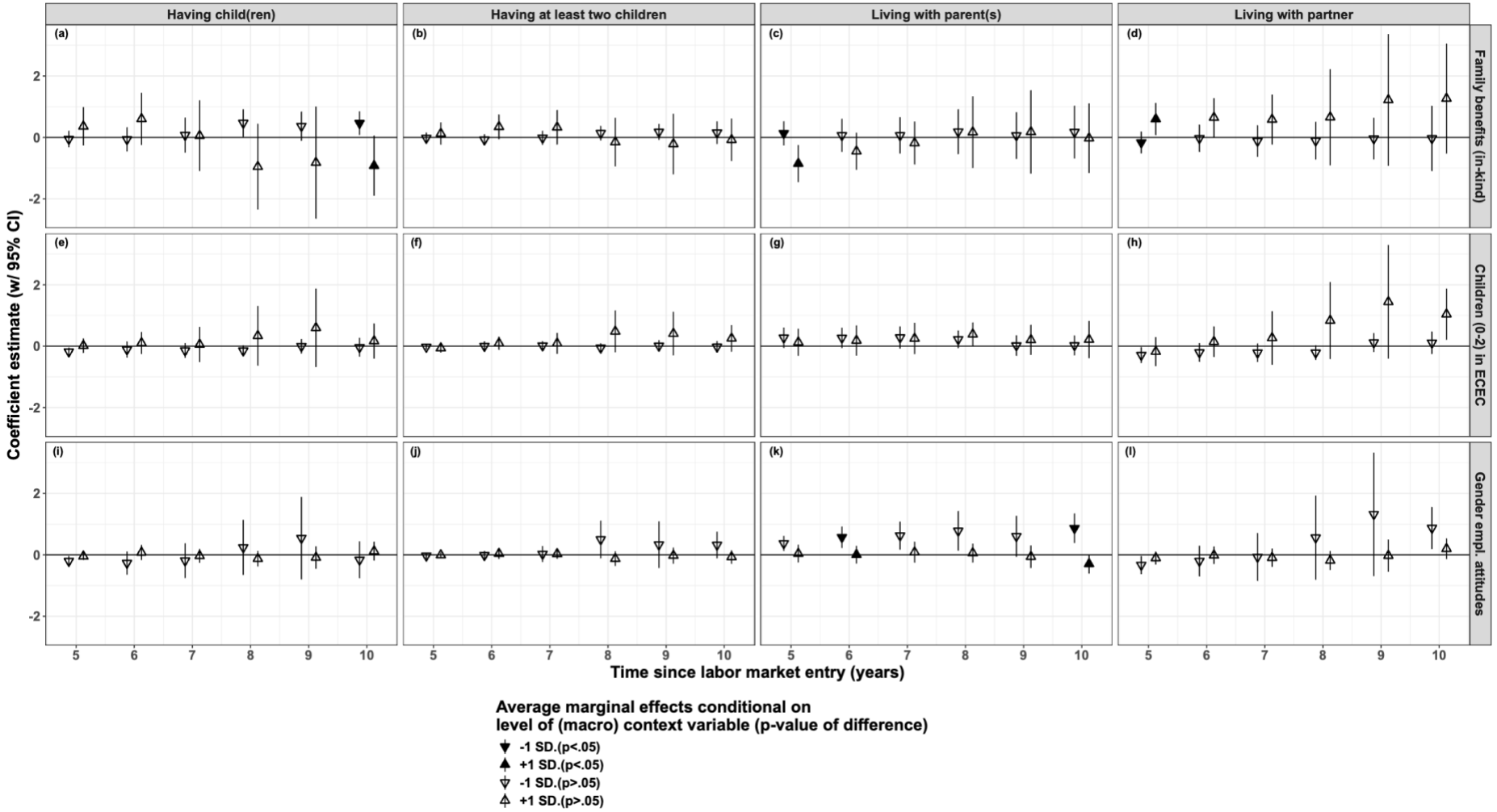
Figure 3. Conditional average marginal effects of within-region variation in unemployment at entry, by levels of macro-level contexts



Notes: Information on national-level in-kind family benefits is measured annually (2001-2021). Information on children in ECEC is obtained for 2015 and information on gender employment attitudes is obtained for 2018 only. Source: EU-LFS, authors' calculations

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Figure 4. Average marginal effects of within-region variation in unemployment at entry conditional on spending on in-kind family benefits by entrants' education

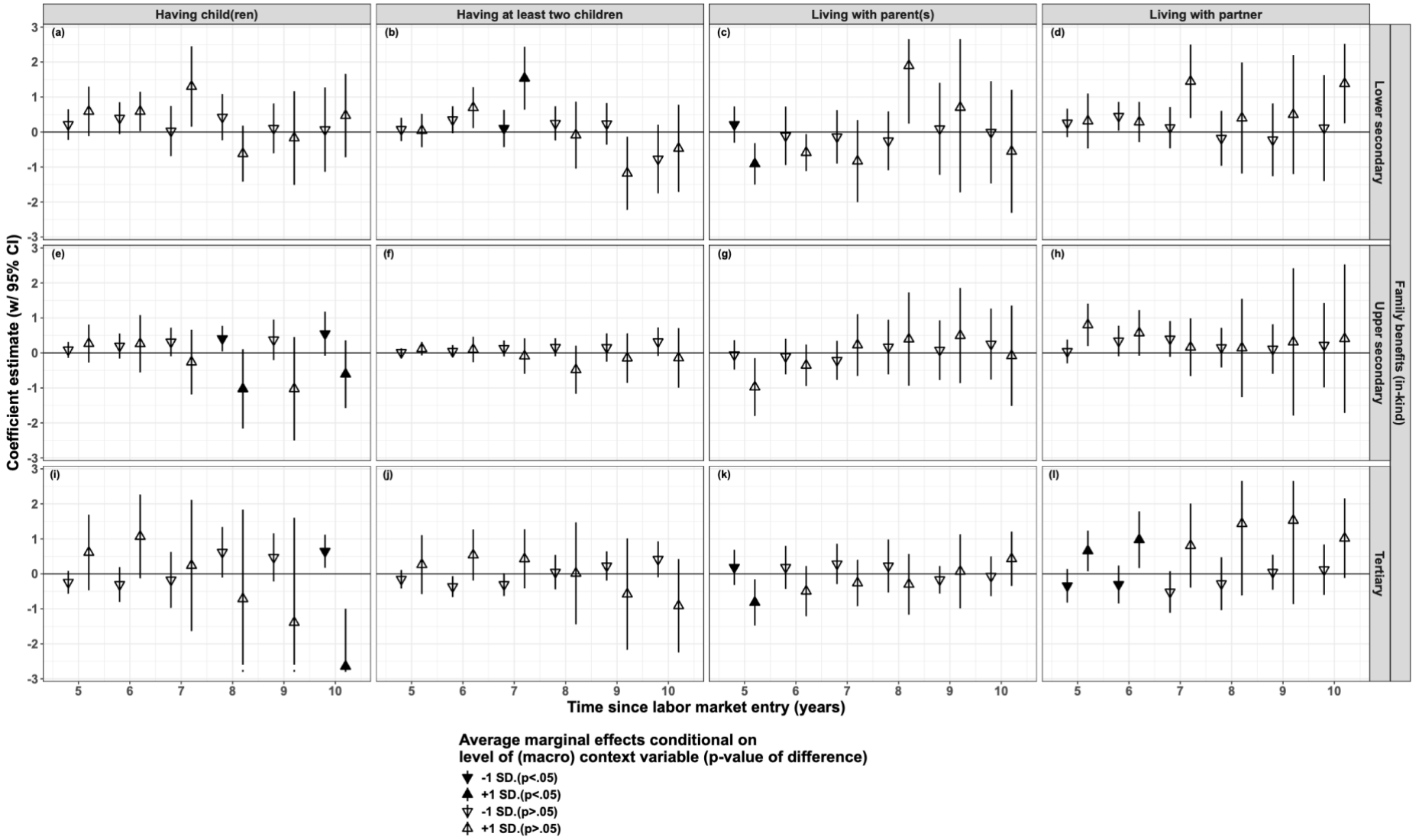

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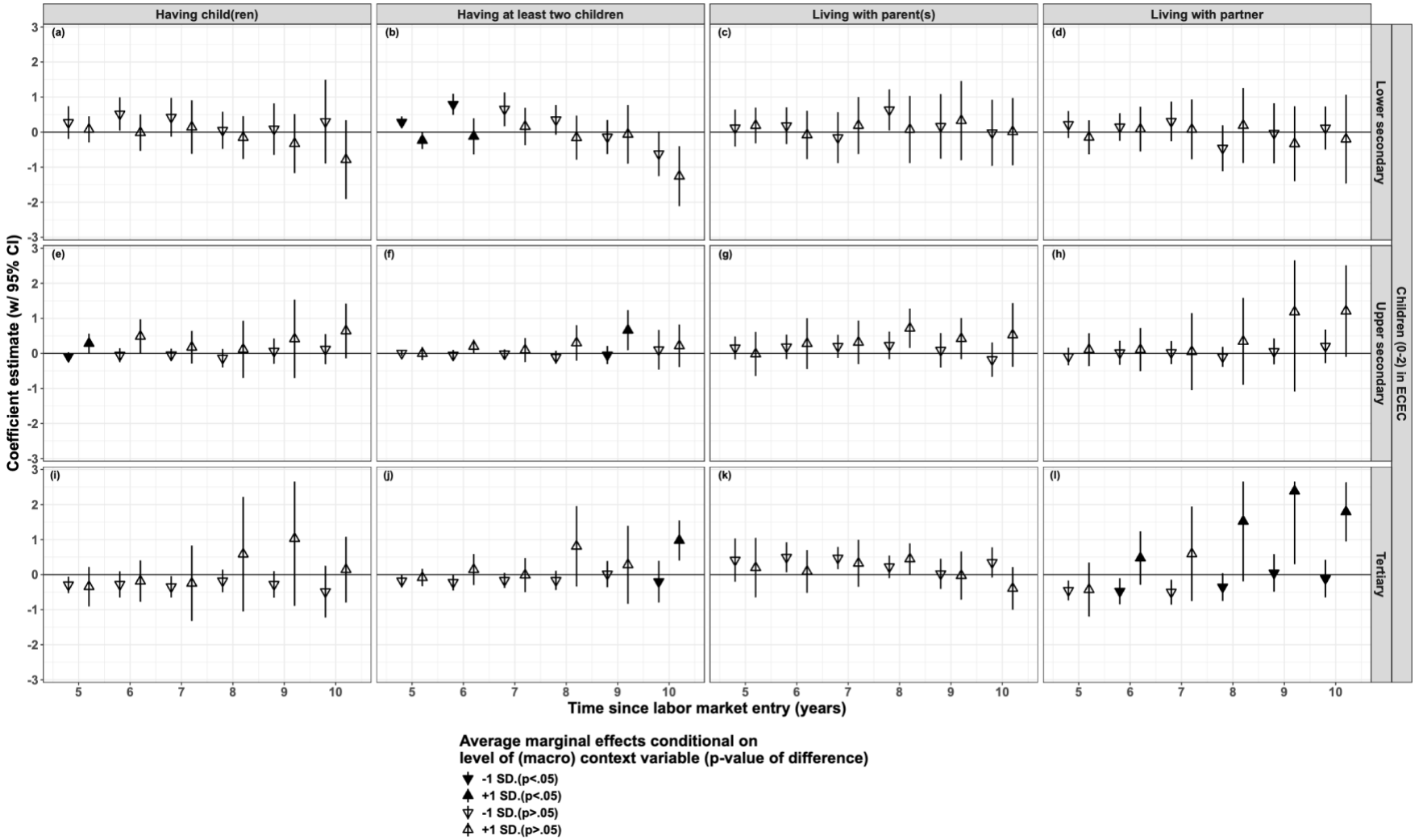
Figure 5. Average marginal effects of within-region variation in unemployment at entry conditional on share of children (aged 0-2) in ECEC by entrants' education



Notes: Information on children in ECEC is obtained for 2015 only. Source: EU-LFS, authors' calculations.

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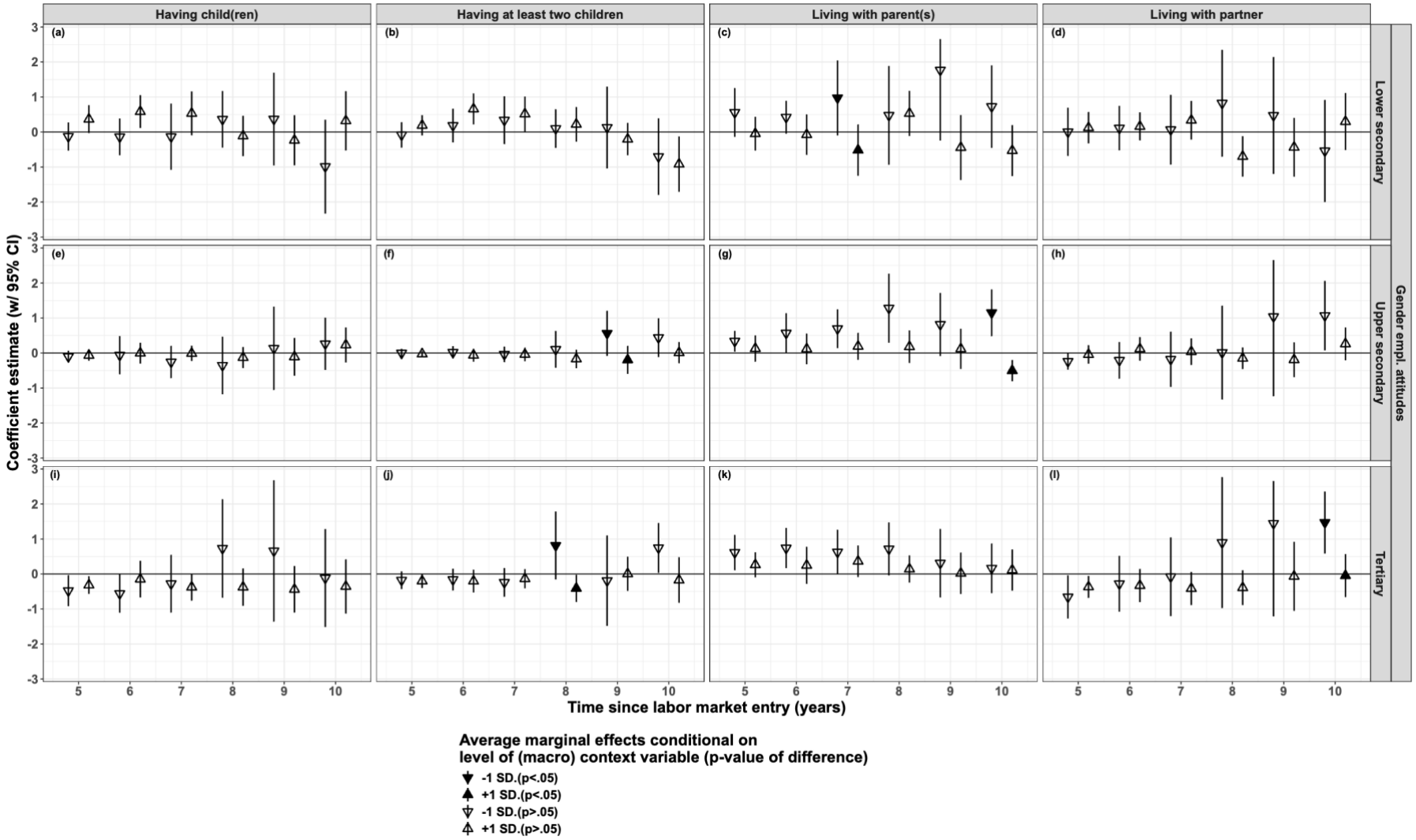
Figure 6. Average marginal effects of within-region variation in unemployment at entry conditional on gender employment attitudes by entrants' education



Notes: Information on gender employment attitudes is obtained for 2018 only. Source: EU-LFS, authors' calculations.

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5. Discussion and conclusion

Based on data pooled across groups, we find no clear evidence of initial regional labor market conditions affecting fertility of young adults. We do find some evidence that poor initial conditions increase the risk among young adults of (still) living with their parents up to 9 years later. However, effect sizes are rather small.

In contrast, estimating the same models separately for women and men with different levels of education, demonstrates interesting differences. We show that relatively high regional unemployment at labor market at entry increases the likelihood of having at least two children among women with only a lower secondary degree. The opposite is true for women with a tertiary degree for whom poor initial labor market conditions are associated with notably lower propensities to become mothers and have more than one child up to 8 years later. Furthermore, we find no clear pattern that initial labor market conditions impact the likelihood of leaving the parental home and/or living with a partner among those with only lower secondary education. Only tertiary-educated women – and to a lesser extent also men – seem to still live with their parents more frequently and less often live with a partner up to 8 years later compared to equally educated young adults entering the labor market with lower regional unemployment rates.

These results suggest that being able to maintain a certain standard of living throughout the child-rearing years (consumption smoothing motive) somewhat influences family formation and fertility behavior during periods of poor labor market conditions. This seems to be particularly true for individuals with higher levels of education who delay leaving the parental home and forming their own household with a partner, and also postpone childbearing. Apparently, their transitions into adulthood do respond to general labor market uncertainties at labor market entry, whereas falling opportunity costs do not seem to play a role. The observed increase in the share of less-educated women with at least two children associated with relatively higher regional unemployment at labor market entry support the uncertainty reduction hypothesis (Friedman et al. 1994). Accordingly, this group responds to a high degree of uncertainty with regard to their very own career and life course by starting a family earlier with longer term labor market detachment eventually.

In a set of exploratory analyses, we also examined whether family-related contextual factors moderate the relationship between regional labor market conditions at labor market entry and family formation and fertility outcomes later on. Overall, we find little evidence that these family-related contextual factors mitigate or exacerbate the shorter- and longer-term effects of poorer initial labor market conditions.

The results of our study have some policy implications for ensuring young adults' successful transitions to adulthood regardless of the labor market situation. Our findings highlight the need to acknowledge intersectionalities between education and gender, as the consequences of entering the labor market during periods of high unemployment for family formation and fertility differ significantly between groups. The most vulnerable group are less-educated women. Moreover, the exploratory analyses of the role of country-level contextual factors seem to suggest that a good childcare infrastructure helps alleviate the

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negative impact of unfavorable initial labor market conditions on the family formation and parenthood decisions of highly educated individuals.

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Appendix

Figure A. 1. Comparison of effect estimates based on between-within decomposition approach (only component capturing within-region variation displayed) with corresponding estimates based on OLS regressions including region and graduation year fixed effects

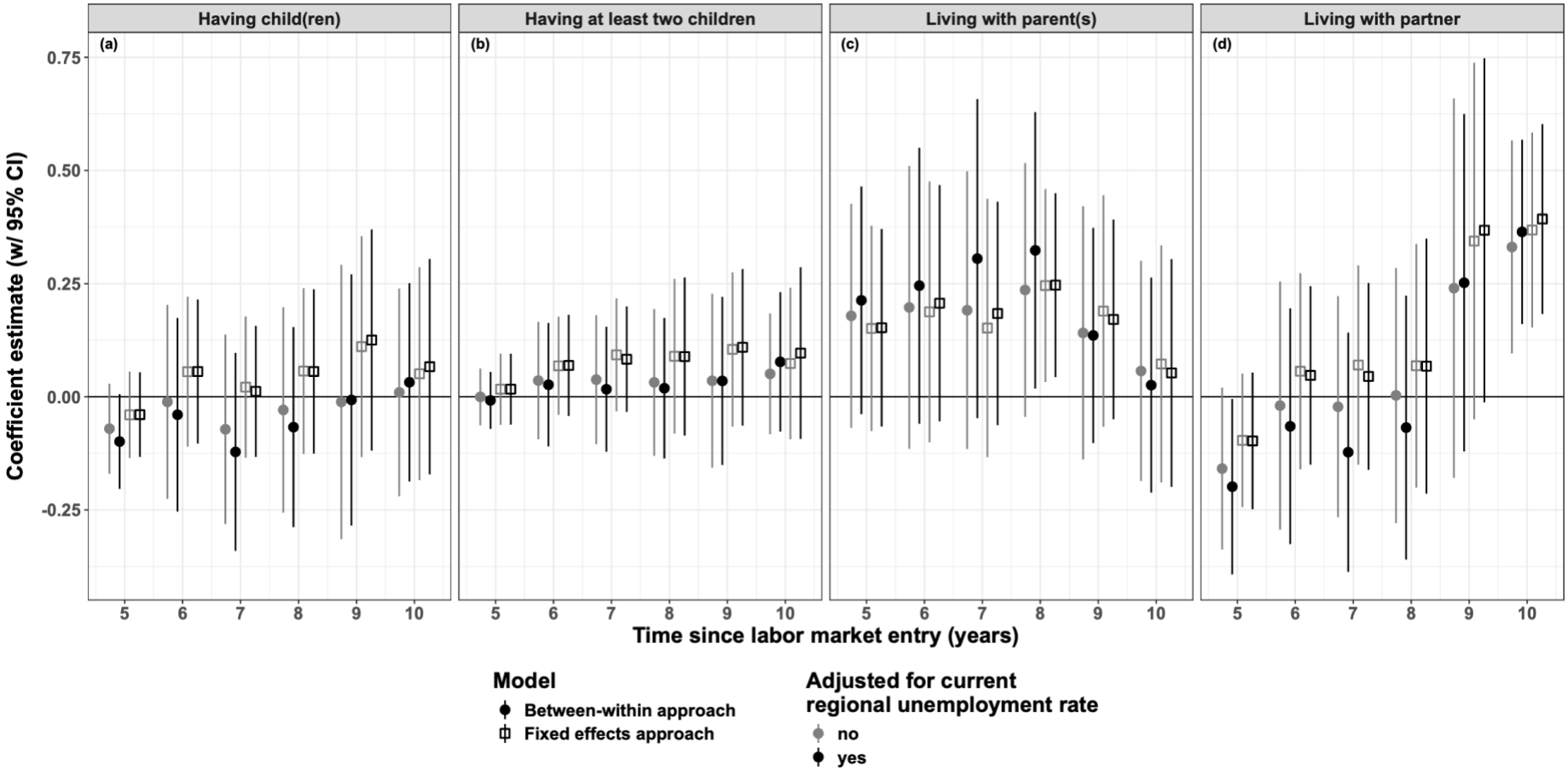

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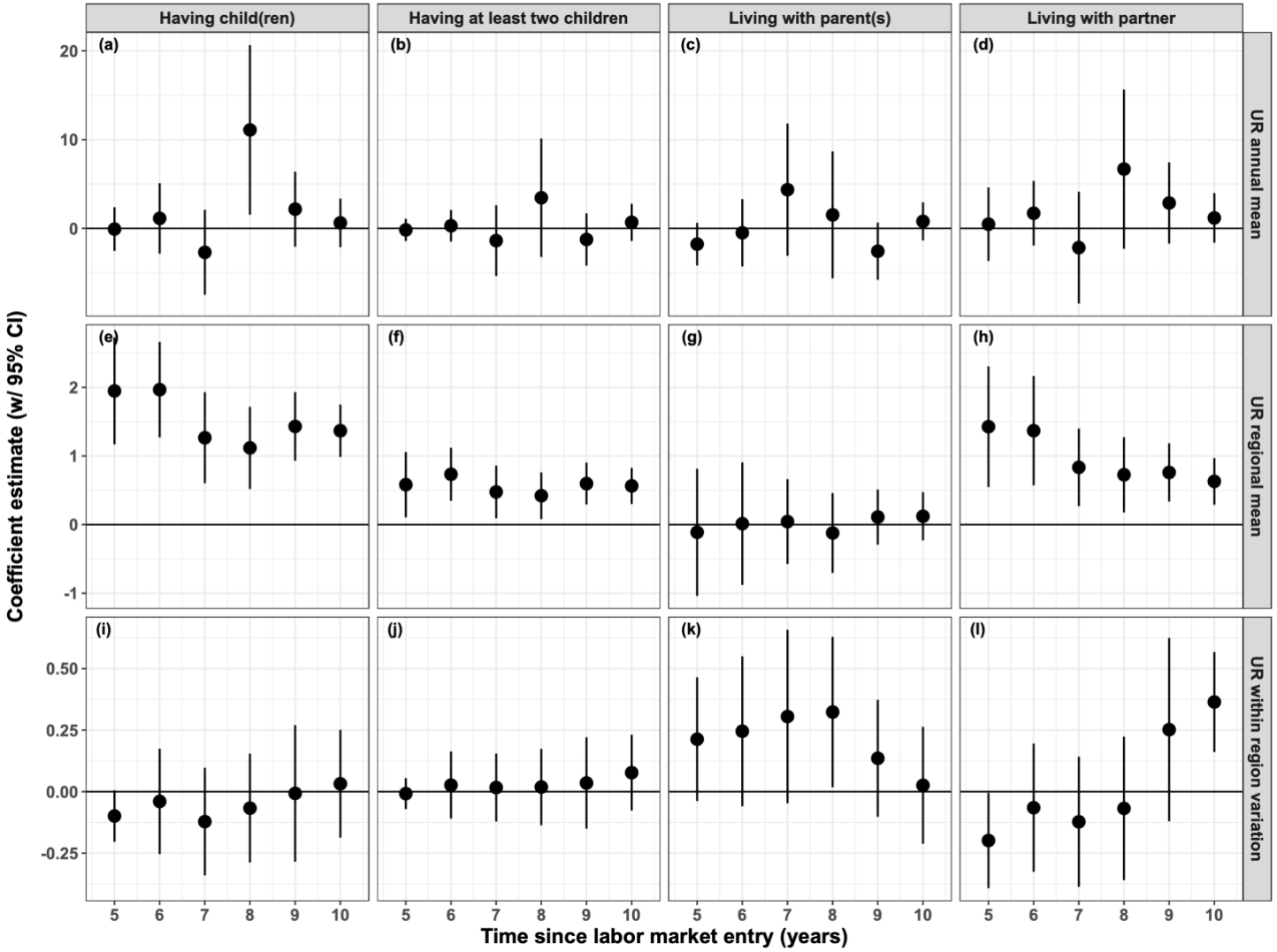
Figure A. 2. Coefficient estimates for the annual and regional mean components of the decomposed unemployment variable



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