From Partners to Parents: Pre-Birth Income Inequalities and the Evolution of Maternal Absolute and Relative Income Trajectories after Childbirth

Max Reichert[1], Lili Vargha[2], Flora Zhou[1]

This study analyzes the absolute and relative income trajectories of Dutch first-time mothers over a 12-year period, from two years before to ten years after their first childbirth, using an intra-household bargaining framework. Using Group-Based Multi-Trajectory Modelling (GBMTM), the study aims to identify distinct groups based on the trajectories of mothers' absolute income, their relative contribution to total household income, and patterns of subsequent births. By jointly analyzing these dimensions, the study tests how mothers' household bargaining power in the two years before pregnancy is associated with the evolution of her bargaining power over ten years post-birth. The dataset comprises all first births in the Netherlands in 2013 using register data, with annual measurements of maternal absolute income and their share of total household income. The study contributes to the literature in two key aspects: first, it provides a typology of trajectories of absolute and relative maternal income within a household context over 10 years after first childbirth. Second, it explicitly tests the association between these typical trajectories and pre-pregnancy income dynamics. We identify 8 distinct trajectories, ranging from 'Lowest income with growing dependency' (characterized by high dependency and multiple births) to 'High-Income Autonomous Breadwinners' (with strong income growth and high autonomy). Pre-pregnancy income dynamics, such as absolute levels and slopes as well as the age of the mother strongly predict group membership, with higher pre-pregnancy bargaining power and older age associated with more autonomous post-birth trajectories.

1. Introduction

The birth of a child is typically more disruptive for the labour market attachment and income progression of mothers relative to fathers (Goldin, 2014; Kleven et al., 2018). The reasons are manifold. One of them is an increase in household care demand that may interrupt continuous employment and suppress the income of the main carer, usually the mother (Cortés & Pan, 2023). In the Netherlands, a country in which the labour market attachment of women is relatively strong, mothers nevertheless face a childcare penalty of 20% (Kleven et al., 2023). Even if mothers' incomes increase after birth, they are unlikely to rise as fast as those of other household members. Relative contributions to household incomes are hence likely to remain stable or decrease during the

[1] Erasmus University Rotterdam

[2] University of Vienna

time around first and subsequent births. From a household bargaining perspective (Bittman et al., 2003), a decrease in mothers' absolute and relative incomes translates into a loss in intra-household bargaining power.

Inequalities prior to pregnancy may already foreshadow developments of later disparities. Pre-pregnancy dynamics may influence the post-birth progression of absolute and relative maternal incomes (Angelov et al., 2016; Schober, 2013). We distinguish between two key mechanisms. First, mothers' absolute and relative income levels before pregnancy determine their initial position in the post-birth income trajectory. Second, pre-pregnancy income growth both in absolute terms and relative to the household may affect the direction and pace of income developments after childbirth. From a household bargaining perspective, this may lead into differing degrees of dependency or relative autonomy. The discussion whether and to which extent pre-pregnancy income dynamics matter for post-birth income trajectories is contested and seldom examined. Some studies argue that mothers' absolute income matters most for post birth absolute and relative income progression (Gupta, 2007), while others assume that their relative incomes are most explanatory of post birth dynamics (Angelov et al., 2016). In addition to absolute and relative maternal income before pregnancy, we propose to incorporate a more longitudinal and embedded perspective, and to include the slope at which maternal income grows or decreases before pregnancy. Additionally, if the mother is cohabiting already before pregnancy, the slope relative to total household income should be taken into account as well.

Our study addresses these gaps in the existing literature. First, we create a typology of maternal post-birth income progression over 10 years in the Netherlands using register data. To this end, we examine mothers' income within the broader household financial context. The advantage of this approach is that it is partner-agnostic, encompassing all households in which a mother resides. It thus allows for greater flexibility in implicitly capturing various partnership configurations over time, such as changes in partnership status or single-motherhood. The use of register data herein allows us to capture groups that are difficult to identify using e.g, survey data.

Second, we test whether group membership is associated with previous maternal income dynamics. To this end, we expand our models to incorporate predictors for group membership probabilities that are measured before pregnancy. We capture both absolute and relative income in the year prior to pregnancy. To include pre-pregnancy dynamics in how maternal income developed we also include predictors that capture whether maternal income had a tendency to increase or decrease in the two years before pregnancy, both gross and net of absolute changes in total household income.

2. Data and analytical strategy

The data used in this study is from Statistics Netherlands Microdata (https://www.cbs.nl/en-gb/our-services/customised-services-microdata/microdata-conducting-your-own-research/microdata-catalogue). Statistics Netherlands maintains longitudinal administrative data for the entire Dutch population (Bakker et al., 2014). The measures are constructed from the tax registers, which are available each year starting in 2011. We select mothers who had their first child in 2013 (N = 56,187) and align the tax registers based on the year of childbirth to include 2 years before pregnancy until 10 years after birth (N=674,244 person years).

We measure mothers' absolute personal income using INPPERSINK from the CBS file INPATAB. This indicator includes income (top coded and deflated based on CPI of NL, 2010=100) from employment, self-employment, benefits from income insurance, and benefits from social provisions. We measure mothers' relative income as their share of the total income of the household in which the mother is registered in any given year. This implies that mothers may either live alone, with the father of the child, or in a separate household with another partner, and that these circumstances may change over time. We further include subsequent births. We record the total number of births per mother during the observation window, up to a maximum of 3, and their year of occurrence. We consider 1–3 births a meaningful range for distinguishing between low and high fertility.

In a first step, we model these three dependent variables jointly up to ten years from the year of childbirth (t0). The group based multi trajectory model is selected following the steps detailed by Nagin (2006), and Nagin (2018). First simple group-based trajectory models are run for each of the outcomes separately for a specified number of groups (1-8). Models are then selected based on Bayesian information criterion, other model adequacy measures, and theoretical parsimony. In a second step, we extend the model with baseline covariates, including the mother's absolute income and income progression before pregnancy. For the analysis we use the traj plugin to Stata (Jones and Nagin 2013).

3. Preliminary results

We identify 8 distinct groups based on model fit and parsimony (see *Figure 1*): G1 Lowest income with growing dependency (5.8%), G2 Low-income emerging 1.5 earner households (23.4%), G3 Mid-income shared earners (mothers' 40% share) (28.3%), G4 Mid-income equal earners (16.9%), G5 Low-income emerging sole breadwinner (5.9%), G6 Low-income continuous sole breadwinner (7.6%), G7 High-income high autonomy dual earners (8.45)), G8 Highest income high autonomy dual earners (3.6%). Higher pre-pregnancy maternal income share and stronger absolute income growth markedly increase the probability of belonging to dual earner and high-autonomy

trajectories (G4, G7, G8), whereas low shares and weak growth select into the low-income, high-fertility paths (G1, G2). Younger age and declining pre-pregnancy income slopes are associated with the emerging or persistent sole-breadwinner groups (G5, G6), while older mothers disproportionately enter the high-earning trajectories (G7, G8).

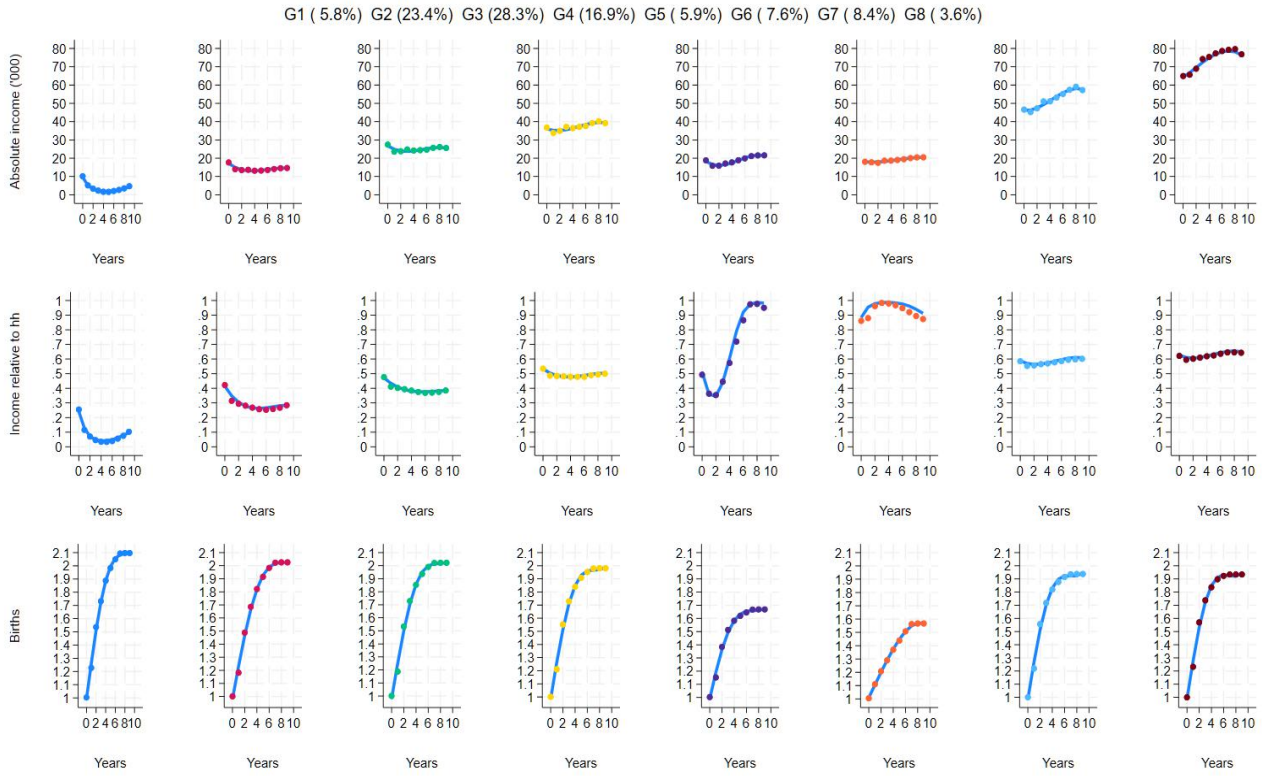

***Figure 1**: Eight-group Group-Based Multi-Trajectory Model of Dutch first-time mothers showing deflated absolute annual income (in 1.000, top), income share within the household (0–1, middle), and cumulative births (bottom) from t0 (first birth in 2013) to t+10; panel headers report group membership shares.*