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Descriptive Finding

Higher incomes are increasingly associated with higher fertility: Evidence from the Netherlands, 2008–2022

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Contents

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Abstract

BACKGROUND
The relationship between income and fertility appears to be changing across rich societies at the national and regional levels. However, less is known about how the individual-level relationship between income and fertility has changed over time.

OBJECTIVE
To examine how the relationship between income and fertility changed between 2008 and 2022 in the Netherlands, and how this trend differs by gender and parity.

METHODS
Using register data on the full population, I link income quintiles in year t–2 to births in year t. Separate logistic regression models are estimated for each gender and year.

RESULTS
Over the 2008–2022 period, income became increasingly positively associated with fertility. Although income effects are stronger for men than for women, the intensifying of the income effect over time is evident for both genders. These results are driven by first births. For higher-order births, income effects are much weaker and did not change over the study period.

CONCLUSIONS
Earning a high income constitutes an increasingly strong prerequisite for the transition to parenthood in the Netherlands. This likely contributes to the postponement of parenthood and the decline of fertility and suggests that low-income groups may increasingly be unable to fulfill their fertility desires.

CONTRIBUTION
This study adds to a small number of studies that have shown that the individual-level relationship between income and fertility has become more positive over the past decades in rich societies, and it shows that this trend is driven by first rather than higher-order births.

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1. Introduction

The relationship between income and fertility appears to be changing across rich societies. Whereas the country-level correlation between income and fertility has historically been negative across the income distribution, it changed to positive for OECD countries in the late 1980s and has remained that way ever since (Doepke et al. 2023). There is also some evidence for a turnaround in the relationship between income and fertility at the subnational/regional level, as shown by Fox, Klüsener, and Myrskylä (2019) for European countries between 1990 and 2012.

Less evidence is available, however, on changes in the link between income and fertility at the individual level, which cannot readily be inferred from aggregate data. Whereas the individual-level relationship between employment status and fertility is well documented (Raymo and Shibata 2017; Wood and Neels 2017; Dupray and Pailhé 2018; Yu and Sun 2018; Miettinen and Jalovaara 2020; Alderotti et al. 2021; Kristensen and Lappegård 2022; van Wijk, de Valk, and Liefbroer 2022), few recent studies have examined the effects of income on fertility (but see Adsera 2011; Miettinen and Jalovaara 2020; van Wijk, de Valk, and Liefbroer 2021, 2022). Historically it was argued that gendered divisions of labor result in lower fertility among women with higher incomes due to increased opportunity costs but result in higher fertility among higher-income men as men's income was expected to help cover the costs of having and raising children (Becker, 1991 [1981]). Recent studies have disputed this claim, however, by showing that high incomes have become associated with higher fertility for men and women alike, suggesting that assumptions based on gendered divisions of labor are no longer valid (Hart 2015; van Wijk, de Valk, and Liefbroer 2021). At the same time, in some countries income effects remain stronger for men than for women (Schmitt 2012; van Wijk, de Valk, and Liefbroer 2022), suggesting that gendered divisions of labor and male breadwinner norms may continue to be relevant.

Even fewer studies have explored how the association between income and fertility has changed over time. Of these, a study by Hart (2015) based on Norwegian register data showed that the relationship between income and the probability of having a first child became more strongly positive over the period 1995–2010 for both men and women. Likewise, based on data from panel surveys conducted in seven rich societies, van Wijk and Billari (2024) found that the relationship between income and first birth became more positive between the late 1990s and the late 2010s for men and women in Australia, Germany, and the United Kingdom, as well as for women in Russia, Switzerland, and the United States. In contrast, no changes in income effects over time were found for men and women in the Republic of Korea and for men in Russia, Switzerland, and the United States. Van Wijk and Billari (2024) concluded from this finding that the income prerequisites of parenthood have increased in many rich societies. They attributed this to societal developments such as an increasing compatibility of female employment and having and raising children, rising costs of childrearing, and

increases in the economic standards that young adults wish to reach before becoming parents.

In this study, I aim to add to this still rather scarce literature on changes in the relationship between income and fertility by using register data on the full population of childbearing age of the Netherlands. Whereas previous studies focused on first births, I also examine changes in the association between income and higher-order births. I focus on the period between 2006 and 2022, for which data are available on fertility, income, and important control variables. During this period, fertility in the Netherlands peaked at a total fertility rate of 1.80 in 2010, after which it gradually declined to 1.49 in 2022 (Statistics Netherlands 2023), a fertility decline similar to that observed in many other rich societies during this period (Human Fertility Database 2024). The present study contributes to the search for an explanation of this fertility decline, as potential increases in the income prerequisites of childbearing may well make people decide to postpone or even put off childbearing. Moreover, changes in the relationship between income and fertility show to what extent different socioeconomic groups are able to fulfill their fertility desires, potentially signaling rising reproductive inequality.

2. Data and methods

I use full-population register data from Statistics Netherlands' System of Social Statistical Datasets (Bakker, van Rooijen, and van Toor 2014). High-quality information on childbirth, income, and important control variables is available for the period 2006–2022. For each year in this period, I select all men aged 18–50 and all women aged 18–45 living in the Netherlands.

The dependent variable in all models measures whether the person had a (or more than one) child in a given year.

The main independent variable of interest is personal income, which is measured per calendar year. I measure income in year t–2 to ensure that incomes are fully measured before conception. As a result, incomes are measured over the years 2006–2020 and are linked to births in the years 2008–2022. Persons who immigrate to or emigrate from the Netherlands or pass away somewhere between the start of the measurement of income (in the beginning of year t–2) and the end of the measurement of births (at the end of year t) are excluded from the models. Income data are derived from tax registers and include all income from employment, business, and benefits earned by a person. I measure income at the individual rather than the household level to allow the estimation of gender-specific income effects. Moreover, measuring income at the individual level ensures that income effects do not capture effects of the type of household a person is part of, which is important given that union formation and stability may be important mechanisms that link income to fertility (Hart 2015; Miettinen and Jalovaara 2020). Although the measurement of income is more complete in the register data than it usually is in survey

data, incomes are still missing in 0.87% of all observations, for example because people file their taxes in another country or because incomes are paid directly by non-Dutch organizations (e.g., embassies). Observations with missing income data are excluded from the analyses. Incomes are measured using quintiles, which are constructed separately for each year to obtain an indicator of an individual's income position relative to others in a given year (cf. Hart 2015; van Wijk and Billari 2024).

All models control for age, migration background, educational attainment, employment status, and fertility history. Age is measured using yearly age dummies. Migration background is indicated by a five-category variable that distinguishes between persons who were (1) born in the Netherlands to parents born in the Netherlands; (2) born in the Netherlands to parents born in another European country; (3) born in the Netherlands to parents born outside Europe; (4) born in another European country; and (5) born outside Europe. Educational attainment is measured by grouping individuals into five categories based on the highest level of education they completed (ISCED 0–1, 2, 3, 4–6, or 7–8). A separate category is added for persons whose level of education is unknown, which may happen because of education at a private institute or abroad, for example. A variable that measures employment status is included to account for whether persons were employed, self-employed, not employed, or in education, measured in January of year t–1. Finally, a person's fertility history is measured by a variable with 36 categories based on the combination of parity and time since previous birth. The reference category includes people who do not have children; the other 35 categories include cross-classification of the number of children (one, two, three, four, or five or more) and the time since the previous birth (1, 2, 3, 4, 5–7, 7–11, or 12 or more years).

Given the large number of observations (N = 52,327,941 for men; N = 42,823,262 for women), I focus on substantive rather than statistical significance in the analyses. Models are estimated separately for men and women using discrete-time event history analysis with logistic regression. I estimate separate models for each year, effectively controlling for potential changes in the effects of control variables over time (Hart 2015). Most importantly, this approach has the advantage of controlling for changes in the age pattern of fertility over time. From these regression models I calculate predicted probabilities. I then divide the predicted probability of having a child for persons in income quintiles 2–5 by the predicted probability of having a child for persons in the lowest income quintile, creating an intuitive measure of the size of the income effect. In additional analyses, I estimate parity-specific models by running separate analyses for persons who have no children, one child, and two or more children.

3. Results

Figure 1 shows the predicted probability of conceiving a child for men and women in the second, third, fourth, and fifth income quintiles relative to the probability for the lowest income quintile. For men, earning a higher income strongly increases the probability of birth in all years. Although men in the first and second quintiles are roughly equally likely to conceive a child, the probability of birth increases more or less linearly with increasing incomes after the second quintile. The income effect for women is also generally positive, although women in the first income quintile are more likely to conceive a child than women in the second income quintile. Moreover, the positive income effects for incomes above the second income quintile are generally weaker for women than they are for men, illustrating the gendered nature of the link between income and fertility.

Between 2008 and 2022, the income effect on the probability of birth became more strongly positive for both men and women. For example, as shown in Figure 1, whereas men in the highest income quintile were 1.64 times more likely to conceive a child than men in the lowest income quintile in 2008, this had increased to 1.89 by 2022. Likewise, women in the highest income quintile were 1.41 times more likely to conceive a child in 2008 than their counterparts in the lowest income quintile, whereas in 2022 this number was 1.61. This increase in the income effect resulted from a strong decline in fertility among men and women with low incomes, whereas fertility decreased less among high-income men and women.

Although the general trend is one of increases in the income effect on fertility over time, Figure 1 also shows fluctuations around this trend. Most strikingly, the income effect appears to have decreased in magnitude somewhat in 2011 and in 2021–2022. As these are the years following the 2008–2009 financial crisis and the COVID pandemic, this suggests that periods of crisis may see (temporary) attenuations of the positive income effect, mainly resulting from a decline in fertility among higher-income individuals.

Figure 1: Ratio of the predicted probability of having a child for persons in income quintiles 2–5 relative to persons in income quintile 1, by gender and year

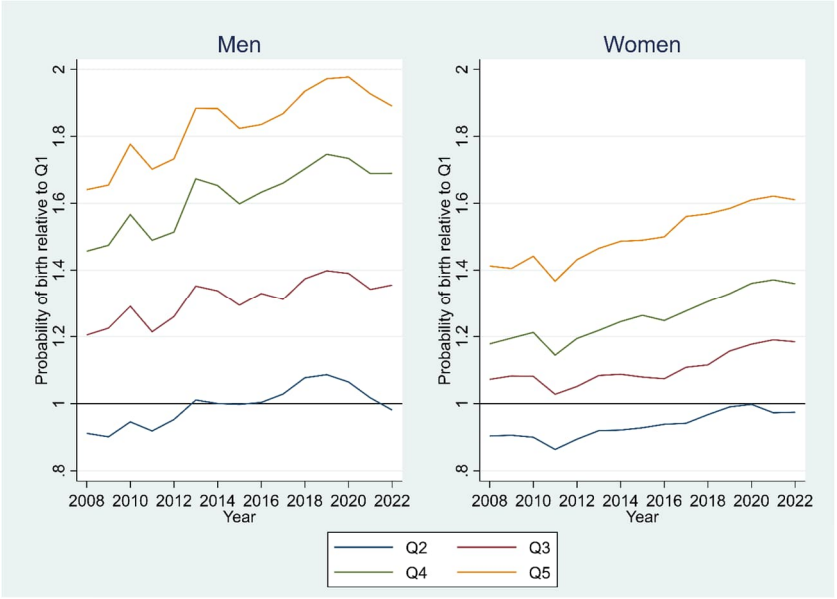
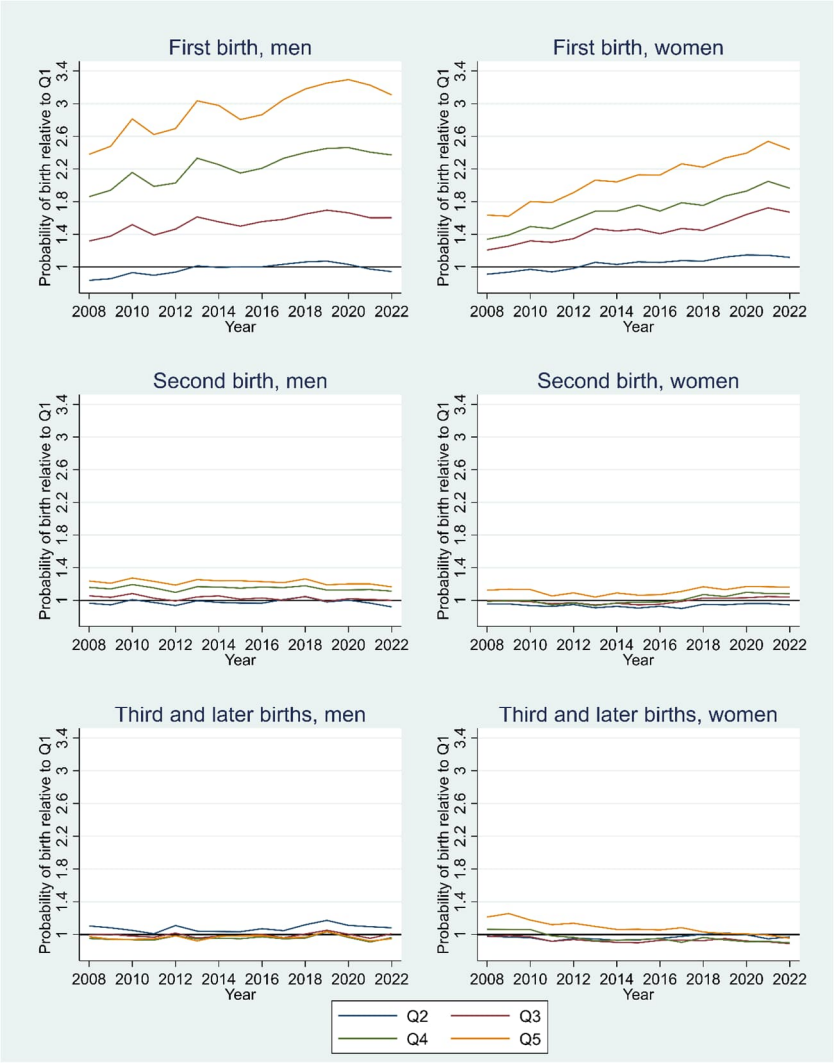


Figure 2 again shows the ratio of the predicted probability of having a child for persons in income quintiles 2–5 relative to persons in the lowest income quintiles, this time distinguishing between births of different parities. The income effects on fertility are large and positive for men's and women's first births, are smaller but still positive for second births, and are largely absent for third and later births. Moreover, the increase in the size of the income effect over the 2008–2022 period is exclusively found for first births, where the change in effects is quite large. For example, whereas men in the fifth income quintile were 2.38 times more likely to have a first child than men in the lowest quintile in 2008, this had increased to 3.11 by 2022. Likewise, women in the fifth income quintile were 1.63 times more likely to become mothers than women in the lowest quintile in 2008, but this effect had increased to 2.44 by 2022. In contrast, the small positive income effect on second births did not change noticeably over the study period, and the probability that women in the fifth income quintile had a third child even declined somewhat relative to women in lower income quintiles. Overall, these findings show that income plays an important role in the birth of a first child, and this importance has increased over time. But for those who are already parents, income plays less of a role in the decision to have more children.

Figure 2: Ratio of the predicted probability of having a child for persons in income quintiles 2–5 relative to persons in income quintile 1, by gender, year, and parity



4. Sensitivity analyses

I conducted several robustness checks to investigate the sensitivity of the findings to alternative specifications. First, I reran the models using absolute income (adjusted for inflation) rather than persons' relative income positions. This did not noticeably change the results. Second, to examine whether the results change when the data are analyzed at the couple level instead of the individual level, I selected all different-sex co-residing couples and used the combined income of both partners in the analyses. Although the magnitude of the (changes in) income effects is smaller when modeled at the couple level, the results of the couple-level models support the main findings of the individual-level analyses regarding the positive sign of the income effect, the strengthening of income effects over time, and the differences by parity. Finally, I estimated a single model that pooled data for all years in the observation period, and I included an interaction effect between the period dummies and the income quintiles. In this analysis, the strengthening of the income effect over time was even more pronounced compared to the results reported above (where separate models were estimated for each year), potentially because changes in the effects of the other control variables (e.g., age) over time are not controlled for in this specification. The results of these sensitivity analyses are available upon request.

5. Discussion

Using full-population register data, this study has shown that the relationship between income and fertility is intensifying in the Netherlands. Men and women with higher incomes were already more likely to have a child than their lower-income counterparts in the late 2000s, and this relationship strengthened throughout the 2010s. These results are driven by a large and increasing gap between high- and low-income men and women in their likelihood to have a first child. In contrast, among the increasingly selective group of parents, income is much more weakly associated with fertility, and the income effect on higher-order births has not changed noticeably over time.

These findings add to a small body of literature that evinces the existence of a more general trend across low-fertility societies in which earning a high income constitutes an increasingly strong prerequisite for the transition to parenthood (Hart 2015; van Wijk and Billari 2024). Such a trend has important implications for our understanding of fertility patterns and trends. As earning a low income increasingly seems to be an obstacle to becoming parents, people who do not have the financial resources (perceived to be) required to have and raise children may postpone or even put off the transition to parenthood. So the intensifying link between income and first birth may well contribute to the postponement of parenthood and the decline in fertility observed in many rich

societies, particularly since the incomes of young adults have stagnated over the past decade (Hammer, Spitzer, and Prskawetz 2022). It should be noted that under the current study design, I could not distinguish between tempo effects – where people increasingly have children at points in the life course at which income is higher – and quantum effects – where increasingly it is those with lower incomes who remain childless. However, it seems likely that postponement will result in a decrease in completed fertility, at least for some (Kohler, Billari, and Ortega 2002). This would imply emerging inequality in reproductive outcomes between low-income and high-income individuals, with a low-income group that is increasingly marginalized also in terms of completed fertility. Finally, increases in the income prerequisites of parenthood offer a plausible explanation for recent shifts in the educational gradient of fertility from negative to positive (Jalovaara et al. 2019).

Whereas income effects are strong and intensifying over time for first births, this finding does not extend to higher-order births. Combined with the relatively high overall probability of having a second child, this may indicate that most parents who have a first child tend to have another child within a few years regardless of their economic position, consistent with strong two-child family ideals (Sobotka and Beaujouan 2014). Moreover, having second and, particularly, third and later children may be more dependent on preferences than on economic constraints. However, when interpreting these findings it should be kept in mind that those parents at risk of higher-order births form an increasingly selective group with high incomes, which eventually results in increasing selectivity also among those with larger families.

Future research should examine heterogeneity in income effects on fertility by population subgroup, for example by age, educational attainment, or residential context. This could contribute to uncovering the mechanisms behind the intensifying relationship between income and the transition to parenthood, for which several potential candidates emerge from the literature. First, the gender revolution has increased the compatibility of female (full-time) employment and motherhood, which reduces the opportunity costs of parenthood for higher-income women (Goldscheider, Bernhardt, and Lappegård 2015). This has likely contributed to the increasingly positive income effect for women, although the finding that income effects remain more strongly positive for men than for women signifies that the gender revolution is by no means complete. In the Netherlands in particular, the high share of women who work part-time and the corresponding "one and a half earner model," in which the man's income makes up a large part of total family income, have likely contributed to the stronger effect of men's relative to women's incomes.

However, as the income effect has also strengthened over time for men, the gender revolution alone is not sufficient to explain the trends. A second explanation focuses on the rising costs of having and raising children, for example with regard to housing and child care, which may have increased the level of income required to support a family. Third, a shift to more intensive parenting strategies may have increased the investments

potential parents aspire to make in their children, which could have elevated the level of income they wish to achieve before having children (van Wijk and Billari 2024). Fourth, developments in birth control and infertility treatments may have contributed to changes in the link between income and fertility. Specifically, declines in the number of unintended births may have contributed to the declining fertility of low-income men and women in particular, whereas the spread of assisted reproductive technology may help explain the relative increase in fertility among higher-income individuals (Doepke et al. 2023). Finally, changes in the economic foundations of union formation and stability (Sweeney 2002) could imply that earning a high income is increasingly associated with stable partnerships, which would likely also result in a strengthening of the link between income and fertility.

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