The Impact of Earnings on the Transition to Fatherhood in Norway 1975-2009*

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Abstract

Higher earnings potential and more gender egalitarian attitudes are expected to make men with higher educational attainment more attractive as partners and thus more likely to have a first child. To distinguish the impact of earnings potential from the impact of attitudes and values, this study uses observed annual earnings, rather than educational level, as a proxy for earnings potential. Hazard regressions are estimated on highly accurate registry data, covering all Norwegian men born 1955-1988 who are at risk of having a first child in the period 1975-2009. Results show that the yearly first birth rate increases monotonously with earnings quintile. Being in the 5th earnings quintile more than doubles yearly first birth rate compared to being in the 1st earnings quintile. The impact of earnings on first birth rate strengthens over time, despite fathers' stronger involvement in child care and house work and women's increasing labour force participation.

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1 Introduction

Sociodemographic studies of the transition to fatherhood have focused mainly on the impact of educational attainment (see e.g.Koropeckyj-Cox and Call 2007 for an overview). Men with higher educational attainment are consistently found to be less likely to remain childless, and this finding is explained by their higher propensity to marry. Higher education is associated with higher earnings potential, but also with knowledge, attitudes and values that facilitate union entry and protect against union dissolution (Kravdal and Rindfuss 2008). To better understand the impact of men's earnings potential on fertility, a better proxy for of earnings potential is needed.

Studying couples' transition to parenthood, Heckman and Walker (1990) and Merrigan and St.-Pierre (1998) find no significant impact of the male partners's (predicted) income on first birth rate. Obviously, these studies will not capture any impact of earnings potential on fertility that is mediated by union entry. At the end of the reproductive years, fathers are found to have higher income than men who have remained childless (Fieder and Huber 2007; Nettle and Pollett 2008). Though this may result from a positive impact of earnings on the transition to fatherhood, an alternative explanation is that fatherhood has a positive effect on men's earnings (as shown by for instance Lundberg and Rose (2002)).

Using highly accurate registry information on observed annual earnings and first births covering all Norwegian men born 1955-1988 (N$\sim$ 1.1 million), I estimate the impact of earnings on men's first birth rate. The impact of earnings potential of men's family formation is, according to some studies, weaker in contexts where gender equality is high (Kalmijn 2011). Throughout the period of study, 1975-2009, the labour force participation of Norwegian mothers increased substantially, and Norwegian fathers increasingly took part in care work. This may weaken the impact of earnings potential on first birth rate for men. By estimating an interaction term between earnings and

period, I investigate whether the impact of men's earnings potential on first birth rate has decreased over the last 35 years.

2 Theory and background

Earnings potential is expected to affect the first birth rate through three mechanisms: Firstly, men with higher earnings potential may be more attractive as partners. Secondly, his earnings may affect both whether and when couples have a first child. Finally, men's propensity to have first child without living with a partner may vary with earnings potential.

2.1 Men's earnings and union entry and stability

For obvious reasons, being married or cohabiting facilitates the transition to parenthood[1]. Particularly, studies of men's fertility preferences show that these are often developed together with a partner (Wetlesen 1991; Marsigilio 2007). The theory of gender specialisation (Becker 1991) and the theory of pooling of resources (Oppenheimer 1997) both predict that women seek partners with higher earnings potential. This prediction is supported by empirical studies showing that men's earnings potential is associated with higher marriage rates (Sweeney 2002; Xie et al. 2003; Kalmijn and Luijkx 2005; Petersen, Penner and Høgsnes 2006) and lower divorce rates (Hoffman and Duncan 1993; Jalovaara 2003; Lyngstad 2004; Kalmijn, Loeve and Manting 2007).

In the period of study, childbearing to cohabiting couples has become increasingly common in Norway (e.g. in 2011 49 per cents of first births were to cohabiting parents, compared to 32 per cent to married couples[2]). A positive impact of earnings on entry into cohabitation is found in the Nordic countries (Bracher and Santow 1998; Jalovaara 2012), and men's lower earnings potential has consistently been found to elevate the

risk of cohabitation dissolution (Jalovaara 2011; Texmon 1999; Brines and Joyner 1999; Kalmijn, Loeve and Manting 2007). Cohabiting unions have higher dissolution rates than marriages (Lyngstad and Jalovaara 2010). Cohabiting couples are a heterogenous group, and Wiik, Bernhardt and Noack (2009) find that Norwegian men and women who plan to marry their cohabiting partner are not more likely to have breakup plans than married men and women. As men with higher earnings potential are more likely to have marriage plans than men with lower earnings potential (Kravdal 1999; Wiik, Bernhardt and Noack 2010), this again supports the idea that men with higher earnings potential live in more stable cohabiting unions.

2.2 Men's earnings and household fertility decisions

According to conventional microeconomic theory of fertility (Becker 1991), the earnings potential of the spouses affects a couple's demand for children. Becker (1991) assumes that couples with higher income, rather than having more children, invest more in each child. Additionally, the cost of childbearing depends on the (hourly) price of the time used for childrearing, which is also related to household income. Under gender specialization, the cost of childrearing will be higher in the the households of high-earning men if there is associative mating on earnings potential (as shown by e.g. Nakosteen, Westerlund and Zimmer (2004) and Breen and Andersen (2012)). If fathers participate extensively in childrearing, the cost of childbearing will increase substantially with the father's earnings potential (Ermisch 2003). As both the investment in each child and the cost of time spent on childrearing is expected to increase with household income, household income is expected to have only a weak positive impact or no impact at all on couple's decision to have a first child. Earnings may, however, affect the *timing* of a first birth: If household income is low and expected to increase in the future, couples

[2]http://www.ssb.no/emner/02/02/10/fodte.

may decide to postpone childbearing (Happel, Hill and Low 1984).

In line with the expectations from the microeconomic theory of fertility, Heckman and Walker (1990) and Merrigan and St.-Pierre (1998), using data from Sweden and Canada respectively, find no significant impact of men's earnings on first birth rate after controls for woman's wages and marital status. Similarly, Freedman and Thornton (1983) find no positive impact of husband's income on the transition to a first child, in a design without controls for the wife's earnings potential. Controlling for the partner's (observed) earnings, Andersson and Scott (2007) find a positive impact of men's (observed) earnings on the risk of having a second birth. This result stands in contrast to the negative but insignificant estimates obtained by Heckman and Walker (1990) for second births. A number of differences between the studies may explain the different results obtained using Swedish data. Most importantly, Andersson and Scott (2007) use observed earnings, while Heckman and Walker (1990, p. 1422) use constructed time series of wages and income.The inconclusive results indicate further studies of the impact of men's earnings on couple's transition to parenthood are called for.

Observed earnings reflect both (future) earnings potential and (current) employment status. Working for some years before having a first child gives a person a stronger foothold in the labour market, enabling parents to both devote more time to home production and maintain a stable income (Cooney et al. 1993). In line with this, being employed is found to facilitate the transition to fatherhood (Liefbroer and Corijn 1999; Winkler-Dworak and Toulemon 2007). It should be noted that these studies include the full male population, and that limiting the study samples to men living with a partner may change the results.

Unobserved personal characteristics such as willingness to work hard, health, etc. may affect both earnings and entry into fatherhood. Thus, any positive association between earnings and first birth risk for men is expected to be at least partly driven by

selection.

2.3 Men's earnings and childbearing outside unions

Non-union childbearing is associated with socioeconomic disadvantage among women (see e.g. Perelli-Harris et al. 2010). Research on men's non-union childbearing is scarce, but points in the same direction. Non-residential fatherhood is associated with lower socioeconomic status (Nelson 2004; Skrede 2004), and though this is partly due to the socioeconomic gradient in union dissolution risk, it also indicates that non-union childbearing is associated with socioeconomic disadvantage.

Previous studies indicate that men with lower income have higher risk of contraceptive failure (see Nelson (2004) for an overview). As non-union births are more often unplanned (Hayford and Guzzo 2010), and thus likely to more often be a result of contraceptive failure, men with lower income may have an elevated risk of fathering an unplanned child. A conception outside union does not necessarily lead to a non-union birth if it is carried to term, as the parents-to-be may choose to form a union before the child is born. Expectant mothers may be more interested in forming a union if the father-to-be has higher earnings than if he has lower earnings (Ermisch 2003). This would also give a higher risk of non-union birth among men with lower earnings potential.

2.4 Summary and expectated associations

A positive impact of earnings potential on men's first birth rate is expected, mainly because men's earnings potential increases their union entry rate and protects against union dissolution. Lower earnings potential may elevate the risk of a non-union birth, but as most births take place in a union where the impact of earnings is positive, the impact of earnings potential on the transition to fatherhood is expected to be positive.

3 Expected change over time

Some cross-sectional studies indicate that the earnings-union entry association is weaker for men in contexts where the labour supply of mothers is high and fathers spend much time on childcare and housework (Kalmijn 2011). Throughout the period of study, the labour force participation of Norwegian mothers has increased substantially (Statistics Norway 2012). As women increasingly are economically independent, they may put less emphasis on earnings potential when looking for a partner. Norwegian fathers have also increasingly taken part in care and house work (Kitterød 2002), actively encouraged by family policies. Some men with higher earnings may find that the forgone earnings associated with fathering have become too high, and thus choose to remain childless. Both these mechanisms would lead to a weakening of the impact of earnings potential on entry into fatherhood over time.

Union instability has increased markedly in the period of study, also among couples with children (Noack 2010). If some women prefer fathers with higher earnings over childless men with lower earnings, some men with lower earnings potential may not be able to find a partner and remain childless. Increasing union instability may thus strengthen the impact of earnings potential on men's first birth rate over time.

4 Method and data

4.1 Data

The analysis is based on data on births, gross annual pensionable earnings and educational level/enrollment for all men born 1955-1987 from the Norwegian population registers. The data set further is restricted to men who have at least one Norwegian-born parent, who are Norwegian citizens, and who did not have a first child before

age 20. Fertility behaviour is observed in the period 1975-2009, and observations are censored at whatever occur first of a first birth, age 50 or calendar year 2009. The study sample consists of ~ 1.1 million men.

Table 1: Summary statistics: Distribution of exposure time on independent variables

	Percent
Earnings quintile	
Q1	20.3
Q2	18.7
Q3	17.4
Q4	16.9
Q5	16.4
Missing	10.2
Educational attainment	
Higher education, higher degree	3.6
Higher education, lower degree	14.2
Secondary education	63.5
Primary education	17.9
Missing information	0.7
Educational enrollment	
Less than 4 months	68.8
Four months or more	31.2
Period	
1975-1979	4.0
1980-1984	9.7
1985-1989	14.0
1990-1994	16.6
1995-1999	18.0
2000-2004	18.8
2005-2009	19.0

Based on 1 077 672 subjects with 624 454 failures (births).
Total exposure time 11 800 401 years.

4.2 Method

Continuous-time hazard regression models for first birth rates are estimated with the baseline rate (hazard) specified as a linear spline with 5-year knots. Estimations are done with the Stata command STREG. Results are reported as hazard ratios.

4.3 Variables

Observed annual earnings are categorised into quintiles separately for each calendar year and age. Missing earnings are included as a separate category. As a robustness check, models with earnings quintiles calculated separately by calendar year but not by age, as well as models with linear and log-linear coding of earnings are estimated. When absolute rather than relative income is used, earnings are inflated or deflated to 1998-kroner using the Consumer Price Index[3].

Educational attainment and enrollment may confound the association between annual earnings and first birth risk, and are thus included as controls. Men who are in education for at least 4 months are defined as students. All models also estimated with students excluded to see if the results are sensitive to this. Separate models by educational attainment are estimated to investigate if the impact of earnings depends on these factors.

Calendar time is included as a grouped variable (5-year categories) and is in some models allowed to interact with earnings. A set of dummies for *region of birth* is included, to capture regional variation in earnings level and fertility that may confound the estimates for earnings.

A couple's decision to get married may result from an intention to have a first child, and if so, a control for marital status would be a control for an intention to start a family. Including marital status in the model would also control out any indirect

[3]Obtained from http://statbank.ssb.no/statistikkbanken/?PLanguage=1.

effect of earnings potential on fertility that is mediated by marriage. For these reasons, controls for martial status are *not* included in the models. A covariate for marital status would also make comparison over time less clear due to the increase in first births to cohabitants: As non-marital childbearing increased substantially throughout the period, non-marital births in the first part of the period will have a large proportion of births to single mothers, while the majority of non-marital births in the late part of the period will be births to cohabiting couples.

Table 2: Model 1

	Model 1a		**Model 1b**	
	Estimate	(95% C. I.)	Estimate	(95% C. I.)
Educational attainment (ref=secondary)				
Higher education, higher degree	1.42	(1.40-1.43)	1.18	(1.16- 1.19)
Higher education, lower degree	1.13	(1.12-1.14)	1.07	(1.06-1.07)
Primary education	0.75	(0.74-0.75)	1.05	(1.05-1.06)
Educational enrollment (ref=<3 months)				
Enrolled> 3 months	0.59	(0.59-0.60)	0.76	(0.75-0.76)
Earnings quintile (ref=Q1)				
Q2			1.38	(1.37- 1.40)
Q3			1.77	(1.75-1.78)
Q4			2.02	(2.00-2.04)
Q5			2.21	(2.19-2.23)

Estimates not significant at the 0.001-level are in italics.
Both models includes baseline hazard (linear spline) and controls for region of birth and period.

5 Results

Summary statistics (distribution of exposure time on values of covariates) is shown in table 1. Note that there is less exposure time in the earliest period, due to the exclusion of men born before 1955. As earnings quintiles are calculated on basis of all men, and

fathers on average earn more than those who are (still) non-fathers, a larger per cent of the exposure time is found in the lower earnings quintiles than in the higher earnings quintiles. Men with missing information on earnings and educational level are included in the analysis, but estimates for these groups are not shown.

5.1 The impact of earnings on first birth rate

Model 1a (earnings excluded) shows that the first birth rate increases monotonously with educational attainment when earnings are not controlled for (table 2). The lowest birth rate is found among men with primary education, and the highest among men with higher education of higher degree. Being enrolled in education lowers the birth rate substantially[4]. The estimates for higher education (higher and lower degree) are reduced substantially when dummies for earnings quintile are included in the model (model 1b, table 2). This indicates the higher earnings potential explains much of the positive impact of educational attainment on first birth rate. Substantially, men with higher education are more likely to enter fatherhood than men with lower education because they have higher earnings. In particular, the lower first birth rate of men with primary education is fully explained by their lower earnings potential.

The impact of annual earnings on first birth rate is estimated in model 1b. The null hypothesis that earnings potential has no impact on first birth rate is not supported by the data. The robustness of the results has been checked by running models with different codings of earnings (results not shown). Earnings quintiles not calculated separately by age a yields similar pattern, but slightly higher estimates. The estimate for log earnings is positive, and consistent with the findings of Lappegård and Rønsen (2011). A statistically significant but substantially very weak impact is found when

[4]The impact of earnings is here assumed to be independent of educational attainment. This assumption is tested in the models presented in figure 1.

income is linearly coded, indicating that the association between earnings and first birth rate is non-linear. The finding is consistent with Huinink's (1995) results for former West-Germany.

To test whether the impact of earnings potential depends on mens's education, separate models were estimated by educational attainment and enrollment. Hazard ratios by earnings quintile, estimated separately by educational attainment and enrollment, are shown in figure 1. The most striking feature of figure 1 is that the impact of earnings is fairly similar across education level: The birth rate increases monotonously with earnings quintile, and the lowest earnings quintile stands out with particularly low birth rate in all educational groups. The impact of earnings is lowest among men with the highest educational attainment. Though some of the estimated interaction terms between income and education are significant when tested in a pooled model (not shown), there is no clear pattern in how the impact of earnings varies by educational attainment and enrollment.

The impact of earnings is substantial: Being in the fifth earnings quintile, compared to being in the first, more than doubles the yearly birth rate. The strong positive impact of earnings stand in contrast to the non-significant impact of men's income on first birth rate found by Heckman and Walker (1990) and Merrigan and St.-Pierre (1998), using constructed time series of income. The estimates obtained are more similar to the estimated impact of earnings on second birth rate obtained by Andersson and Scott (2007).

As discussed above, the estimates for earnings reflect both the impact of being employed and the pure income effect of earnings. The estimates are consistent with the results for employment on men's transition to fatherhood found by Liefbroer and Corijn (1999) and Winkler-Dworak and Toulemon (2007). It is noteworthy that the impact of earnings on men's first birth rate resembles the impact of earnings on men's

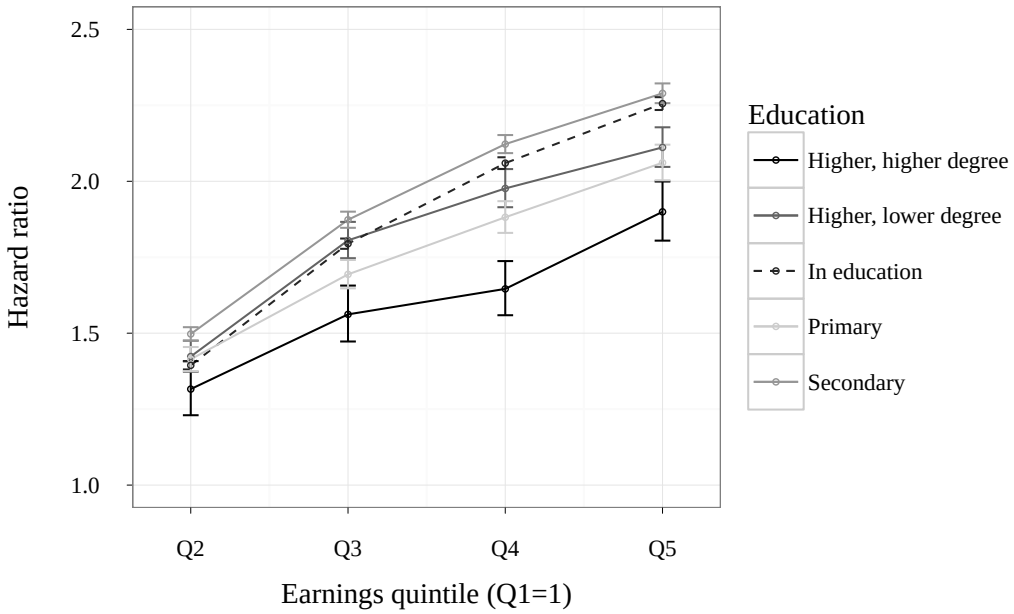

Figure 1: Relative first birth rate by earnings quintile: Estimates from separate models by educational attainment and achievement

The baseline hazards are included as a linear splines. Models include controls for region of birth and period.The model for men in education includes control for educational attainment.

rate of union entry found by Jalovaara (2012). This supports the interpretation that union entry is an important mechanism linking earnings and entry into fatherhood.

5.2 Changes over time

Figure 2 shows how the impact of men's earnings on first birth risk varies in the period 1975-2009 (estimates for earnings quintile, period and interaction between earnings quintile and period are found in appendix). The earnings estimates are relatively high in the first part of the period, low throughout the 1980s and early 1990, and peaks towards the end of the period. Estimates from hazard regressions run separately by birth cohort in 5-year categories (figure 3) confirm this pattern. The earnings estimates are higher among men born 1965-1969 than among men born 1955-1959 and 1960-1964. The increase in the impact of earnings over cohort is not substantial, but the

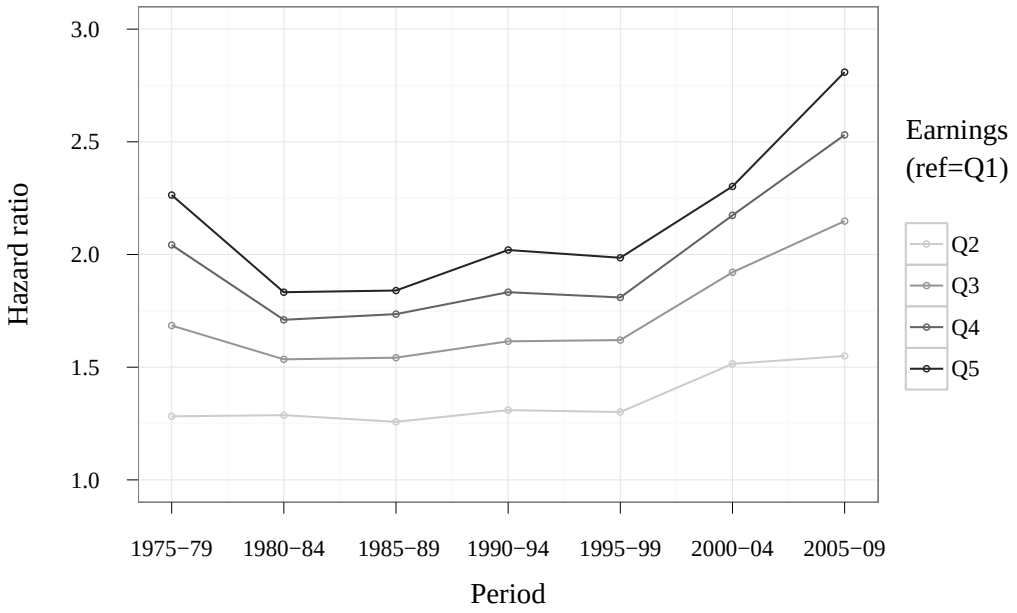

Figure 2: Relative first birth rate by earnings quintile and period
The baseline hazard is included as a set of dummies for 5-year age categories. Estimates are controlled for region of birth and educational attainment and enrollment. Interaction between period and all other variables are included in the model.

95% confidence intervals indicate that the differences by cohort are significant.

In a period of increasing gender equality, the importance of earnings for the transition to fatherhood has increased. The results stand in contrast to the findings of cross-sectional studies, where the impact of earnings on men's family formation is weaker in contexts of high gender equality (Kalmijn 2011). It is possible that gender egalitarian practices *have* weakened the impact of earnings on fertility for men, but that other societal changes working in the opposite direction have masked this effect. For instance, the strengthening impact of earnings on the transition to fatherhood could be linked to increasing union instability. If the *increase over time* in union instability has been stronger among men with lower earnings potential, men with lower earnings may increasingly remain childless because their unions are dissolved before the birth of a child. Increasing union instability also changes the pool of available partners, making

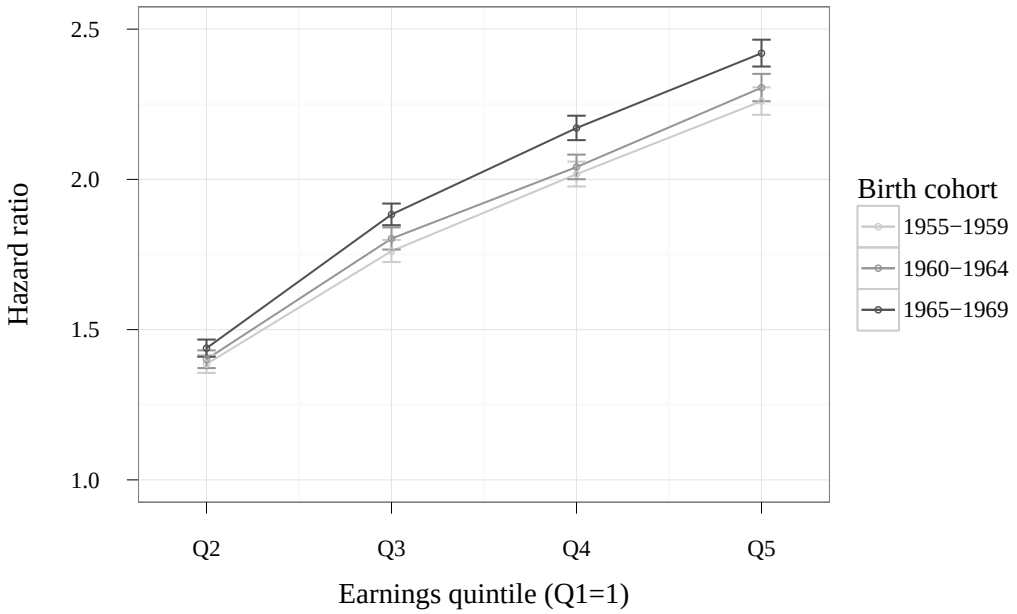

Figure 3: Relative first birth rate by earnings quintile: Estimates from separate models by birth cohort (5-year groups)

The baseline hazards are included as linear splines. All models include controls for educational attainment and enrollment, region of birth and period.

it possible for women to choose a man with higher earnings and children of his own over a childless man with lower earnings as a partner.

6 Conclusion

This study finds that earnings have a substantial impact on the transition to fatherhood in Norway: Being in the fifth earnings quintile more than doubles the first birth rate compared to being in the first earnings quintile. The results indicate that men with higher earnings potential have a double advantage, as doing well in paid work facilitates starting a family. The estimated impact of earnings is substantially stronger than found in studies focusing on men living with a partner only, indicating that union entry and stability mediates the impact of earnings on entry into fatherhood.

Contrary to expectations, the impact of earnings on the transition to fatherhood has *strengthened* over time. Identifying the mechanisms that drive this change is beyond the scope of this study, but one could speculate that increasing union dissolution rates make it possible for women to choose high-earning men who are already fathers over low-earning men with no children on their own. The strong association between earnings potential and entry into fatherhood indicates that Norwegian men still are seen as breadwinners, either by themselves, prospective partners, or both. The results also indicate that the future cohorts of elderly childless men will consitute an increasingly volnurable group, as they will have an increasingly weak position on the labour market.

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Table 3: *

Appendix: Interaction between period and earnings quintile

Baseline hazard (dummies for 5-year age categories), region of birth and educational attainment and achievement,and interaction between period and all other variables are included in the model.Estimates not significant at the 0.001-level are in italics.

Earnings quintile(ref=Q1)	
Q2	1.55
Q3	2.14
Q4	2.52
Q5	2.80
Period(ref=2005-2009)	
1975-1979	1.98
1980-1984	1.77
1985-1989	1.38
1990-1994	1.35
1995-1999	1.37
2000-2004	1.12
*Period*earnings quintile*	
1975-1979 * Q2	0.83
1975-1979 * Q3	0.80
1975-1979 * Q4	0.81
1975-1979 * Q5	0.82
1980-1984 * Q2	0.84
1980-1984 * Q3	0.73
1980-1984 * Q4	0.69
1980-1984 * Q5	0.66
1985-1989 * Q2	0.82
1985-1989 * Q3	0.72
1985-1989 * Q4	0.69
1985-1989 * Q5	0.66
1990-1994 * Q2	0.85
1990-1994 * Q3	0.75
1990-1994 * Q4	0.72
1990-1994 * Q5	0.71
1995-1999 * Q2	0.83
1995-1999 * Q3	0.74
1995-1999 * Q4	0.70
1995-1999 * Q5	0.69
2000-2004 * Q2	0.97
2000-2004 * Q3	*0.88*
2000-2004 * Q4	0.85
2000-2004 * Q5	0.81