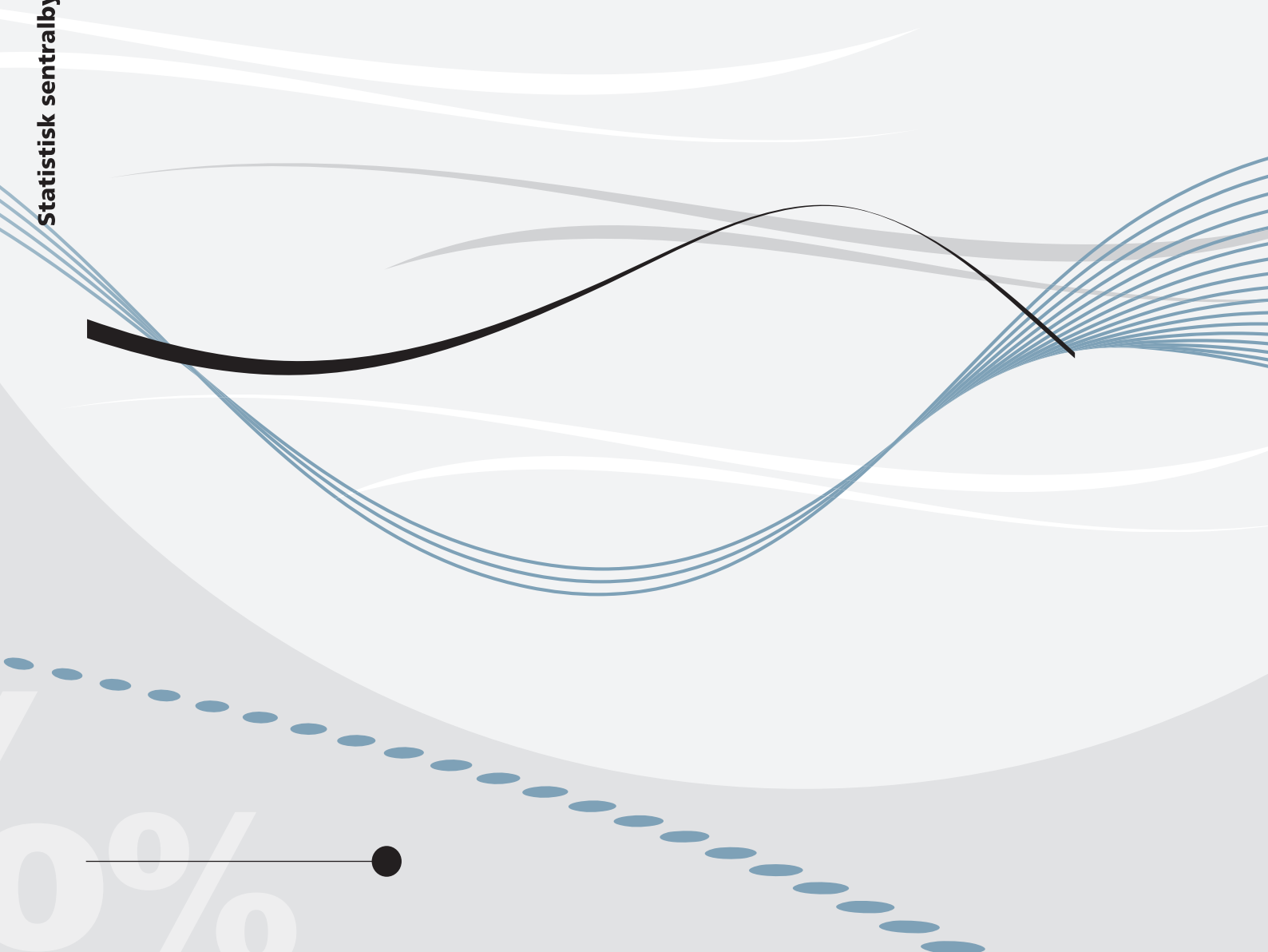Statistics Norway

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Recent trends and variation

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Abstract:
Universal parental leaves with job protection and earnings compensation increase women's attachment to the labour market, but very long leaves may have negative consequences both at the individual and the societal level. Some scholars have therefore argued that generous family-friendly policies in the Nordic countries have been counterproductive in achieving one of the main goals, gender equality. In this paper we ask whether it is possible to offset the potential negative effects on women's labour supply of long parental leaves by policies targeted especially at the father, and policies making formal day care cheaper and more easily available for parents. Norway is an interesting case in this respect, since all recent extensions in the parental leave scheme have been reserved for fathers and at the same time there has been a vast expansion of the day-care sector combined with reduced parental payment. Using panel data from 1996-2010, we find that Norwegian mothers did indeed enter work faster after childbirth in the late 2000s than about a decade earlier. This suggests that the latest initiatives have contributed to a shortening of women's employment interruptions and a more equal division of paid and unpaid work among parents.

Keywords: Female labour supply, childbirth, parental leave, gender equality

JEL classification: J13, J16, J22, J24, I38

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Sammendrag

Gode fødselspermisjonsordninger øker kvinners tilknytning til arbeidsmarkedet, men langvarige yrkesopphold kan ha negative konsekvenser, både for den enkelte kvinne og for samfunnet som helhet. Noen forskere har derfor hevdet at generøse fødselspermisjoner i de nordiske land kan ha virket mot sin hensikt når det gjelder å oppnå større likestilling mellom kvinner og menn. I denne studien spør vi om det er mulig å motvirke de potensielle negative effektene av lange permisjoner på kvinners yrkeskarrierer ved å reservere en større del av foreldrepermisjonen for fedre og ved å etablere et godt barnehagetilbud. Vi tar utgangspunkt i situasjonen i Norge på 2000-tallet, der samtlige utvidelser av foreldrepermisjonen ble forbeholdt fedre samtidig som barnehagedekningen for de aller minste barna ble omtrent fordoblet og foreldrebetalingen gikk betraktelig ned. Spørsmålet belyses ved å analysere hvor raskt mødre går ut i jobb etter at de får barn, om dette har endret seg over tid, og hva som påvirker hvor lang tid de er hjemme. Analysen er basert på paneldata fra den kvartalsvise arbeidskraftsundersøkelsen (AKU) for perioden 1996-2010.

Vi finner at mødre gikk raskere ut i jobb mot slutten av 2000-tallet etter at barnehageutbyggingen skjøt fart og fedrekvoten ble utvidet. Det står i kontrast til utviklingen på slutten av 1990-tallet og begynnelsen av 2000-tallet, da mødres yrkesavbrudd ble lengre. Det siste ser vi i sammenheng med innføringen av kontantstøtten i 1998/99, der tidligere tverrsnittsstudier har vist at den medførte et lavere arbeidstilbud fra mødre. Vår analyse viser videre at mødres kortere yrkesopphold på slutten av 2000-tallet først og fremst gjaldt dem som hadde betalt fødselspermisjon, og som begynte å jobbe heltid. Vi tolker det dit hen at fedres mulighet til å ta en større del av barneomsorgen *og* flere og rimeligere barnehageplasser gjorde det lettere for mødre å begynne å jobbe heltid etter fødselen.

Generelt sett er det likevel slik at mødre går raskere ut i deltid enn i heltid etter en fødsel. Våre beregninger viser for eksempel at det tar omtrent 15 måneder før halvparten av mødrene begynner å jobbe deltid, mens det tar over to år før halvparten begynner å jobbe heltid. Om vi ser både deltid og heltid under ett, finner vi at halvparten av mødrene har begynt å jobbe innen barnet er 13 måneder. Det er naturlig å se den raskere utgangen i deltid i lys av Arbeidsmiljølovens bestemmelser om foreldres rett til redusert arbeidstid og at deltidsjobber er lett tilgjengelige i Norge.

En svakhet ved vår analyse er at vi ikke kan fastslå med sikkerhet om mødres kortere yrkesopphold er en direkte følge av endringene i familiepolitikken. Vi kan heller ikke si hva som har hatt størst betydning: forlengelsen av fedrekvoten eller utbyggingen av barnehagesektoren, ettersom disse utvidelsene skjedde så å si samtidig. Analysen er imidlertid kontrollert for en rekke andre faktorer som kan påvirke mødres yrkestilknytning. Vår tolkning er derfor at kombinasjonen av lengre fedrekvote og et bedre og billigere barnehagetilbud har gjort det mulig for mødre å gå raskere tilbake til arbeid etter fødselen. I tillegg kommer at den politiske målsettingen om nok barnehageplasser til alle og mer barneomsorg fra fedre har påvirket den offentlige opinionen og ført til mer positive holdninger både til mødres yrkesarbeid og til at små barn går i barnehage. Nå forventes det at småbarnsmødre jobber, og at småbarnsfedre tar sin del av den daglige barneomsorgen.

I de nordiske land har en mer engasjert farsrolle vært en sentral idé i likestillingsdebatten i mange tiår, og i Norge og Sverige nedfelte dette seg i egne kvoter i foreldrepermisjonsordningen for far tidlig på 1990-tallet. Selv om fedrekvoten trolig var for kort i begynnelsen til å føre til vesentlige endringer i mors- og farsrollen, kan den ha påvirket hvordan både mødre og fedre, arbeidsgivere og offentlig opinion tenker rundt foreldreskap og likestilling. Senere, og etter at fedrekvoten ble utvidet i flere omganger, var antakelig samfunnet mer klart for en større omfordeling av det ulønnede og lønnede arbeidet mellom kvinner og menn. Sammen med et sterkt forbedret barnehagetilbud kan dette ha lagt grunnen for mer kontinuerlig yrkesarbeid blant mødre og for mer omsorgsarbeid blant fedre – og vi kan også legge til - flere små barn i barnehage.

1. Introduction

Like the other Nordic countries, Norway is known for its policies aimed at facilitating the combination of work and family for both mothers and fathers. The dual-earner/equal-sharing family model with two full-time working parents is a central political ambition and is by many viewed as an important precondition for the Norwegian welfare state. Along with the provision of high quality, subsidised day care, long parental leaves at high earnings compensation have been an important ingredient in the carer/worker family policy "package". Since the early 1990s, Norwegian parents have been entitled to a full year's leave with 80 per cent earnings compensation, which clearly has placed Norway at the top of international rankings with respect to the length of paid leave together with other Nordic countries (Ray, Gornick and Schmitt, 2010).

The behavioural consequences of leave schemes are complex, however. On the one hand paid maternity leave with job protection increases women's attachment to the labour market by giving future mothers strong incentives to be employed prior to birth in order to qualify for benefits, and by raising the likelihood of their return to work when the leave expires (see e.g. Joesch, 1997; Pronzato, 2009; Ruhm, 1998; Rønsen and Sundstrøm, 1996; Waldfogel, Higuchi and Abe, 1999). Where these rights are in place and well established, extensions of the leave period may, on the other hand, prolong the career breaks of mothers as they tend to make full use of the leave they are entitled to (Rønsen and Sundstrøm, 2002; Pylkkänen and Smith, 2003).

Lengthy employment breaks may have significant negative consequences both at the individual level and for society at large. At the individual level, extended periods out of work entail reduced lifetime earnings and lower pension disbursements, and may also lead to poorer earnings and career prospects (Albrecht, Björklund and Vroman, 2003; Duvander and Evertsson, 2011; Ejrnæs and Kunze, 2011; Nielsen, Simonsen and Verner, 2004; Theunissen, Verbruggen, Forrier and Sels, 2011). At the societal level, longer employment interruptions among women imply a lower female labour supply, which clearly is unfavourable in a country with a great demand for labour and an aging population, as in present-day Norway.

Recently some scholars have argued that generous family-friendly policies in the Nordic welfare states have been counterproductive in achieving one of their main goals, gender equality, and that they may have certain 'boomerang' effects on women's position in the labour market (Datta Gupta, Smith and Verner, 2008; Hakim, 2008; Mandel and Semyonov, 2005 and 2006). Evidence in this direction is a persistent gender gap in wages, which has remained more or less constant since the late 1980s, a

highly gender-segregated labour market, high shares of female part-time work, and relatively few women in top positions in industry and commerce. In Norway, concerns about the stagnant gender wage gap resulted in the appointment of an Equal Pay Commission in 2006 (NOU 2008:6). One of their recommendations on how to reduce the male-female wage differential was to reserve a larger proportion of the statutory leave for fathers, and in the last decade all extensions in the Norwegian parental leave scheme have been designated fathers. During the same period there has been a renewed political emphasis on the day-care sector with more kindergartens and lower child-care prices.

Recent Norwegian family policy initiatives should thus have made it easier for new mothers to start working after birth. Increasing education among women, more egalitarian gender roles in society (Vaage 2012), more positive attitudes towards employed mothers (Ellingsæter and Gulbrandsen, 2007), more explicit political expectations of continuous full-time work for all adults (NOU 2004:1) and a booming economy may further have pulled in the same direction. However, we know little about recent developments in birth-related work interruptions in Norway, since the latest studies in this area are from the 1970s and 1980s (Rønsen and Sundström, 1996, 2002)[1]. The present article fills in this gap by analysing the timing of entry into work following childbirth among Norwegian mothers based on panel data from the regular Labour Force Survey for the period 1996-2010.

The Norwegian setting also provides an opportunity to explore whether it is possible to offset the potential negative effects on women's labour supply of long parental leaves such as in the Nordic countries by policies targeted especially at the father, and policies making public childcare more easily available and cheaper for parents. A main goal of this article is therefore to assess the potential importance of such initiatives for the timing of mothers' work entry after birth. However, it is difficult to disentangle the separate effects of extensions in the father's quota and improvements in the day-care sector as these developments have gone more or less hand in hand in the last decade. Our ambition is therefore not to identify the causal effect of each policy, but rather to assess the joint importance of these reforms. We do so by analysing women's spells out of work following childbirth in a multivariate framework, using period indicators to reflect policy expansions, also taking into consideration business cycles and individual characteristics known to affect female employment. Since part-time work is a common adaptation for women after having children, we distinguish between entries into full-time and part-time work. That is, we employ a competing risk model where the non-work spell has three possible outcomes: a full-time job, a part-time job or no work entry.

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[1] In a recent paper on pregnancy-related sick leave, Rieck and Telle (2012) record women's employment activity from 3 years before to 3 years after birth, but the timing of the return to work is not addressed explicitly.

The paper proceeds as follows: As a background, Section 2 gives some stylized facts about work-family related policies and practices in Norway. Section 3 sets forth the conceptual framework for the analysis and describes the empirical model used. Section 4 presents the data and the variables included in the model, and Section 5 reports the results. Section 6 concludes with a brief summary and discussion.

2. Work-family policies and practices in Norway

An important aim of Norwegian work-family policies has been to encourage the combination of employment and family duties for both women and men. Gender equity in paid and unpaid work has been an important goal, but there has also been a strong focus on parental choice and flexibility regarding employment and childcare. Hence, is has been argued that the Norwegian work-family policies are characterised by a certain ambivalence (Ellingsæter, 2003).

The right to job-protected leave for both parents in connection with childbirth has existed in Norway since 1977. Wage compensation during the leave requires that the parent in question has been employed 6 out of the last 10 months prior to birth. The leave period was significantly extended in the late 1980s and early 1990s, reaching 42 weeks with full pay or 52 weeks with 80 per cent wage compensation in 1993. The extension in 1993 comprised a total of seven weeks, of which four were reserved for the father (the father's quota). Nine weeks of the total leave were reserved for the mother (tree weeks prior to delivery and six weeks after delivery), while the remaining 39 weeks could be shared according to the parents' own preferences. To be entitled to the father's quota both the father and the mother must be eligible for a paid leave.

All further extensions have been reserved for the father, resulting in a fathers' quota of five weeks in 2005, six weeks in 2006, 10 weeks in 2009 and 12 weeks in 2011[2]. In the two last amendments some of the extra weeks to the father were taken from the weeks that parents may share as they like, reducing the joint period by two weeks in 2009 and another week in 2011. The general rule is that when one parent has paid parental leave, the other parent has to be occupied with employment or studies, if he or she is not unable to take care of the baby because of illness. However, when it comes to the father's quota, these requirements do not apply. Hence, the mother may stay at home when the father takes his quota.

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[2] In May 2012 the Norwegian parliament passed an act that will also reserve 12 weeks of the total parental leave for mothers, but this amendment will not become operative before 2013.

In the late 1990s, a cash benefit for childcare was introduced after a heated public debate[3]. All parents of 1-2 years old children who do not use state-sponsored childcare are entitled to the benefit, and children in part-time care may receive a reduced benefit proportional to stipulated weekly attendance. The stated purpose of the reform was to enable parents to spend more time with their children, give parents more flexibility in their work and childcare choices, and distribute public transfers more equally between users and non-users of subsidised childcare (Ministry of Children and Family Affairs, 1998). It was also argued that the cash benefit would upgrade the status of women's traditional family work (Ellingsæter, 2003). Even though it was not a requirement that parents should look after their children themselves in order to receive the benefit, strong voices in the public debate prior to its implementations argued that parents should spend more time with their children and that full time work for both parents might be stressful for the family. Still, many parents have actually spent the benefit on private nannies.

The reform was a success in the sense that the great majority of parents of eligible children did indeed chose to use the benefit. However, the high take-up rate was mainly due to the low coverage of public childcare for young children in the late 1990s. In 1999, the parents of 73 percent of 1-2 years old children received the benefit. Since then, the percentage has decreased in tandem with the growth in public childcare places, and in 2010 parents received the benefit for only 22 percent of 1-2 year olds (Egge-Hoveid, 2012). The uptake of the benefit has varied largely between groups with higher rates among immigrants, less educated parents and parents in the southern counties of Norway, typically groups with a looser attachment to the labour market. Although the benefit is now less used in all groups, the differences between groups are still substantial (Daugstad, 2006; Hirsch, 2010). In 2006 the maximum age for children who was eligible for the benefit was reduced from 36 to 35 months. In August 2012 it will be further reduced to 24 months.

Historically there has been a large unmet demand for day-care places in Norway, particularly for the youngest children, but the coverage has greatly improved, especially in the last decade. In 1993, only 25 per cent of children 1-2 years of age attended a kindergarten. The percentage rose somewhat during the 1990s, but was still less than 40 percent at the turn of the millennium. However, following a political agreement in 2003 resulting in an ambitious plan for the escalation of public childcare for young children, Norway witnessed a tremendous growth in the proportion of 1-2-year olds in public day care. In 2010 as much as 77 percent of children 1-2 years attended kindergarten, mostly on a full-time basis. In accordance with a so-called Maximum price reform, the price of a place in the

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[3] The benefit was introduced for one year old children in August 1998 and for two year old children in January 1999.

kindergarten has been substantially reduced. The reform was implemented in 2004 and came into full effect in 2006.

From 2009, all children who become one year old by the end of August in the year of application are guaranteed a place in kindergarten. It is now widely recognized in Norway that kindergartens are good pedagogical institutions that provide ample opportunities for development, activity and socialisation. They are also considered to provide vital preparation for formal schooling, and to contribute to reducing social inequality and ease the integration of children from immigrant families (St.meld. nr. 41: 2008-2009; NOU 2009:10; NOU 2011:14; Drange and Telle, 2010). The use of kindergartens has varied considerably between groups of children, with lower participation rates among those with less educated parents, parents with low income and immigrant parents (Ellingsæter and Gulbrandsen, 2003). The participation rates have increased strongly in these groups in recent years, but they still lag somewhat behind other groups (Sæther, 2010; Moafi and Bjørkli, 2011).

Table 1. Family policy and business cycle in Norway 1996-2010

	Parental leave				Kindergarten		Cash for care		Business cycle
	Total leave (80% wage compensation)	Father's quota	Reserved for the mother	Optional use (80% wage compensation)	Policy	Percentage users, 1-2 years	Policy	Percentage users, 1-2 years	Unemployment rate
1996	52	4	9	39		34		-	4.8
1997	52	4	9	39		40		-	4.8
1998	52	4	9	39		39	Implemented, 1 year olds		3.2
1999	52	4	9	39		37	Implemented, 2 year olds	73	3.2
2000	52	4	9	39		37		73	3.4
2001	52	4	9	39		38		71	3.5
2002	52	4	9	39		41		69	3.9
2003	52	4	9	39	Kindergarten agreement	44		66	4.5
2004	52	5	9	39	Maximum price introduced	48		61	4.5
2005	53	6	9	39		54		65	4.6
2006	54	6	9	39	Maximum price completed	61	Eligibility reduced to 35 months	46	3.4
2007	54	6	9	39		69		38	2.5
2008	54	6	9	39		75		31	2.6
2009	56	10	9	37		77		27	3.2
2010	56	10	9	37		79		22	3.6

In tandem with the expansion of kindergarten for young children, attitudes towards working mothers of young children have become far more positive (Ellingsæter and Gulbrandsen, 2003), and there is less focus on the stress and time squeeze in dual-earner families. In fact women now face strong expectations of being gainfully employed following childbirth. Norwegian mothers have high employment rates by international standards. For instance, 82 percent of mothers in couples with children 1-2 years of age were employed in 2010 (Kitterød and Rønsen, forthcoming). However, the

part-time rate is high with approximately half of employed mothers working less than full hours. Parents have good access to reduced hours in Norway. The Norwegian Work Environment Act legalises parents' rights to reduced hours, unless this puts the interest of the company seriously at risk.

Family policy and practices and business cycles for the period 1993-2010 are summarised in table 1. The unemployment rate is used as an indicator for business cycles.

3. Conceptual framework

Women's employment choices following childbirth are a result of both personal preferences and constraints and social and cultural norms in the society. Our point of departure is an inter-temporal labour supply model in which fertility decisions already have been made (see e.g. Even, 1987; Leibowitz, Klerman and Waite, 1992). The mother maximises discounted expected utility, and enters employment - full time or part time - when her full wage exceeds her reservation wage. The full wage reflects her opportunity costs of not working and consists of the current market wage as well as the present value of the reduction in future earnings associated with depreciation and non-accumulation of human capital.

The reservation wage is the lowest wage rate at which the woman is willing to work. It reflects the utility of her time at home, including the value of her home production. The birth of a child will raise the reservation wage by increasing the demand for the mother's time in childcare, but will also lower it by increasing the demand for market inputs in home production (see e.g. Hotz and Miller, 1988). Since the time component is more important when the child is young, the presence of a newborn child will raise the reservation wage. As children grow older they become less time-intensive and more goods-intensive. Hence, the reservation wage is hypothesized to fall with time since birth.

The timing of the return to work will thus depend on changes in the reservation wage and in the full wage, and the choice between full-time and part-time entry will depend on which alternative yields the highest expected utility. At equal reservation wages, we expect women with higher market earning capacity to choose full-time work rather than part-time work. Conversely, women who have higher reservation wages, at equal full wages, would tend to choose part-time work.

The availability of a paid maternity leave will give mothers-to-be strong incentives to be employed prior to birth in order to qualify for benefits, and extensions of the leave will strengthen these incentives. After childbirth paid leave will obviously increase the reservation wage, making women

less inclined to return to work while they are entitled to benefits. A longer leave will therefore tend to prolong the career breaks of eligible women. When the leave is relatively short, some women with strong preferences for home time and own child-care may still find it too early to return to work when the leave expires and therefore quit employment at this point. For these women, extensions of the leave period may promote a return to work upon leave expiry and thus shorten their career breaks compared to what would have been the case if the leave had been shorter. The effect of paid maternity leave and its length on the average duration of mothers' time out of work after childbirth is therefore ambiguous (Klerman and Leibowitz, 1999; Joesch, 1997). However, if the leave is already relatively long and most mothers have worked up entitlement before birth, such as in present-day Norway, a longer paid leave for mothers is likely to prolong the average employment interruption.

A quota in the paid parental leave that is lost if not taken by the father is a strong incentive for fathers to take the reserved period. As mothers are not required to be engaged in employment or studies when the father takes this part of the parental leave (see Section 2), the consequences for mothers' time use is uncertain. If mothers' and fathers' time inputs in childcare and home-production are close substitutes, one would expect mothers to respond to fathers' increased time at home by increasing their time in paid work and taking shorter employment breaks. If, on the other hand, the parents' time inputs in the household are complements, a longer leave for fathers may also prolong the time mothers stay at home. For Norway, there is recent evidence of both outcomes. Kotsadam, Ugreninov and Finseraas (2011) find for example that women who gave birth after the introduction of the father's quota had higher annual earnings both in the short and in the somewhat longer run compared to women who gave birth immediately before the reform. Although the results are sensitive to various robustness checks, this may indicate that mothers specialize more in market work and fathers more in household work after the reform, and that there is some substitution going on. In contrast, Cools, Fiva and Kirkebøen (2011) report that mothers seemed to respond to the introduction of the father's quota in 1993 by reducing their labour supply, and speculate that there may be complementarities in child rearing. Both studies only address the effects of the introduction of a father's quota of four weeks, however. Later extensions may have had larger effects as the total quota has increased considerably and the scheme has become more established and accepted by both fathers and employers alike.

The impact of increases in the availability of subsidised childcare and lower parental payment is more clear-cut: A lower price will increase the demand for a place in a kindergarten, and greater availability implies that more of this demand will be met. There will be less of a need for the mother's time in childcare, which will reduce her reservation wage and accelerate employment entry after birth. Such

positive effects of day-care availability on after-birth employment have previously been documented for Norway and Sweden (Rønsen and Sundström, 2002). Moreover, a recent analysis from Norway indicate that cheaper child-care can spur employment activity among mothers even in an economy where female labour supply is already high (Hardoy and Schøne, 2011). Others have concluded that there is no causal effect of subsidised childcare on maternal employment (Havnes and Mogstad, 2009), but this analysis is restricted to expansions in the late 1970s when the coverage rates were very low and places in kindergartens were highly rationed. In fact, previous research has contended that the causal direction between subsidised day care and female employment is likely to run in the opposite direction for the 1970s and 1980s, as the rapid growth in women's labour force participation created a vast demand for childcare and triggered a major expansion of the day-care sector (Leira, 1993; Ellingsæter and Rønsen, 1996).

A cash benefit for childcare only to parents who do not use public subsidised care will on the other hand make a place in a kindergarten relatively more expensive as parents who choose subsidised care forego a sizeable cash benefit. This makes home-care relatively cheaper and increases the demand for mother's time at home. Consequently, her reservation wage will increase and delay employment entry after birth. Previous cross-sectional analyses on the effects of the Norwegian cash for childcare benefit corroborates that this program had significant negative effect on mothers' labour supply (Rønsen 2009; Schøne 2004). These studies are from the late 1990s and early 2000s when day-care places were rationed and quite expensive. Following the expansion of the day-care sector with more and cheaper day care, the cash-for-care alternative has become less profitable, implying that the negative effect on mother's labour supply is likely to have become smaller over time.

Finally, the cultural and normative climate in Norway in recent years may have spurred mothers' entry into work following childbirth. This includes more positive attitudes towards mothers' employment in society at large (Ellingsæter and Gulbrandsen, 2007) and a stronger emphasis on kindergartens as good pedagogical institutions also for the youngest children (St.meld. nr. 41:2008-2009). The fact that fathers have become more involved in housework and childcare in recent decades (Vaage, 2012) and also work somewhat less long hours in the labour market (Kitterød, 2007) probably work in the same direction. In fact, Hook and Wolfe (2012) observe less variation in fathers' childcare time in Norway than in some other countries, and argue that the Norwegian policy context and the strong gender norms enhance all fathers' involvement in childcare, regardless of their own and their partner's working hours.

4. Empirical model

Guided by the theoretical considerations above, we estimate a dynamic reduced-form model of employment entry. When modelling these dynamics, the hazard rate is a useful concept. The hazard rate multiplied by Δt yields the probability that an event occurs within a certain short time interval (t, t+Δt) given that it has not occurred before. In our case, the career break ends with an exit to either full-time or part-time work. We then have a so-called competing-risk model. Let the stochastic time-variable T denote the duration in the initial state (not working), and let J denote the end state (full-time or part-time work). The event-specific hazard function can then be written

$$(1) \quad h_j(t) = \lim_{\Delta t \to 0^+} P(t \le T < t + \Delta t, J=j \mid T \ge t) / \Delta t; \qquad j=1,2; t \ge 0$$

Individuals experiencing an event other than j are treated as censored at the time of the other event. Since the two events are mutually exclusive the overall hazard function $h(t)$ - the hazard of employment entry regardless of working hours - is just the sum of the full-time and part-time hazards.

There is little a priori knowledge of the functional form of the hazard rate of employment entry after birth. A rising full wage and a falling reservation wage imply a rising hazard rate, while a falling full wage and a rising reservation wage imply a falling hazard rate. If the full wage and the reservation wage develop in the same direction, the direction of the resulting hazard is ambiguous. We use a discrete hazard rate model that makes no assumption about the functional form of the baseline hazard. The choice is further motivated by the fact that we use data that are collected quarterly (see below), so we do not know the exact timing of events, only that they occurred within a given 3-months interval.

Besides depending on time, the hazard rate will vary with individual characteristics. Using a logit transformation, the discrete hazard rate function can then be expressed as

$$(2) \quad \log (P_{jt}/1-P_{jt}) = \beta_j X_{jt}$$

where P_{jt} is the conditional probability that event j occurs at time t, β_j is a vector of parameters associated with event j, and X_t is a vector of covariates that may or may not vary with time (see, e.g. Alison 1995).

5. Data and variables

The analysis is based on the Norwegian Labour Force Survey (NLFS) which is the main source of labour market statistics in Norway. The sample comprises 24 000 respondents each quarter, and since 1996 each respondent has participated in eight consecutive quarters. This provides an opportunity to follow the labour market adaptations of the same person over a period of almost two years. We use data from 1st quarter 1996 to 4th quarter 2010[4]. The respondents are asked about their relationship to the labour market in one specific reference week, spread over the three months of the quarter. Those who worked for pay or profit for at least one hour in the survey week, or who were temporarily absent from work for some reason are classified as employed. Contractual as well as actual working hours are recorded, and those who are temporarily absent from work are asked to indicate the reason for this. One of the alternatives is "maternity/parental leave", and the interviewers are instructed that this alternative only concerns statutory paid leave. Information on education is linked to the data using Statistics Norway's educational database. In married couples, both partners are interviewed, but so far this has not been the case for cohabiting couples.

Our strategy has been to extract a sample of mothers who had a newborn child at the time of interview, and who had not yet started working. We include both employed mothers who are temporarily absent from work and non-employed mothers, as the recent policy changes may potentially have affected both groups. More and cheaper day care is available to all women and should thus generally have promoted a faster transition to work whether the mother has a job to go back to or not. Extensions of the father's quota, on the other hand, primarily benefit employed mothers who are on parental leave, as eligibility to this quota requires that both the mother and the father are entitled to a paid leave (see Section 2). However, in line with Hook and Wolfe (2012) we would contend that the political initiative of securing a longer leave for fathers also has had a bearing on society at large and created a cultural climate in which a greater father involvement has become more of an expectation and a norm. Hence, the partners of non-employed mothers who gave birth towards the end of our study period may also take a greater part of the childcare responsibilities than the fathers of children born earlier in the period.

Since very few mothers are at work before the child is six months old, we select those who have a 1-5 months old child at the time of interview[5]. This may be in the first or in later waves of the survey, which implies that some mothers can be followed until the child is about two years old, while others can only

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[4] Due to several changes in the NLFS in 1996 involving both the survey plan and the questionnaire, the data from before and after that time are not quite comparable. Hence, our analysis starts in 1996.

[5] Only 7 per cent of the mothers are at work when the baby is 1-5 months old.

be followed for a shorter period. However, different exposure times are of no concern in hazard rate regression as long as the time of censoring (here: panel exit) is independent of the time of work entry, which seems a plausible assumption. Women who are enrolled in education when first observed are left out of the analysis, and women who enter education later during follow-up are censored at that point. If mothers have a new baby during follow-up, she is censored at the time of the new childbirth. The total analysis sample consist of 4 824 mothers who contribute with a total of 17 826 person-quarters, i.e. the average follow-up time before work entry or censoring is 3.7 quarters. Table 2 further shows that 73 per cent of the mothers are on parental leave when first included into our analysis. Among the remaining 27 per cent that are not on parental leave, most are non-employed (92 per cent) and the rest is employed and temporary on leave for other reasons. The latter is probably a group of mothers who have not had sufficient employment activity before birth to be entitled to a paid parental leave.

The trend in birth-related leaves among women in Norway is of particular interest in this analysis, since recent family policy initiatives should have made it easier for mothers to go back to work sooner after childbirth. The trend variable for family policy expansion during the study period is a set of period dummies. We distinguish between the following years: 1996-1997, 1998-1999, 2000-2002, 2003-2005, 2006-2008 and 2009-2010. The intervals have been chosen to capture the most important junctures during 1996-2010 (cf. Table 1).

1996-1997 serves as a reference period with no big policy changes and relatively low day-care coverage. 1998-1999 covers the introduction of the cash-for-care benefit to 1-year olds in August 1998 and 2-year olds in January 1999. In 2000-2002 the cash-for-care reform had taken full effect, while the parental leave system and day-care coverage remained stable. The latter part of our study period is characterized by the escalation of the day-care sector and extensions of the father's quota. After the political "kindergarten compromise" in 2003 and the introduction of a maximum price in 2004, day-care coverage expanded rapidly. At the same time the father's quota was extended several times. Here we distinguish between 2003-2005 which were the introductory years of the new day-care initiative, 2006-2008 when the maximum price had been fully attained and the father's quota had reached six weeks, and 2009-2010 when the father's quota had been extended by another four weeks. Two of those weeks were taken from the period available to either parent.

Based on the policy changes mentioned above and our reasoning in chapter 3 we would expect a negative time trend in mothers' entry rates into work in the first part of our study period. This is mainly due to the introduction of the cash-for-care reform and no further incitements from either the

day care sector or the parental leave programme. However, in the latter part of the period we expect an upward turn in entry rates with positive incentives primarily from improvements in the day-care sector, but also from the extensions of the father's quota, and towards the end a somewhat shorter joint parental leave period.

Changes in public attitudes and norms concerning women's employment and public childcare also cause us to expect a negative time trend in mothers' return rates in the first part of the observation period, and a an upward trend in the latter part. An important underlying assumption in the debate preceding the cash-for-childcare reform in the late 1990s was that parental care was best for young children, and that mothers' employment would involve stress and time-pressure for the family (Ellingsæter and Guldbrandsen 2007). This may have led mothers to postpone their work entry following childbirth. After the turn of the century, attitudes towards working mothers and public daycare have become increasingly favourable (ibid). Employment among mothers with small children is now more and more expected. Hence, we may assume a faster work entry in the later years.

Since our period indicators also may pick up other time trends, it is important to control for such trends. Labour market conditions and labour demand are obviously of vital importance, and we include the *municipality unemployment rate* as a business cycle indicator. It reflects the local labour market situation, and we expect entry into work to be slower the higher the local unemployment rate is. On the other hand, women who are on leave may feel that their job is less secure in business cycle downturns, and this may cause them to return faster to work than they would otherwise have done. The end result is therefore somewhat ambiguous, but since most mothers in Norway work in sectors with relatively high job security, we primarily expect higher unemployment to lead to longer periods out of work following birth.

Turning to individual characteristics, the two central covariates of the hazard rate model are the mother's full wage and her reservation wage, as discussed. Unfortunately we do not observe any of these variables directly. The reservation wage cannot be known without asking women what is the lowest wage rate at which they are willing to work, and this information is rarely available in surveys. Concerning the full wage, some surveys may have information on the current market wage, but the present value of the reduction in future earnings associated with depreciation and non-accumulation of human capital is not known. Not even the women themselves will know exactly the size of the two latter components, but they probably have an idea of their magnitude, i.e. whether it is going to be considerable or of minor importance. In our data there is no information on the current market wage either, so we have no information on any of the components of the full wage.

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Table 2. Descriptive statistics of model covariates measured *at time of birth*

	All mothers		Mothers on parental leave		Mothers not on parental leave	
	N	Per cent	N	Per cent	N	Per cent
Period						
1996-1997	800	16.6	544	15.4	256	19.7
1998-1999	743	15.4	552	15.7	191	14.7
2000-2002	997	20.7	744	21.1	253	19.5
20032005	914	19.0	657	18.6	257	19.8
2006-2008	854	17.7	618	17.5	236	18.2
2009-2010	516	10.7	410	11.6	106	8.2
Municipality unemployment rate	4 824	3.0	3 525	3.0	1 299	3.2
Age of youngest child						
1 month	1 373	28.5	1 010	28.7	363	27.9
2 months	1 348	27.9	1 022	29.0	326	25.1
3 months	1 374	28.5	992	28.1	382	29.4
4 months	363	7.5	251	7.1	112	8.6
5 months	366	7.6	250	7.1	116	8.9
Parity						
1st birth	1 920	39.8	1 438	40.8	482	37.1
2nd birth	1 855	38.5	1 404	39.8	451	34.7
3rd birth or higher	1 049	21.8	683	19.4	366	28.2
Mother's age (years)	4 824	30.2	3 525	30.8	1 299	28.8
Mother's age square/10 (years)	4 824	94.0	3 525	96.8	1 299	86.3
Union status						
Single	296	6.1	122	3.5	174	13.4
Married	2 455	50.9	1 810	51.4	645	49.7
Cohabiting	2 061	42.7	1 592	45.2	469	36.1
Missing/unknown	12	0.3	1	0.03	11	0.9
Level of education						
Primary school	397	8.2	184	5.2	213	16.4
Secondary	2 448	50.8	1 697	48.1	751	57.8
University, short	1 590	33.0	1 326	37.6	264	20.3
University, long	370	7.7	318	9.0	52	4.0
Missing/unknown	19	0.4	0	0.0	19	1.5
Occupation						
Teaching			444	12.6		
Professional and practical nursing			572	16.2		
Other health and social workers			486	13.8		
Senior managers and professionals			381	10.8		
Other high-school professionals			435	12.3		
Clerical work, sales and services			853	24.2		
Other occupations			354	10.0		
Employment status						
Employee			3 430	97.3		
Self-employed			95	2.7		
Region						
Oslo/Akershus	1 037	21.5	801	22.7	236	18.2
Hedmark/Oppland	294	6.1	211	6.0	83	6.4
South-Eastern Norway	821	17.0	609	17.3	212	16.3
Agder	320	6.6	206	5.8	114	8.8
Rogaland and Western Norwa	1 367	28.3	1 017	28.9	350	26.9
Trøndelag	423	8.8	292	8.3	131	10.1
Northern Norway	562	11.7	389	11.0	173	13.3
Country of birth						
Norway	4 250	88.1	3 240	91.9	1 010	77.8
EU/EEA etc.	200	4.2	137	3.9	63	4.9
Asia/Africa etc.	374	7.8	148	4.2	226	17.4
On parental leave						
Yes	3 525	73.1	3 525	100.0	0	0.0
No	1 299	26.9	0	0.0	1 299	100.0
Number of mothers	4 824		3 525		1 299	

The remaining covariates of our model are therefore indicators that are closely associated with the full wage and the reservation wage. A full list with descriptive statistics of the variables included is given in Table 2.

Human capital variables are standard explanatory variables in wage equations, and are therefore obvious indicators for the current market wage. Furthermore, past evidence suggests that there is a positive relationship between the level of human capital and depreciation and appreciation rates (Mincer and Polachek 1974, 1978; Mincer and Ofek 1982). We use educational level and age as our human capital indicators. *Age* is here a proxy for employment experience, as our data do not contain such information. It is a continuous variable measured in years with a square term to catch possible non-linearities. *Educational level* is the highest level attained in the quarter under observation. We distinguish between four levels: primary and lower secondary school (reference), upper secondary school and short and long university education (1-4 years versus minimum 5 years), and expect women with higher education to have higher full wages (and possibly lower reservation wages) and therefore shorter spells out of work following childbirth.

The distinction between short and long university education has proven very useful in previous analyses of maternal employment in Norway, as the behaviour of these groups often differ significantly (Kitterød and Rønsen, 2012). From a sociological viewpoint, singling out the top-educated may also be important since a family model with continuous full-time work for both parents primarily seems to find support among high-educated parents (Ellingsæter et al., 1997; Skilbrei, 2010; Stefansen and Farstad, 2010). The strong positive association between education and employment among women may be due to the fact that employment-oriented women invest more in education than those who prefer to work less and also that positive attitudes towards paid work are promoted through the educational system. Besides, the highly educated usually have higher wages than the less educated and work in professions that require substantial time inputs in order to succeed. Hence, they may loose more both in terms of money and professional development by taking a longer break. However, they also tend to have more flexible working hours than the less educated (Bø, 2004) which may be more easily combined with young children.

Another indicator that is likely to reflect differences in both current market wage and reductions in future earnings associated with depreciation and non-accumulation of human capital is occupation. Since non-employed mothers have no present occupation, this information is only relevant for mothers who are on leave from a job at the time of birth. In models which are estimated separately for mothers

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on leave (see below), we also include *occupation at time of birth* as a covariate. Based on the Norwegian Standard Classification of Occupations, we differentiate between seven occupational groups, namely teaching (reference), professional and practical nurses, other health and social workers, leaders and academic workers, other university professions, clerical work and sales and services, and finally a residual group of "other occupations", which mainly includes jobs in the primary industries, transport and manufacturing, craft and trade workers and jobs with no educational attainments. This classification has proven particularly suitable for categorizing women's occupations in previous studies of women's employment in Norway (Håland and Næringsrud 2004).

As argued previously, we expect the reservation wage to fall as the child gets older. All else equal, this means that the work hazard will increase with the age of the child. *Age of youngest child* constitutes the duration or follow-up time in our hazard model, and is thus a central variable in the analysis. However, age of youngest child also reflects whether mothers on leave are still eligible for compensation or not. Past research has shown that the length of the paid leave to a large extent determines the duration of the career break for eligible mothers (e.g. Rønsen and Sundström 2002, Pylkkänen and Smith 2003, Burgess et al. 2007). Since most of the mothers in our sample are on parental leave (73 per cent, see Table 1), we expect the hazard rate to peak around leave expiry. In most of our study period the paid leave available to mothers was 48 weeks, but since three of those had to be taken before the expected date of birth, 45 weeks were left for the after-birth period. Hence we expect employment entry to peak when the child is around 10-11 months old.

Other indicators of the reservation wage are *parity* (the current child's number in the mother's birth rank) and *union status*. Since the demand for the mother's time at home will be higher the more children she has, her reservation wage is expected to increase and her employment entry to decrease with parity. Likewise, if the mother is married or cohabiting and has alternative sources of economic support, her reservation wage is likely to be higher and her employment entry rate lower than if she is a single mother whose main alternative to income from work is social security benefits. Although tax policy and the social security system have moved in the direction of equating cohabitation with marriage in Norway, married couples are more likely to pool their economic resources than are cohabiting couples, at least if they have no marriage plans (Lyngstad et al., 2010). Previous research has also shown that cohabiting women are more likely to work full time, indicating that they may have a stronger attachment to the labour market than their married counterparts (Kjeldstad and Nymoen, 2004). We therefore further distinguish between married and cohabiting mothers.

Finally, we include dummies for *region* and *country of birth* to pick up cultural and normative differences in work-family orientation and work-behaviour related to place of residence and country of origin. Region is based on information on the respondent's residential area (municipality), which have been collapsed into seven larger regions. The Agder counties in the south of Norway are known to have more traditional values and gender norms and practices than most other regions, so we expect mothers in Agder in particular to have lower employment entry rates after birth than mothers in other regions. Concerning country of birth we distinguish between Norway, and western and non-western countries. Western in this respect comprise countries in the EU/EEA region plus USA, Canada, Australia and New Zealand, whereas non-western comprise European countries outside the EU/EEA region plus Asia, Africa, Latin-America and remaining countries in Oceania. From regular employment statistics we know that non-western immigrants have lower employment rates in general than other immigrants and people born in the country. Hence, we expect mothers from non-western countries to be less inclined to begin working following birth than Norwegian-born and other foreign-born mothers.

As mentioned, studies from many countries have established that mothers who are eligible to paid leave enter work faster after childbirth than other mothers. Whether this is a causal effect of maternity leave entitlements or an unobserved underlying stronger attachment to the labour market is difficult to say, however. Still, a recent study from the UK indicates that there remains a substantial impact of maternity rights on behaviour even when differential attachment is taken into account (Burgess et al. 2007). Because of the potential endogeneity problems related to parental leave status we have not included this as a covariate in the models reported below[6]. However, we have run models separately for mothers on leave and mothers not on leave since the relationship between observed characteristics and employment entry may differ in these groups.

6. Results

Before turning to the model estimates, we take a look at a couple of Kaplan-Meyer survival plots showing how long it takes before the average mother starts working. The survival rate is an expression of the probability that a mother remains out of work until time t+1 given that she was still out of work at time t. Or expressed in a slightly different way: the probability that the mother had not entered work

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[6] We have also tested models where parental leave status has been included as a dummy variable (on leave/not on leave). The variable is highly significant and strongly positive, suggesting that entry rates into work is about three times higher among mothers on parental leave than among mothers not on parental leave. When distinguishing between full-time and part-time entries this contrast becomes even more accentuated, as the odds ratio for full-time work is estimated to be 4.2.

before the child reaches a certain age. Figure 1 gives the overall picture for all entries into work, and entries into either full-time or part-time work respectively, for the whole of our study period, whereas Figure 2 reports entry into work for each of the yearly intervals used in the analysis.

Figure 1 shows that most mothers had started working by the time the child is two years old. Entry into part-time is much faster than entry into full-time, however. The probability of having started a full-time job by the child is about 2 years old is only about 50 per cent, whereas the chance having started a part-time job by the same time is about 75 per cent. Or expressed in terms of "survival times": the median period out of work after birth is estimated to be 26 months before full-time entry, 15 months before part-time entry and 13 months for all work entries taken together. The much faster entry into part-time work is an interesting finding, and probably reflects that part-time jobs are easily available in Norway and that parents' rights to reduced hours are protected by law (see Section 2).

Figure 1. Kaplan-Meyer survival function for entries into work, and divided by full-time and part-time entries. Norwegian mothers 1st quarter 1996 to 4th quarter 2010
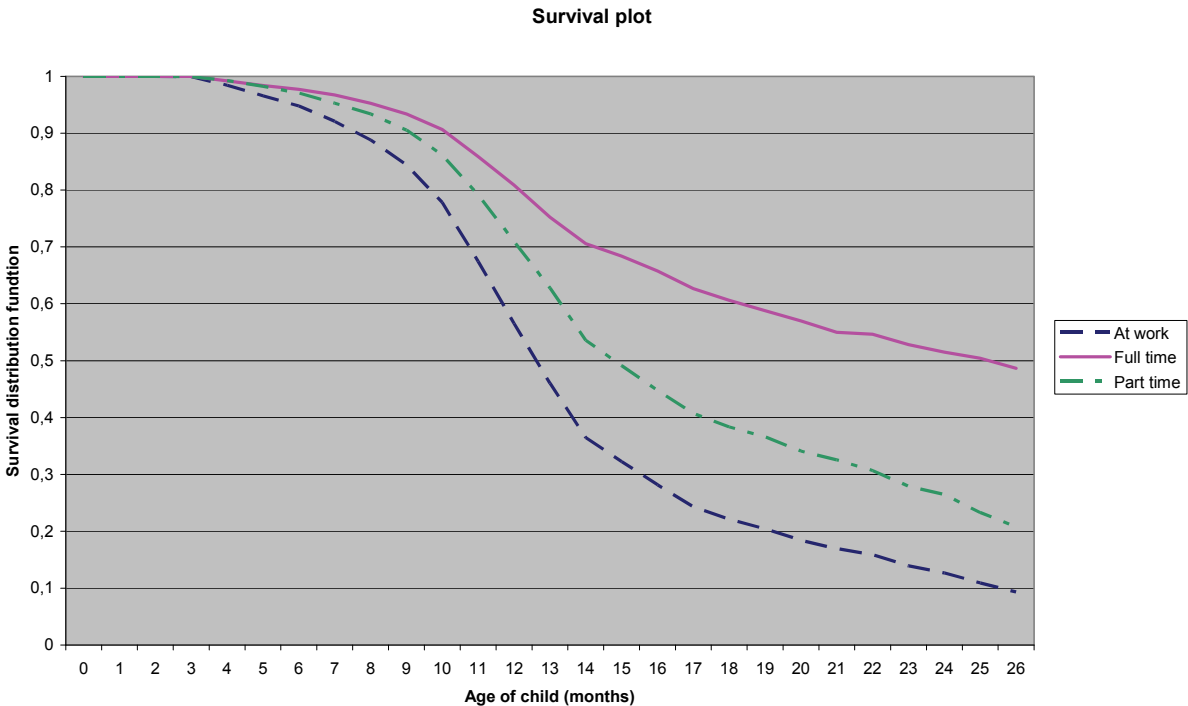
Figure 2. Kaplan-Meyer survival function for entries into work by calendar period. Norwegian mothers 1st quarter 1996 to 4th quarter 2010.
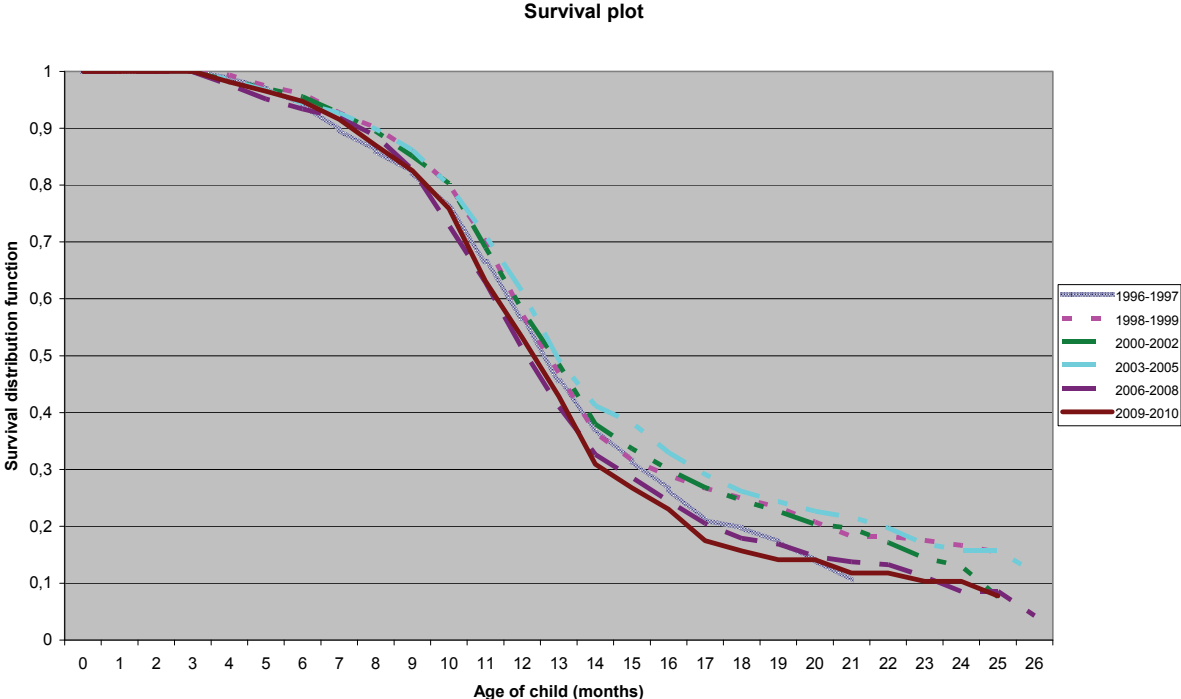
Survival plot

Figure 2 reflects the time trend in entry rates during 1996-2010. Even if there are no big changes, the curves for the last two periods, 2006-2008 and 2009-2010, lie consistently below the curves for the periods covering 1998-2005 especially from the child is about 9 months old. This is an indication that mothers started working sooner after birth towards the end of the 2000s than in the beginning of that decade, but whether this is associated with policy changes or other factors is too early to say based on a descriptive survey plot.

Tables 3-5 show the results of the multivariate hazard rate models that control for individual characteristics and other macro trends (business cycle) that may have changed during the period. The estimates are reported as odds ratios, implying that a coefficient greater than one signifies a positive association, while a coefficient smaller than one signifies a negative association. We have estimated one model where the event is entry into work regardless of working hours (Model I) and one model where we distinguish between full-time and part-time entries (a so-called competing risk model). The results for the two sub-groups, mothers on leave and mothers not on leave, are shown in Table 4 and 5, respectively.

Table 3. Entry into work and entry into full-time or part-time work after childbirth among *all* Norwegian mothers. Discrete hazard rate model. Odds ratios

	Model I	Model II	
	Work	Full time	Part time
Period (Ref: 1996-1997			
1998-1999	0.866	0.806	0.896
2000-2002	0.895	0.941	0.874
2003-2005	0.915	0.978	0.887
2006-2008	1.113	*1.312*	1.002
2009-2010	**1.267**	**1.651**	1.035
Unemployment rate in municipality	**0.924**	*0.928*	**0.921**
Age of youngest child (Ref: 1-5 months)			
6-8	**3.883**	**3.161**	**4.696**
9-11	**14.307**	**11.718**	**17.222**
12-14	**39.981**	**29.922**	**50.487**
15-17	**23.700**	**15.498**	**31.810**
18-23	**14.736**	**10.571**	**19.096**
24-27	**15.205**	**7.347**	**21.227**
Parity (Ref:1st birth)			
2nd	**0.827**	**0.732**	*0.891*
3rd or higher)	**0.626**	**0.525**	**0.783**
Mother's age	**1.151**	**1.251**	1.092
Mother's age square	**0.981**	**0.969**	0.988
Union status (Ref: married)			
Single	0.930	1.198	**0.765**
Cohabiting	0.987	0.947	1.009
Level of education (Ref: primary school)			
Secondary	**1.265**	1.040	**1.437**
University, short	**1.513**	*1.305*	**1.696**
University, long	**1.986**	**2.142**	**1.838**
Region (Ref: Oslo/Akershus)			
Hedmark/Oppland	1.117	0.906	*1.267*
South-Eastern Norway	1.033	0.906	1.131
Agder	0.970	**0.535**	*1.274*
Rogaland and Western Norway	1.022	0.959	1.068
Trøndelag	**1.240**	0.863	**1.495**
Northern Norway	**1.412**	1.381	**1.441**
Country of birth (Ref: Norway)			
EU/EEA etc.	1.043	1.145	0.987
Asia/Africa etc.	**0.570**	**0.569**	**0.568**
Likelihood ratio	3 177.4	3 293.8	
DF	31	62	
N (person-quarters)	17 826	17 819	
Number of events (work / full-time)	2 496	912	
Number of events (part-time)		1 577	

Table 4. **Entry into work and entry into full-time or part-time work after childbirth among Norwegian mothers** *on parental leave*. **Discrete hazard rate model. Odds ratios**

	Model I	Model II	
	Work	Full time	Part time
Period (Ref: 1996-1997)			
1998-1999	0.854	0.763	0.897
2000-2002	0.881	0.906	0.864
2003-2005	*0.813*	0.850	*0.791*
2006-2008	0.996	1.122	0.915
2009-2010	1.185	**1.542**	0.948
Unemployment rate in municipality	0.967	0.976	0.960
Age of youngest child (Ref: 1-5 months)			
6-8	**3.885**	**3.001**	**4.897**
9-11	**15.674**	**12.454**	**19.371**
12-14	**54.404**	**39.065**	**71.547**
15-17	**33.194**	**20.619**	**47.230**
18-23	**20.929**	**12.262**	**30.750**
24-27	**38.348**	**16.020**	**56.368**
Parity (Ref:1st birth)			
2nd	0.937	*0.856*	0.993
3rd or higher)	0.954	0.821	1.058
Mother's age	1.061	1.041	1.068
Mother's age square	0.992	0.995	0.991
Union status (Ref: Married)			
Single	*1.379*	**1.749**	1.152
Cohabiting	1.047	0.994	1.084
Level of education (Ref: Primary school)			
Secondary	0.954	0.769	1.143
University, short	1.014	0.891	1.166
University, long	**1.489**	*1.442*	**1.540**
Occupation (Ref: Teaching)			
Professional and practical nursing	1.166	**0.629**	**1.573**
Other health and social workers	1.081	0.983	1.151
Senior managers and professionals	*1.228*	**1.388**	1.068
Other high-school professionals	1.026	0.984	1.061
Clerical work, sales and services	1.012	0.905	1.094
Other occupations	1.072	1.056	1.089
Self-employed	**2.416**	1.452	**3.173**
Region (Ref: Oslo/Akershus)			
Hedmark/Oppland	1.194	0.978	**1.350**
South-Eastern Norway	1.048	0.985	1.105
Agder	1.007	**0.640**	1.272
Rogaland and Western Norway	1.040	0.987	1.087
Trøndelag	1.206	0.895	**1.435**
Northern Norway	**1.433**	**1.444**	**1.419**
Country of birth (Ref: Norway)			
EU/EEA etc.	**1.346**	*1.408*	1.307
Asia/Africa etc.	1.098	1.089	1.111
Likelihood ratio	2 939.6	3089.0	
DF	37	74	
N (person-quarters)	12 751	12 747	
Number of events (work / full-time)	2 103	809	
Number of events (part-time)		1 290	

Table 5. **Entry into work and entry into full-time or part-time work after childbirth among Norwegian mothers *not on parental leave*. Discrete hazard rate model. Odds ratios**

	Model I	Model II	
	Work	Full time	Part time
Period (Ref: 1996-1997)			
1998-1999	0.728	0.881	0.690
2000-2002	0.773	0.755	0.782
2003-2005	0.988	1.284	*0.920*
2006-2008	1.087	1.604	0.921
2009-2010	1.048	0.842	1.053
Unemployment rate in municipality	**0.815**	**0.708**	**0.852**
Age of youngest child (Ref: 1-5 months)			
6-8	**4.340**	**5.879**	**4.334**
9-11	**12.026**	**12.631**	**13.316**
12-14	**21.271**	**20.438**	**24.192**
15-17	**15.235**	**13.967**	**17.025**
18-23	**13.172**	**21.846**	**11.872**
24-27	**8.104**	*7.915*	**9.223**
Parity (Ref:1st birth)			
2nd	**0.721**	**0.486**	0.841
3rd or higher)	**0.571**	**0.351**	**0.675**
Mother's age	1.045	**1.535**	0.913
Mother's age square	0.993	**0.933**	1.015
Union status (Ref: Married)			
Single	**0.482**	*0.484*	**0.432**
Cohabiting	0.867	0.742	0.901
Level of education (Ref: Primary school)			
Secondary	1.211	1.172	1.216
University, short	**1.890**	1.631	**2.014**
University, long	1.369	1.321	1.397
Region (Ref: Oslo/Akershus)			
Hedmark/Oppland	1.097	1.184	1.056
South-Eastern Norway	0.897	0.542	1.057
Agder	1.261	0.388	*1.612*
Rogaland and Western Norway	1.024	1.105	0.975
Trøndelag	*1.471*	0.949	*1.623*
Northern Norway	**1.748**	**2.077**	**1.669**
Country of birth (Ref: Norway)			
EU/EEA etc.	0.791	1.287	0.643
Asia/Africa etc.	**0.554**	0.619	**0.510**
Likelihood ratio	426.0	473.7	
DF	31	62	
N (person-quarters)	5 075	5 072	
Number of events (work / full-time)	393	103	
Number of events (part-time)		287	

We start by examining the association between entry rates and family policy extensions during the period. From Table 3 we notice immediately that the time trend was negative up to and including 2005, but then there was a turn in positive direction. The estimate is clearly significant for 2009-2010 and suggests that there was a shift towards shorter periods out of work after birth for mothers towards the end of our study period. When distinguishing between full-time and part-time entries the results show furthermore that the positive shift primarily is linked to full-time entries, and from Table 4 we

see that this is mainly due to higher full-time entry rates among mothers on parental leave. For mothers not on leave there is some evidence of higher full-time entry rates in 2006-2008, but this estimate is not significant due to the much smaller sample size.

The development during 1996-2010 is thus in concordance with our a priori expectations. It is interesting to observe the upward turn in entry rates in the latter part of our study period when the more expansionary family policies gained momentum. By 2009-2010 the policy environment looked quite different than it did in the first few years of our study period (see Table 1). The father's quota had increased by 150 per cent, from 4 weeks to 10 weeks, the joint parental leave period had become two weeks shorter, and the kindergartens provided day-care for almost 80 per cent 1-2 year old children, about twice as many as at the end of the 1990s. In addition parents paid a much lower price for a day-care place, especially in real terms. It is also worth noticing that the faster entry rates first and foremost concerned full-time work, which is encouraging in a country where part-time among women have been very persistent and more labour supply is greatly needed.

To purge our period indicators of business cycle fluctuations and labour market conditions during the period, we included the unemployment rate in the municipality. This indicator is significant in most models and negative, as expected, implying that mothers enter work later when labour market conditions are deteriorating. However, this mostly concerns mothers who are not on leave (Table 5), which is not surprising, since they have no job to go back to and jobs presumably are harder to find when unemployment is higher.

The individual characteristics in our models are important as controls for compositional changes during the period, but they also throw more light on variations in women's after-birth employment and deserve a few comments. Turning first to the age of the youngest child, which is the duration variable in our hazard rate regression, we see that the propensity to start working is highest when the child is 12-14 months old. This goes for entries into both full-time and part-time work and for mothers on leave as well as for mothers not on leave. Hence, the peak entry time is a little after the expiry of the statutory leave period even for mothers on leave, implying that they probably postpone re-entry a bit so that the whole family can spend some time together when the father is on leave. Previous analyses have for example shown that when the father's quota was 4-6 weeks, about one of three mothers took holiday or unpaid leave when the father took his quota (Brandth and Øverlie, 1998; Grambo and Myklebø, 2009). The somewhat later job start may also be due to the fact that the child has not yet got a place in a kindergarten. The latter may especially concern children born early in our study period

when day care was still in short supply as well as children born after the end of August each year who are not guaranteed a day-care place in the annual August up-take (see Section 2). As expected we find that mothers start working faster after the first than after later births, but this is more pronounced for full-time entries than for part-time entries (Table 3) and concerns mainly mothers who are not on leave (Table 5).

When analysing all women together, we find no difference in entry rates between single and married and cohabiting mothers, but in the separate analysis, some interesting contrasts appear (Tables 4 and 5). Among those on leave, single mothers have somewhat higher work entry rates than married mothers, but among those not on leave, work entry rates are lower among single mothers than among their married counterparts. Presumably, single mothers on leave is a group with very strong work attachment that have paid work as their main source of living, and who accordingly return to work relatively fast after birth. Conversely, single mothers not on leave is likely to be a group with much weaker work orientation and a looser attachment to the labour market that wait long before they start working. In the meantime their main source of economic support is usually social security benefits, and in Norway this is a feasible option while children are small (generally until the child is 3 years old, see e.g. Kjeldstad and Rønsen, 2004).

When distinguishing between full-time and part-time entries, it becomes clear that single mothers in general have lower entries into part-time work than married mothers (Table 3). This corroborates the findings of previous research (Rønsen and Sundström, 1996 and 2002), and indicates that this pattern is quite persistent in Norway. However, the lower part-time entry rates only concern single mothers not on leave (Table 5), while single mothers on leave have higher full-time entry rates than their married counterparts (Table 4). When comparing married and cohabiting mothers, we find no significant differences whatsoever in the present analysis.

The results for our human capital indicators are mainly as expected with positive and significant estimates for both age and education (Table 3). The positive association with age is mainly related to full-time entries, however, and declines with higher age of the mother (mother's age square is negative). Table 5 further shows that the positive association is particularly strong for entry rates into full-time work among mothers who are not on parental leave. Higher education increases mothers' entry into both full-time and part-time work, but for full-time work the higher entry rates only concern university-educated mothers, and particularly those with a long university education (Table 3).

When occupation is concerned, there is some indication that senior managers and professionals have shorter career breaks than the reference group of teachers (Table 4), and when distinguishing between full-time and part-time entries, it becomes clear that senior managers and professionals return faster to full time than most other occupational groups. Nurses, on the other hand, have significantly lower full-time return rates and much higher part-time return rates than teachers. Another job-characteristic of great significance is self-employment. Self-employed mothers have much shorter career breaks than other mothers on leave, which could be expected as they often run a business with none or only a few other employees. However, their higher return rates reflect primarily a faster return to part-time work, which is surprising since self-employed women usually work longer hours than other women (Statistics Norway, 2011). Our interpretation is therefore that the higher part-time return rates among self-employed mothers primarily reflect a more flexible working situation with greater opportunities to set their own working hours and more options to work from home or closer to home.

Regional and cultural differences turn up in higher work entry rates among mothers from the northern parts of Norway (Trøndelag and Northern Norway), and this is more pronounced for part-time than for full-time entries (Table 3). Mothers in Agder also display differential behaviour with lower full-time entry rates and higher part-time entry rates than mothers in the capital region (Oslo/Akershus, the reference group). Finally, we find that non-western immigrant mothers start working later than Norwegian-born mothers, but this only concerns mothers who are not on leave (Table 5). However, this is by far the largest group of non-western mothers, about 60 per cent (see Table 2). If on leave, immigrant mothers from Western countries return faster to work than Norwegian-born mothers (Table 4). We speculate whether this have something to do with the employment pattern in their country of origin, as the statutory parental leave and the corresponding career breaks among women in these countries are usually shorter than in present-day Norway.

7. Summary and discussion

The primary purpose of this article is to analyse recent developments in birth-related spells out work among mothers in Norway. Norway is an interesting case in this respect, since it ranks among countries with the longest and highest earnings-compensated parental leaves, and some authors have started to question whether such policies are counterproductive in achieving one of their main goals, gender equality (Datta Gupta, Smith and Verner 2008; Hakim, 2008, Mandel and Semyonov, 2006). The gender wage gap has, for example, remained fairly constant since the late 1980s, the labour market is more gender segregated than in most other countries, relatively few women hold top positions in business and commerce, and female part-time work is widespread.

In the last few years, family policy reforms in Norway have prioritised initiatives that facilitate a faster entry into work after childbirth for mothers. The fathers' quota of the parental leave has been extended from four to twelve weeks, and the kindergarten sector has expanded considerably with almost full day-care coverage and lower parental payment. In this article we investigate whether the trends in mothers' after-birth employment reflect these policy developments based on data from the panel of the regular Labour Force Survey 1996-2010. A key question in this connection is whether it is possible to offset the potential negative effects on women's labour supply of a long parental leave by policies targeted especially at the father, and policies making public childcare easier available and cheaper for parents.

Interestingly, we find that there was a turn-around in the trend of mothers' entry rates into work in the mid 2000s when the new policy initiatives gained momentum. Before then and after the introduction of the cash-for-care benefit in 1998/99 the trend was negative and quite stable. This is in line with the findings of previous research that this reform had a negative effect on female labour supply (Rønsen, 2009; Schøne, 2004). After the mid 2000s there was a new upward trend, and towards the end of our study period, mothers' spells out of work were significantly shorter than they had been in the late 1990s and early 2000s. The results show furthermore that the positive shift primarily was linked to full-time entries among mothers who were on parental leave, indicating that more father involvement and easier access to formal day care may have facilitated a faster return to full-time work. At the same time, cheaper day care meant that it became less advantageous for mothers (and fathers) to receive the cash-for-care benefit and stay home to take care of the children themselves.

Nevertheless, the overall picture reveals that mothers enter part-time work much faster than full-time work after birth. Whereas the median period out of work is estimated to be 26 months before full-time entry, it is only 15 months before part-time entry. This is an indication that the easy access to good quality part-time jobs plays an important role in the retention of new mothers in the workforce and the high maternal employment rates in Norway.

In line with previous research (Joesch, 1997; Ruhm, 1998; Rønsen and Sundstrøm, 1996; Waldfogel, Higuchi and Abe, 1999), we find that mothers who are on parental leave enter work much faster than mothers who are not on leave. This may be due to selection, as mothers on leave already have a closer attachment to the labour market and are likely to have a stronger work orientation than mothers who are not on leave. We have therefore run separate models for mothers on parental leave and mothers not on parental leave. As could be expected, the positive association with age and education become weaker when only considering mothers on parental leave. On the other hand, we find some

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occupational differences suggesting that senior managers and professionals return faster to full-time work, while nurses return faster to part-time work and later to full-time work than other mothers. Moreover, return rates are positively associated with self-employment, but somewhat surprisingly this is more pronounced for part-time than for full-time work.

A drawback with our study is that we cannot establish for sure whether the shortening of women's spells out of work is a causal effect of the latest Norwegian policy expansions, nor can we tell which policy is of greatest importance: the extension of the father's quota or to the expansion of the day care sector, as these improvements have taken place more or less simultaneously. While the former may be believed to primarily impact mothers entitled to parental leave, the latter has facilitated an earlier work entry after birth among mothers in general. Hence, we would argue that the joint initiatives of reserving a significant period of the parental leave for fathers and making day-care available for all who want at an affordable price have been vital ingredients in the development towards shorter spells out of work among mothers in Norway. In addition to changing the structural constraints for parents' employment and childcare choices, the new emphasis on day care for all children and more father involvement has also influenced public opinion and led to more favourable attitudes towards working mothers and non-parental care even for very young children. Now mothers of young children are expected to work and fathers of young children are expected to take their share of the daily childcare.

For policy initiatives to be accompanied by such attitudinal and behavioural changes it may be a prerequisite that the society is "ready for it" (Karu, 2012). In the Nordic countries, more involved fatherhood has been a central idea in the gender equality debate for decades, and since the early 1990s it has been an integral part of the development of the parental leave institution. Norway is amongst countries where the chief policy instrument has been a non-transferable leave exclusively to fathers, and this quota has greatly increased the take-up of parental leave among fathers (Brandth and Kvande, 2001). At the same time employers have adjusted to the new regulations and become accustomed to fathers' leave-taking during the child's first year. Even if the quota was probably too short at first to lead to a major role reversal between mothers and fathers, it may have influenced the way both mothers and fathers, employers and the general public alike thought about parenthood and equal sharing (Brandt and Kvande, 2001; Hook and Wolfe, 2012). Later on when the quota was extended, the society may have been more ready for a greater change in the gender division of paid and unpaid work. Together with an ample provision of state-sponsored day-care for all who wanted it, this may have laid the ground for more father involvement in childcare and more mother involvement in employment, and we might add, more young children being cared for outside the home.

References

Albrecht, J. , A. Björklund and S. Vroman (2003): Is there a glass-ceiling in Sweden? *Journal of Labor Economics* 21(1): 145-177.

Allison, P. D. (1995): *Survival Analysis Using the SAS System: A Practical Guide.* Cary, NC: SAS Institute Inc.

Brandth, B. and E. Kvande (2001): Flexible work and flexible fathers. *Work, Employment and Society* 15(2): 251-267.

Brandth, B. and B. Øverli (1998): Omsorgspermisjon med "kjærlig tvang". En kartlegging av fedrekvoten. Trondheim: Allforsk.

Burgess, S., P. Gregg, C. Propper and E. Washbrook (2007): Maternity rights and mothers' return to work. *Labour Economics* 15: 168-201.

Bø, T. P. (2004): Hver tredje har fleksibel arbeidstid.
http://www.ssb.no/vis/magasinet/slik_lever_vi/art-2004-11-23-01.html

Cools, S., J. H. Fiva and L. J. Kirkebøen (2011): Causal effects of paternity leave on parents and children. *Discussion Papers* 657, Statistics Norway.

Datta Gupta, N., N. Smith and M. Verner (2008): The impact of Nordic countries' family friendly policies on employment, wages, and children. *Review of Economics of the Household* 6: 65-89.

Daugstad, G. (2006): Omfang og bruk av kontantstøtte blant barn med ikke-vestlig innvandrerbakgrunn. Rapporter 2006/26, Statistics Norway.

Drange, N. and K. Telle (2010): The effect of preschool on the school performance of children from immigrant families. Results from an introduction of free preschool in two districts in Oslo. Discussion Papers 631, Statistics Norway.

Duvander, A.-Z. and M. Evertson (2011): Parental leave – possibility or trap? Does family leave length effect Swedish women's labour market opportunities? *European Sociological Review* 27(4): 435-450.

Egge-Hoveid, K. (2012): Stadig færre mottakere av kontantstøtte.
http://www.ssb.no/vis/magasinet/slik_lever_vi/art-2012-03-05-01.html).

Ellingsæter, A. L. (2003): The complexity of family policy reform. The case of Norway. *European Societies* 5 (4): 419-443.

Ellingsæter, A. L. and M. Rønsen (1996): The dual strategy: Motherhood and the work contract in Scandinavia. *European Journal of Population* 12: 239-260.

Ellingsæter, A. L. and L. Gulbrandsen (2003): Barnehagen – fra selektivt til universelt velferdsgode. NOVA Rapport 24/03, Norwegian Social Research.

Ellingsæter, A. L. and L. Gulbrandsen (2007): Closing the Childcare Gap: The Interaction of Childcare Provision and Mothers' Agency in Norway. *Journal of Social Policy*, 36 (4): 649-669.

Ejrnæs, M. and A. Kunze (2011): Work and wage dynamics around childbirth. *IZA Discussion Paper No. 6066.* Bonn: Institute for the Study of Labor.

Even, W. E. (1987): Career interruptions following childbirth. *Journal of Labour Economics* 5: 255-277.

Grambo, A.-C. and S. Myklebø (2009): Moderne familier – tradisjonelle valg. En studie av mors og fars uttak av foreldrepermisjon. NAV-rapport 2/2009, Norwegian Welfare and Labour Organisation

Hakim, C. (2008): Is gender equality legislation becoming counter-productive? *Public Policy Research,* September-November 2008

Havnes, T. and M. Mogstad (2011): Money for nothing? Universal childcare and maternal employment. *Journal of Public Economics* 95: 1455-1465.

Hardoy, I. and P. Schøne (2011): Enticing women to work – the impact of affordable day care. Unpublished paper, Institute for Social Research.
supply. *Econometrica* 56: 91-118.

Hook, J. L. and C. M. Wolfe (2012): New Fathers?: Residential fathers' time with children in four countries. *Journal of Family Issues* 33(4): 415-450

Håland, I. and G. Næringsrud (2004): *Kontantstøtte og Arbeidskraftundersøkelsen*. Notater 2004/82, Statistics Norway.

Joesch, J. M. (1997): Paid leave and the timing of women's employment before and after childbirth. *Journal of Marriage and the Family* 59: 1008-1021.

Karu, M. (2012): Parental leave in Estonia: Does familization of fathers lead to defamilization of mothers? *NORA – Nordic Journal of Feminist and Gender Research* 20(2): 94-108.

Kitterød, R. H. (2007): Fremdeles et tosporet foreldreskap? Mors og fars yrkesarbeid i barnefasen. In E. Kvande and B. Rasmussen (eds): *Arbeidslivets klemmer. Paradokser i det nye arbeidslivet*. Bergen: Fagbokforlaget.

Kitterød, R. H. and M. Rønsen (2012): Non-traditional dual earners in Norway: when does she work at least as much as he? *Work, Employment and Society* 26(4):657-675.

Kitterød, R. H. and M. Rønsen (forthcoming): Kvinner i arbeid ute og hjemme. Endring og ulikhet. In A. L. Ellingsæter and K. Widerberg (eds): *Familieendring i velferdsstaten.* Oslo: Gyldendal Akademisk.

Kjeldstad R. and M. Rønsen (2004): Welfare rules, business cycles, and employment dynamics among lone parents in Norway. *Feminist Economics* 10(2): 61-89

Kjeldstad, R. and E. H. Nymoen (2012): Part-time work and gender: Worker versus job explanations. *International Labour Review* 151(1-2): 85-107.

Klerman, J. A. and A. Leibowitz (1999): Job continuity among new mothers. *Demography* 36: 145-155.

Kotsadam, A., E. Ugreninov and H. Finseraas (2011): The long-term effect of parental leave on mothers' earnings. Unpublished paper, Norwegian Social Research.

Leibowitz, A., J. A. Klerman and L. J. Waite (1992): Employment of new mothers and childcare choice. *Journal of Human Resources* 27: 112-133.

Leira, A. (1993): *Welfare States and Working Mothers.* Cambridge: Cambridge University Press.

Lyngstad, T. H., T. Noack. P. A. Tufte (2010): Pooling of economic resources: A comparison of Norwegian married and cohabiting couples. *European Sociological Review,* Advance access. First published online June 24th, 2010. Doi:10.1093/esr/jcq028.

Mandel, H. and M. Semyonov (2005): Family policies, wage structures, and gender gaps: Sources of earnings inequality in 20 countries. *American Sociological Review* 70(December): 949-967.

Mandel, H. and M. Semyonov (2006): A welfare state paradox: State interventions and women's employment opportunities in 22 countries. *American Journal of Sociology,* 111(6): 1910-1949.

Mincer, J. and S. Polachek (1974): Family investment in human capital: Earnings of women. *Journal of Political Economy* 82(2): 76-108.

Mincer, J. and S. Polachek (1978): Women's earnings re-examined. *Journal of Human Resources* 13(1): 118-134.

Mincer, J. and H. Ofek (1982): Interrupted work careers: Depreciation and restoration of human capital. *Journal of Human Resources* 17(1): 3-24.

Ministry of Children and Family Affairs (1998): Stortingsproposisjon 53, 1997-98.

Moafi, H. and E. S. Bjørkli (2011): Barnefamiliers tilsynsordninger, høsten 2010. Rapporter 34/2011, Statistics Norway

Nielsen, H. S., M. Simonsen and M. Verner (2004): Does the gap in family-friendly policies drive the family gap? *The Scandinavian Journal of Economics* 106(4): 721-744.

NOU 2004:1. Modernisert folketrygd. Bærekraftig pensjon for framtida

NOU 2008:6: Kjønn og lønn. Fakta, analyser og virkemidler for likelønn

NOU 2009:10: Fordelingsutvalget.

NOU 2011:14: Bedre integrering. Mål, strategier og tiltak.

Pronzato, C. D. (2009): Return to work after childbirth: does parental leave matter in Europe? *Review of Economics of the Household* 7: 341-360

Pylkkänen, E. and N. Smith (2003): *Career interruptions due to parental leave: A comparative study of Denmark and Sweden.* OECD Social, Employment and Migration Working Papers No. 1, 2003.

Ray, R., J. C. Gornick and J. Schmitt (2010): Who cares? Assessing generosity and gender equality in parental leave policy designs in 21 countries. *Journal of European Social Policy* 20(3): 196-216.

Rieck, K. M. E. and K. Telle (2012): Sick leave before, during and after pregnancy. Discussion Papers No. 690, Statistics Norway.

Ruhm, C. (1998): The economic consequences of parental leave mandates: Lessons from Europe. *Quarterly Journal of Economics* 113: 285-317.

Rønsen, M. (2009): Long-term effects of cash for childcare on mothers' labour supply. *Labour* 23(3): 507-533

Rønsen, M. and M. Sundstrøm, (1996): Maternal employment in Scandinavia: A comparison of the after-birth employment activity of Norwegian and Swedish women. *Journal of Population Economics* 9: 267-285.

Rønsen M. and M. Sundstrøm (2002): Family policy and after-birth employment among new mothers. *European Journal of Population* 18: 121-152.

Schøne, P. (2004): Labour supply effects of a cash-for-care subsidy. *Journal of Population Economics* 17: 703-727

Skilbrei, M.-L. (2010): Den som står med begge beina planta på jorda står stille. Om kjønn og klassereiser. In Kenneth Dahlgren and Jørn Ljunggren (eds): *Klassebilder. Ulikhet og sosial mobilitet i Norge*. Oslo: Universitetsforlaget.

Statistics Norway (2011): Grunntabeller, Arbeidskraftundersøkelsen (AKU).

Stefansen, K. and G. R. Farstad (2010): Classed parental practices in a modern welfare state: Caring for the under threes in Norway. *Critical Social Policy*, 30 (1): 120-141.

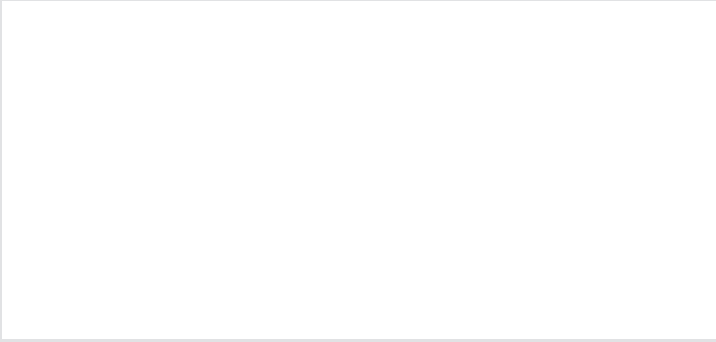Stortingsmelding nr. 41 (2008-2009): Kvalitet i barnehagen.

Sæther, J. P. (2010): Barn i barnehage – foreldrebakgrunn og utvikling de seneste årene. Rapporter 11/2010, Statistics Norway

Theunissen, G., M. Verbruggen, A. Forrier and L. Sels (2011): Career sidestep, wage setback? The impact of different types of employment interruptions on wages. *Gender, Work and Organization* 18:110-131.

Vaage, O. (2002): Til alle døgnets tider. Tidsbruk 1971-2000. Statistical Analyses 52, Statistics Norway.

Vaage, O. (2012): Tidene skifter. Tidsbruk 1971-2010. Statistical Analyser 125, Statistics Norway.

Waldfogel, J., Higuchi, Y. and Abe, M. (1999): Family leave policies and women's retention after childbirth: Evidence from the United States, Britain, and Japan. *Journal of Population Economics* 12(4): 523-546

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