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Katrin Sommerfeld

Older Babies - More Active Mothers? How Maternal Labor Supply Changes as the Child Grows

Berlin, November 2008

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ISSN: 1864-6689 (online)

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Older Babies - More Active Mothers? How Maternal Labor Supply Changes as the Child Grows

Katrin Sommerfeld*

Abstract

Female labor market activity is dependent on the presence and the age of a child, but how do the determinants develop in magnitude and significance with the child's age? Using German SOEP data from 1991 to 2006 for mothers with young children, the change in maternal labor supply when the child is one, two, and three years old is explicitly addressed. According to the tobit regression results for precise working hours, maternal labor supply becomes increasingly responsive to economic incentives - mainly to imputed wages - as the child grows.

Keywords: Female labor supply, childbirth, parental leave
JEL-Classification: J13, J22, D13

* *Acknowledgments:* I would like to thank the Center for European Economic Research (ZEW) in Mannheim where part of this research was conducted. In particular I am grateful to S. Steffes and B. Fitzenberger for helpful remarks. Moreover I thank participants at the 23rd Annual Congress of the European Economic Association in Milan, the 8th International German Socio-Economic Panel User Conference 2008 in Berlin, the XXII Annual Conference of the European Society for Population Economics 2008 in London, and seminar participants at the Albert-Ludwigs-University Freiburg. All remaining errors are my own.

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1 Introduction

The current debate about maternity leave policies in Germany centers around the topic of maternal labor supply. Based on the aim of fostering fertility and the child's well-being, it is intended to facilitate mothers the work-life balance. As the question of mothers' (re)entry into the labor market naturally comprises the timing of (re)entry, it is of great relevance to consider the development of maternal labor supply as the child grows. Thus it is of interest what determines if mothers return to the labor market and how much they work? Most of all: do these factors change with the age of the baby? For example, do mothers always respond to higher wages?

German mothers reduce their labor supply dramatically in the context of childbirth, although maternal labor supply increased over the past decades in Germany as in most other industrial countries.[1] Geyer and Steiner (2007), for example, find that mothers' employment rate drops by almost 60 percentage points in the year of giving birth. This appears huge in comparison to 30 percentage points in the UK, 16 percentage points in Denmark and six percentage points in Italy (ibid. p. 17). As one reason for this dissimilarity, the generosity of the German maternity leave policy has repeatedly been cited (Sonderhof, 2007; Schönberg and Ludsteck, 2007; Beblo et al., 2006) as it comprises a three year period of job protection ("Elternzeit", i.e. parental leave) for previously employed mothers[2] as well as different kinds of benefit payments (maternity benefit, transfer payments, child allowance). A reform of maternity benefits came into effect in 2007 and childcare policies are under way with the aim of facilitating the combination of motherhood with work. Against the background of current reforms, and keeping in mind that the timing of the (re)entry is one important component of fostering maternal employment, it is thus indispensable to analyze its development and determinants in the first few years after childbirth.

Previous studies frequently focus on the participation decision (Schönberg and Ludsteck, 2007; Bender et al., 2003; Voicu and Buddelmeyer, 2003) or solely distinguish between full-time and part-time work (Ondrich et al., 1999; Kreyenfeld and Hank, 2000).[3]

[1] See for example Jaumotte (2003); Gornick et al. (1998); Geyer and Steiner (2007) and for data on Germany: Statistisches Bundesamt (1999).

[2] In 1992 the job protection period during which a mother can return to a comparable job at her previous employer was extended from 18 to 36 months (see for example Sonderhof, 2007). This however does not affect the present analysis. A precise summary of the German regulation can be found in Kreyenfeld (2001) and Schönberg and Ludsteck (2007). The effects of the prolonged maternity leave period on the child are analyzed by Dustmann and Schönberg (2008).

[3] Geisler and Kreyenfeld (2006) estimate participation rates for different hours categories, but limit their subsequent regression to odds ratios for full-time employment. Djurdjevic (2005) also uses different

Instead, the present paper uses a continuous specification of working hours (as also done by Geyer and Steiner, 2007) in order to capture labor supply most precisely. As working hours are naturally censored from below a tobit model is employed. Precise actual working hours are provided by the GSOEP data where the waves from 1991 to 2006 are used.

For the present subject it is a decisive question at what point in time mothers' labor supply is observed. Several studies pool over all mothers and simply control for the age of the (youngest) child (Geyer and Steiner, 2007; Geisler and Kreyenfeld, 2006). Their approach attempts to explain long-term effects of childbirth, whereas here a more short-run perspective on the first few years after birth is adopted. Pooling over the age of the child as the previously mentioned studies do, however, is incapable of detecting potential non-linearities in participation and working hours after birth as indicated for example by Geyer and Steiner (2007, p. 9), Geisler and Kreyenfeld (2006) and Städtner (2004). Simple inclusion of the age of the youngest child as one of the explanatory variables does not solve the problem. Instead, variation of the impact of labor supply variables can only be captured if separate regressions are run for different ages of the child or analogously sufficient interaction terms are included. This is done by Leibowitz et al. (1992) who estimate participation rates separately for mothers with children of different age groups. The present study proceeds similarly but – after presenting detailed descriptive – runs a regression with interactions of *all* covariates with the separate ages of the child. To my knowledge, this is the first analysis that uses this technique to detect changes in mothers' labor supply.

The results clearly confirm the non-linear development of the coefficients for labor supply in the first few years after childbirth. More specifically, the wage, which is imputed to account for the inherent non-observability for non-employed mothers, increases in importance as well as the partner's earnings. This important result suggests that mothers grow increasingly responsive to economic incentives. Simultaneously, the labor force participation before birth is strongly correlated with post-birth working hours. Moreover, higher educated mothers and those living in the East of Germany clearly display higher labor supply, whereas surprisingly no such interrelation seems to hold for the availability of informal daycare.

The remainder of this paper is organized as follows. Section two sketches the theory behind maternal labor supply. Next, the data are described and descriptive statistics presented. Part four discusses the regression results. Finally, section five provides some

hours categories.

concluding remarks.

2 Theoretical background

In this section the labor supply model with household production (Gronau, 1977) is extended to explicitly account for the effect of the age of the child a mother has. The extension of the model follows Leibowitz et al. (1992) who however build upon the standard neoclassical model of labor supply which only allows for market work and leisure[4], whereas the household production model adds home time. Here, the starting point is given by the individual utility maximization under the budget and time constraint:

$$\max_{H_1,H_2} \; U(x, T - H_1 - H_2, C, \mu) \tag{1}$$

$$s.t.\; px = f(H_2) + (w - cc)H_1 + V$$

where x denotes consumption, C observable characteristics including the number and ages of children, μ unobservable characteristics, and V non-labor income such as partner's earnings.[5] Moreover, a mother can divide her total available time T between leisure, market work H_1 and home time H_2 during which she produces goods with a value $f(H_2)$ which denotes a concave home production function. In particular, home production subsumes childcare, which otherwise has to be bought on the market for the price of cc per hour so that her hourly net wage reduces to $w - cc$. Setting up the Lagrangian leads to the following optimality condition:

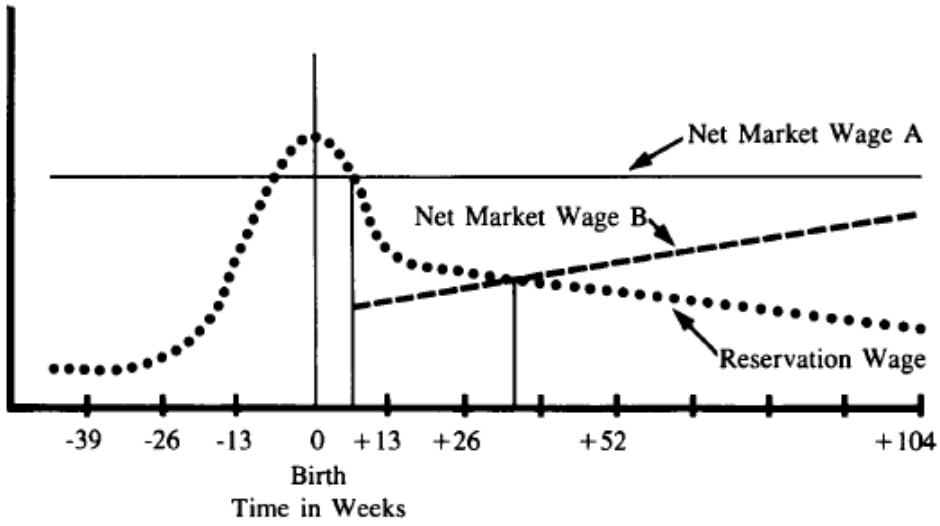
$$w - cc = f'(H_2) \tag{2}$$

Leibowitz et al. (1992) observe that "younger children require more intensive supervision" (ibid. p. 117) and from this they follow that the hourly cost of childcare decreases as the child grows (also Weber, 2004). This in turn raises maternal labor force participation as figure 1 shows – yet for the case of standard labor supply without household production.

Here, the x-axis depicts the age of the baby relative to birth and the wage is graphed on the y-axis.[6] While the market wage w is assumed to remain constant over time (depicted

[4] See the time allocation model of Becker (1965).
[5] The standard model can be found for example in Franz (2006, p. 28).
[6] The ticks on the x-axis are chosen arbitrarily to represent the age of the baby in quarters of a year up

Figure 1: Labor force participation after childbirth



Source: Leibowitz et al. (1992, p. 118)

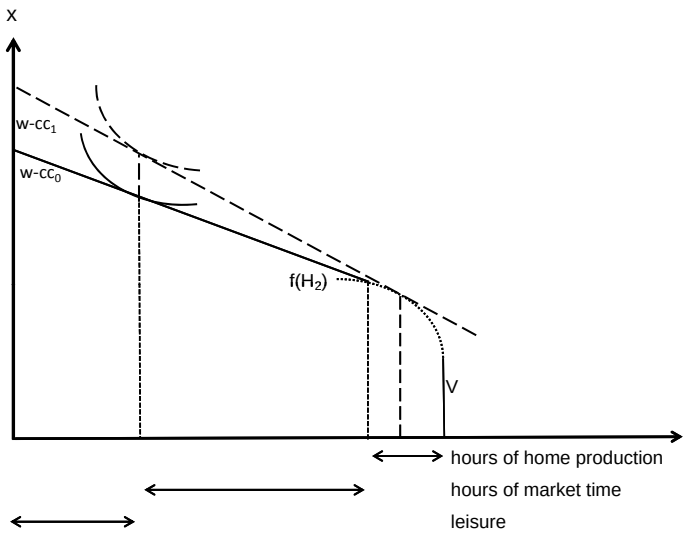
by the flat line labeled A), the net wage $w - cc$ increases over time as a consequence of decreasing childcare costs (line B). Decreasing childcare costs over the child's age translate into a time dependency of childcare costs with $\frac{\delta cc_t}{\delta t} < 0$. Here, in the context of childbirth, the reservation wage is assumed to change over time with a peak at delivery when the distress from pregnancy is greatest and steadily declines thereafter (dotted line). Re-entry into the labor force is determined by the crossing of the reservation wage with the net wage due to the optimality condition that positive hours are only offered if $w - cc > w^R$.

Turning to the framework with household production, figure 2 depicts non-labor income (V), the concave home production function $f(H_2)$ (dotted line), the net wage $w - cc$ (straight line) as well as the indifference curve between leisure and market work. The interaction of these determines how much time is spent in home production, market work, and leisure. More specifically, figure 2 illustrates how participation is determined by the optimality condition that a mother works as long in household production H_2 (movement along the concave home production function to the top left) until the net wage exceeds her productivity at home (point of tangency). Thereafter, working hours are determined from the point of tangency with the indifference curve. Now, as the child grows, external childcare becomes cheaper ($cc_1 < cc_0$, see move to dashed line) and hence participation increases unambiguously whereas time in home production is reduced (due

to the age of two years.

to the concavity of the home production function). However, working hours depend on the sum of the opposing income and substitution effect and are thus undetermined from theory, except if a constant amount of leisure is assumed.

Figure 2: The effect of decreasing childcare requirements in the household production model



Source: Own extension of the household model in Gronau, 1977, p. 1107

One crucial assumption of Leibowitz et al. (1992) is the constancy of the market wage rate. In contrast, the depreciation of human capital leads to a reduction of the market wage the longer the mother stays out of the labor force as is endorsed empirically for example by Beblo et al. (2006) and Görlich and de Grip (2007). This partly counteracts the increase in the net market wage from the reduced childcare costs in particular for mothers who (re-)enter the labor market very late after childbirth. For figure 2 this means that the increase of the net wage from period 0 to period 1 is not as strong as it would be without human capital depreciation. In extreme cases, the effect might even reverse its sign.

The previous analysis is based on decreasing childcare costs as the child grows, but Leibowitz et al. (1992) acknowledge that the costs also depend on childcare availability. Poor childcare availability is a crucial problem in Germany.[7] Geisler and Kreyenfeld (2006) report childcare availability rates as low as 5 % for up to three year-olds in West Germany for the year 2005 and van Ham and Büchel (2004) find a discouragement effect

[7] Geisler and Kreyenfeld (2006); Kreyenfeld and Hank (2000); Kreyenfeld (2001, 2000); Bender et al. (2003); van Ham and Büchel (2004)

from poor childcare availability on the maternal labor supply. Moreover, Kreyenfeld and Hank (2000) observe that the shortage of supply is more important for female labor supply than the cost of childcare. However, regardless of formal daycare, informal daycare is often available at the cost of a childminder. Alternatively the grandparents or other relatives sometimes stand by to guard the child. Hence, maternal labor supply is expected to decrease with the distance to the closest grandparents of the child as analyzed in Weber (2004); Lauer and Weber (2003) and in the following.

Finally it should be noted that the responsiveness to childcare costs and availability is largely influenced by personal preferences for childcare by the mother herself in contrast to external childcare.[8] In the Western part of Germany more than the majority of mothers believes that small children would suffer from mother's employment (Geisler and Kreyenfeld, 2006, p. 8).[9] Preferences and the acceptance of external childcare probably also change as the child grows.

After these theoretical considerations, the following empirical analysis will shed some light on the changing maternal labor supply during the first few years after childbirth.

3 Data and Descriptive Statistics

The data is drawn from the German Socio-Economic Panel (SOEP) from 1991[10] up to the wave 2006, which includes among many other variables precise information on actual working hours. Approving of the panel dimension of the SOEP, pre-childbirth information is constructed from the wave preceding the year of childbirth in analogy to Lauer and Weber (2003, p. 10). More precisely, the pre-birth information on employment status is drawn 12 months or more before childbirth in order to avoid bias from a reduction in labor supply as the pregnancy proceeds (analogously to "Ashenfelter's dip" in the training literature, see Ashenfelter, 1978).[11] Similarly the first post-birth data is taken at age one, i.e. at least 12 months after childbirth, in order to assure that all women

[8] Blau et al. (2005, p. 122) explain how the value of non-market time depends on tastes.

[9] In 1992 74% of West-German mothers strongly or tentatively agreed to the statement that "A small child will certainly suffer if the mother is employed." This percentage reduced to 62% in 2004 and totaled 51% and 29% in East Germany in the two respective years. ibid.

[10] However, no births from before 1992 are considered in order to avoid bias from the policy change in that year which increased the maximum time of job protection from 18 to 36 months (Kreyenfeld, 2001; Sonderhof, 2007). 1991 data is only used for pre-birth information.

[11] There are very few exceptions in which data from that point in time is not available because the woman has just recently entered the SOEP. Reducing the minimum time span between the pre-birth interview and childbirth to three months for those exceptions allows 3% of additional mothers to enter the data set used.

have reported that child's birth already.[12] This way working hours after childbirth are drawn so as to make sure that the baby has turned one, two, or three years already, as the precise age might play a role for childcare. The possibility that a mother may give birth to another child is taken into account by always employing the age of the *youngest* child.

The present analysis studies 'only' mothers whereas some other papers include non-mothers as a comparison group (Haan, 2005) and a few control for self-selection into motherhood (Lauer and Weber, 2003 follow the approach from Hotz and Miller, 1988; also see Djurdjevic, 2005). In contrast, the procedure employed here has the advantage of allowing all coefficients to vary freely in comparison to non-mothers. Some other studies limit the sample to married women (Geyer and Steiner, 2007; Blau and Kahn, 2007) or women who were working before birth (Weber, 2004; Bender et al., 2003; Ondrich et al., 1999). However, as pointed out by Lauer and Weber (2003), the restriction to previously employed women likely introduces a problematic self-selection bias. Therefore this study is *not* limited to the mentioned subgroups but adequate controls are included.

In order to limit the sample of women to those in childbearing age, only mothers who are between 18 and 47 years at childbirth are included. Births by younger or older mothers are very rare and their labor supply decisions will be influenced to a very large extent by education or retirement plans.[13] For the same reason, namely incomparable labor force participation decisions, women in education or in an apprenticeship as well as pensioners and disabled are also dropped from the sample. The remaining mothers are on average almost 32 years old and more than one third of them bears their first child ever as can be found in table 2 in the appendix.

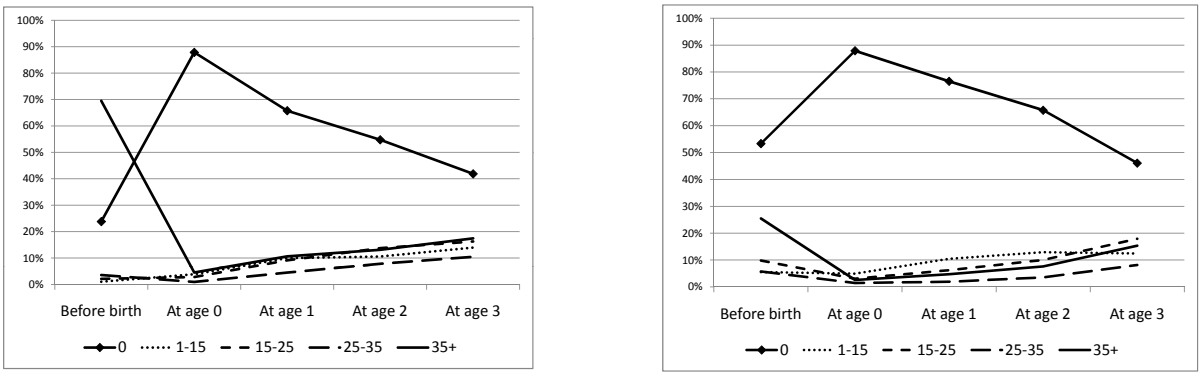
When analyzing maternal labor supply it is insightful to distinguish between different forms of employment according to the quantity of working hours. Therefore, figure 3 documents the share of mothers not working, working in minor employment (1-15 hours), two distinct part-time categories (15-25 hours and 25-35 hours) and full-time (35 hours and more). It pictures the large magnitude to which the event of childbirth reduces female employment, in particular for first-time mothers. In addition, it depicts a continuous increase in all employment categories except in minor employment which plateaus at the level of age two, suggesting that low working hours may serve as a stepping

[12] The reason is that the birth notification is taken from the post-birth year and thus some babies are already older than 12 months. Therefore the sample of mothers with babies below one year of age would be small and selective.

[13] Comparable age groups have been used in the literature, for example by Lauer and Weber (2003), Geisler and Kreyenfeld (2006) and Geyer and Steiner (2007).

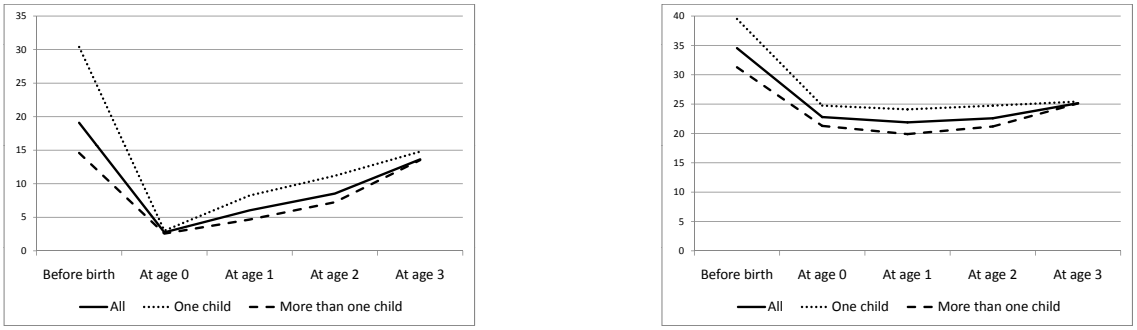
stone for higher working hours. In general, part-time work is clearly preferred to full-time work after childbirth which is also supported by the study of Geisler and Kreyenfeld (2006) on the basis of Microcensus data.

Figure 3: Grouped working hours for first-time mothers (left) and mothers with more than one child (right)



Nevertheless, as figure 4 shows average working hours conditional on working persist between 20 and 25 hours and display little variation, only for mothers with more than one child there is a notable increase in average working hours at age three of the newborn (from 21.2 to 25.1 hours). Similar results are found by Geyer and Steiner (2007) who report slightly higher conditional working hours except in a small dip which they detect at age two.

Figure 4: Average working hours (left) and conditioned on working (right)

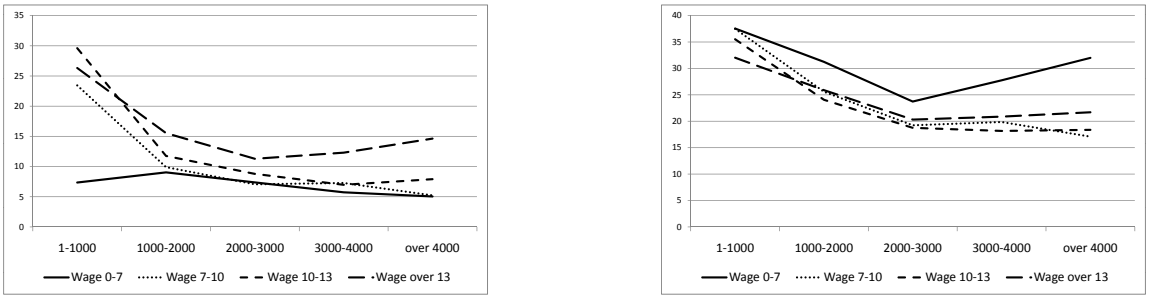


Finally, the correlation between the imputed wage[14] and partner's earnings on maternal labor supply is reported in figure 5 which joins these two covariates since a positive

[14] Wages are imputed because they are unobservable for non-employed mothers. In order to control for self-selection into employment, the Heckman two-step procedure is employed and the results are reported in table 1.

correlation is expected due to assortative mating (Becker, 1991, Chap. 4). Both panels side by side show that mothers with a lower potential wage are less likely to work, but if they do they work higher hours. It is most interesting to note that the wage groups are almost exactly ordered in the left panel, confirming the higher propensity to work at higher potential wages. Additionally, mothers whose partner earns very little appear to work more.[15]

Figure 5: Average working hours after birth (left) and conditioned on working (right) stratified by partner's income and imputed wage



Having established some empirical evidence on the relationship between the age of a baby and the mother's labor supply, the next section will deepen the empirical analysis in a tobit regression analysis.

4 Estimation and Results

Due to natural data censoring at zero, a tobit regression model is employed where actual working hours constitute the dependent variable. Different regressions are run for separate points in time when the baby is one, two, or three years old (table 3).[16] In fact, the regression results in tables 3 and 4 are based on a single regression in which all explanatory variables are interacted with the age of the child. The underlying model reads as follows:

$$hours_i = \beta'_{age1} X_i * D_{age1} + \beta'_{age2} X_i * D_{age2} + \beta'_{age3} X_i * D_{age3} + \epsilon_i \qquad (3)$$

[15] In case the partner's income is not observed in the data either because the woman does not live in a relationship or because he lives in another household, it is set to zero. Still, the following regression will control for this by a dummy.

[16] During the first twelve months after childbirth only 11.8 % of mothers are working at all, so inclusion of working hours from that age was not feasible here. Moreover, all multivariate analyses are weighted by the inverse sampling probability.

where each X_i contains a separate intercept and the D_{age} denote dummies for age one, two, and three of the child. This procedure is identical to running three separate regressions, but easily permits testing and adapting the standard errors to the panel structure by clustering them on the individual level.[17] For interpretation two distinct average marginal effects are reported: The first relates to the effect on the actual working hours which takes into account that some mothers may change from non-employment into employment in relation with the change in the respective covariate.[18] The second reported marginal effect reports the change in the probability of working.[19] For comparison, the employment probability of a mother who has another child between four and six years and was not employed before birth is 6.6 %, 12.0 %, and 20.0 % at age one, two, and three of the newborn, respectively. In contrast, these employment probabilities amount to 40.8 %, 46.4 %, and 45.6 % respectively for a mother who has no other child and had a white-collar job before giving birth.[20]

First, the economic incentives as measured by the imputed hourly wage[21] and partner's earnings are significantly related to mothers' working hours in the expected direction. Hence, maternal labor supply is higher when the potential wage increases, but lower when the partner earns more. However and most interestingly, as the detailed results show, at age one of the baby mothers' labor supply is not significantly related to these covariates, but only from age two on, implying that money does not matter at age one. This new insight indicates that women grow increasingly responsive to this type of economic incentive as the child grows. This is to my knowledge the first study to analyze this effect for Germany, whereas for the U.S. Leibowitz et al. (1992) find to the contrary that the predicted wage is already significant three months after childbirth which is not surprising against the different institutional background in the U.S..

Next, the occupation before childbirth is also strongly correlated to labor supply thereafter. The direction of the coefficients, which has to be interpreted in light of the reference category of previously non-employed mothers, shows that labor force participation before birth is decisive for a re-entry thereafter. Positive state dependence has also been found

[17] This is necessary as a mother is usually observed three times.

[18] It is calculated as $\frac{\delta E(y_i|x_i)}{\delta x_k} = \beta_k \cdot \Phi\left(\frac{x_i'\beta}{\sigma}\right)$, see for example Wooldridge (2002, p. 523).

[19] It is computed as $\frac{\delta P(y_i>0|x_i)}{\delta x_k} = \frac{\beta_k}{\sigma} \cdot \phi\left(\frac{x_i'\beta}{\sigma}\right)$, see for example Verbeek (2004, p. 220).

[20] Moreover, both reference mothers are between 28 and 32 years old, have completed an apprenticeship, are married and live in the West of Germany. Their potential wages and the available partner incomes correspond to the unconditional average.

[21] Wages are imputed because they are unobservable for non-employed mothers. In order to control for self-selection into employment, the Heckman two-step procedure is employed and the results are reported in table 1.

for example by Städtner (2004); Voicu and Buddelmeyer (2003) and Haan (2005) who finds a strong effect on the extensive, but only a modest if any effect on the intensive margin of labor supply (ibid.) leading to the same conclusion as the present analysis: Participation before birth matters more than hours. In more detail the present results show that self-employed and civil servants display the largest labor supply. For the latter, the higher labor supply could be due to favorable working hours and good part-time work opportunities as argued by Bender et al. (2003, p. 14). In their paper, they differentiate only between blue and white collar workers and find that the latter take shorter leaves which is in line with the present analysis.

Care has to be taken when the other covariates are analyzed as some of them do not only work directly, but also through the imputed wage (cf. table 1). For the education variable the direct and the indirect effect through the imputed wage oppose each other but the latter dominates. Hence, as expected from Human Capital Theory, mothers with a higher educational degree supply more labor to the market. Similarly, age also works mainly through the imputed wage and in the direction as expected from Human Capital Theory. For illustration, figure 6 in the appendix displays simulated employment probabilities which also take the indirect effect via the imputed wage into account. Again, results for the two before-mentioned reference mothers are shown. Thus, younger mothers tend to enter the labor market somewhat more frequently after childbirth as also found by Weber (2004). In a different specification, Ondrich et al. (1999) find that mothers with the strongest labor force attachment tend to take full advantage of their leaves. Other reasons apart from Human Capital Theory and labor force attachment may include birth order or employment stability and deserve further attention.

The largest point estimate apart from the pre-birth occupation is given by the region of residence where mothers living in the East of Germany work much more. However, this correlation is again partly offset by the negative effect of this covariate on the imputed wage. The higher labor supply of East German mothers is explained by the tight labor market which goes along with fear of job loss and a much better childcare provision. Along the same lines, van Ham and Büchel (2004) point out that a discouragement effect from poor childcare infrastructure might be at work in West Germany. Moreover, in the German Democratic Republic (GDR) in the 1980s it was common that mothers took up full-time work again one year after childbirth (Geisler and Kreyenfeld, 2006) so that historically grown attitudes could also play a role.[22]

[22] To check whether origin or current residence matters, a regression was run with both, where the former proved significant at age two and three, but less than the current residence (not displayed). This lends support to the stronger effect of childcare availability and the tight labor market instead of attitudes.

Surprisingly, first-time mothers seem not to behave significantly different from mothers who already have another child between four and six years old (reference category), except at age two of the child. Confirming the expectation, mothers provide more labor with every month that the child grows (captured by the variable for the relative babyage which runs from one to 12 months), although this is not the case in the paper of Lauer and Weber (2003) who, however, consider only participation as the dependent variable.

It is also astonishing that the proxies for informal childcare (i.e. distance to the closest grandparents, i.e. parents or in-laws) prove seldomly significant individually, but still they are jointly significant at the 5 %-level. Correspondingly, Kreyenfeld and Hank (2000) neither find a significant effect of the distance to the grandparents nor of the childcare provision rate. The controls for marriage and foreign nationality prove not significant here.

In a nutshell, the positive correlations of post-birth labor supply with the imputed wage, the pre-birth occupation, and the region of residence stand out, as well as the indirect effect of education and age through the imputed wage.

5 Conclusion

This paper investigates how maternal labor supply changes as the child grows. Specifically, changing working hours during the first few years after childbirth are extensively characterized. The focus of this paper is on how the determinants of maternal labor supply develop in magnitude and significance while allowing for a non-linear evolution as suggested by the literature (Leibowitz et al., 1992; Geyer and Steiner, 2007). Hence, in the present analysis the child's age is not regarded as merely another explanatory variable, but instead addressed explicitly both in the bivariate descriptive analysis and in the tobit regression framework. Both empirical parts as well as the theoretical model support continuously increasing labor supply after childbirth.

Similar to previous findings for Germany, female labor supply drops dramatically at childbirth to about 12 % and only picks up slowly thereafter (Geyer and Steiner, 2007; Lauer and Weber, 2003). Participation and not working hours is the driving force for the recovery of maternal labor supply after childbirth. According to the bivariate analysis, mothers with only one child exhibit a stronger labor force attachment than mothers with more children.

The econometric approach allows for free variation of the coefficients at different ages of

the child and the results confirm the necessity for proceeding this way. The central finding is that the economic incentives given by the imputed wage and partner's earnings matter only from age two on. Put differently, monetary incentives appear not always relevant for mothers. Moreover, the effects of education and age are mainly driven through imputed wages. Additionally, labor force participation before birth is strongly positively related to working hours thereafter as well as the region of residence.

These findings deserve further investigation, not least due to the topicality of the subject in Germany. For example, what role does the new "Elterngeld" (parenting benefit) play for the responsiveness to work incentives? Moreover, it is obvious that the next step consists of trying to find a causal explanation for the changing work behavior of mothers after childbirth. Here the causal effect of age on employment outcomes after childbirth could prove particularly interesting as childbirth is nowadays often postponed.

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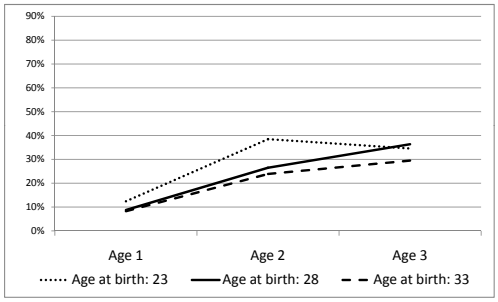
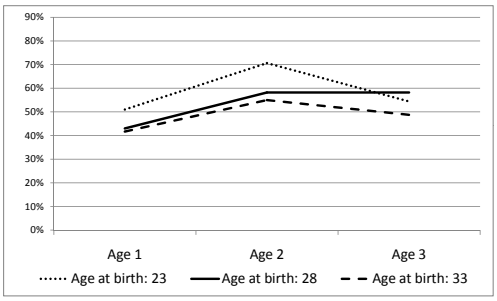
Appendix

Figure 6: Effect of age on employment probability



Reference mother 1: Not working before birth, another child age 4-6



Reference mother 2: Working white collar before birth, no other child

Table 1: Heckman two-step wage imputation

	Log wage equation		Selection equation	
	Coefficient	t-value	Coefficient	t-value
Work experience	0.013	(6.41)	0.180	(64.38)
Work experience square	-0.0003	(-5.07)	-0.003	(-32.64)
Unemployment experience	-0.014	(-3.23)	-0.273	(-39.24)
Unemployment experience square	0.0001	(0.21)	0.015	(20.10)
Age	0.022	(6.31)	0.284	(44.68)
Age square	-0.0002	(-4.59)	-0.005	(-51.12)
No training degree	-0.189	(-26.81)	-0.038	(-2.88)
University degree	0.310	(51.40)	0.171	(13.03)
Currently living in East	-0.461	(-79.80)	-0.047	(-3.73)
Number of children			-0.240	(-23.65)
Dummy for child up to 3			-0.822	(-47.09)
Dummy for child 4 to 6			-0.102	(-5.66)
Dummy for child 7 to 12			0.001	(0.04)
Dummy for child 13 and over			0.126	(7.99)
Dummy for marriage			-0.152	(-10.80)
Constant	1.753	(30.06)	-4.364	(-44.51)
rho	-.238***			
sigma	.557***			
Number of observations	86,615			
Censored observations	33,011			
Uncensored observations	53,604			

Table 2: Summary statistics

	Pooled	Age 1	Age 2	Age 3	
Working hours	8.68	6.11	8.36	13.55	
Working hours if positive	23.15	21.89	22.39	25.07	
Participation rate	37.5%	28.5%	37.3%	54.0%	
Imputed hourly wage	9.05	9.01	9.07	9.11	
Squared imputed wage	86.62	85.91	86.87	87.58	
Partner's earnings	2262.52	2232.86	2290.68	2277.46	
Partner's earnings missing	18.6%	18.5%	17.5%	20.3%	Dummy
Before birth not employed (Ref)	47.2%	47.5%	47.4%	46.4%	Dummy
Before birth blue collar	12.2%	11.8%	12.2%	12.8%	Dummy
Before birth self-employed	2.2%	2.4%	2.3%	2.0%	Dummy
Before birth white collar	35.3%	35.3%	35.1%	35.7%	Dummy
Before birth civil service	2.8%	2.9%	2.7%	2.7%	Dummy
Before birth not available	0.3%	0.2%	0.4%	0.5%	Dummy
No professional training	21.3%	21.3%	21.4%	21.3%	Dummy
Training degree (Ref.)	62.3%	61.6%	62.7%	62.9%	Dummy
University degree	15.2%	15.8%	14.9%	14.6%	Dummy
Currently in living East	18.4%	18.3%	17.8%	19.2%	Dummy
Age	31.65	30.79	31.87	32.89	
Age 18 - 22	8.0%	8.8%	7.6%	7.1%	Dummy
Age 23 - 27	27.8%	28.1%	27.2%	27.9%	Dummy
Age 28 - 32 (Ref.)	37.8%	37.3%	38.2%	38.2%	Dummy
Age 33 - 37	21.0%	20.4%	21.0%	22.2%	Dummy
Age 38 - 47	4.6%	4.7%	4.8%	4.0%	Dummy
No other child=first birth	36.4%	38.1%	32.7%	38.5%	Dummy
Another child up to 3	12.2%	16.9%	13.2%	2.2%	Dummy
Another child 4-6 (Ref.)	27.6%	29.8%	31.5%	18.5%	Dummy
Another child 7-12	20.5%	12.8%	19.4%	35.8%	Dummy
Another child 13-15	2.3%	1.6%	2.1%	3.5%	Dummy
Another child 16+	1.1%	0.8%	1.1%	1.5%	Dummy
Twin birth	2.7%	2.5%	2.9%	2.6%	Dummy
Age of baby in months	27.74	18.06	30.04	42.03	
Relative babyage in months		6.06	6.04	6.03	
Parents in same house	15.1%	15.1%	15.5%	14.5%	Dummy
Parents in neighborhood	23.6%	23.5%	24.3%	22.8%	Dummy
Parents in same town (Ref.)	23.5%	23.7%	22.7%	24.3%	Dummy
Parents in another town	24.9%	24.6%	24.1%	26.6%	Dummy
Parents far away	8.7%	9.1%	8.9%	7.6%	Dummy
Parents abroad	3.8%	3.8%	4.1%	3.7%	Dummy
Married	86.2%	85.1%	87.1%	87.0%	Dummy
Foreign nationality	16.5%	16.5%	16.7%	16.2%	Dummy
Observations	3619	1562	1195	862	

Reference categories for the later regression denoted by (Ref.)

Table 3: Regression with interactions for separate ages: Coefficients and significance

	At age 1		At age 2		At age 3	
	Coef.	p-value	Coef.	p-value	Coef.	p-value
Imputed hourly wage	2.308	(0.762)	18.71	(0.005)	15.34	(0.036)
Squared imputed wage	0.157	(0.551)	-0.433	(0.071)	-0.318	(0.192)
Partner's earnings	-0.00121	(0.123)	-0.00133	(0.110)	-0.00277	(0.000)
Partner's earnings missing	-9.844	(0.027)	-6.862	(0.114)	-5.645	(0.247)
Before birth blue collar	17.61	(0.000)	18.66	(0.000)	12.98	(0.005)
Before birth self-employed	42.13	(0.000)	39.84	(0.000)	17.91	(0.004)
Before birth white collar	23.47	(0.000)	24.78	(0.000)	8.915	(0.029)
Before birth civil service	39.47	(0.000)	38.63	(0.000)	19.81	(0.001)
Before birth not available	41.24	(0.025)	27.23	(0.018)	12.12	(0.239)
No professional training	6.018	(0.377)	12.55	(0.042)	0.928	(0.898)
University degree	-8.097	(0.373)	-19.37	(0.010)	-21.45	(0.015)
Age 18 - 22	3.371	(0.689)	16.09	(0.025)	12.81	(0.073)
Age 23 - 27	7.110	(0.119)	12.70	(0.000)	3.559	(0.363)
Age 33 - 37	-2.809	(0.449)	-5.495	(0.106)	-7.068	(0.075)
Age 38 - 47	-11.38	(0.050)	-7.924	(0.154)	-15.53	(0.034)
Currently living in East	17.55	(0.231)	46.54	(0.000)	44.49	(0.002)
No other child=first birth	1.665	(0.583)	-6.954	(0.027)	1.928	(0.687)
Another child up to 3	0.782	(0.823)	-7.045	(0.049)	-11.55	(0.155)
Another child 7-12	-2.226	(0.553)	-13.37	(0.000)	-1.372	(0.698)
Another child 13-15	-3.348	(0.603)	0.199	(0.980)	-4.119	(0.612)
Another child 16+	2.254	(0.810)	5.494	(0.536)	9.655	(0.224)
Twin birth	7.961	(0.237)	9.867	(0.054)	14.07	(0.020)
Relative babyage in months	1.024	(0.002)	0.931	(0.003)	0.358	(0.343)
Parents in same house	-3.998	(0.273)	-0.713	(0.838)	-2.691	(0.509)
Parents in neighborhood	0.701	(0.825)	3.685	(0.253)	1.914	(0.563)
Parents in another town	0.460	(0.892)	-4.038	(0.205)	4.629	(0.225)
Parents far away	1.212	(0.758)	-10.07	(0.019)	2.492	(0.611)
Parents abroad	7.391	(0.349)	10.10	(0.100)	-0.236	(0.974)
Married	-0.006	(0.999)	-1.821	(0.629)	-6.623	(0.191)
Foreign nationality	1.219	(0.789)	4.168	(0.302)	3.759	(0.340)
Constant	-67.80	(0.190)	-152.6	(0.001)	-114.3	(0.022)
Observations	3475					

Year dummies have been controlled for.

Standard errors adjusted for clustering.

Table 4: Regression with interactions for separate ages: Marginal effects

	ME on actual variable			ME on $P(y > 0)$		
Imputed hourly wage	.944	**7.650**	**6.284**	.032	**.256**	**.210**
Squared imputed wage	.064	-.177	-.130	.002	-.006	-.004
Partner's earnings	.000	-.001	**-.001**	.000	-.000	**-.000**
Partner's earnings missing	**-4.028**	-2.807	-2.313	**-.135**	-.094	-.077
Before birth blue collar	**7.202**	**7.635**	**5.318**	**.241**	**.255**	**.178**
Before birth self-employed	**17.23**	**16.31**	**7.337**	**.577**	**.545**	**.245**
Before birth white collar	**9.600**	**10.14**	**3.652**	**.321**	**.339**	**.122**
Before birth civil service	**16.15**	**15.80**	**8.112**	**.540**	**.529**	**.271**
Before birth not available	**16.88**	**11.14**	4.965	**.565**	**.373**	.166
No professional training	2.462	**5.134**	.380	.082	**.172**	.013
University degree	-3.313	**-7.924**	-8.785	-.111	**-.265**	-.294
Age 18 - 22	1.378	**6.585**	5.249	.046	**.220**	.175
Age 23 - 27	2.907	**5.200**	1.458	.097	**.174**	.049
Age 33 - 37	-1.148	-2.250	-2.896	-.038	-.075	-.097
Age 38 - 47	**-4.652**	-3.244	**-6.366**	**-.156**	-.109	**-.213**
Currently living in East	7.178	**19.04**	**18.23**	.240	**.637**	**.609**
No other child=first birth	.681	**-2.846**	.790	.023	**-.095**	.026
Another child up to 3	.320	**-2.884**	-4.733	.011	**-.096**	-.158
Another child 7-12	-.910	**-5.474**	-.562	-.030	**-.183**	-.019
Another child 13-15	-1.369	.081	-1.687	-.046	.003	-.056
Another child 16+	.921	2.250	3.954	.031	.075	.132
Twin birth	3.255	4.042	**5.762**	.109	.135	**.193**
Relative babyage in months	**.419**	**.381**	.147	**.014**	**.013**	.005
Parents in same house	-1.635	-.292	-1.102	-.055	-.010	-.037
Parents in neighborhood	.287	1.510	.784	.010	.050	.026
Parents in another town	.188	-1.655	1.896	.006	-.055	.063
Parents far away	.495	**-4.127**	1.021	.017	**-.138**	.034
Parents abroad	3.021	4.139	-.097	.101	.138	-.003
Married	-.002	-.745	-2.715	- .000	-.025	-.091
Foreign nationality	.498	1.706	1.540	.017	.057	.051
Constant	-27.72	**-62.51**	**-46.81**	-.928	**-2.089**	**-1.565**

Bold values indicate significance at the 5%-level.

Year dummies have been controlled for.