

Long Term Performance of Young Mothers and their Children in Denmark: Labour Market, Health Care and Prescription Drugs*

Rasmus Højbjerg Jacobsen*

Centre for Economic and Business Research,
Copenhagen Business School

This version:

14 January 2011

Abstract:

This paper uses a register dataset for the entire Danish population to examine the effect of early motherhood on labour market measures, health care measures and family measures for the mothers and their offspring. The dataset is divided into three groups according to the age of the woman at the time of her first child delivery. Using standard cross-sectional econometric techniques the results show that very young mothers (aged 16-21) have significantly lower employment rates, higher propensity to receive welfare benefits and a lower wage income. Children of very young mothers have a higher family replacement rate, more services received from General Practitioners and a higher propensity to receive ADHD-medications. The majority of the effects reported are also significantly greater for mothers who were aged 22-25 at the birth of their first child compared to older mothers.

* This paper is an offshoot of a cost-benefit project paid for by the Danish organization “Mødrehjælpen” – an NGO with the purpose of helping mothers through any hardships of motherhood. The author wishes to thank Mødrehjælpen for comments and suggestions during this original project. The responsibility for any remaining errors is mine.

* Postal address: Porcelaenshaven 16A, 2nd floor, DK-2000 Frederiksberg, Denmark. E-mail: rhj.cebr@cbs.dk.

Introduction

Entering motherhood often has significant bearings on a woman's opportunities on the labour market and/or in the education system. Consequently, an increasing share of children in the Western countries is born to women who have already finished their education and entered the labour market.

However, a significant share of children is born to young mothers who have not yet finished their education or entered the labour market. It is a well-known fact that motherhood has a large negative impact on female labour supply and subsequently on earnings.¹ Consequently, entering motherhood at a young age may harm a woman's chances for labour market success.

Other studies in several disciplines, mostly medicine and economics, have looked at the long term consequences of early motherhood for performance with respect to a variety of measures. A few of these studies will be presented below.

For Britain Goodman et al. (2004) use a cohort of women born in 1970 to study the effects of early motherhood on a number of economic variables. They find large effects on education, income and partner's wage when using OLS-regressions, but these effect to a large extent disappear when they use matching and IV-estimators. However, they used a sample of only 5,700 women, of which only 541 had been pregnant at age 18.

Looking at the effects for children of teenage mothers, Francesconi (2008) using the British Household Panel Survey, finds that being born to a teenage mother has adverse effects on a number of outcome variables measured at early adulthood of the offspring. The paper employs standard econometric cross-sectional analysis as well as siblings estimations and find, that irrespective of the econometric technique used, being born to a teenage mother has a negative impact on a number on outcomes: education, teenage pregnancy, income and economic inactivity.

It has been argued that using crude econometric methods results in biased estimates of the effect of teenage or young adult childbirth. The argument goes as follows: if the negative outcomes are not related to the actual teenage pregnancy, but rather to unobserved characteristics, then the effect will be biased upwards. In addition, there may exist endogeneity problems, as the decision of becoming a parent and the decision on what education to complete and what amount of labour to supply may be simultaneous. For further studies of this question the reader is referred to e.g. Hotz et al. (1997), Bronars and Groggers (1994) of Geronimus and Korenman (1992).

Chevalier and Viitanen (2003) look at the effect of teenage childbearing on schooling later in life and finds, after controlling for possible endogeneity, that post-16 years of schooling is reduced by 12 to 24 percent in a sample of 5,800 mothers from the National Child Development Survey in Britain.

Fewer studies in economics have looked at the impact on the children of young mothers, but there exist a larger literature in medicine regarding this question. For example, Gueorguieva et al. (2001) looks at the outcomes of children of teenage mothers during their kindergarten years. They find that

¹ See for example Blau and Kahn (2005).

using the raw data, children of teenage mother have significantly higher risk of being placed in special education classes, but this effect disappears after controlling for maternal education, marital status, poverty level, and race.

Olausson et al. (2001) carry out a longitudinal study using a dataset somewhat similar to the one used in this paper. Their data covers Swedish mothers who were born between 1941 and 1970, and the authors compare and group them according to the age at the first child delivery. They find that teenage mothers were much more likely to become blue collar workers, more likely to be living without a partner and more likely to have 4 or more children compared to older mothers. These effects are confirmed in both crude data and in logistic regressions. While similar in some respects to the present study, the study of Olausson et al. (2001) does not present results related to either the children of young mother, nor does it look at the use of medical service or medicine.

The present paper presents data for Danish mothers divided into subgroups according to their age at the time of the birth of their first child. The descriptive statistics for a number of performance variables clearly indicate that young mothers have lower labour market participation, higher propensity to receive income transfers and larger propensity to receive certain types of prescription drugs. The paper proceeds by carrying out econometric analyses of labour supply for mothers as well as for other performance indicators by making use of all the data available. The purpose is to examine whether early motherhood has an identifiable effect on these performance measures after controlling for other covariates. The paper contributes by (a) introducing a number of different measures of performance for young mothers and their children such as medicine use, the risk of family replacement of children and the number services received from GPs, by (b) carrying out analyses on Danish data with focus on the performance of young mothers relative to other mothers, and by (c) making use of an extensive register-based dataset covering the entire Danish population.

Data source and data construction

The data for this paper come from registers at Statistics Denmark. These registers have extensive information about individuals in Denmark, such as gender, age, family, education, income, receipt of public transfers, tax payments etc.

The data sets used in the present paper includes all women resident in Denmark who had become mothers by 2006 and their children up to age 13. The analysis proceeds by looking at the performance of these mothers and children in the year 2007 distributed by age. The mothers are divided into three groups according to their age when they became mothers for the first time:

1. Women, who first became mothers at age 16-21. This group will be denoted “very young mothers” (VYM)².
2. Women, who first became mothers at age 22-25. This group will be denoted “young mothers” (YM).

² Most often the in the literature the age threshold for young mothers is set at 19 in order to look at the effects of teenage pregnancies. However, Denmark has a low rate of teenage birth, with a teenage fertility rate of only 8 per 1,000 women, well below the European average and the level in e.g. Britain, see UNFPA (2002). Therefore in a Danish context a mother of age 20 or 21 is still to be considered a very young mother.

3. Women, who first became mothers at age 26 or older. This group will be denoted “older mothers” (OM).

A consequence of this grouping is that women, who had not become mothers at all before 2006, are excluded from the analysis. The main reason for making this choice is that focus in the paper is on the effect of early motherhood and not on motherhood per se.

The data set for mothers includes the following variables (all variables give the status as of 1 January, 2007 or the total in 2007 if not otherwise indicated):

EMPLOY: Dummy-variable indicating whether the woman in question was employed or not.

QUALEDU: Dummy-variable indicating whether the person had a qualifying education or not.³

WAGEINC: Total wage income in thousands of DKK. This income includes employer pension contributions as well as mandatory personal pension contributions.

GROSSINC: Total gross income including income transfers, thousands of DKK.

WELFBFT: Dummy-variable indicating whether the woman received welfare benefit income transfer during 2007 or not.

SINGLE: Dummy-variable indicating whether the person was single or not.

CHLD0_6: The number of children between ages 0 and 6 in the woman’s household.

AGE: The woman’s current age.

AGEMOM: The age when the woman first became a mother.

IMMI: Dummy-variable taking the value one if the woman is an immigrant.

DESCEND: Dummy-variable taking the value one if the woman is a first-generation descendant of an immigrant.

EXP: The woman’s labour market experience in years.

DRUGCRM: Dummy-variable indicating whether the woman has been convicted of possession of drugs during the years 2005-06.

SICKBEN: Dummy for receipt of sickness benefits in 2007.

GPSERV: Number of services given by GP to the woman.⁴

PRESCDRG: The number of times a person has got prescription drugs from a pharmacy.

The data set also contains the dummy variables VYM, YM and OM for very young mothers, young mothers and older mothers, respectively. Since I want to be sure that the women in the dataset have the true classification with respect to their VYM-, YM- or OM-status, I have excluded women

³ A qualifying education is either higher education or vocational education. Graduating from secondary schooling is not in itself a qualifying education.

⁴ A single consultation may include more than one service, for example vaccination, prescribing medicine or measuring a person’s blood pressure.

younger than 26, and since there is only observations for the VYM-group up to age 58 that is the oldest cohort included.

In addition to this data set the paper also makes use of a data set for the children up to 13 years old. This data set contains the following variables:

AGECHLD: The child's age. The squared age is also in the dataset.

REPLACE: Dummy indicating whether the child has been replaced to another family.

PREVENT: Dummy indicating whether the child has been part of a preventive measure aimed at reducing the risk of replacement.

GPSERV: Number of services given by GP to the child.

PSYCMED: Dummy indicating whether the child has

ADHDMED

The remaining variables concern the mother of the child:

EMPLOY: Dummy-variable indicating whether the mother was employed or not.

GROSSINC: Gross income of the mother.

SINGLE: Dummy indication whether the mother is living in a single-adult household.

QUALEDU: Dummy-variable indicating whether the mother has a qualifying education or not.

IMMI: Dummy indicating whether the mother is an immigrant or not.

VYM, YM, OM: Status of the child's mother. Please note that this status is given to the mother. This means that later born children of young and very young mothers are still associated with these group of mothers even though the mother may have passed the age thresholds at the time of their birth.

In the following two subsections the descriptive statistics for the two data sets are presented and a number of econometric analyses are carried out.

Descriptive statistics

This section presents some descriptive statistics for the data sets that were outlined above. In addition a few figures is provided that compare different measurement variables for the three groups of mothers and their children. TABLE 1 below shows the descriptive statistics for the mothers-dataset. In a similar way TABLE 2 shows the descriptive statistics for the children-dataset.

The first table shows that little over half of the women in the data set first became mothers when they were older than 25 while 15 per cent became mother before the age of 22. This is also reflected in the AGEMOM-variable which has a mean of 26.1. This number is somewhat lower than the current average age of the first motherhood which was 29.0 years in 2008, see Statistics Denmark (2010). However, the average age for first-time mothers have been declining steadily since 1970, and since a large share of women in my dataset are older than 30, they have on average become

mothers for the first time at a lower age. For the same reason the shares of very young and young mothers are also much lower for younger cohorts than for older.

TABLE 1 **DESCRIPTIVE STATISTICS FOR MOTHERS**

Variable	Mean	Std. dev.	Min	Max
AGE	43.6159	8.5947	26	58
AGEMOM	26.1167	4.4702	13	50
VYM	0.1510	0.3581	0	1
YM	0.3237	0.4679	0	1
OM				
SINGLE	0.2099	0.4072	0	1
CHLD0_6	0.4309	0.7305	0	7
IMMI	0.0710	0.2569	0	1
DESCEND	0.0044	0.0661	0	1
EXP	16.6972	9.7512	0	44
EMPLOY	0.8364	0.3699	0	1
WAGEINC	254.0898	175.5276	-164.8	9275.8
GROSSINC	275.6135	200.3689	-3282.3	112629.2
QUALEDU	0.7045	0.4563	0	1
SICKBEN	0.1812	0.3852	0	1
GPSERV	11.5907	12.2093	0	658
PRESCDRG	8.2718	14.8154	0	897
DRUGCRM	0.0009	0.0304	0	1
N	913,187			

Compared to the mothers-dataset above the average gross income for mothers is lower in the children-dataset, there is a larger share with a qualifying education, and there is a larger share of immigrant mothers. All these differences, however, are mostly – if not entirely – due to the fact that the average age of the mothers is lower in the children-dataset. Another thing that can be observed from TABLE 2 is that children receive far fewer services from GPs than mothers and that about ½ percent of children receive medication for either ADHD or other psychiatric disorders. Finally, the table shows that 0.85 percent of children have been replaced to another family in 2007, and 1.1 percent of children are taking part in preventive measures to avoid a replacement.

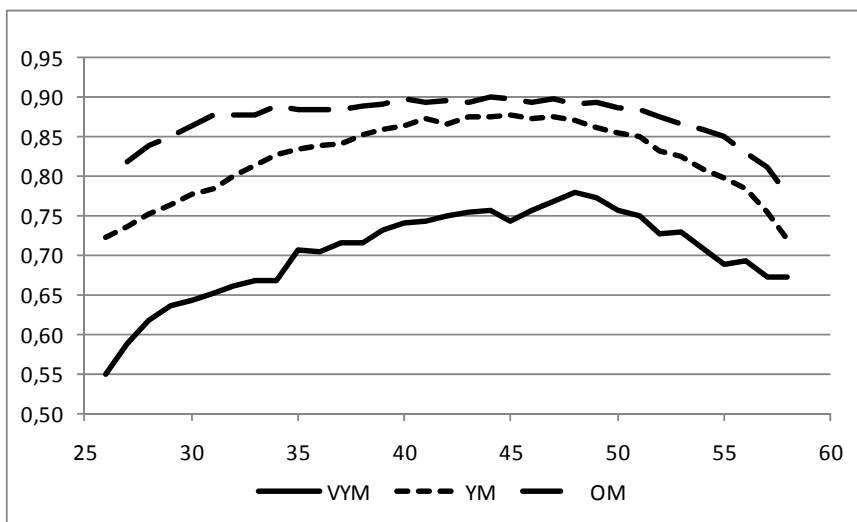
The total number of observations is 913,000 in the mothers-dataset and 850,000 in the children-dataset since the dataset covers the entire Danish population as of 2007.

TABLE 2 DESCRIPTIVE STATISTICS FOR CHILDREN

Name	Mean	Std.dev.	Min	Max
AGECHLD	6.5711	4.0451	0	13
VYM	0.1190	0.3238	0	1
YM	0.2564	0.4366	0	1
OM	0.6237	0.4845	0	1
REPLACE	0.0085	0.0918	0	1
PREVENT	0.0114	0.1059	0	1
GPSERV	6.1519	6.8939	0	165
PSYCMED	0.0055	0.0738	0	1
EMPLOY	0.8401	0.3665	0	1
GROSSINC	267.8750	141.8462	-2714.10	13374.97
SINGLE	0.1615	0.3680	0	1
QUALEDU	0.7393	0.4390	0	1
IMMI	0.1020	0.3027	0	1
AGECHSQ	59.5419	54.6419	0	169
ADHDMED	0.0056	0.0747	0	1
N	850,557			

To illustrate the raw differences in the performance measures between the three groups of mothers a few figures are presented below. First, FIGURE 1 show the mean of EMPLOY by age separated between the three groups.

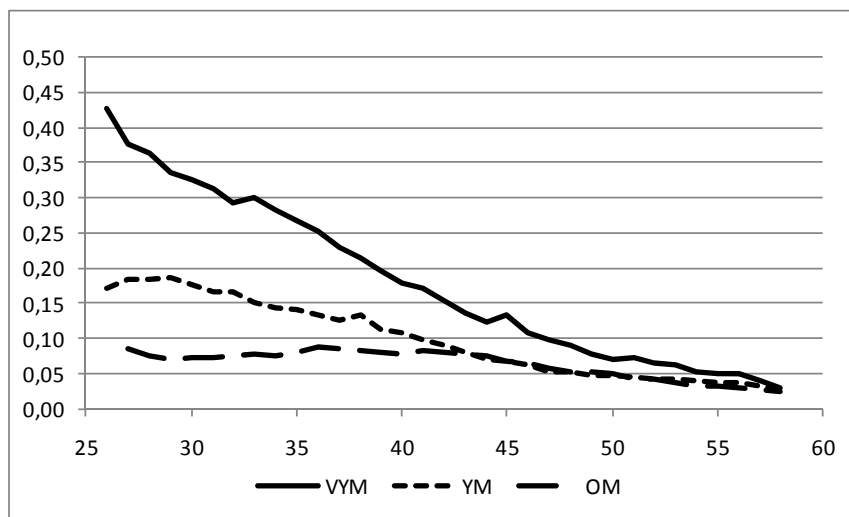
FIGURE 1 EMPLOYMENT RATE OF MOTHERS



The figure clearly shows that the employment rate of very young mothers is much lower than those of young and older mothers. While almost 90 per cent of prime age older mothers are employed, the corresponding number for very young mothers is only around 75 per cent. With respect to the group “young mothers” it is also clear that this group has a lower employment rate than older mothers, but

the difference is not as large as it is the case for very young mothers. Thus, at age 45 there is only a 2 percentage point difference in the employment rate between young mothers and older mothers. Apart from that the figure also confirms the familiar inverted U-shaped relationship between age and employment.

FIGURE 2 SHARE OF MOTHERS RECEIVING WELFARE BENEFITS



When we look at FIGURE 2, which shows the share of mothers receiving welfare benefits, the picture is reversed. Here we observe that very young mothers even at age 40 have an around 10 percentage points higher risk of being a welfare benefit recipient than young or older mothers, and for younger age groups the differences are even higher. As in the previous figure we also here observe that young mothers are closer to older mothers than to very young mothers, as there is little or no difference in the shares receiving welfare benefits for ages above 43, and only a small difference for ages 30-40.

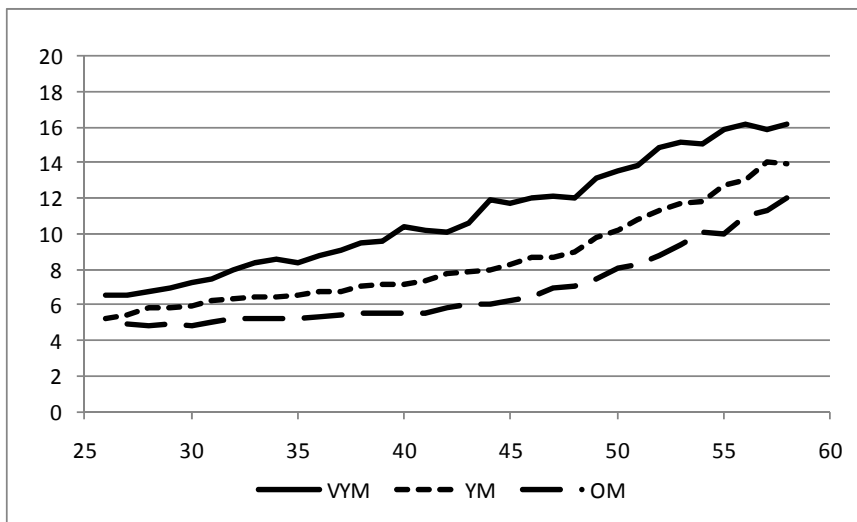
The figure generally shows that the propensity to receive welfare benefit decreases with age, and this is especially true for the VYM-group and the YM-group. For the OM-group the share is approximately constant at 7-9 percent up to age 45 and then decreases with age hereafter. This may reflect that a larger number of women of age 45-60 receive early retirement benefits, and also that more women of that age have not entered the labour market and therefore are being provided for by their spouses.

A final figure presented for mothers here is FIGURE 3 which shows the average number of handouts of prescription drugs during 2007 distributed by age and groups of mothers. Also this figure depicts a clear distinction between the different groups of mothers as very young mothers receive more prescription drugs.

All the figures presented here show important differences between the three groups of mothers. It is important to remember that the only distinction between the three groups is that of their age at the birth of their first child. In light hereof the figures show remarkable long-run differences between

the groups – even at age 40 or 50 there are huge differences in i.e. the employment rate and the number of handouts of prescription drugs.⁵

FIGURE 3 NUMBER OF HANDOUTS OF PRESCRIPTION DRUGS

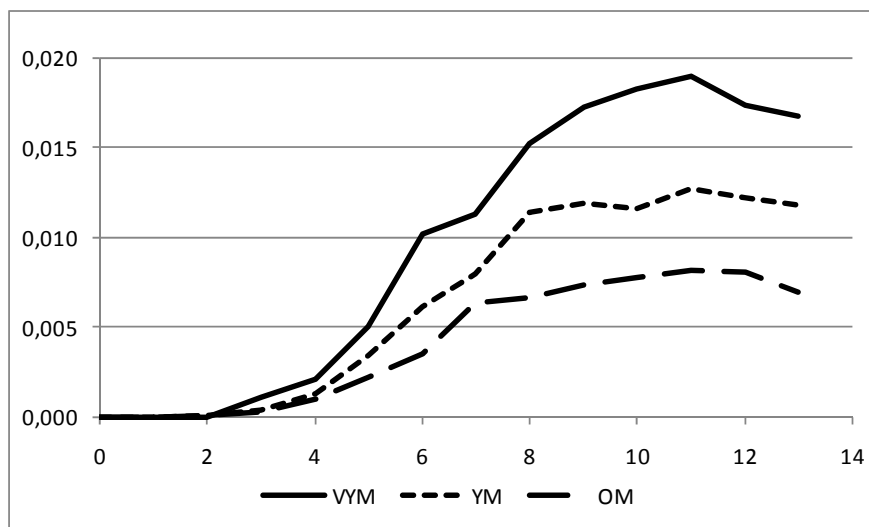


This subsection can be concluded by presenting a single figure illustrating the differences for children of the three groups of mothers. FIGURE 4 thus shows the share of children who received medicine treating Attention Deficit Hyperactivity Disorder (ADHD), a psychiatric disorder characterized by the co-existence of attentional problems and hyperactivity.

The figure clearly shows that children of very young mothers have a higher risk of receiving ADHD medications. Children of young mothers of approximately age 9-13 have ½ percentage point higher risk of being an ADHD-patient, and for children of very young mothers the risk is increased by an extra ½ percentage point.

⁵ Jacobsen (2010) presents a large number of figures similar to FIGURES 1-4. From the figures therein it is clear that the four measures above are not the only ones showing remarkable long-run differences between the three groups of mothers. Other variables showing the same tendency include: the propensity to receive sickness benefit, the number of services received from GPs, specialists or emergency doctors, the propensity to receive antidepressants or other drugs against psychiatric disorders.

FIGURE 4 SHARE OF CHILDREN HAVING RECEIVED MEDICINE TREATING ADHD



In the following subsection the econometric analyses are presented where the long-run differences shown above are put into regression controlling for the different covariates affecting them in order to more precisely capture the effect of early motherhood.

Econometric analyses

This section presents econometric analyses for a number of the performance variables presented in the previous subsection. The main focus in the present paper is not on the single equation estimated, but rather on the large number of different long-run measures that is presented.

The first analyses are presented in TABLE 3 which contains the results of OLS-regressions for a total of four variables from the Mothers-dataset.

The table shows regressions for wage income, gross income, the number of services received from a GP and the number of prescription drug-handout; all variables are from 2007. The regressions for wage income and gross income are Mincer-style regressions controlling for labour market experience, educational level and other covariates. The variables YM and VYM are highly significant and an effect of very young motherhood of approx. DKK -36,000 on the wage income and approx. DKK -32,000 on gross income is estimated. For young mothers the effects are of a smaller magnitude, but still significant. The variables EXP and EXPSQ enter the equation as expected.

It is noteworthy that the coefficients to the variable SINGLE have opposite sign in the two income equations. While the average wage income of a single mother is DKK 7,360 lower than that of other mothers after controlling for experience and education, the average gross income is DKK 9,190

higher than that of other mothers.⁶ The reason for is the means-testing effect of the tax and income transfer system in Denmark. Several income transfers are more generous for single adults and even more generous to single parents.

For the medical variables it is also clear that both young and very young mothers receive more services from GPs and get more prescription medicine. For the latter variable the size of the effect is approximately 2 extra handouts per very young mother compared to older mothers with the same characteristics. It is worth noting that both EMPLOY and SICKBEN have been included as regressors in these estimations to account for the fact that persons who receive sickness benefit are more likely to get some sort of prescription drug and to consult their GP. The effect of early motherhood can therefore not be attributed to the fact that younger mother a more likely to receive sickness benefit and less likely to be employed than older mothers, cf. the previous subsection.

TABLE 3 OLS-REGRESSIONS, MOTHERS

	WAGEINC	GROSSINC	GPSERV	PRESCDRG
VYM	-35.818** (0.477)	-32.065** (0.616)	1.214** (0.037)	2.095** (0.045)
YM	-29.973** (0.356)	-27.016** (0.459)	0.408** (0.028)	0.895** (0.034)
EXP	16.793** (0.063)	8.914** (0.082)		
EXPSQ	-0.242** (0.002)	-0.123** (0.002)		
AGE			-1.149** (0.016)	-0.248** (0.019)
AGESQ			0.012** (0.000)	0.005** (0.000)
QUALEDU	63.539** (0.370)	50.206** (0.478)	-0.687** (0.029)	-0.707** (0.035)
SINGLE	-7.360** (0.391)	9.188** (0.505)	1.115** (0.031)	1.580** (0.037)
EMPLOY			-7.239** (0.035)	-11.054** (0.042)
SICKBEN			5.459** (0.032)	3.382** (0.038)
R-squared	0.2842	0.0842	0.0991	0.1245

Remark: Standard errors in parentheses. ** indicates significance at the 1 percent level, and * indicates significance at the 5 percent level. The number of observations is 913,187. All regressions included the variables IMMI, DESCEND and CHLD0_6.

⁶ The term "single mother" in this sentence does not comply strictly to the ordinary use of this term as single mothers in the present context includes both mothers who are single and live with their children as well as mothers who are single, but where the children have move away from home.

For mothers three probit analyses have been run, the marginal effects of which are reported in TABLE 4 below.

The marginal effects of the VYM-variable are all statistically significant, indicating that young mothers have a significantly higher propensity to receive welfare benefits, a lower employment rate and a higher risk of being convicted of possession or sales of illegal drugs.

The magnitude of the effect is considerable. For very young mothers the estimated effect on the employment rate is thus almost 10 percentage points, and the effect on the propensity to receive welfare benefits is 5 percentage points. Comparing to FIGURES 1-2 above this shows that only a small part of the difference between the VYM-group and the OM-group can be explained by the fact that the former has much lower education level. As could be expected from the figures, the estimated effects are much smaller, although significant, for the YM-group. The estimations also clearly highlight the importance of education for employment as QUALEDU has a 16 percentage points positive effect on the employment rate and a 7 percentage points negative effect on the propensity to receive welfare benefit.

TABLE 4 MARGINAL EFFECTS OF PROBIT-ANALYSES, MOTHERS

	WELFBFT	EMPLOY	DRUGCRM
VYM	0.050** (0.001)	-0.0989** (0.001)	9.62E-05** (0.00002)
YM	0.017** (0.001)	-0.03278** (0.001)	-4.02E-06 (0.00001)
AGE	0.0040** (0.000)	0.0268** (0.000)	1.04E-05 (0.00001)
AGESQ	8.81E-05** (0.000)	-0.00033** (0.000)	2.66E-07** (0.00000)
EMPLOY			-3.26E-04** (0.00006)
WAGEINC			-6.80E-07** (0.00000)
QUALEDU	-0.069** (0.001)	0.1615** (0.001)	-1.11E-04** (0.00002)
SINGLE	0.081** (0.001)	-0.1205** (0.001)	4.79E-04** (0.00005)
Pseudo R-squared	0.1333	0.1257	0.2343

Remark: Standard errors in parentheses. ** indicates significance at the 1 percent level, and * indicates significance at the 5 percent level. The number of observations is 913,187. All regressions included the variables IMMI, DESCEND and CHLD0_6.

In the last column of TABLE 4 the estimated effects are very small in terms of numerical magnitude, as the effect for the VYM-group is only 0.0096 percentage point. However, as the VYM-group

contains more than 130,000 individuals this still corresponds to an extra 13 persons being convicted compared to a similar group of older mother. Again, the effect of education is apparent in this equation.

The final estimations to be presented cover the children. TABLE 5 below contains five estimations in total; the first column is an OLS-regression for the number of services at a GP, while the final four columns report the marginal effects from probit-analyses of the variables shown.

The results in Table 5 to a large extent confirm that also the children of young mothers face long run effects. The children of mothers from the VYM-group thus receive more GP-services and are more likely to be replaced to another family and to receive ADHD-medicine than children of mothers from the OM-group. Only for other psychiatric medicine does the result not indicate any effect.

TABLE 5 RESULTS OF OLS- AND PROBIT-ANALYSES, CHILDREN

	GPSERV	REPLACE	PREVENT	PSYCMED	ADHDMED
VYM	0.053* (0.021)	0.00236** (0.00015)	0.00383** (0.00027)	0.00043 (0.00025)	0.00220** (0.00020)
YM	0.089** (0.014)	0.00067** (0.00008)	0.00104** (0.00017)	-0.00002 (0.00017)	0.00104** (0.00011)
AGECHLD	-2.244** (0.006)	0.00021** (0.00003)	0.00174** (0.00008)	-0.00209** (0.00006)	0.00276** (0.00006)
AGECHSQ	0.125** (0.000)	6.02E-06** (0.00000)	-6.10E-05** (0.00001)	1.36E-04** (0.00000)	-0.00013** (0.00000)
QUALEDU	-0.031 (0.016)	-0.00360** (0.00014)	-0.00447** (0.00021)	-0.00051** (0.00019)	-0.00059** (0.00011)
SINGLE	0.192** (0.017)	0.00437** (0.00017)	0.01226** (0.00033)	0.00117** (0.00022)	0.00171** (0.00014)
EMPLOY	-0.520** (0.019)	-0.00598** (0.00025)	-0.01008** (0.00037)	-0.00135** (0.00024)	-0.00118** (0.00015)
R-squared	0.2049	0.2739	0.1474	0.0245	0.0839

Remark: Standard errors in parentheses. ** indicates significance at the 1 percent level, and * indicates significance at the 5 percent level. The number of observations is 850,557. All regressions included the variables IMMI and GROSSINC.

With respect to the magnitude of the effects the numbers in the table may not be straightforward to interpret. The marginal effect of VYM in the equation for family replacement shows an effect of 0.22 percentage points which may not seem as a large number. However, in terms of affected children this translates into a total of more than 200 extra children being replaced in Denmark anno 2007 compared to children of older mothers with similar characteristics. A similar number of extra children on ADHD-medicine can also be observed.

A few final things to note from Table 5 are (a) the importance of a qualifying education, and (b) the effect of single mothers.⁷ The marginal effects of having a qualifying education are all highly significant and have the expected signs. Also, the sign of the marginal effect for single mothers is as expected in all cases. Especially in the estimations for family replacement and preventive measures are the magnitudes of this effect also quite large.

Family fixed effects and other possible improvements

The existing literature within this field clearly documents that the estimated effects of being a very young or a young mother may be subject to an upward bias in absolute magnitude in the previous subsection. This is due to the fact that the VYM- and YM-variables are likely to be correlated with the error term in the regressions, because of unobserved variables such as ability, intelligence and coming from a rougher social background.

To the extent that these variables are correlated with family background and are (approximately) constant over time, it is possible to remove the effect hereof by running family fixed effects regression.

Future work with the present study includes regressions with family fixed effects as well as augmenting the regressions in the previous subsection with more detailed variables for education and for the mothers' status with respect to family replacement and other preventive social measures.

Finally, the figures in the descriptive statistics part of the paper seem to suggest that the effect of either being a young mother or being born to a young mother may be quite different for different age group. It is therefore worthwhile exploring whether the estimated effects change with age.

Discussion and conclusion

This paper presents a number of indicators for the labour market performance of mothers in Denmark. Specific attention is being paid to the performance of young mothers relative to older mothers. The descriptive statistics and figures shown in Section 2 clearly demonstrates that young and very young mothers have lower employment rate, lower education, lower income and a higher risk of receiving welfare benefits than older mothers – even in the long run.

Following up on the descriptive part, the paper has also shown that the long-run effects of entering motherhood at a young age are statistically significant for a number of outcome variables. The paper thus confirms what is found in other countries, namely that chance of finishing a qualifying education; the employment rate and the yearly wage income are significantly lower for young and very young mothers.

In addition, this paper also supplements with analyses of the medicine consumption and the use of primary medical services. This analysis confirms the negative effects of entering motherhood at an early age as young and especially very young mothers have a larger number of prescription drug handouts and receive a larger number of services from GPs than older mothers.

⁷ In this context the term may be understood as its ordinary meaning as the children in question are only up to 13 years old.

A final measurement included is the performance of the children of very young mothers with respect to medical and social measures. There is was found that children of very young and young mothers have a higher risk of being replaced to another family as well as taking part in preventive measures preventing replacement. Also, the medicine use of children varies with the status of their mother, as children of very young mothers have an increased risk of being treated with ADHD-medicine. Finally, the use of GP-services is also related to the mother's status.

A key issue in the discussion of the results from this paper is causality and endogeneity. While some studies confirm the adverse effects of entering motherhood at a young age even after controlling for endogeneity, others reject the existence of such an effect, concluding that there is not effect of early motherhood per se, and that the adverse outcomes can be related solely to family issues, financial hardship or ability.

Leaving this issue aside the results from this paper and from just about all other papers dealing with this subject show that children of young mothers as well as the young mothers themselves face severe problems later in life. There is thus little doubt that helping these families can result in better outcomes for both mothers and children. In fact, the extra costs to society in terms of extra welfare benefit, more medical services and more family replacements of children are of a very large magnitude, cf. Jacobsen (2010) in the Danish case, and it is likely that most targeted programs that aim to better the situation for these families can stand up to a cost-benefit test.

References

Blau, F. D. and L. M. Kahn (2005), Changes in the Labor Supply Behavior of Married Women: 1980-2000, NBER Working Paper #11230.

Bronars, S. G. and J. Grogger (1994), The Economic Consequences of Unwed Motherhood: Using Twin Births as a Natural Experiment, *The American Economic Review*, 84(5), pp. 1141-1156.

Chevalier, A. and T. K. Viitanen (2003), The long-run labour market consequences of teenage motherhood in Britain, *Journal of Population Economics*, 16(2), pp. 323-443.

Francesconi, M. (2008), Adult Outcomes for Children of Teenage Mothers, *Scandinavian Journal of Economics*, 110(1), pp. 93-117.

Geronimus, A. and S. Korenman (1992), The Socioeconomic Consequences of Teen Childbearing Reconsidered, *The Quarterly Journal of Economics*, 107, pp. 1187-1214.

Goodman, A., Kaplan, G. and Walker, I. (2004), Understanding the Effect of Early Motherhood in Britain: The Effects on Mothers. IFS Working Paper no. 04/18, London.

Gueorguieva R.V., R. L. Carter, M. Ariet, J. Roth, C. S. Mahan, and M. B. Resnick (2001), Effect of Teenage Pregnancy on Educational Disabilities in Kindergarten, *American Journal of Epidemiology*, 154(3), pp. 212-220.

Hotz, V. J., C. H. Mullin and S. G. Sanders (1997), Bounding Causal Effects Using Data From a Contaminated Natural Experiment: Analysis the Effects of Teenage Chilbearing, *Review of Economic Studies*, 64, pp. 575-603.

Jacobsen, R. H. (2010), *Beskrivende analyse og cost-benefit-analyse af en ekstra indsats over for unge mødre*, Centre for Economic and Business Research Analysis Report. (In Danish)

Olausson, P. O., B. Haglund, G. Ringbäck Weitof and S. Chattingius (2001), Teenage Childbearing and Long-Term Socioeconomic Consequences: A Case Study in Sweden, *Family Planning Perspectives*, 33(2), pp.70-74.

Statistics Denmark (2010), *Statistisk Årbog*, Copenhagen. (In Danish)

UNFPA (2002), *State of the World Population 2002*, New York.