

TEENAGE PREGNANCY

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# By choice or by chance

**What effect does teenage motherhood have on later life?**

**Arnaud Chevalier and Tarja Viitanen look at the evidence about the “Class of ’58” to measure the cost of early pregnancy and its implications for public policy.**

**B**ritain has the worst record on teenage motherhood in Western Europe. It is also the only EU country where the rate has not decreased in the past 20 years. The UK figure is nearly three times as high (at around 30 births per 1000 women) as the European rate (around 11 per 1000).

Early motherhood is commonly associated with lower levels of education, reduced participation in the labour market and poverty. The lower income of teenage mothers affects not only their own but also their children's economic well-being.

Governments have repeatedly emphasised the importance of reducing the rate of teenage motherhood, mainly to reduce the risk of long-term social exclusion and welfare dependency. The 1992 White Paper “Health of the Nation” promised to halve the teenage pregnancy rate by the year 2000, a goal now postponed until 2010. However, the rate of teenage conception has remained stable for the past decade at 45 per 1000 women, with approximately 40% of those pregnancies ending in abortion.

The question of interest to policy makers is whether early pregnancy really has a significant impact on later socio-economic outcomes, or whether these observed outcomes are due to other factors. In short, are teenagers who give birth just like other teenagers except that they are supporting a child, or are they different in the first place? If early

motherhood per se leads to poorer outcomes, then policies reducing early childbearing will have positive effects on the economic prospects of these young women. However, if the different adult outcomes are linked to pre-motherhood differences between teenage mothers and those who delay childbearing, then the poorer outcomes would surface regardless. The answer to this question is, therefore, essential in designing an effective policy to reduce social exclusion and the transmission of poverty from one generation to the next.

For our research into this question for the UK we used data from the National Child Development Study. This is a continuing survey of all individuals born in Britain during the first week of March 1958. We took the fifth wave of the survey, conducted in 1991 when the respondents were 33 years old, and selected a sub-sample of 5,799 women, who responded to a questionnaire relating to the history of their fertility. Those who provided information on the outcome of their first pregnancy and the year in which it happened were used in the analysis. (See box for details on the data used.)

For our sample, Table 2 gives the proportions (broken down by teenage pregnancy experience) of those who invested in post-compulsory education, the highest qualification they obtained, their labour force status, their total of months spent in the labour force, their average wage by age 33 and, for mothers, the average number of their children. The sample size is smaller because of missing information on

We divided the women in our sample into four categories: never been pregnant, mothers/still pregnant in 1991, miscarried and aborted. The year in which the outcome took place was misreported in 82 cases and unreported in another 20, leaving us with a sample of 5,697 women: of these 1,070 had never been pregnant, 3,895 were pregnant for the first time when answering the questionnaire or had given birth at the end of their first pregnancy, 445 had miscarried and 287 aborted (see Table 1).

Unlike most such studies, we assessed the age at which the pregnancy started by using the date at

the end of the first pregnancy (regardless of its outcome), combined with information on whether the delivery was late or premature.

Aged 33, nearly 20% of our sample had never been pregnant. The outcome of their first pregnancy was affected by the age at which it took place. More than 33% of those under the age of 16 terminated their pregnancy by abortion. This proportion fell to 12% for those aged 16 to 18 and to less than 4% for adult women.

We split our sample into women who gave birth before their 18th birthday, women who conceived before 18 but did not give birth, and all other women.

Some, who miscarried or aborted their first pregnancy, got pregnant again before their 18th birthday. For this group, we determined the time and outcome of their second pregnancy. This left us with 404 who gave birth as teenagers, another 99 who conceived but did not give birth and 5,194 who did not report being pregnant as a teenager. The rate of under-18 pregnancy in this sample reaches 71 per 1000, slightly higher than comparable estimates for the UK population.

**Table 1** First pregnancy outcomes

|                | Never pregnant | Currently pregnant | Birth       | Miscarriage | Abortion   | Total       |
|----------------|----------------|--------------------|-------------|-------------|------------|-------------|
| Pregnant by 16 | –              | –                  | 58          | 4           | 35         | 97          |
| Pregnant by 18 | –              | –                  | 333         | 25          | 48         | 406         |
| Other          | 1070           | 60                 | 3444        | 416         | 204        | 5194        |
| <b>Total</b>   | <b>1070</b>    | <b>60</b>          | <b>3835</b> | <b>445</b>  | <b>287</b> | <b>5697</b> |

**Childbearing has a clear negative effect on schooling investment**

**Table 2** Outcome by age 33 by teen fertility group

|                                      | Birth before 18           | Conception, no birth      | No conception before 18    |
|--------------------------------------|---------------------------|---------------------------|----------------------------|
| Attending post-compulsory education  | 0.094<br>[328]            | 0.322<br>[87]             | 0.446<br>[4528]            |
| No qualification by age 33           | 0.149                     | 0.051                     | 0.045                      |
| Other and CSE                        | 0.236                     | 0.119                     | 0.125                      |
| O level and low vocational           | 0.308                     | 0.373                     | 0.254                      |
| A-level and medium vocational        | 0.231                     | 0.220                     | 0.279                      |
| Degree and high vocational           | 0.077                     | 0.237                     | 0.297                      |
| Months in labour force               | 55.10<br>(51.05)<br>[328] | 104.45<br>(59.60)<br>[87] | 109.8<br>(58.15)<br>[4528] |
| Working                              | 0.625<br>[328]            | 0.713<br>[87]             | 0.700<br>[4528]            |
| Pay per hour                         | 3.933<br>(1.595)<br>[168] | 5.047<br>(2.729)<br>[50]  | 5.718<br>(2.977)<br>[2493] |
| Number of children if greater than 1 | 2.699<br>(1.174)<br>[328] | 2.227<br>(0.837)<br>[66]  | 2.052<br>(0.828)<br>[3299] |

**Note:** Mean (Standard deviation) [Number of observations]

educational achievement and misreporting of labour force status in 1991.

Childbearing has a clear negative effect on schooling investment. Only 10% of teenage mothers attended post-compulsory education, compared with 45% for other teenagers. This educational choice made at age 16 had a permanent impact on the educational attainment of teenage mothers. By the age of 33, they were three times as likely as those not pregnant in their teens to have no qualification. At the other end of the distribution, fewer than 8% of teenage mothers had a degree or high vocational qualification, compared with nearly 30% for other women. Women without a teenage motherhood or pregnancy had almost twice as much work experience by the age of 33 and were 8 percentage points more likely to be in the labour force. These combined effects produce a pay differential of 45% between the two groups of women.

Teenagers who became pregnant but did not give birth have characteristics common to both groups of women. By choice or by chance, they did not give birth and, therefore, faced similar conditions to women who did not give birth as teenagers. Nevertheless, they tended to be less qualified and were 13 percentage points less likely to have attended post-compulsory education than teenagers who did not get pregnant. Despite similar lengths of experience in the labour market, by age 33 they earned on average 13% less. These facts support the view that some of the negative effects associated with teenage motherhood are in fact due to the original characteristics of teenage mothers.

We looked at two measures of education: attendance in post-compulsory schooling and highest qualification obtained at the age of 33. For those interested in the detail of our model and the economic techniques used, they are set out in detail in our CEP Discussion Paper "The Long-Run Market Consequences of Teenage Motherhood in Britain".

As with other studies, we included the following in our factors likely to influence the decision to invest in post-compulsory education: (1) family characteristics, such as parental education, family structure, number of siblings, parental ethnicity (approximated by country of birth), social class of the father, mother's interest in child's schooling and financial situation at age 16; (2) the child's academic characteristics (test score in English and maths at age 7 and use of public libraries at age 10); and (3) social characteristics, approximated by the type of school attended and the socio-economic background of the area (measured as the proportion of children with fathers in non-manual occupations in the school attended). The sample dropped to 4,233 women because we left out those who reported themselves as suffering from a long-term illness (48 observations) and those that did not participate in the third wave of the study at age 16 (1,416).

Table 3 summarises the results. Unsurprisingly, parental education, maternal attention, having foreign-born parents

**Table 3** Post-compulsory education (marginal effects)

|                                        | Probit            | IV                |
|----------------------------------------|-------------------|-------------------|
| Teen mother                            | -0.238<br>(0.036) | -0.231<br>(0.389) |
| Father Education                       | 0.021<br>(0.006)  | 0.021<br>(0.006)  |
| Mother Education                       | 0.054<br>(0.008)  | 0.053<br>(0.008)  |
| Both parents @16                       | 0.074<br>(0.029)  | 0.077<br>(0.030)  |
| Nbr. of sibling @16                    | -0.032<br>(0.006) | -0.033<br>(0.008) |
| Mother foreign born                    | 0.133<br>(0.052)  | 0.132<br>(0.053)  |
| Father foreign born                    | 0.182<br>(0.053)  | 0.181<br>(0.053)  |
| Use of library @10                     | 0.087<br>(0.023)  | 0.087<br>(0.023)  |
| Mother interest @7                     | 0.089<br>(0.020)  | 0.088<br>(0.022)  |
| Math test @7                           | 0.040<br>(0.011)  | 0.040<br>(0.011)  |
| English test @7                        | 0.086<br>(0.013)  | 0.086<br>(0.014)  |
| Comprehensive                          | 0.096<br>(0.024)  | 0.097<br>(0.024)  |
| Grammar                                | 0.222<br>(0.037)  | 0.223<br>(0.037)  |
| Other LEA supported                    | 0.073<br>(0.078)  | 0.069<br>(0.076)  |
| Private                                | 0.237<br>(0.058)  | 0.238<br>(0.058)  |
| Father SOC professional & manager      | 0.266<br>(0.054)  | 0.260<br>(0.059)  |
| Father SOC 3 non manual                | 0.176<br>(0.058)  | 0.169<br>(0.061)  |
| Father SOC 3 manual                    | 0.128<br>(0.052)  | 0.121<br>(0.054)  |
| Father SOC 4 n m                       | 0.112<br>(0.091)  | 0.101<br>(0.090)  |
| Father SOC 4 manual                    | 0.058<br>(0.057)  | 0.052<br>(0.062)  |
| Financial trouble @16                  | -0.039<br>(0.037) | -0.042<br>(0.042) |
| Peers: quintile 1                      | -0.147<br>(0.047) | -0.147<br>(0.048) |
| Peers: quintile 2                      | -0.103<br>(0.048) | -0.104<br>(0.049) |
| Peers: quintile 3                      | -0.096<br>(0.048) | -0.096<br>(0.048) |
| Peers: quintile 4                      | -0.016<br>(0.055) | -0.017<br>(0.055) |
| Observations                           | 3757              | 3757              |
| R <sup>2</sup> / pseudo R <sup>2</sup> | 0.2288            | 0.2216            |
| Instrument                             |                   | Menarche          |
| Smith-Blundell Chi <sup>2</sup>        |                   | Pr=.493           |

**Note:** Also includes dummies for the observations missing on the following variables: parental education and location of birth, number of siblings, use of library, ability test missing, type of school, social class of fathers and social class of peers' fathers. Standard error corrected for heterogeneity.

and a better social class were associated with more schooling, whereas broken family and a large number of siblings reduce it. Surprisingly, financial hardship at age 16 did not seem to affect educational choice.

Personal characteristics of the child also had the expected effect: better test scores and the use of public libraries improved the likelihood of post-compulsory schooling. Peer effects appear to be important in determining post-compulsory schooling decisions: the social environment, as measured by the social class of the fathers of the child's schoolmates, had a significant effect. Being in a school where fewer than 20% of fathers were in a non-manual occupation reduced the probability of post-compulsory education by 15%, compared with a school where more than 80% of fathers were in a non-manual occupation. Teenagers who were not in a secondary modern school were more likely to have attended post-compulsory education. This effect was strongest for grammar and privately funded schools. A teenage mother was 24% less likely to have invested in post-compulsory education, compared with other teenagers. Accounting for factors that may influence both the schooling and motherhood decisions, the negative effect of teenage motherhood is reduced to 12% to 17%.

Having children, by increasing the importance and value of domestic work, had an obvious negative impact on the length of time spent in the labour force. However, the effect of teenage motherhood on experience seems ambiguous. Women who do not bear a child as teenagers are mostly only deferring their motherhood. Thus, over a whole lifetime, teenage motherhood could be neutral to work experience. However, as wages increase throughout the life cycle, earnings forgone at a later point in life are likely to be larger than earnings forgone during adolescence. Hence, adult mothers are less likely to drop out of the labour force than teenage mothers. So we would expect teenage motherhood

to have a permanent negative effect on work experience.

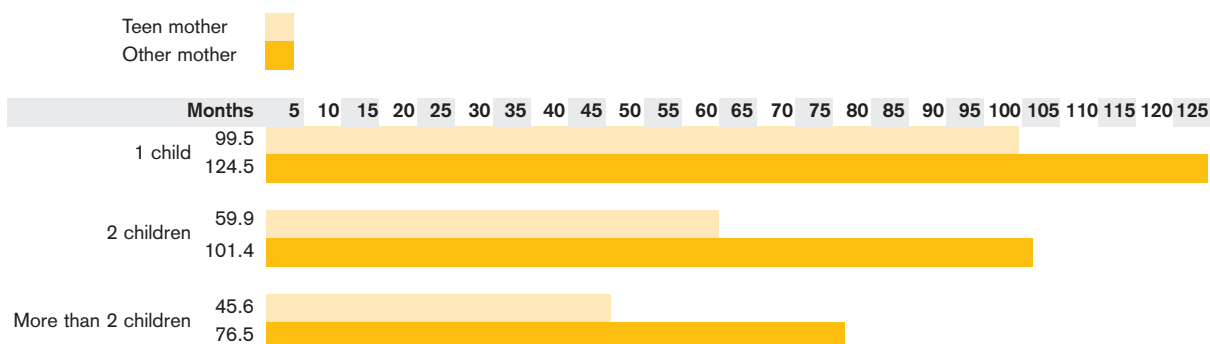
Our sample here was restricted to mothers only (2,514 observations). Labour market experience is measured as the total number of months worked since age 16, with part-time work given a weight of 0.5. Figure 1 gives, for different numbers of children, the mean labour market experience for teenage mothers and for other mothers in the sample. At each family size, teenage mothers have significantly less work experience than other mothers.

Teenage motherhood seems to have a permanent effect on labour market experience, resulting on average in two and a half years less employment experience.

Again, it must be observed that the linkage between the decision to have a child as a teenager and lower labour market participation may not be causal. If there is some common link not identified in the data, then the effect of teenage motherhood on labour force experience would be biased upwards. In the model, teenage motherhood is estimated using as identifying variables the age of first menstruation, the woman's financial situation at age 16 and whether she had older siblings (who might play a role model). The calculations based on this data suggest that teenage mothers have unobserved characteristics that make them less attached to the labour market. However, accounting for this does not remove the previously measured negative effect of teenage motherhood on employment: teenage motherhood is associated with a reduction in labour market experience by age 33 ranging from 30 to 40 months compared with other mothers.

In analysing women's wages at age 33, the sample size dropped to 1,918 mothers, who gave complete information on earnings and working status. Of these, 1,196 were working. In this reduced sample, only 134 women had been teenager mothers, of whom 99 (74%) were working. This

**Figure 1** Months of participation in the labour market by age 33



**Table 4** Log hourly pay at age 33

|                          | OLS               | Heckman           | Double<br>selection | Heckman           | Double<br>selection |
|--------------------------|-------------------|-------------------|---------------------|-------------------|---------------------|
|                          | Selection (1)     |                   | Selection (2)       |                   |                     |
| Teen mother              | -0.118<br>(0.037) | -0.053<br>(0.042) | -0.102<br>(0.040)   | -0.045<br>(0.041) | -0.084<br>(0.040)   |
| Other qual.              | 0.122<br>(0.148)  | 0.129<br>(0.161)  | 0.117<br>(0.155)    | 0.132<br>(0.164)  | 0.121<br>(0.155)    |
| CSE                      | 0.025<br>(0.048)  | 0.038<br>(0.052)  | 0.027<br>(0.055)    | 0.041<br>(0.053)  | 0.040<br>(0.055)    |
| Vocational               | 0.086<br>(0.048)  | 0.112<br>(0.052)  | 0.090<br>(0.054)    | 0.116<br>(0.053)  | 0.117<br>(0.055)    |
| O-levels                 | 0.164<br>(0.076)  | 0.173<br>(0.082)  | 0.159<br>(0.079)    | 0.179<br>(0.083)  | 0.169<br>(0.079)    |
| Vocational medium        | 0.094<br>(0.048)  | 0.111<br>(0.052)  | 0.093<br>(0.055)    | 0.112<br>(0.053)  | 0.105<br>(0.055)    |
| A-levels                 | 0.096<br>(0.066)  | 0.100<br>(0.072)  | 0.090<br>(0.075)    | 0.104<br>(0.073)  | 0.096<br>(0.075)    |
| Vocational high          | 0.427<br>(0.056)  | 0.484<br>(0.062)  | 0.441<br>(0.060)    | 0.492<br>(0.062)  | 0.495<br>(0.063)    |
| Degree                   | 0.590<br>(0.073)  | 0.621<br>(0.079)  | 0.588<br>(0.072)    | 0.625<br>(0.080)  | 0.614<br>(0.072)    |
| Experience 16-20         | -0.095<br>(0.039) | -0.088<br>(0.039) | -0.091<br>(0.035)   | -0.084<br>(0.039) | -0.090<br>(0.034)   |
| (Exp 16-20) <sup>2</sup> | 0.015<br>(0.008)  | 0.016<br>(0.008)  | 0.015<br>(0.008)    | 0.015<br>(0.008)  | 0.016<br>(0.008)    |
| Experience 20-33         | -0.002<br>(0.007) | -0.004<br>(0.007) | -0.003<br>(0.008)   | -0.005<br>(0.007) | -0.004<br>(0.008)   |
| (Exp 20-33) <sup>2</sup> | 0.002<br>(0.001)  | 0.002<br>(0.001)  | 0.002<br>(0.001)    | 0.002<br>(0.001)  | 0.001<br>(0.001)    |
| Math test                | 0.010<br>(0.011)  | 0.020<br>(0.012)  | 0.010<br>(0.012)    | 0.021<br>(0.012)  | 0.019<br>(0.012)    |
| English test             | 0.036<br>(0.011)  | 0.030<br>(0.012)  | 0.028<br>(0.013)    | 0.030<br>(0.013)  | 0.023<br>(0.013)    |
| Private/public           | -0.108<br>(0.021) | -0.108<br>(0.021) | -0.108<br>(0.021)   | -0.112<br>(0.021) | -0.110<br>(0.021)   |
| Size <25                 | -0.206<br>(0.030) | -0.206<br>(0.029) | -0.203<br>(0.030)   | -0.210<br>(0.029) | -0.200<br>(0.030)   |
| Size 25-99               | -0.122<br>(0.030) | -0.118<br>(0.029) | -0.119<br>(0.033)   | -0.121<br>(0.029) | -0.118<br>(0.033)   |
| Size 100-499             | -0.061<br>(0.033) | -0.057<br>(0.032) | -0.057<br>(0.034)   | -0.060<br>(0.031) | -0.054<br>(0.034)   |
| Part time                | -0.125<br>(0.022) | -0.134<br>(0.022) | -0.131<br>(0.022)   | -0.131<br>(0.022) | -0.133<br>(0.022)   |
| IMR: Participation       |                   | 0.260<br>(0.045)  | 0.139<br>(0.093)    | 0.296<br>(0.034)  | 0.411<br>(0.131)    |
| IMR: Teen mother         |                   |                   | 0.067<br>(0.035)    |                   | 0.074<br>(0.034)    |
| Constant                 | 1.642<br>(0.072)  | 1.454<br>(0.084)  | 1.445<br>(0.116)    | 1.432<br>(0.079)  | 1.278<br>(0.129)    |
| R-squared/log like       | 0.49              | -1576.7           | 0.49                | -1587.7           | 0.49                |

**Note:** Standard error for Kernel-based estimates are obtained by bootstrap (500 replications).

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at age 16 did not  
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is a significantly larger proportion than for non-teenage mothers (61%).

As a benchmark, least squares regression estimates are shown in the first column of Table 4. The model includes the highest qualifications obtained by age 33, years of labour force participation (split before and after age 20) and measures of ability at age 7. Some characteristics of the job are also included. As expected, more educated mothers with greater ability, especially in English, earned more than the others. Teenage participation in the labour force has a negative effect, as it typically captures the effect of leaving school early. The effect of adult work experience was less clear. This is typical of cohort data, where variation in experience is mostly captured by length of education and, for women, the number of their children. Teenage motherhood had an effect on adult wages over and above the education and labour force experience. Accounting for differences in educational attainment and early labour force participation, women who experienced early motherhood were paid 12% less than other women.

Again this will be an overestimate if teenage mothers have characteristics that make them less likely to participate and less productive. First, we estimate the decision to participate. Women whose mothers were working when they were seven were more likely themselves to be working at age 33, which could reflect a role model played by the mother. Previous participation had a mixed effect on current labour market attachment. Mothers who were working at the age of 16 were 8% more likely to be working at 33, but those not working at age 23 were 13% less likely to be

**Table 6** Double selection: teenage mother (marginal effects)

|                             | Teen motherhood   |
|-----------------------------|-------------------|
| Math test                   | -0.009<br>(0.006) |
| English test                | -0.009<br>(0.006) |
| Parents                     | -0.026<br>(0.017) |
| Father SOC prof and manager | -0.057<br>(0.012) |
| Father SOC 3 non manual     | -0.034<br>(0.015) |
| Father SOC 3 manual         | -0.012<br>(0.018) |
| Father SOC 4 non manual     | 0.007<br>(0.038)  |
| Father SOC 4 manual         | -0.040<br>(0.013) |
| Menarche                    | -0.009<br>(0.004) |
| Financial trouble @16       | 0.080<br>(0.026)  |
| Birth order                 | 0.008<br>(0.003)  |
| Constant                    | -0.299<br>(0.478) |
| Observations                | 1918              |
| Pseudo R <sup>2</sup>       | 0.092             |

**Note:** Also includes dummies for the observations missing on father's social class. Standard errors are corrected for heterogeneity.

**Table 5** Matched estimates of differences in log hourly pay: include control for children

|                    | One to One     |                 | Kernel         |                 |
|--------------------|----------------|-----------------|----------------|-----------------|
|                    | Bandwidth=0.01 | Bandwidth=0.001 | Bandwidth=0.01 | Bandwidth=0.001 |
| Teen mother (T=1)  | 1.294          | .293            | .284           | .294            |
| Other mother (T=0) | 1.515          | .528            | .456           | .437            |
| P(T=1)-P(T=0)      | -0.220 (0.057) | -0.234 (0.060)  | -0.172 (0.044) | -0.143 (0.054)  |

**Note:** Standard error for Kernel-based estimates are obtained by bootstrap (500 replications)

**Those who were working at 23 may have postponed childbearing longer**



working. This could reflect differences in the timing of having children and their age. Those who were working at the age of 23 may have postponed childbearing longer and have younger children at age 33 than other mothers. Variables capturing the opportunity cost of labour market participation, number of children and marital status were also included. These variables are often assumed to be related to the decision to participate in the labour market and may also be correlated with teenage motherhood. Compared with having only one child, having two reduced the probability of labour force participation by 6% (and having more than two by 19%). By age 33 those who had been teenage mothers were more likely than other mothers to be working full-time (49% as against 35%). Thus the pay differential between women who experienced teenage motherhood and other mothers cannot be explained by the so-called "part-time wage gap". Accounting for selection in teenage motherhood and labour market participation, the effect of teenage motherhood on earnings at age 33 is a penalty reaching 5% to 10% compared with other mothers.

Teenage motherhood, labour force participation and wage levels are all interacted elements that should be estimated simultaneously in order to arrive at entirely satisfactory conclusions. The difficulty of such an approach is in finding enough valid exclusion variables. Instead, in Table 5, we present results obtained with matching estimates. The matching is based on the estimated probabilities of teenage motherhood, shown in Table 6. As these estimates do not allow for selection in the labour market, they are probably biased upwards. They show that teenage mothers suffer a pay penalty against other women ranging from 14% to 22%,

a significantly higher figure than in previous estimates.

To summarise, our evidence indicates that having a child as a teenager has dire consequences in terms of post-compulsory schooling, long-term labour market outcomes and pay differentials. Hence teenage motherhood is likely to lead to the transmission of poverty from one generation to the next.

It would thus appear that policies preventing the long-term consequences of teenage motherhood should focus first on helping teenage mothers to achieve their school potential. The fact that teenage motherhood appears to have a substantial negative effect, even after allowing for educational differences, suggests that teenage mothers have difficulties combining labour market participation and child rearing. A second focus, therefore, should be on easing their integration into the labour market. Easy access to child care and the Working Families Tax Credit are the kind of promising strategies against the permanent negative effects of early childbearing that need to be tested for their cost effectiveness.

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## Teenage mothers suffer a pay penalty ranging from 14 to 22%

