Women's economic opportunities and the intra-household production of child human capital

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1. Introduction

The economic opportunities of married women have improved substantially over the past half century. Divorce law reform, the development of the contraceptive pill, improvements in home production technology and the increasingly widespread adoption of anti-discrimination legislation have all permitted women to participate in society on a more equal economic footing (Greenwood et al., 2005; Chiappori and Oreffice, 2008; Bailey et al., 2012). This is evidenced by the substantial improvements in married women's education levels (see Table 1), and in their wages relative to those of their husbands (see Fig. 1). At the same time, the past 50 years have seen increases in the total time parents spend with children (see Fig. 1), as well as the amount spent on children's clothing and education (see Table 1).

Fig. 1 depicts the increases in parents' time with children and the female-to-male wage ratio from 1975 to 2005. A number of papers have analysed these trends in parents' time-use. Ramey and Ramey (2010a) argue that the increase is the result of a more competitive university admissions process focused on extra-curricular activities. Alternative explanations, including changes in the returns to investment in children and in preferences for "child consumption", are proposed in Sacks and Stevenson (2007). In this paper we explore a different hypothesis: namely that there is a causal relationship between women's economic opportunities, as measured by the female-to-male wage ratio, and the time that parents spend with children.

The American Time Use Survey (ATUS), which commenced in 2003, is the first regular (annual) survey of time use in the United States. Using data over the period 2003–2012, this large dataset provides us with considerable power with which to estimate the effect of mothers' wages on the time they spend with their children. While this dataset shows no positive time-series relationship between the female-to-male wage ratio and parents' time with children, there is a strong positive correlation between these elements in the cross-section. By exploiting a cross-sectional relationship, rather than trending variables, estimates are thus unlikely to be contaminated by other trending variables, such as technological changes or increases in educational levels. (Note, for instance, the large increase in the proportion of mothers with a college degree over 2003–2012, from 33 per cent to 43 per cent; see Table 1.) Taking this approach, our estimates suggest that an increase in the female-to-male wage ratio leads to a large and statistically significant increase in mothers' time with children. This is surprising because if we hold constant the dollar amount spent on resources for the child (including time-use), cost minimisation would suggest that an increase in the price of any productive input should reduce the demand for it.

We theoretically and empirically explore why we might observe such a relationship, using the collective model and estimates of the response in parents' time-use to changes in their wages from Bruins (2014). Our conclusion is that our results can only be rationalised by the explanation that an increase in the female-to-male wage ratio also
improves female bargaining power. Interestingly, these predictions do suggest that both mothers’ and fathers’ time with children should increase along with the female-to-male wage ratio, while our estimates suggest that only mothers’ time responds.

Identifying the relationship between the female-to-male wage ratio and the time parents spend with children is potentially problematic, as households in which the mother earns a higher wage (relative to her husband) may have different preferences for investing in children, or may differ on unobservables, compared with those households in which the mother earns a lower wage. To address such problems as unobserved heterogeneity and omitted variable bias, we instrument for relative wages using a measure which reflects exogenous variation in relative labour demand, following a procedure developed by Bartik (1991), which has been used for this purpose in several other studies (see e.g., Blanchard et al., 1992; Autor and Duggan, 2003; Aizer, 2010). It should also be noted that, due to the onset of the Great Recession, which disproportionately affected industries with predominantly male labour forces, our sample period (2003–12) exhibits considerable variation in the relative demand for male and female labour.

Taking all this into account we estimate that a 5 percentage point increase in the female-to-male wage ratio leads to an increase in parental time spent with children of more than one hour per week (h/ wk), with even larger responses in relation to time parents spent educating their children. We further combine our results with those of Fiorini and Keane (2014) to show that a 5 percentage point increase in the female-to-male wage ratio would have raised a five-year-old child’s scores on both the Peabody Picture Vocabulary Test and Matrix Reasoning Test by 8 per cent of a standard deviation.

This paper is organised as follows. Section 2 discusses the related literature, and Section 3 the data sources. Section 4 discusses the theoretical framework for our analysis. Section 5 discusses the econometric approach used to analyse more recent, pooled cross-sectional data on time use and expenditure on children’s clothing (2003–12), the results of which are presented in Section 6. A further analysis and conclusion is given in Section 7.

2. Background

2.1. Trends

The analysis undertaken in this paper is motivated by the concurrent wage ratio and time-use increases depicted in Fig. 1. Over this period we also see a large increase in expenditure on goods for children’s consumption, i.e. clothes and education (see Table 1) - both in absolute terms, and as a proportion of total expenditure (Kornrich and Furstenberg, 2013).

What is less clear is whether parents’ time with children has continued to increase over the past decade; close inspection of the ATUS data suggests that short-term fluctuations are too large to distinguish a clear continuation of the trend increase in parents’ time with children observed over 1975–2005. However, this is not critical, as we are interested in using the ATUS to establishing a causal relationship between the female-to-male wage ratio and parents’ time with children, exploiting cross-sectional variation. Fig. 2 contains local polynomial regressions of the log female-to-male wage ratio regressed on parents’ time with children. These graphs demonstrate a strong positive correlation in the cross-section.

2.2. Related literature

Research demonstrates that the economic opportunities, or economic resources, of women are important determinants of the health and educational outcomes of children, particularly girls, in developing countries (see e.g. Thomas et al., 1991; Thomas, 1994; Dufo, 2000). The literature examining this relationship in developed countries is sparse, however there is some evidence to suggest this is the case in those areas as well; for instance Lundberg et al. (1997) found that switching child support benefits from father to mother in the 1970s increased household expenditure on children’s clothing in the UK.

It is difficult to rationalise the unitary model of household behavior (which treats the household as a single individual) with the empirical findings of Lundberg et al. (1997), because this model provides no explicit mechanism through which variations in the ownership of household resources can influence outcomes. An alternative perspective on household decision-making is provided by the collective...
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