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# ABSTRACT

# The Stress Cost of Children*

We use longitudinal data describing couples in Australia from 2001-12 and Germany from 2002-12 to examine how demographic events affect perceived time and financial stress. Consistent with the view of measures of stress as proxies for the Lagrangean multipliers in models of household production, we show that births increase time stress, especially among mothers, and that the effects last at least several years. Births generally also raise financial stress slightly. The monetary equivalent of the costs of the extra time stress is very large. While the departure of a child from the home reduces parents' time stress, its negative impacts on the tightness of the time constraints are much smaller than the positive impacts of a birth.

JEL Classification: J13, J20

Keywords: time use, children, demographic economics

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This study uses unit record data from the Household, Income and Labour Dynamics in Australia (HILDA) Survey and German Socio-Economic Panel (SOEP). The HILDA Survey project was initiated and is funded by the Australian Government Department of Social Services and is managed by the Melbourne Institute of Applied Economic and Social Research (at the University of Melbourne). The German data used in this publication were made available to us by the German Socio-Economic Panel Study (SOEP) at the German Institute for Economic Research (DIW), Berlin.

*Insanity is inherited—we get it from our children.* [Mark Twain]

## I. Background

We address the question of whether the addition of a child to a family imposes costs that are not accounted for in the immense literatures on the cost of children and on equivalence scales, and thus whether there are hitherto unaccounted factors that affect the decision to have a child or that increase the perceived costs of rearing a child. The literature on equivalence scales focuses solely on the monetary costs of children (e.g., Muellbauer, 1977; Pollak and Wales, 1979; Bourguignon, 1999). The sparser literature on the time costs of children (e.g., Gustafsson and Kjulin, 1994; Bradbury, 2008) engages in accounting exercises, totalling up the amounts of time that each parent devotes to child care, and perhaps valuing them, and examining gender differences and secular changes in time allocated to child care.

Hamermesh and Lee (2007) constructed and estimated a model describing cross-section differences in the extent of expressed time stress. The theoretical basis was Becker's (1965) model of the use of time and goods to produce commodities that contribute to a household's utility. The theoretical part of the study identified time stress as the Lagrangean multiplier on a household's time constraint and linked financial worries to the Lagrangean multiplier on its goods constraint. Using cross-section data from Australia, Germany, Korea and the U.S., they found that individuals with higher Beckerian full incomes expressed greater feelings of time stress, consistent with a more tightly binding time constraint, and that they were less likely to express concerns about money (consistent with a looser goods constraint).[1]

Our approach here combines these two strands of the literature: We examine the extent to which people find that the time and goods constraints in their utility maximization bind more tightly when a child is added to the household. We are not examining generalized responses to a birth, such as happiness or life satisfaction (see, e.g., Baetschmann *et al*, 2012, Pedersen and Schmidt, 2014), nor are we examining emotional responses to particular aspects of child-rearing (e.g., Connelly and Kimmel, 2013). Instead, we study how a specific life event—the birth of a child—affects empirical

[1]DeVoe and Pfeffer (2011) use several waves of the Australian data set to demonstrate the relationship between income and time stress.

analogs of parameters that arise within a family's welfare maximization. We thus develop a new dimension on the cost of children; and, because additional time loosens the time constraint while additional income loosens the goods constraint, our approach allows us to extend the measurement of the monetary and time costs of children. We complement the examination of the impact of births on the household's utility maximization by studying what might be viewed as the obverse of a birth—the departure of a child from the household.

To obtain these estimates we need data sets that contain respondents' views of the time and monetary stress that they perceive, our analogs to the Lagrangean multipliers in their utility maximization. Longitudinal data are also required, since in order to identify the effect of an addition to the household we need a household-specific baseline against which to compare the empirical counterparts to the multipliers. Fortunately, since 2001 the Household, Income and Labour Dynamics in Australia (HILDA) Survey has collected annual information from a panel of respondents on their perceptions of time and financial stress. Also, since 2002 the German Socio-Economic Panel (SOEP) has collected similar information biennially. We use both data sets in the empirical work here, thus providing a check on the specific cognitive implications of the questions and on culture-specific differences in couples' responses to the birth of a child.

## II. Theoretical Motivation and Considerations

Consider a household that combines goods (a vector $x_j$) and the time of each spouse (vectors $T^M_j$ and $T^F_j$) to produce a vector of commodities $Z_j$ (j=1,…, N) that determines its utility:

(1) $U = U(Z_1(x_1, T^M_1, T^F_1), \ldots, Z_N(x_N, T^M_N, T^F_N))$.

The maximization of this utility function, given the technologies of household production and the household's wage rates, $W^M$ and $W^F$, unearned income I, and the vector of goods prices that it faces, $P_j$, yields a utility-maximizing vector of demands for both time and goods inputs into the production of each commodity.

The demands for time and goods inputs are functions of these prices. Similarly, the household's Lagrangean multipliers on the spouses' time, $\lambda^M$ and $\lambda^F$, and on goods, $\mu$, are functions of the parameters facing the household — the wage rates, unearned income and goods prices. We can thus write each as:

(2a) $\lambda^M_t = \lambda^M(W^M_t, W^F_t, I_t, P_{jt})$;

(2b) $\lambda^F_t = \lambda^F(W^M_t, W^F_t, I_t, P_{jt})$;

(2c) $\mu_t = \mu(W^M_t, W^F_t, I_t, P_{jt})$,

where t is some time period. Comparing across households, we make the standard assumption that all households face the same goods prices, so that these can be ignored here and in the empirical work. The usefulness of the model comes from its prediction that higher W and I raise $\lambda^M$ and $\lambda^F$ and lower $\mu$.

We could estimate equations (2) directly from survey respondents' answers on their perceived time and financial pressures. Some individuals may, however, always feel pressured, and others may feel less pressured, even in the face of the same objective circumstances. Also, the amount of pressure generated by the birth may depend on its interaction with the family's existing demographic structure. Taking these considerations together, recognizing that all the information affecting maximization in the previous period will be subsumed by the outcomes in that period, and linearizing (2), we can rewrite the model as:

(3a) $\lambda^M_t = a_1\lambda^M_{t-1} + a_2\lambda^F_{t-1} + a_3\mu_{t-1} + \alpha_1 W^M_t + \alpha_2 W^F_t + \alpha_3 I_t + \alpha_4 \Delta K_t + \nu^M_t$,

(3b) $\lambda^F_t = b_1\lambda^M_{t-1} + b_2\lambda^F_{t-1} + b_3\mu_{t-1} + \beta_1 W^M_t + \beta_2 W^F_t + \beta_3 I_t + \beta_4 \Delta K_t + \nu^F_t$,

(3c) $\mu_t = c_1\lambda^M_{t-1} + c_2\lambda^F_{t-1} + c_3\mu_{t-1} + \gamma_1 W^M_t + \gamma_2 W^F_t + \gamma_{3t} I_t + \gamma_4 \Delta K_t + \eta_t$,

where the a, b and c are parameters describing the autoregressions, $\eta$ and the $\nu$ are normally distributed error terms, and $\Delta K$, the focus of most of this study, denotes the change in the family's demographic structure, including crucially the addition of a child.

A potentially important issue here is the problem of the endogeneity of births in a year in response to stress (both time and financial) in that same year. To model this potential endogeneity in this context, let us assume that, along with many other things described by the vector of variables X, both expected time stress and expected financial stress affect the probability of having a child. Let S* be the upper limit to perceived time stress beyond which people will decide not to have a child, and let F* be the analogous upper limit to financial stress. Then assuming that the couple has complete control over its fertility, the probability that a child is born is the joint probability:

(4) $\Pr\{\Delta K_{i,t+1}=1\} = \Pr\{[\ \alpha E(\Delta X_{i,t+1}) + \beta S_{it} + \varepsilon_{it} < S^*],[\ \gamma E(\Delta X'_{i,t+1}) + \delta F_{it} + \theta_{it} < F^*]\}$,

where ε and θ are normally distributed and presumably are not independent, and α, β, γ and δ are parameters describing this probability. Equation (4) can be rewritten as the bivariate probit:

(5) $\Pr\{\Delta K_{i,t+1}=1\} = \Pr\{[\varepsilon_{it} < S^* - \alpha E(\Delta X_{i,t+1}) - \beta S_{it}\ ],[\theta_{it} < F^* - \gamma E(\Delta X'_{i,t+1}) - \delta F_{it}]\}$.[2]

There are several ways of dealing with this potential endogeneity. We could expand beyond estimating (3a) - (3c) jointly to estimating them jointly with the selection equation (5). The difficulty with this approach lies in finding exclusion restrictions appropriate for the four equations (the couple's financial stress, the time stress of each spouse, and fertility). An alternative approach would argue that any biases to the estimates of the impact of a birth on time and financial stress that are caused by the potential endogeneity of births will be negative. Those parents who expect smaller increases in stress are those who are more likely to have a child. Thus we would expect that any estimated positive impacts of a birth on stress that we find will understate the "treatment effect" that would be observed if births were distributed randomly across the population of couples arrayed by the impact of births and changing stress.

## III. Data and Descriptive Statistics

Both surveys that we use provide nationally representative longitudinal sets of data describing the populations of the countries studied. The HILDA Survey asks the following question of survey participants: "How often do you feel rushed or pressed for time?" with possible answers "almost always," "often," "sometimes," "rarely" and "never". Thus we currently can index t = 2001, 2002, …, 2012, which, allowing for lagged values, enables us to estimate autoregressions based explicitly on (3a) and (3b) for eleven years of births. Participants are also asked to rate their satisfaction with their financial situation on an eleven-point (0 to 10) scale ranging from "totally dissatisfied" to "totally satisfied", allowing us to estimate autoregressions based explicitly on (3b). To provide comparability with the scale on time stress, we collapse the responses to this latter question into five

[2]Since having children is hardly an uncommon event, one might wonder why couples do not forecast its impact on their time and financial stress—essentially, why they might lack rational expectations about the effects of a birth on stress. Odermatt and Stutzer (2014) provide some evidence and arguments for why people do not forecast the impact of life events on a loosely related concept, their happiness, very well.

categories.[3] Thus the autoregressions that we estimate track the Lagrangean multipliers λ and μ. Since both spouses express satisfaction with their financial situation, we estimate separate equations for each and test for the equality of their responses to a birth.

We currently have six waves of data from the SOEP with the necessary information, t = 2002, 2004, …, 2012, allowing, with the required lag, for five biennia of births. Biennially the SOEP has included the question: "Think about the last four weeks. How often during this period did it happen that you felt rushed or under time pressure?" with possible responses "always" "often,", "sometimes", "almost never" and "never." [4] Perhaps because of the differences in phrasing in the SOEP or in how the answers are elicited, the distribution of responses to this question is tilted more heavily toward being less rushed for time than in the HILDA Survey.[5] The SOEP asks all respondents the same question about financial stress as the HILDA Survey, and we treat responses exactly the same.[6] Thus, except for relying on biennial observations, the estimates of the determinants of the analogs of λ and μ are based on similar questions in the two data sets. Replacing the one-year by a two-year lag in (3a) – (3c), we can estimate equations for Germany that resemble those for Australia very closely.[7]

Table 1 presents the statistics describing the couples included in the sub-samples from the HILDA Survey and SOEP over which we estimate (3a) - (3c). Here and in all subsequent tables involving the examination of the impacts of births we exclude couples in which the wife is over age 45. In the HILDA Survey sub-sample wives report being significantly more stressed for time than

[3]From the 0 (dissatisfied) to 10 (satisfied) we recode responses 0-2 as 5 (4.9 percent of the sample), 3-4 as 4 (9.3 percent), 5-6 as 3 (28.2 percent), 7-8 as 2 (45.2 percent), and 9-10 as 1 (12.4 percent). Here and throughout this study we weight all sample observations by their sampling weights.

[4]The SOEP uses a four-week reference period and employs a multi-mode approach, with data collected by both interviewer and via self-administration, whereas in the HILDA Survey this question is always administered as part of a separate self-completion questionnaire.

[5]In the SOEP the distribution (never to always) is 5.8 percent, 15.1 percent, 39.2 percent, 33.9 percent, and 6.0 percent. In the HILDA Survey the comparable distribution is 0.8 percent, 10.3 percent, 40.1 percent, 36.0 percent, 12.8 percent.

[6]The percentages of observations in the five recoded categories in the SOEP are 6.2 percent, 13.7 percent, 27.4 percent, 40.8 percent and 11.9 percent, remarkably similar to the distribution of responses to this question in the HILDA Survey.

[7]We use PanelWhiz (Hahn and Haisken-deNew, 2013) to create the sub-samples that underlie all our calculations.

their husbands (paralleling the greater time stress perceived by women generally that was reported in Hamermesh and Lee, 2007), but both spouses feel roughly the same financial stress. Ten percent of the couples produced a child between successive interviews (and thus between responses on time and financial stress); and the majority had other children present too. Half the respondents reported being in excellent or very good health, with a higher fraction of wives reporting this. During the average week the husbands spent 46 hours working (in paid employment) and commuting, while their wives spent nearly 24 hours per week in these market-related activities. Time spent in household production was almost reversed, so that reported (not from time diaries) total market and non-market work time was not quite identical for the spouses (see Burda *et al*, 2013).[8] Average total annual earnings (in 2012 dollars) in the couples were around A$96,000, while average unearned income (in 2012 dollars) among these couples was about A$20,000.[9]

The descriptive statistics from the SOEP show quite similar patterns on time stress. Wives are significantly more stressed for time than their husbands. Husbands, however, express significantly more financial stress than their wives. About one-eighth of the couples experience a birth during a biennium over the time period 2002-12 (implying, consistent with data on vital statistics, a lower annual birth rate than in Australia). In line with popular perception, husbands report more market work time than their wives, and wives report significantly more home production time on weekdays. Average annual earnings of the couples are roughly €53,000 per year in 2012 prices), which is consistent with published data, but average unearned income, at about €7,100 per year, may be low (although these are prime-age intact couples).[10]

[8]The measure of household production constructed from the HILDA Survey data is the amount of time in a typical week spent on household errands, housework, outdoor tasks, caring for children (including the children of other people, if unpaid) and caring for disabled or elderly relatives. In contrast, the SOEP only allowed us to include time spent on a typical weekday. The list of activities, however, was similar, and included running errands, housework, child care, helping other persons in need of care, repairs to the house/car, and garden work. For further details, see the Data Appendix.

[9]In 2007, the mid-point of the sample, the Australian dollar was worth about $US 0.79. We deflated all monetary measures by the Australian CPI.

[10]In 2007 the euro was worth about $1.34. All monetary measures are deflated by the German CPI.

## IV. Preliminary Examination of Patterns of Stress

We will initially estimate equations (3a) - (3c) separately for each spouse including a number of controls. As a first step toward this, and to obtain a picture of how a birth/adoption alters the time and goods constraints, we examine transitions of the empirical counterparts of $\lambda$ and $\mu$. Consider columns (1) and (3) of the top panel of Table 2, which show the fractions of the samples for which time stress increased, remained the same or decreased between annual interviews in the HILDA Survey sub-sample, separately by gender and by the indicator for the addition of a child to the household.[11] Husbands in households adding a child are more likely than other husbands to feel increasingly stressed for time. Comparing the changes in time stress for men in the HILDA Survey yields a test statistic of $\chi^2(2) = 15.99$ ($p < .001$). Wives' time stress is increased even more significantly on average by the birth of a child: The same test for Australian women in this table yields $\chi^2(2) = 24.97$ ($p < .001$).

Columns (2) and (4) in the upper panel of Table 2 show the same changes (over two-year periods) calculated for the couples in the SOEP. For men the results look quite similar, and the trivariate distributions (more, the same, or less time stress) are only barely distinguishable ($\chi^2(2) = 3.96$, $p = .14$). Among wives, however, the patterns differ greatly, with a much greater fraction exhibiting increases in time stress if a birth has occurred in the biennium ($\chi^2(2) = 8.17$, $p = .02$, on the trivariate distributions).

In columns (1) and (3) of the bottom panel of Table 2 we present the analogous patterns of changes in perceived financial stress from the HILDA Survey, again separately for husbands and wives by the indicator for the addition of a child to the household. As with time stress, adding a child increases financial stress for both spouses. Also as with time stress, perceived financial stress increases more among new mothers than new fathers. Comparing households without and with a birth in the HILDA Survey, husbands in the latter group are more likely to perceive an increase in financial stress than those in the former group ($\chi^2(2) = 25.55$, $p < .001$), but the difference between the changes in financial stress among wives is larger and even more significant statistically ($\chi^2(2) = 37.68$, $p < .001$).

[11]The full 5x5 transition matrices underlying these statistics are presented in the Appendix.

Columns (2) and (4) in the bottom panel of Table 2 present the same calculations for biennial transitions in financial stress from the SOEP. For both spouses there are more increases in financial stress among those couples that experience a birth. Among men we cannot reject the hypothesis that the trivariate distributions are the same ($\chi^2(2) = 4.18$, $p = .12$). For their wives, however, the difference in the distributions is highly statistically significant ($\chi^2(2) = 11.18$, $p = .004$).

We can expand upon these one- or two-year transitions by examining averages of time and financial stress for each year before and after a birth, thus accounting for any changes in stress that might be missing from the models that include only one year of lags (but excluding the vector X, and not based on comparisons to couples without a birth in a particular year or biennium). Figure 1a presents these measures for both husbands and wives in couples that produced a child, from four years before the birth through four years after, in the HILDA Survey. The picture is of clear increases in both types of stress for both spouses after a birth; but paralleling the results for Australia in Table 2, the graph suggests that the increases are greater for the wife than for her husband and greater for time than for financial stress. Indeed, the wife's time stress continues to rise steadily each year after the birth, while her financial stress remains constant. The husband's time and financial stress both diminish, although they remain higher than they were on average before the birth.

The patterns in the figure suggest care in interpreting the parameter estimates of (3a)-(3c). For women, but not for men, there is a clear "Ashenfelter dip" in both time and financial stress in the year before the birth, especially so for time stress (Ashenfelter, 1978). Indeed, perhaps the temporary decrease in stress increases the couple's interest in having a child, as the discussion surrounding equations (4) and (5) suggests. Regardless, these findings indicate that estimates of the determinants of current stress that include only one lagged value may overstate the impact of the birth for women in the Australian data. For men there is no pre-birth dip in time stress, but financial stress is much lower in the pre-birth year.

In the SOEP, for which the patterns of time and financial stress before and after a birth are shown in Figure 1b, there is no evidence of dips in either time or financial stress in the biennium before a birth. There may in fact be no dips, but perhaps our inability to detect any could be due to the relative infrequency with which the data on time and financial stress are collected.

## V. Estimates of Models of Stress

Table 3a lists least-squares estimates of analogs to (3a)-(3c) using the HILDA Survey (again, with separate estimates of the impacts on financial stress for husbands and wives). We include and report on the impacts of each spouse's time allocation, weekly earnings (and thus, since work hours are included, implicitly the full prices of their time), the family's unearned income, and the respondent's self-reported health. (See the Data Appendix for further details of these and the other variables included.[12]) More time spent at market work or in household production increases time stress for each spouse, with market work being especially stressful. (Given a fixed time budget, this means that shifting away from leisure or personal time increases time pressure.) A higher hourly wage appears to have no impact on time stress in these estimates, but among women, who do most of a household's purchasing, having a higher-earning husband or greater unearned income increases time stress, providing some support for the idea that households combine time and goods. For both spouses being in good health reduces both time and financial stress, presumably by adding to the efficiency of household production.[13]

The birth of a child significantly increases the perceived time stress of both husbands and wives. The impact, however, is three times greater on the wife's time stress than on her husband's, confirming the evidence from the changes in time stress shown in Table 2. Independent of the wife's greater shift from leisure/personal time to household production that raises her time pressure when a child is born (since the equation held the allocation of time constant), the very fact of the birth has a much larger effect on the time pressure that she perceives than on her husband's.

The changes in Table 2 suggested that both husbands and wives perceive additional financial stress with a birth, and holding constant for time allocation and full incomes this conclusion remains, although neither effect is strongly significant statistically. If we include only the lagged stress

[12]Also included are vectors of indicators of the number and ages of other children in the household (0-4, excluding the newborn, 5-10, 11-15, 16-18), the respondent's and spouse's ages (31-40, 41+), and year indicators. We also include, as per the theoretical motivation, lagged values of the other three stress measures (e.g., in the case of husband's time stress, the wife's time stress and both spouses' financial stress). In addition, we estimated each model using an ordered probit, with no qualitative difference from the least-squares estimates reported in Table 3a. All four estimated impacts of a birth on stress are positive and statistically significant, and the average derivatives differed by less than 0.02 from the OLS estimates. The impact on the wife's time stress is over twice that on her husband's, while the impacts on the spouses' financial stress are nearly identical.

[13]Some direct evidence supporting this assertion is provided by Podor and Halliday (2012).

measures and the indicator for a birth, husbands' stress does increase, and nearly significantly so, while the impact on his wife's financial stress becomes even larger and even more statistically significant. The theoretical motivation in Section II suggested that the spouses' views of their financial stress might respond identically to a birth. Jointly estimating the equations describing their perceived financial stress, we cannot reject the hypothesis that the responses are equal ($t = 0.15$). The main conclusion here is that a birth causes increases in both spouses' perceptions of financial stress, with perhaps a larger response by the wife than by the husband.

It is well known that women's time in the market and in home production responds to a birth (by decreasing and increasing respectively), so that the impacts of time use on stress are quite likely in part generated by the birth itself. To circumvent what is essentially a problem of spurious correlation, we re-estimate the models in Table 3a without the time-use variables. The impacts of a birth on husbands' time stress and both spouses' financial stress are essentially unaffected by this deletion. The parameter estimate on wives' time stress drops from +0.254 to +0.214, an insignificant decline and one that still leaves the wife's response significantly above the husband's. If we drop all controls except the lagged values of the stress measures, the indicators of the spouses' ages, and the year indicators, the estimated impacts of a birth on the husband's (wife's) time stress become +0.060 (+0.136), and on their financial stress +0.079 (+0.152). The overall conclusion is that relatively little of the impact of the birth on stress works through a re-allocation of time. Most is inherent in the changed circumstances in the nature of the household's combination of goods and time that are generated by the addition of a child, circumstances that increase the wife's time stress and probably her financial stress more than her husband's.

Table 3b presents the same estimates for the SOEP sample. Unsurprisingly, given the biennial data here, the sizes of the impacts of lagged stress are less and of lower statistical significance than in Table 3a. More important, while the birth has a large and significant positive impact on the wife's time stress, unlike in the HILDA Survey its impact on her husband's time stress is not statistically

significant. Neither spouse's financial stress is significantly affected by the birth, however, and both impacts are tiny.[14]

Here too, given their weekly earnings an extra hour of market work in a week raises both spouses' perceived time stress; but while it has significant negative effects on the husband's perceived financial stress, it has no impact on the wife's. Consistent with the role of the husband as the major earner in most couples, his financial stress is barely affected when his wife works more, while hers decreases substantially when her husband works more (at the same hourly earnings). Additional time spent in home production raises the wife's time stress. Given each spouse's time use, when either spouse earns more per hour (has a higher full income) the time stress of each spouse increases, although not statistically significantly; and unsurprisingly each spouse's financial stress diminishes significantly. The one set of surprising results in Table 3b is the negative (albeit not statistically significant) impact of additional unearned income on time stress, and its positive impact on financial stress. As in the HILDA Survey, being in good health reduces both time and financial stress.

Excluding the time-use measures hardly alters the estimated parameters on the indicator of a birth in the equations describing time stress nor in those describing financial stress. In the former the estimate for men rises slightly to +0.073, while for women it falls slightly to +0.196. The estimates for this indicator in the financial stress equation both remain tiny and statistically insignificant. Deleting all the controls except the indicators for year and for respondents' ages, the impact on men's time stress changes little (+0.050), while that for women remains statistically significant but falls dramatically (+0.086).

The amount of stress felt by new parents may be greater among first-time parents than others. To examine this possibility we add an indicator for first-birth to all the equations. In the equations describing time stress in the HILDA Survey the coefficients on this indicator were -0.010 (s.e. = 0.038) and -0.004 (s.e. = 0.040) for men and women respectively. In the equations describing financial stress their counterparts were -0.063 (s.e. = 0.038) and 0.031 (s.e. = 0.041). In the SOEP the

[14]Orderered probit estimates of the four specifications reported in Table 3b yield similar results. The impacts of a birth on each spouse's financial stress are statistically insignificant, as is the impact on the husband's time stress, while the effect on the wife's time stress is highly significant and positive. As in the HILDA Survey estimates, the average derivatives differed very slightly from the OLS estimates.

extra impacts of a first child on time stress were -0.043 (s.e. = 0.049) for husbands and -0.052 (s.e. = 0.056) for wives. For financial stress the additional impacts were 0.037 (s.e. = 0.051) and -0.013 (s.e. = 0.051). A fair conclusion is that there is no evidence that a first child adds more to time or financial stress than do subsequent children.

As an extension to these basic estimates we examine whether the changes in time and financial stress occasioned by a birth depend on the presence of older children in the household. We thus interact the birth indicator with the vector of indicators for older children and re-estimate the time and financial stress models for husbands and wives. In the HILDA Survey these interactions (four in each model) are not statistically significant as a group or individually in describing time stress, but the impacts on both husbands' and wives' expressed financial stress are significantly affected by the presence of other children. Having a primary-school age child reduces the perceived financial stress occasioned by a birth, while having a teenager raises it. In the SOEP the presence of older children does not interact significantly with a birth to influence financial stress; but when a child under age 5 is present, a birth increases the time stress that the mother feels after a birth. Taken together, the estimates make it clear that the magnitudes of the effect of a birth on time stress do not vary much with the ages or numbers of older children present in the household.

As noted earlier, one spouse's idiosyncratic responses to a birth may interact with the other's, and each spouse's perceived time pressure may be related to his or her perceived financial stress. Since the equations include all the same variables, the only issue here is the extent to which the errors in the four equations are correlated. In both samples, once we account for the X variables, the four lagged measures of stress and the birth indicator, the only significant correlations are between the spouses' financial stress (r = +0.28 in the Australian data, r = +0.36 in the German data) and between their time stress in the SOEP (r = +0.19).[15]

The presence of the pre-birth "Ashenfelter dip" in expressed time stress, especially wives', could be at least partly responsible for the estimated impacts of a birth on time stress. One way to circumvent this problem is to estimate the models without any lagged measures of time stress, but

[15]These conclusions do not change qualitatively if we exclude the time-use measures or, indeed, all the other controls from the basic equations.

including person fixed effects. The estimated impact of a birth then becomes the difference between the stress measure immediately after a birth and its person-specific average over the entire panel, adjusted for current measures of time use, earnings and unearned income, health and family structure. Estimating these fixed-effects models for Australia yields an impact of birth on husbands' time stress of +0.113 (s.e. = 0.026), and on wives' of +0.260 (s.e.= 0.028). For Germany the analogous fixed-effects estimates are +0.068 (s.e.=0.034) for husbands and +0.246 (s.e.=0.034) for wives. These estimated impacts differ little from those shown in Tables 3a and 3b. The results differ little if we estimate fixed-effect ordered logit models.

A potential difficulty with using fixed-effects estimation is that the impact of a birth on time stress may remain high for several years after the birth. An alternative approach to handling the dip (at the cost of shortening the sample period and losing observations) is to use longer lags in the stress measures, so that the comparisons are to earlier sets expressions of stress rather than merely to the previous year's (or in the SOEP, the previous biennium's). Re-estimating the models in Table 3a by adding two- and three-year lagged measures of stress, the estimated impact of a birth on husbands' time stress increases to +0.134 (s.e.=0.044), while that on wives' falls to +0.153 (s.e. = 0.049). In the SOEP we add lagged measures of stress from the interview four years before the year after the birth, with the resulting estimated impacts of the birth on time stress equalling +0.039 (s.e.= 0.043) among husbands, and +0.176 (s.e.=0.044) among wives.

These two methods to account for the drop in perceived time stress during the year ending before the decision to have the child yield somewhat different results. The overall conclusion, however, is that the implied significantly positive impact of the birth on time stress is robust, and that this effect is greater on the wife's time stress than the husband's.

Does the effect of a birth on time and financial pressure increase or diminish over time? In other words, are the effects that we have demonstrated temporary and caused by the birth, or do they represent the persistent stress costs of a child? To answer this question for Australia we estimate the same models as presented in Table 3a, except that we include lagged terms for successively two, three and four years in the birth indicator and in the stress measures. We restrict the sample to couples that had no additional birth, so that we are examining how a birth between Years t and t+1 affects stress at

Years t+1 (the results in Table 3a), t+2, t+3 and t+4. All estimates include the same other current-period controls as were included in the specifications underlying the results in Table 3a.

The estimates are reported in the top part of Table 4, measured in standard-deviation units of stress. While the estimated effects on time stress fluctuate from year to year, with generally smaller effects the more distant in the past the birth is, they remain positive, larger among wives than husbands, and statistically significant among wives. The initial effects on financial stress diminish and are essentially zero two years after the birth. The general conclusion here is that, at least for the four post-birth years that the sample size allows us to follow these couples, time stress, especially the wife's, remains above what it was before the birth, while the extra financial stress essentially disappears.

With the biennial data in the SOEP the specification of the lag structure must be different, since taking more than two lags would remove most of the sample observations. Accordingly, in the bottom row of the bottom panel of Table 4 we report the estimated (in standard-deviation units) impacts of a birth between Years t and t+2 on stress at Year t+4, including lagged stress measures from Year t and all the current-period controls. The upper row in this panel converts the estimates from Table 3b into standard-deviation units. Between two and four years after the birth none of the effects on stress are statistically significant; the wife's time stress remains, however, substantially positively affected, and both spouses' financial stress is higher than before the birth.

Not surprisingly there are some major differences in the results between the two data sets. Partly they occur because of the different frequencies at which stress is measured; and we can examine the extent to which the difference in the frequency of the data on stress is generating the different results by aggregating births in the HILDA over two years and re-estimating the models describing current time and financial stress, using the same controls and a two-year lag in time stress. Given this temporal aggregation, we lose nearly half the observations (but none of the births), as we are only using observations from 2004, 2006, …, 2012. The results of estimating the models using this aggregation look somewhat like those reported in Table 3a, although the coefficient on births describing women's time stress is somewhat reduced (but remains statistically significant). The

difference in the frequency of the questions on stress between the two panel data sets explains some of the differences in the results across the two countries/data sets but far from all.

The results may also differ because the questions eliciting time stress and the measures of time inputs differ across the surveys. We account for those discrepancies by including an indicator of whether the stress measures in the SOEP are elicited by an interviewer or are responses to a self-administered questionnaire. Those respondents who were interviewed express significantly less stress on both dimensions; but their time and financial stress responds to a birth almost identically to that of respondents who completed a questionnaire.[16]

There is a remarkably consistent pattern throughout the results: A birth generates initial time stress in the new mother, and that stress persists for at least four years. Moreover, it is greater than the new father's additional time stress, which in any case does not persist. There is much less evidence of an increase in perceived financial stress felt by either spouse.[17]

## VI. The Stress Cost of Children

Since the largest immediate effect of a birth is on the time stress felt by new mothers, in attempting to monetize the costs of stress we concentrate on that particular form of stress. While we propose three approaches to calculating the monetary equivalent of the additional time stress felt by mothers that is generated by a birth, there are undoubtedly many other simulations beyond those examined here that might be proposed. But at least these three do give an indication of the magnitude of the monetary amounts needed to compensate for the psychological burden of the birth.

In all of the simulations we ask the question: what is the monetary transfer or infusion of earnings that would reduce the new mother's financial stress by an amount equal to the increased time stress generated by the birth? The measures of subjective stress (time and financial) are not directly

[16]Another set of possible causes of the differences involves different policies on child care and family subsidies. While with two observations we cannot examine these possibilities, we did consider how an increase in the generosity of child payments in Germany after 2007 might have affected the estimates. Perhaps because of the resulting small sample sizes, or perhaps because it actually had no effect, when we disaggregate the SOEP sample into pre- and post-2007, we find no differences in the estimated impacts of a birth on time stress.

[17]Our findings are captured in a letter from a mother of two pre-school children (July 5, 2002, from Hannah Ebin), "With the kids and the house, I often feel I have four hours of tasks and only two hours to do them in."

commensurate, so we calculate all effects in standard-deviation units. We conduct simulations to answer three questions:

> Simulation 1: What transfer of weekly earnings from the husband to the wife would reduce her financial stress by the same amount that the birth has increased her time stress?
>
> Simulation 2: What increase in the wife's weekly earnings would decrease her financial stress by the same amount that the birth has increased her time stress?
>
> Simulation 3: What increase in the husband's weekly earnings would decrease the wife's financial stress by the same amount that the birth increased her time stress? [18]

We perform all three simulations for both the HILDA Survey and SOEP using the estimates in Tables 3. In addition to calculating these one-time transfers/infusions immediately after a birth, we also calculate their cost per married couple if each couple, regardless of whether it experiences a birth in the year (biennium in the SOEP), were to pay taxes annually into a fund to finance the transfers.

We show the results of these simulations in Table 5. The effects are remarkably large, especially in the first simulation, where even in the HILDA Survey the required one-time transfer is over twice the average husband's annual earnings (and even the annual transfer from all couples would exceed 20 percent of husbands' annual earnings). Clearly, there is no reasonable transfer of earnings from husband to wife that can compensate for the increased time stress that she experiences with the new child. The other possible changes would be more feasible, but might require infusions of income from outside the household, and these infusions could represent substantial increases in government activity. Thus even the least costly (Simulation 2, and Simulation 3 in the SOEP) would require payments during the first year of each child's life whose annual cost to every couple (the few new parents and all other couples) of over US$4000 per year would represent a substantial increase in the burden of taxes/transfers.

These simulations suggest that the psychological cost of a new child is huge in comparison to the monetary cost and, even more so, to the value of time that the new mother and father expend on

[18]The difference among Simulations 1, 2 and 3 is that under Simulation 1 total household earnings remain unchanged, whereas in the others they increase.

the addition to the family. While other simulations would generate different monetary comparisons to the time stress experienced by new mothers, given our estimates it is doubtful that any reasonable simulation would suggest that these costs are small. One might think that providing subsidized early childhood care would reduce time stress; but a comparison of the coefficients in Tables 3 to the means in Table 2 indicates that, even with no time spent in household production (including childcare), a birth generates substantial additional time stress for the wife.

## VII. Experimenting with the Endogeneity of a Birth

While we have argued that selectivity into child-bearing will bias downward our estimates of the impact of a birth on time and financial stress, we cannot demonstrate that proposition empirically; it is a sensible theoretical assertion about behavior. Our estimates would thus be even more convincing if we could find a satisfactory instrument for birth. Regrettably, neither of the data sets has any other variables that one could not easily argue also affect time and/or financial stress directly, and other variables that might predict birth (age, number of children of various ages, spouses' earnings, and time allocation) are also predictors of time/financial stress (and are included in (3a) – (3c)). The finding of a pre-birth dip in women's time stress, however, might make the dip itself an appropriate instrument to identify a five-equation model of this process (describing each spouse's time and financial stress and also the birth).

The pre-birth drop in women's time stress may be behavioral. As implied in (5), unusually low time and financial stress should induce couples to select into the population of new parents. There is also biomedical evidence that women with low stress, as measured by low values of a particular biological marker, are more fecund (Louis *et al*, 2011). While we cannot distinguish the behavioral from the biological in either of our data sets, the two effects work in the same direction.

Using the HILDA Survey we estimated an equation describing the probability of a birth that included the lagged change in each spouse's time and financial stress, plus the lagged indicators of the number of children in each of the four age categories.[19] In a linear-probability model the parameter estimates on the husband's and wife's lagged change in time stress are +0.0077 (s.e. = 0.0044) and -

[19]The parameter estimates change minutely if we add each spouse's earnings and the household's unearned income to the specification.

0.0170 (s.e. = 0.0044); those on the husband's and wife's lagged change in financial stress are -0.0098 (s.e. = 0.0043) and -0.0012 (s.e. = 0.0042). These effects are small as well as being in some cases statistically insignificant

Observing stress only biennially in the SOEP makes that data set a weak candidate for investigating this predictor; and Figure 1b showed that unsurprisingly the dip in women's time stress between time periods t-4 and t-2 was much smaller than the dip observed between t-2 and t-1 in Australia. Nonetheless, we used the SOEP to estimate a linear model describing the probability of a birth as a function of each spouse's changes in time and financial stress between periods t-4 and t-2 (i.e., including two measures of lagged changes in stress). The estimated impacts on the probability of a birth were all small and statistically insignificant, and were unexpectedly positive.

Regrettably in both data sets the predictive power of the lagged measures of stress is quite weak: In Australia the adjusted $R^2$ in predicting whether a birth occurs is only 0.050, while in the SOEP it is 0.024. The lagged stress terms would be very weak instruments, so we do not go further and use them to endogenize births. Nonetheless, the findings here are fascinating, suggesting in the HILDA Survey that declines in the wife's time stress and in her husband's financial stress help to induce the couple to have a child.

## VIII. Emptying the Nest

The theoretical motivation in Section II was based on the addition of a child and demonstrated how that demographic change would cause the time and goods constraints facing the household to bind more tightly. The reverse change, the departure of a child, should have the reverse effect: It should decrease the tightness of the constraints and lower measures of their empirical analogs—perceived time and financial stress. To examine this potential asymmetry, we investigate whether the reverse effects exist and are equal but of opposite sign to those demonstrated above.[20]

Because very few children depart their parents' households when the mother is age 45 or less, we expand both samples by removing the restrictions on the mother's age. The averages of the crucial

[20]As with the impact of a birth on a couple's happiness, the impact of a child's departure on happiness has also been examined (Krekel, 2013).

outcomes change substantially (compared to the averages shown in Table 1), decreasing in all cases.[21] In the Australian data the average time stress is 3.10 and 3.31 for men and women respectively, while the average financial stress is 2.36 and 2.32. In the SOEP the means of time stress are 2.65 and 2.84, and of financial stress are 2.61 and 2.52, for men and women respectively.

In Table 6 we present statistics describing changes in husbands' and wives' time and financial stress depending on whether a child departed the household that year (within two years after a departure in the SOEP), thus listing the results in the same way as those for births shown in Table 2. In seven of eight comparisons (husbands-wives, HILDA-SOEP, time and financial stress) those people who had a child leave the household were more likely to experience a decrease in stress, and less likely to experience an increase, than those who did not. The only exception is in the distributions of changes in financial stress among wives in the HILDA Survey.

In general, the results mirror those shown in Table 2 for births: A departure generally reduces stress. Comparing the results here to those in Table 2, however, shows that the differences in changes in stress between those who do or do not experience the demographic event are much smaller for departures of children than they are for births. Indeed, the trivariate distributions are not statistically different from each other for time stress among men and financial stress among women in either the Australian or the German data. While the differences in the impacts of births and departures on time stress are more pronounced among wives, even there the magnitudes of the differences and their statistical significance are far below those of their counterparts in Table 2.[22]

We can explore the dynamics of time stress around this demographic event, as we did for births in Figures 1, by considering averages of time and financial stress +/- four years around a child's departure. The results are shown in Figures 2, constructed exactly as their analogs for births. The first thing to note is that, unlike for births in the HILDA Survey, here we find no pre-event dip in either

[21]Without this expansion of the sample sizes we would observe very few departures of children, and those few would be highly non-randomly selected. Changing the sample definition obviously alters the age mix of the respondents. Thus in the samples used earlier the average ages of wives in the HILDA Survey and the SOEP were 35 and 37 respectively. Removing the age restriction raises these respective averages to 48 and 52. Throughout this section we also exclude observations for years (biennia in the SOEP) in which a couple experienced a birth.

[22]Restricting departures to those that result in an empty nest (where no children remain the household) does not alter the conclusion. The differences between those with and without a final departure remain small.

time or financial stress. Rather, in both surveys and for both husbands and wives, time stress appears to diminish more or less steadily from at least two years before a child departs the household; and it continues decreasing in all cases for two years after. In both surveys, and for both spouses, financial stress also decreases from at least two years before the event; but the decrease stops or even reverses itself within two years after the departure.

Going still further, we estimate equations with specifications like those reported in Tables 3a and 3b, except that here the variable of interest is the departure of a child. To save space, in Table 7 we report only the least-squares estimates of the impacts of the departure on the measures of each spouse's time and financial stress. While in both surveys the wife's time stress decreases with the child's departure, the decreases are small compared to the increases shown in Tables 3a and 3b, and they are not (quite) statistically significant.

While these results weakly corroborate the prediction that having a child leave the house loosens time constraints, they suggest that the responses to what might seem like opposing events are in fact asymmetric. Births tighten the constraints much more than departures loosen them. Moreover, the results imply that, unlike births, departures are associated with a nearly steady diminution of time stress both before and after the event, with generally similar effects on financial stress.

## IX. Conclusions and Implications

Using data from longitudinal surveys for Australia and Germany, we have demonstrated that a birth causes a rise in mothers' time stress that is not dissipated over the first few years of her child's life. There is some evidence of a similar but smaller effect on fathers' time stress; and we find some weak evidence that a birth increases spouses' financial stress. This demonstration is not that births affect such inchoate concepts as well-being or life satisfaction. Rather, by analogizing time stress to the Lagrangean multiplier on each spouse's time constraint, and financial stress to the multiplier on the household's goods constraint, the results are consistent with a model with households maximizing their utility given their full income.

The magnitudes of the impacts of a birth on time stress are substantial, especially for a new mother. Calculating the extra earnings that the mother would have to receive to reduce her financial

stress by as much as the birth increases her time stress (measured in comparable standard deviation units) suggests that the monetary equivalent of the time stress of a birth on average is huge. Demonstrating the magnitude of this additional cost of children might justify the subsidies to new parents offered in many countries that might be viewed as partial attempts to offset these nonmonetary, but measurable costs of having and raising children.

The results also provide evidence of the expected reverse pattern of responses to demographic events, in that a child's departure from the household generally reduces spouses' time stress. But these negative effects appear to be much smaller than the positive effects of a birth. Implicitly, the pleasure of having children is sufficient to offset the implicit additional lifetime stress that they cause parents. This is obvious; but the novelty here is the demonstration of the magnitudes and time paths of that stress.

Because of the limitations of the data sets—and especially the relatively short duration of the panels—our ability to examine the dynamic effects of births and of departures from the household on time and financial stress within a general model of household production has been limited. While this research suggests that having children generates a permanent lifetime increase in perceived stress, the long-term effects of a birth on stress can only be analyzed with longer panels than are currently available. That and linking the impacts of births on time and financial stress to spouses' bargaining behavior in the household remain potentially fruitful avenues for additional study.

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**Table 1. Descriptive Statistics: Couples (Means and Standard Deviations)**

| | HILDA (N=7,376) | | SOEP (N=7,525) | |
|---|---|---|---|---|
| **Variable*** | **Husband** | **Wife** | **Husband** | **Wife** |
| Time stress | 3.41 (0.85) | 3.59 (0.87) | 3.14 (0.97) | 3.25 (0.95) |
| Financial stress | 2.45 (0.98) | 2.43 (0.97) | 2.67 (1.05) | 2.56 (1.06) |
| Child born in year / Born in last 2 years | 0.10 (0.29) | | 0.12 (0.33) | |
| Child 0-4 | 0.46 (0.68) | | 0.17 (0.40) | |
| Child 5-10 | 0.53 (0.78) | | 0.50 (0.68) | |
| Child11-15 | 0.34 (0.66) | | 0.37 (0.62) | |
| Child16-18 | 0.13 (0.38) | | 0.18 (0.43) | |
| Excellent or very good health / very good or good health | 0.51 (0.50) | 0.57 (0.49) | 0.59 (0.49) | 0.61 (0.49) |
| Work and commute time / Work time | 46.23 (17.98) | 23.78 (20.21) | 40.43 (15.87) | 20.05 (17.60) |
| Home production time per week / Home production time per weekday | 25.22 (18.72) | 50.10 (34.24) | 3.73 (3.10) | 9.65 (7.10) |
| Earnings: (2012)A$ per week / Earnings: (2012) € per week | 1269 (1005) | 584 (610) | 794 (598) | 294 (336) |
| Unearned income: (2012) A$ per week / Unearned income: (2012) € per week | 384 (1098) | | 147 (276) | |

*The first variable label describes the HILDA measure, the second the SOEP measure.

**Table 2. Year-to-Year Transition Matrices on Stress, with or without Birth, HILDA 2001-12, SOEP 2002-12***

| No Birth: | HILDA (N=11,203) | SOEP (N=6,571) | HILDA (N=11,228) | SOEP (N=6,567) |
|---|---|---|---|---|
| **Birth:** | **(N=1172)** | **(N=954)** | **(N=1216)** | **(N=958)** |
| | | **Time Stress** | | |
| **Change in Stress** | **Men, No Birth** | | **Women, No Birth** | |
| Increase | 22.2 | 29.1 | 22.2 | 28.7 |
| Same | 54.8 | 43.0 | 53.8 | 43.5 |
| Decrease | 23.0 | 27.9 | 24.0 | 27.8 |
| | **Men, Birth** | | **Women, Birth** | |
| Increase | 25.7 | 28.6 | 32.5 | 37.8 |
| Same | 55.6 | 46.0 | 49.5 | 38.2 |
| Decrease | 18.7 | 25.4 | 18.0 | 24.0 |
| | | **Financial Stress** | | |
| **Change in Stress** | **Men, No Birth** | | **Women, No Birth** | |
| Increase | 22.6 | 27.1 | 23.6 | 25.2 |
| Same | 53.2 | 49.3 | 50.0 | 48.3 |
| Decrease | 24.2 | 23.6 | 26.4 | 26.5 |
| | **Men, Birth** | | **Women, Birth** | |
| Increase | 28.3 | 27.9 | 31.0 | 34.3 |
| Same | 51.2 | 51.3 | 50.2 | 41.5 |
| Decrease | 20.5 | 20.8 | 18.8 | 24.2 |

*The numbers of observations differ slightly for men and women in each category because we condition on item non-response on the control variables used in subsequent regressions.

**Table 3a. LS Estimates of the Effects of a Birth on Stress, HILDA* (N = 7,376)**

| | Time Stress (5 to 1) | | Financial Stress (5 to 1) | |
|---|---|---|---|---|
| **Independent Variable:** | **HUSBAND** | **WIFE** | **HUSBAND** | **WIFE** |
| Lagged stress (own) | 0.547 | 0.507 | 0.498 | 0.466 |
| | (0.013) | (0.015) | (0.017) | (0.016) |
| Birth in past year | 0.093 | 0.254 | 0.063 | 0.072 |
| | (0.032) | (0.040) | (0.041) | (0.039) |
| Excellent or very good health | -0.087 | -0.113 | -0.152 | -0.152 |
| | (0.019) | (0.018) | (0.021) | (0.024) |
| Work and commute time/week (own) | 0.007 | 0.009 | -0.003 | -0.001 |
| | (0.001) | (0.001) | (0.001) | (0.001) |
| Home production/week (own) | 0.002 | 0.002 | 0.001 | -0.0003 |
| | (0.001) | (0.001) | (0.001) | (0.0004) |
| Earnings (own) | -0.006 | 0.022 | -0.118 | -0.172 |
| | (0.010) | (0.020) | (0.012) | (0.024) |
| Work and commute time/week (partner) | -0.0001 | -0.0001 | 0.0001 | -0.001 |
| | (0.001) | (0.0007) | (0.0008) | (0.0008) |
| Home production/week (partner) | -0.0001 | -0.0001 | -0.0002 | 0.0008 |
| | (0.0004) | (0.0007) | (0.0005) | (0.0006) |
| Earnings (partner) | 0.007 | 0.021 | -0.073 | -0.070 |
| | (0.020) | (0.011) | (0.024) | (0.013) |
| Unearned income/week | 0.008 | 0.024 | -0.047 | -0.048 |
| | (0.007) | (0.009) | (0.012) | (0.009) |
| $R^2$ | 0.383 | 0.374 | 0.430 | 0.393 |

*Also includes all three other lagged stress measures, a vector of measures of numbers and ages of children, year indicators and indicators of the respondent's and spouse's decadal ages (31-40 and 41+). Robust standard errors clustered on person identifiers are reported here and in subsequent tables reporting coefficient estimates.

**Table 3b. LS Estimates of the Effects of a Birth on Stress, SOEP* (N = 7,525)**

| | Time Stress (5 to 1) | | Financial Stress (5 to 1) | |
|---|---|---|---|---|
| **Independent Variable:** | **HUSBAND** | **WIFE** | **HUSBAND** | **WIFE** |
| Lagged stress (own) | 0.310<br>(0.018) | 0.303<br>(0.020) | 0.368<br>(0.024) | 0.319<br>(0.021) |
| Birth in past year | 0.052<br>(0.051) | 0.212<br>(0.058) | 0.012<br>(0.051) | 0.014<br>(0.055) |
| Very good or good health | -0.216<br>(0.029) | -0.225<br>(0.034) | -0.176<br>(0.031) | -0.209<br>(0.031) |
| Work and commute time/week (own) | 0.015<br>(0.001) | 0.012<br>(0.002) | -0.006<br>(0.001) | 0.0004<br>(0.0015) |
| Home production/week (own) | 0.003<br>(0.006) | 0.017<br>(0.003) | 0.009<br>(0.006) | 0.0009<br>(0.0035) |
| Earnings (own) | 0.080<br>(0.026) | 0.129<br>(0.064) | -0.302<br>(0.046) | -0.291<br>(0.075) |
| Work and commute time/week (partner) | -0.001<br>(0.001) | 0.0003<br>(0.0012) | -0.001<br>(0.001) | -0.004<br>(0.001) |
| Home production/week (partner) | 0.0005<br>(0.003) | -0.012<br>(0.008) | 0.004<br>(0.003) | 0.002<br>(0.006) |
| Earnings (partner) | 0.103<br>(0.052) | 0.046<br>(0.026) | -0.165<br>(0.070) | -0.250<br>(0.041) |
| Unearned income/week | -0.073<br>(0.036) | -0.009<br>(0.040) | 0.124<br>(0.057) | 0.128<br>(0.042) |
| $R^2$ | 0.248 | 0.231 | 0.404 | 0.386 |

*Also includes all three other lagged stress measures, a vector of measures of numbers and ages of children, year indicators and indicators of the respondent's and spouse's decadal ages (31-40 and 41+).

**Table 4. Lag Structure of Stress in Response to the Addition of a Child***

| | Response in Standard-Deviation Units of Stress | | | |
|---|---|---|---|---|
| | HUSBANDS | | WIVES | |
| **Years after birth:** | **Time stress** | **Financial stress** | **Time stress** | **Financial stress** |
| **HILDA** | | | | |
| 0-1 | 0.080 | 0.062 | 0.224 | 0.071 |
| | (0.028) | (0.040) | (0.035) | (0.071) |
| 1-2 | 0.032 | 0.054 | 0.119 | 0.028 |
| | (0.021) | (0.049) | (0.039) | (0.046) |
| 2-3 | 0.081 | 0.000 | 0.124 | -0.029 |
| | (0.047) | (0.068) | (0.030) | (0.071) |
| 3-4 | 0.051 | 0.017 | 0.157 | 0.000 |
| | (0.070) | (0.094) | (0.064) | (0.093) |
| **SOEP** | | | | |
| 0-2 | 0.050 | 0.013 | 0.202 | 0.015 |
| | (0.049) | (0.053) | (0.055) | (0.058) |
| 2-4 | -0.083 | 0.163 | 0.129 | 0.135 |
| | (0.117) | (0.108) | (0.149) | (0.113) |

*Based on LS coefficient estimates. Each underlying equation contains current values of all the regressors underlying the estimates in Tables 3a and 3b, except that it includes the lagged stress measures the year before the birth (two years in the SOEP). The equations for years after the initial year are restricted to couples who did not experience a second birth in the interval.

**Table 5. Transfers/Extra Income Required to Reduce Wife's Financial Stress Equal to the Increase in Her Time Stress (in SD Units) from a Birth: Simulations from the HILDA and SOEP**

| | | Annual one-time cost per new-parent household | | Annual cost per married couple | |
|---|---|---|---|---|---|
| **Simulation** | **Description** | **HILDA ($)** | **SOEP (€)** | **HILDA ($)** | **SOEP (€)** |
| 1 | Earnings transfer from husband to wife | 144,788 | 296,607 | 14,189 | 23,729 |
| 2 | Increase wife's earnings | 85,879 | 42,104 | 8,416 | 3,368 |
| 3 | Increase husband's earnings | 211,075 | 49,069 | 20,685 | 3,926 |

**Table 6. Year-to-Year Transition Matrices on Stress, with or without Child Departures, HILDA 2001-12, SOEP 2002-12**

| No departure: | HILDA (N=23,869) | SOEP (N=19,039) | | HILDA (N=23,608) | SOEP (N=18,968) |
|---|---|---|---|---|---|
| Departure: | (N=987) | (N=1214) | | (N=987) | (N=1214) |
| | | Time | Stress | | |
| **Change in Stress** | **Men, No Departure** | | | **Women, No Departure** | |
| Increase | 20.8 | 26.4 | | 21.4 | 27.5 |
| Same | 56.6 | 45.9 | | 55.5 | 45.3 |
| Decrease | 22.6 | 27.7 | | 23.1 | 27.2 |
| | **Men, Departure** | | | **Women, Departure** | |
| Increase | 19.2 | 26.3 | | 17.7 | 24.3 |
| Same | 57.2 | 45.3 | | 57.5 | 46.7 |
| Decrease | 23.6 | 28.4 | | 24.8 | 29.0 |
| | | | **Financial Stress** | | |
| **Change in Stress** | **Men, No Departure** | | | **Women, No Departure** | |
| Increase | 22.2 | 25.9 | | 22.4 | 25.3 |
| Same | 54.0 | 50.4 | | 52.9 | 50.1 |
| Decrease | 23.8 | 23.7 | | 24.7 | 24.6 |
| | **Men, Departure** | | | **Women, Departure** | |
| Increase | 18.8 | 25.2 | | 21.2 | 24.9 |
| Same | 56.3 | 48.2 | | 54.9 | 49.3 |
| Decrease | 24.9 | 26.6 | | 23.9 | 25.8 |

**Table 7. LS Estimates of Effects on Stress in Response to the Departure of a Child***

| | Response in Standard-Deviation Units of Stress | | | |
|---|---|---|---|---|
| | HUSBANDS | | WIVES | |
| **Years after birth:** | **Time stress** | **Financial stress** | **Time stress** | **Financial stress** |
| **HILDA** | | | | |
| | -0.038 | -0.005 | -0.057 | 0.042 |
| | (0.030) | (0.040) | (0.030) | (0.038) |
| **SOEP** | | | | |
| | 0.0001 | 0.071 | - 0.041 | 0.026 |
| | (0.039) | (0.040) | (0.035) | (0.035) |

*The underlying equations include all the variables in the specifications reported in Tables 3a and 3b, except that the vectors of indicators of respondents' and spouses' ages denote ages 41-50 and 50+.

**Figure 1a. Time and Financial Stress Before and After Birth of a Child, HILDA 2001-12**

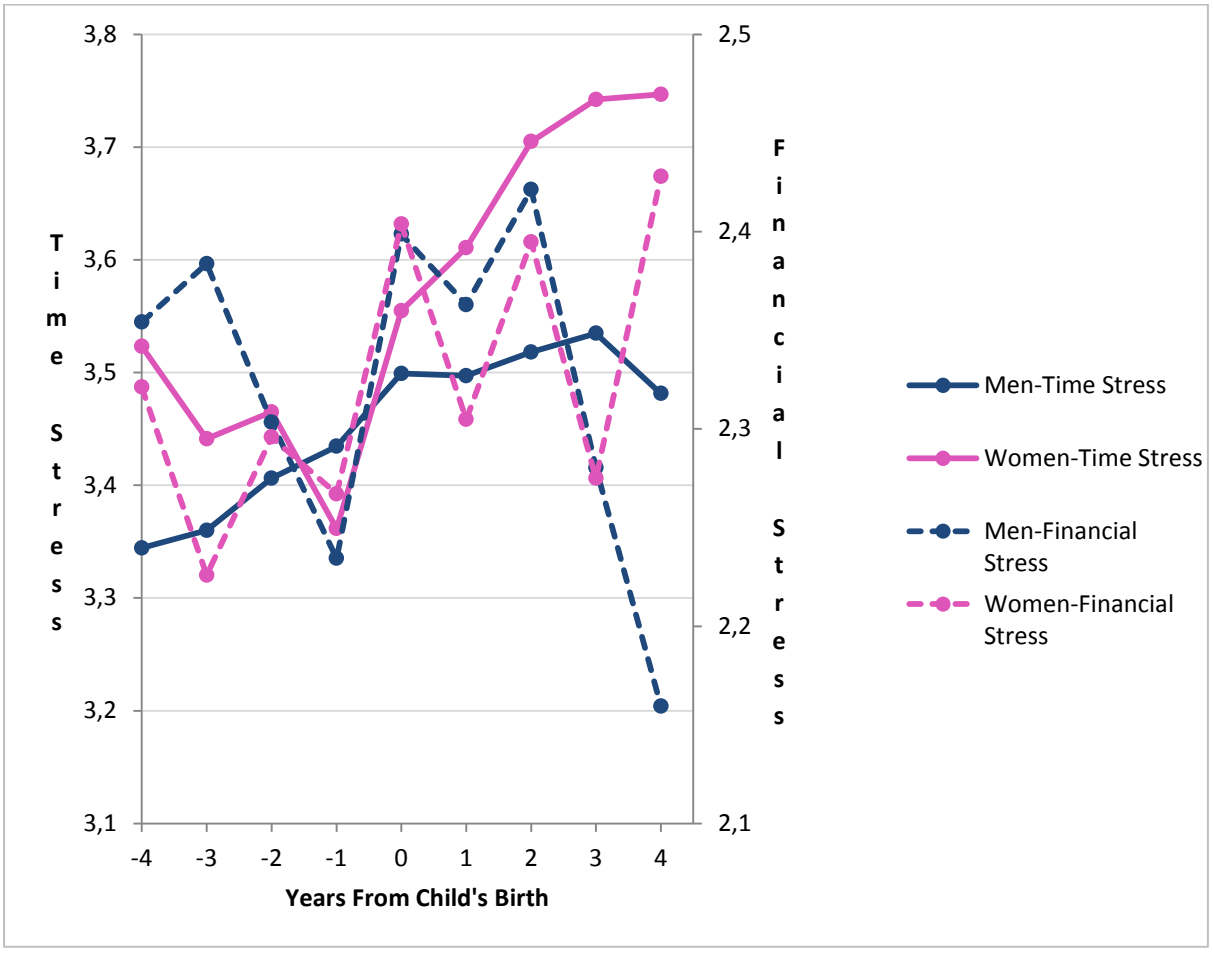


**Figure 1b. Time and Financial Stress Before and After Birth of a Child, SOEP 2002-12**

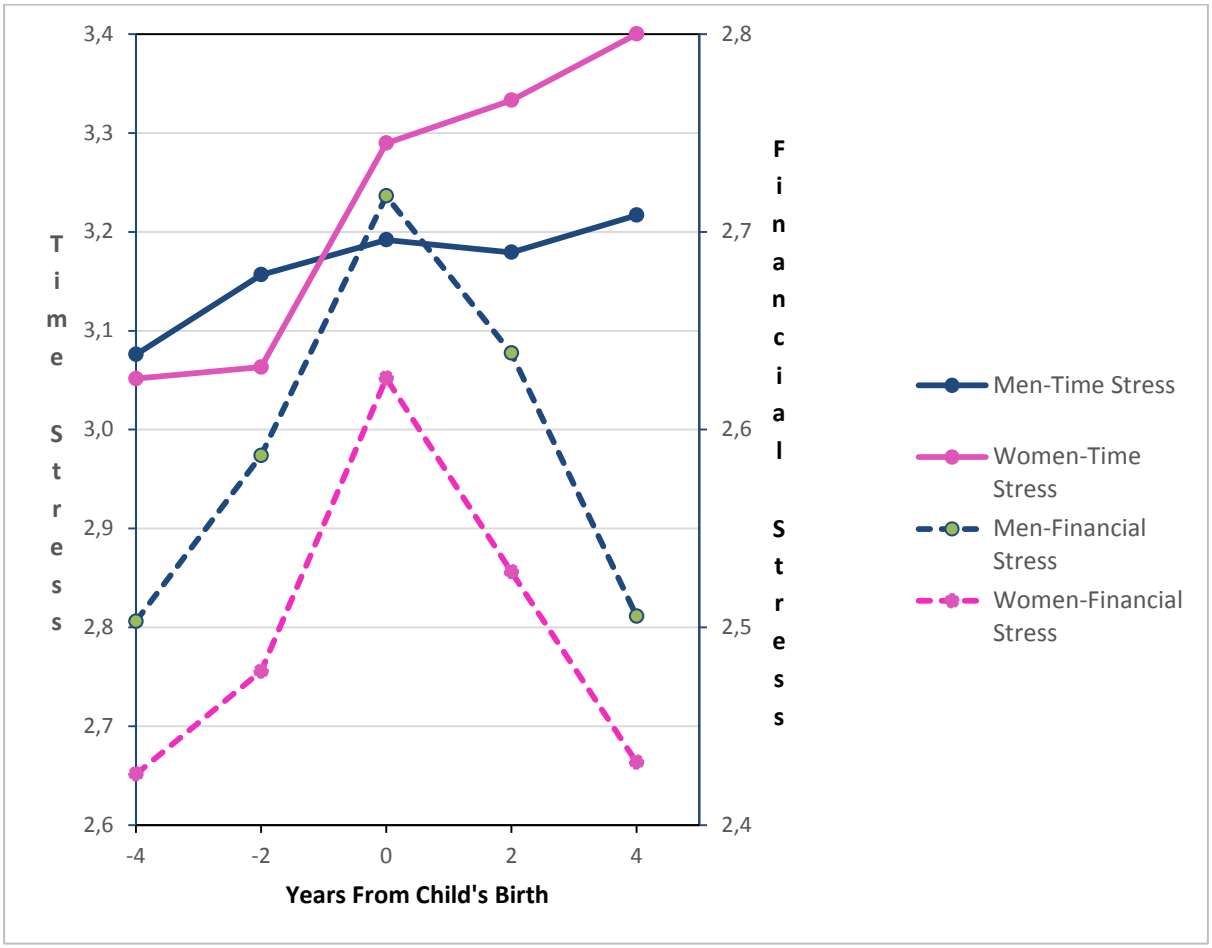


**Figure 2a. Time and Financial Stress Before and After Departure of a Child, HILDA 2001-12**

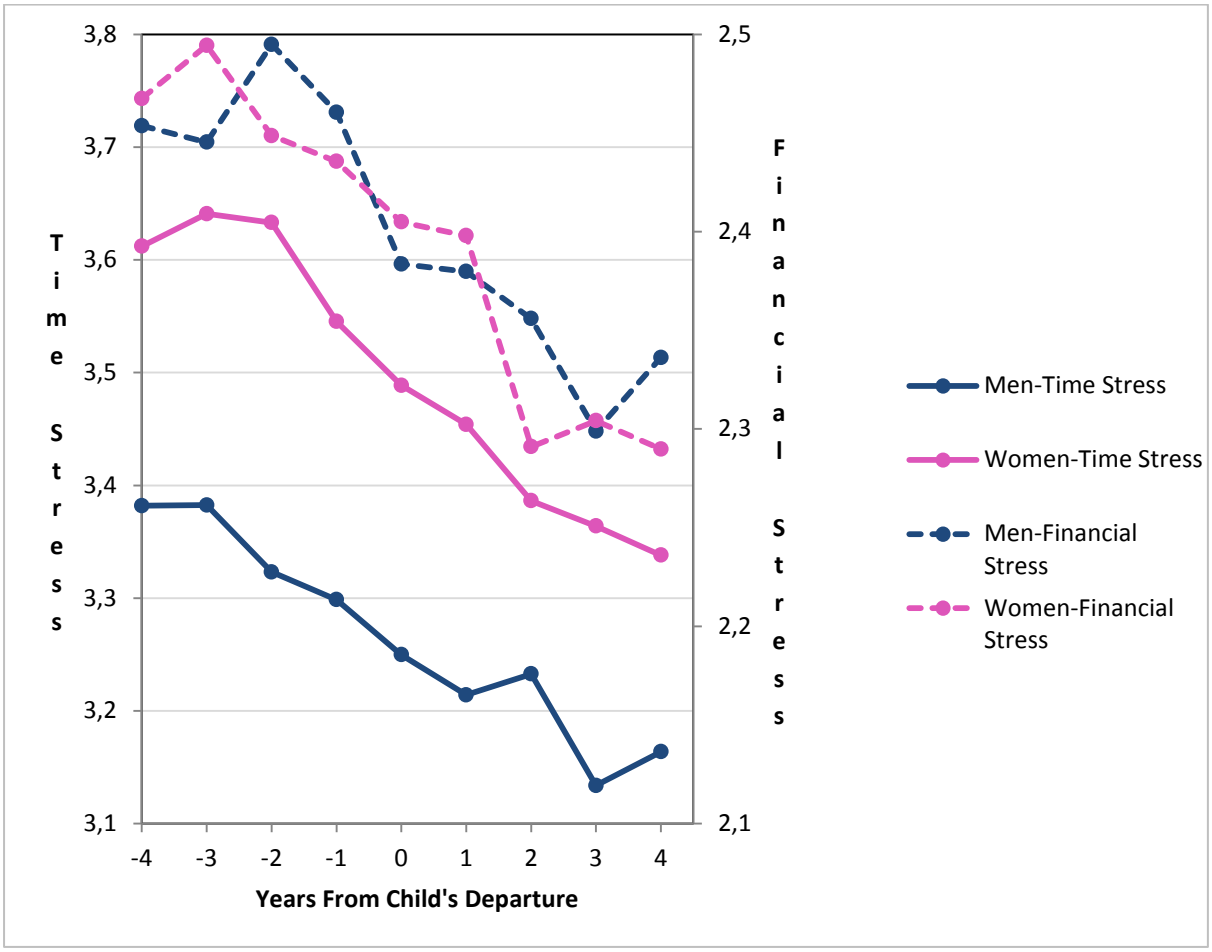
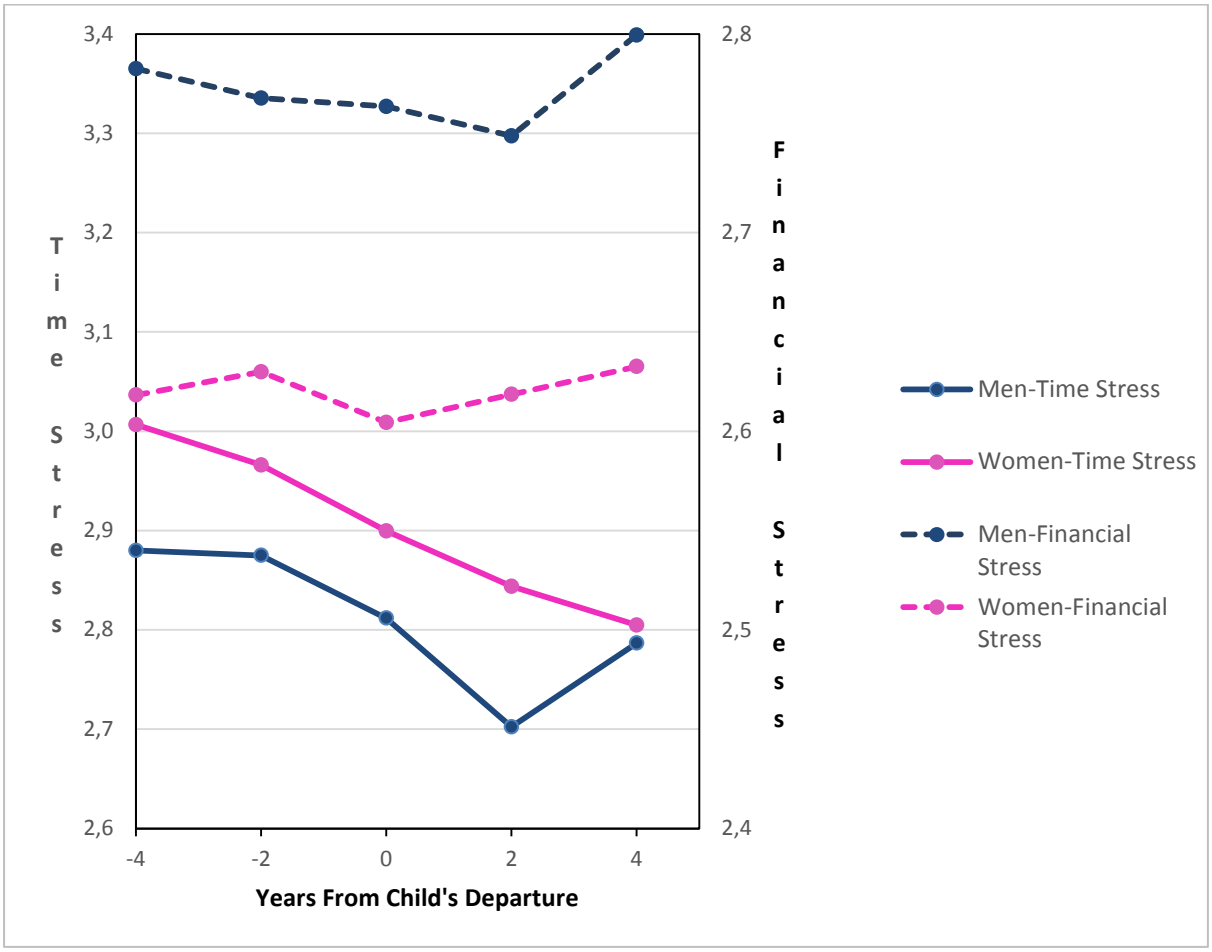


**Figure 2b. Time and Financial Stress Before and After Departure of a Child, SOEP 2002-12**



**APPENDIX TABLES**

## Table 1a. Year-to-Year Transition Matrices on Time Stress, with or without Births, HILDA 2001-12

| | | | | **HUSBAND** | | |
|---|---|---|---|---|---|---|
| | | | | **No child born or adopted in year** | | |
| **Stressed for Time:** | | Always | | | | Never |
| | | 5 | 4 | 3 | 2 | 1 |
| Always | 5 | 45.0 | 42.0 | 10.8 | 2.1 | 0.1 |
| | 4 | 11.9 | 55.9 | 29.3 | 2.5 | 0.2 |
| | 3 | 2.4 | 22.5 | 61.2 | 13.1 | 0.8 |
| | 2 | 0.7 | 7.8 | 48.0 | 40.9 | 2.6 |
| Never | 1 | 1.6 | 4.4 | 39.0 | 40.0 | 15.0 |
| | | | | **Child born or adopted in year** | | |
| | | Always | | | | Never |
| | | 5 | 4 | 3 | 2 | 1 |
| Always | 5 | 50.9 | 37.5 | 11.6 | 0.0 | 0.0 |
| | 4 | 13.7 | 63.4 | 21.3 | 1.4 | 0.2 |
| | 3 | 3.8 | 28.2 | 55.5 | 11.8 | 0.7 |
| | 2 | 1.4 | 9.2 | 50.2 | 36.0 | 3.2 |
| Never | 1 | 10.6 | 11.9 | 21.6 | 19.5 | 36.4 |
| | | | | **WIFE** | | |
| | | | | **No child born or adopted in year** | | |
| | | Always | | | | Never |
| | | 5 | 4 | 3 | 2 | 1 |
| Always | 5 | 51.5 | 38.2 | 9.0 | 1.1 | 0.2 |
| | 4 | 14.6 | 54.5 | 28.0 | 2.7 | 0.2 |
| | 3 | 4.0 | 26.9 | 57.8 | 10.8 | 0.5 |
| | 2 | 1.9 | 9.1 | 44.5 | 40.5 | 4.0 |
| Never | 1 | 0 | 5.0 | 30.5 | 44.4 | 20.1 |
| | | | | **Child born or adopted in year** | | |
| | | Always | | | | Never |
| | | 5 | 4 | 3 | 2 | 1 |
| Always | 5 | 55.3 | 31.7 | 12.4 | 0.6 | 0 |
| | 4 | 17.8 | 52.8 | 27.2 | 2.0 | 0.2 |
| | 3 | 7.5 | 31.3 | 51.5 | 8.9 | 0.8 |
| | 2 | 4.6 | 12.8 | 48.2 | 34.0 | 0.4 |
| Never | 1 | 0 | 33.1 | 34.2 | 32.7 | 0 |

**Table 1b. Two-Year Transition Matrices on Time Stress, with or without Births, SOEP 2002-12**

| | | | | | | |
|---|---|---|---|---|---|---|
| | | **HUSBAND** | | | | |
| | | **No child born or adopted in biennium** | | | | |
| **Stressed for Time:** | | Always | | | | Never |
| | | 5 | 4 | 3 | 2 | 1 |
| Always | 5 | 27.6 | 41.3 | 23.2 | 5.8 | 2.1 |
| | 4 | 6.7 | 48.3 | 34.0 | 8.3 | 2.7 |
| | 3 | 2.6 | 26.8 | 50.1 | 16.0 | 4.5 |
| | 2 | 2.1 | 16.8 | 41.5 | 29.5 | 10.1 |
| Never | 1 | 2.7 | 12.1 | 30.7 | 27.6 | 26.9 |
| | | **Child born or adopted in biennium** | | | | |
| | | Always | | | | Never |
| | | 5 | 4 | 3 | 2 | 1 |
| Always | 5 | 46.1 | 27.1 | 26.3 | 0.5 | 0.0 |
| | 4 | 5.2 | 54.0 | 29.6 | 8.7 | 2.5 |
| | 3 | 3.3 | 29.2 | 49.3 | 13.3 | 4.9 |
| | 2 | 0.2 | 22.8 | 34.4 | 30.7 | 11.9 |
| Never | 1 | 3.2 | 9.2 | 25.2 | 37.2 | 25.2 |
| | | **WIFE** | | | | |
| | | **No child born or adopted in biennium** | | | | |
| | | Always | | | | Never |
| | | 5 | 4 | 3 | 2 | 1 |
| Always | 5 | 23.6 | 47.7 | 18.7 | 8.2 | 1.8 |
| | 4 | 9.2 | 51.8 | 31.3 | 5.8 | 1.9 |
| | 3 | 3.7 | 28.9 | 47.5 | 15.8 | 4.1 |
| | 2 | 2.5 | 15.7 | 42.6 | 28.5 | 10.7 |
| Never | 1 | 2.9 | 13.2 | 31.4 | 29.0 | 23.5 |
| | | **Child born or adopted in biennium** | | | | |
| | | Always | | | | Never |
| | | 5 | 4 | 3 | 2 | 1 |
| Always | 5 | 17.1 | 60.6 | 22.3 | 0 | 0 |
| | 4 | 10.1 | 48.0 | 30.2 | 9.6 | 2.1 |
| | 3 | 1.7 | 36.5 | 45.3 | 14.9 | 1.6 |
| | 2 | 6.8 | 32.3 | 37.1 | 15.9 | 7.9 |
| Never | 1 | 5.6 | 22.7 | 22.6 | 29.4 | 19.7 |

**Table 2a. Transition Matrices on Financial Stress, with or without Births, HILDA 2001-12**

| | | | | **HUSBAND** | | |
|---|---|---|---|---|---|---|
| | | | | **No child born or adopted in year** | | |
| **Financial Satisfaction:** | | Dissatisfied | | | | Satisfied |
| | | 5 | 4 | 3 | 2 | 1 |
| Dissatisfied | 5 | 42.3 | 25.7 | 25.2 | 5.8 | 1.0 |
| | 4 | 15.4 | 29.2 | 35.7 | 18.4 | 1.3 |
| | 3 | 3.9 | 13.0 | 45.2 | 35.2 | 2.7 |
| | 2 | 0.7 | 2.6 | 20.2 | 65.1 | 11.4 |
| Satisfied | 1 | 0.9 | 1.2 | 7.8 | 40.2 | 49.9 |
| | | | | **Child born or adopted in year** | | |
| | | Dissatisfied | | | | Satisfied |
| | | 5 | 4 | 3 | 2 | 1 |
| Dissatisfied | 5 | 31.8 | 23.8 | 27.4 | 11.5 | 5.5 |
| | 4 | 13.5 | 28.8 | 33.2 | 22.3 | 2.2 |
| | 3 | 4.0 | 13.4 | 45.1 | 35.1 | 2.4 |
| | 2 | 0.9 | 3.8 | 25.3 | 63.8 | 6.2 |
| Satisfied | 1 | 0.2 | 2.9 | 7.2 | 48.6 | 41.1 |
| | | | | **WIFE** | | |
| | | | | **No child born or adopted in year** | | |
| | | Dissatisfied | | | | Satisfied |
| | | 5 | 4 | 3 | 2 | 1 |
| Dissatisfied | 5 | 30.4 | 27.3 | 28.0 | 12.0 | 2.3 |
| | 4 | 13.9 | 27.1 | 38.3 | 18.4 | 2.3 |
| | 3 | 3.5 | 12.8 | 45.4 | 34.7 | 3.6 |
| | 2 | 1.0 | 3.6 | 21.0 | 61.1 | 13.3 |
| Satisfied | 1 | 0.4 | 1.4 | 7.3 | 42.2 | 48.7 |
| | | | | **Child born or adopted in year** | | |
| | | Dissatisfied | | | | Satisfied |
| | | 5 | 4 | 3 | 2 | 1 |
| Dissatisfied | 5 | 22.5 | 26.4 | 42.0 | 9.1 | 0 |
| | 4 | 14.6 | 23.2 | 37.3 | 23.0 | 1.9 |
| | 3 | 5.5 | 15.2 | 48.2 | 28.3 | 2.8 |
| | 2 | 1.6 | 3.2 | 30.2 | 57.4 | 7.6 |
| Satisfied | 1 | 0.7 | 0.6 | 9.4 | 39.8 | 49.5 |

**Table 2b. Transition Matrices on Financial Stress, with or without Births, SOEP 2002-12**

| | | | | | | |
|---|---|---|---|---|---|---|
| | | **HUSBAND** | | | | |
| | | **No child born or adopted in biennium** | | | | |
| **Financial Satisfaction:** | | Dissatisfied | | | | Satisfied |
| | | 5 | 4 | 3 | 2 | 1 |
| Dissatisfied | 5 | 44.0 | 24.4 | 22.5 | 5.7 | 3.4 |
| | 4 | 13.8 | 33.6 | 34.3 | 16.4 | 1.9 |
| | 3 | 6.0 | 18.0 | 43.2 | 29.5 | 3.3 |
| | 2 | 1.5 | 5.7 | 22.2 | 60.5 | 10.1 |
| Satisfied | 1 | 1.1 | 3.4 | 13.8 | 37.1 | 44.6 |
| | | **Child born or adopted in biennium** | | | | |
| | | Dissatisfied | | | | Satisfied |
| | | 5 | 4 | 3 | 2 | 1 |
| Dissatisfied | 5 | 52.7 | 33.3 | 7.4 | 6.6 | 0 |
| | 4 | 8.0 | 42.4 | 34.8 | 12.6 | 2.2 |
| | 3 | 4.0 | 15.5 | 48.2 | 31.1 | 1.2 |
| | 2 | 2.4 | 10.0 | 23.2 | 57.5 | 6.9 |
| Satisfied | 1 | 0 | 5.9 | 7.6 | 42.6 | 43.9 |
| | | **WIFE** | | | | |
| | | **No child born or adopted in biennium** | | | | |
| | | Dissatisfied | | | | Satisfied |
| | | 5 | 4 | 3 | 2 | 1 |
| Dissatisfied | 5 | 35.6 | 29.4 | 19.4 | 13.1 | 2.5 |
| | 4 | 11.1 | 30.6 | 35.2 | 19.0 | 4.1 |
| | 3 | 5.1 | 17.8 | 39.1 | 34.0 | 4.0 |
| | 2 | 1.0 | 6.2 | 19.8 | 60.5 | 12.5 |
| Satisfied | 1 | 1.1 | 2.0 | 11.9 | 33.4 | 51.6 |
| | | **Child born or adopted in biennium** | | | | |
| | | Dissatisfied | | | | Satisfied |
| | | 5 | 4 | 3 | 2 | 1 |
| Dissatisfied | 5 | 44.7 | 19.2 | 28.0 | 6.4 | 1.7 |
| | 4 | 10.2 | 27.6 | 31.3 | 29.8 | 1.1 |
| | 3 | 7.8 | 24.5 | 32.6 | 31.9 | 3.2 |
| | 2 | 2.6 | 6.9 | 25.4 | 52.9 | 12.2 |
| Satisfied | 1 | 1.2 | 8.4 | 7.8 | 45.8 | 36.8 |

## DATA APPENDIX

### A. HILDA Survey

The sample comprises individuals who:

- are married or in a *de facto* relationship in the current wave and the previous wave;
- are not in a same-sex relationship;
- are in a relationship with the woman between 18 and 45 years of age (inclusive);
- indicate they have the same partner in both waves (and both partners agree);
- live in the same household (with no other persons other than dependents);
- report valid responses for time stress and financial stress in the current and previous wave; and
- report valid responses for them or their partner giving birth to (or adopting) a child in the previous 12 months – and both partners agree.

With respect to specific variables:

**Time stress** is constructed from answers to the question '*How often do you feel rushed or pressed for time?*', which is asked in the self-completion part of the survey. Possible answers are: Almost always; Often; Sometimes; Rarely; and Never. The original values attached to these responses range from 1 to 5, respectively, but scores are reversed so that higher values represent higher stress levels.

**Financial stress** is the answer to the question, asked in the interview portion of the survey, *'I am now going to ask you some questions about how satisfied or dissatisfied you are with some of the things happening in your life. I am going to read out a list of different aspects of life and, using the scale on SHOWCARD [..], I want you to pick a number between 0 and 10 that indicates your level of satisfaction with each. The more satisfied you are, the higher the number you should pick. The less satisfied you are, the lower the number.'* The actual showcard shows a scale represented by a line with equally spaced ticks numbered 0 to 10 (from left to right). Only the two end points of the scale are labelled; 0 denotes 'totally dissatisfied' and 10 denotes 'totally satisfied' (10). The third entry on the list of eight aspects of life the respondent is asked to rate is '*Your financial situation?*'

**Birth in past 'year'** is our measure of birth/adoption uses information collected in the household relationships grid. This gives a precise indicator for a birth between two waves (on average 12 months apart).

**Weekly hours paid employment plus commuting** is based on the respondents answer to the question, asked in the self-completion portion of the survey, '*How much time would you spend on each of the following activities in a typical week?*' Among the nine activities listed are '*Paid employment*' and '*Travelling to and from a place of paid employment*'. Respondents are instructed to make sure not to count any activity twice and if they do not spend time on a particular activity they record a zero. If either the paid employment or commuting component is missing, the sum (hours paid employment plus commuting) is also missing.

**Weekly hours home production** is based on the same question for which weekly hours of paid employment plus commuting is derived. The activities that make up home production are:

- Household errands, such as shopping, banking, paying bills, and keeping financial records (but do not include driving children to school and to other activities).

- Housework, such as preparing meals, washing dishes, cleaning house, washing clothes, ironing and sewing.
- Outdoor tasks, including home maintenance (repairs, improvements, painting etc.), car maintenance or repairs and gardening.
- Playing with your children, helping them with personal care, teaching, coaching or actively supervising them, or getting them to child care, school and other activities.
- Looking after other people's children (aged under 12years) on a regular, unpaid basis.
- Caring for a disabled spouse or disabled adult relative, or caring for elderly parents or parents-in-law

If any of the six home production components is missing, the sum (weekly hours home production) is also missing.

**Wages/Earnings** is the derived variable 'Current weekly gross wages and salary - all jobs ($) [imputed] [weighted topcode]', which despite the label is actually the gross weekly in a usual week It is the sum of wages and salary in the main job and other employment. Missing values for these components have been imputed (see Hayes and Watson, 2009). To preserve the weighted mean, top-coded variables have a value substituted which is the weighted average value of all cases which exceed the threshold.

**Unearned income** is constructed by taking household total gross income from all sources (excluding windfall income) for the preceding financial year and subtracting the component due to salaries and wages. Missing values for the components have been imputed (see Hayes and Watson, 2009). Note that this variable is a lagged variable by construction, although by how many months depends on when the respondent was interviewed (Australia's financial year runs from 1 July to 30 June, whereas the bulk of respondents are interviewed between September and November each year).

**Number of children** are derived variables constructed from the household relationships grid. They represent the number of dependent children of particular ages in the household (indicated age ranges in the variable names are inclusive), and include partner's children. In the event of a birth between waves, the number of children in the household aged 0 to 4 is reduced by 1 in the wave immediately following the birth only, to ensure the effect of the birth is picked up by the dedicated dummy variable 'birth in last year' and the new addition does not get double counted.

**Very good health** is based responses to the question, "In general, would you say your health is:" excellent, very good, good, fair, and poor. We include the first two as indicating very good health.

**B. German SOEP**

The sample comprises individuals who:

- are married or in a de-facto relationship in the current wave and two waves ago;
- are not in a same-sex relationship;
- are in a relationship and the woman is between 18 and 45 years of age inclusive;
- indicate they have the same partner in this wave as they did two waves ago (and both partners agree);
- live in the same household (with no other persons other than dependents);
- report valid responses for time stress and financial stress in the current wave and two waves ago; and
- report valid responses for them or their partner giving birth to (or adopting) a child in the previous 12 months – and both partners agree

With respect to specific variables:

**Time stress** is based on responses to a question, asked in the individual questionnaire 'Health and Illness' section, that reads: *Please think about the last four weeks. How often did it occur within this period of time, that [...]*. It then asks about 8 specific domains, one of them which reads *"..you felt rushed or pressed for time?"* Possible answers to this question are 'always', 'often', 'sometimes', 'hardly ever', and 'never'. These are recoded from 1 to 5 with higher levels representing greater stress.

**Financial stress** is derived from answers to the question, asked in the individual questionnaire 'Your current life situation' section: *How satisfied are you today with the following areas of your life? Please answer by using the following scale: 0 means "totally unhappy", 10 means "totally happy". How satisfied are you with [...]*. It then asks about 11 specific domains, one of which reads '*your household income?'* The actual questionnaire shows a scale of equally spaced blocks numbered 0 to 10 (from left to right). Only the two end points of the scale are labelled; 0 denotes 'totally unhappy' and 10 denotes 'totally happy'.

**Birth in last two 'years'** is based on the penultimate question in the individual questionnaire 'Family situation and background' section asks about 12 specific live events related to family. Specifically, the question reads: *Has your family situation changed since [wave-specific date]? Please indicate if any of the following apply to you and if so, when this change occurred*. One of the 12 family related life events is *'Had a child'*. Due to the interaction of the wave-specific date in the question itself, the date of birth, and the date of the actual interview it is not straightforward to get an indicator for a birth between this and the previous wave, but very easy to establish if a birth occurred between the current wave and two waves ago by using the variable *fnpar0593.*

**Weekly hours paid employment** is from the individual questionnaire 'Your current employment' section, respondents are first asked about their contractual working hours (if they are employed), followed by the question (which forms the basis of our variable): *And how many hours do your actual working-hours consist of including possible over-time?* with responses required for a week. Unlike the HILDA Survey data, this measure does not include commuting times.

**Hours home production** is based on a series of variables related to time use. In the section 'Your current life situation' of the individual questionnaire (which also collects the information on satisfaction with household finances) respondents are asked: *What does a typical weekday look like*

*for you? How many hours per day do you spend on the following activities? Please give only whole hours. Use zero if the activity does not apply!* It then asks about eight specific activities. We construct household production by summing the amount of time spent on: supporting persons in care; running errands; doing housework; caring for children; and doing repairs around the house. If any of the home production components is missing, the sum (weekly hours home production) is also missing.

**Wages/Earnings** is based on (generated) current gross labour income per month in Euro. The amount is divided by 1000 x 4.3 to obtain weekly amounts in EUR to correspond with the weekly amounts in AUD for the HILDA Survey data. The underlying question on which the variable is based comes from the individual questionnaire 'Your current employment' section and reads: *How high was your income from employment last month? If you received extra income such as vacation pay or back pay, please do not include this. Please do include overtime pay. If you are self-employed: Please estimate your monthly income before and after tax. Please fill in both: gross income, which means wages or salary before deduction of taxes and social security; and net income, which means the sum after deduction of taxes, social security, and unemployment and health insurance.* If the information was missing the data was imputed by the SOEP team (hence the reference to 'generated' in the variable description).

**Unearned income** is constructed by taking the household's pre-Government income and subtracting household labour income, both of which are annual amounts and apply to the previous calendar year. Household public transfers and Social Security pensions are then added in. This amount is divided by 52 (weeks) and 1000 to obtain a measure expressed in Euros per week. Pre-Government income is the sum of total family income from labor earnings, asset flows, private retirement income and private transfers. Labor earnings include wages and salary from all employment including training, self-employment income, and bonuses, overtime, and profit-sharing. Asset flows include income from interest, dividends, and rent. Private transfers include payments from individuals outside of the household including alimony and child support payments. In order to arrive at unearned income, the component from labor earnings is then subtracted. Specifically, labor earnings is the sum of income from the primary job, any secondary jobs, self-employment, service pay, 13th month pay, 14th month pay, Christmas bonus pay, holiday bonus pay, miscellaneous bonus pay, profit-sharing income, indemnity payments, and commuting expenses or travel grants.

**Numbers of children** are based on the information in the household question form. In case there has been a birth in between the last two waves (because of information on time and financial stress is collected biannually), the number of children aged 0 to 4 is reduced by 1 in the wave following the birth only, to ensure the effect of the birth is picked up by the dedicated dummy variable 'birth in last two years' and the new addition does not get double counted.

**Very good health** is based on responses to the question "How would you describe your current health?" Possible responses are very good, good, satisfactory, poor, and bad; we include the first two as indicating very good health.