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Abstract

Applying a propensity score matching approach to UK National Child Development Study, we find that experiencing family difficulties during childhood determines a negative and long-lasting impact on adult employment probabilities and wage. Standard econometric techniques and simulation based sensitivity analysis support our findings. The intensity of the disadvantage appears to increase with the number of recorded family difficulties. Moreover, we find that housing and economic problems are responsible for the more serious disadvantage, while disability of family members and disharmony act statistically significantly only if associated with other problems. Finally, the effect appears not to decline over the cohort working life.

Keywords: family difficulties, childhood, propensity score matching, labour market outcomes, causal effects.
JEL codes: J12, J13, C21

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I. Introduction

Individuals experiencing disadvantages in childhood may suffer direct and indirect consequences in their life development leading to negative performances in terms of different life outcomes, such as cognitive/non-cognitive development, educational attainment, labour market outcomes and social behavior.

In this paper, using data from the National Child Development Study (NCDS), a unique cohort database of British individuals born in 1958, we focus on the long-term effects of family difficulties during childhood on labour market outcomes, in different moments of their working life. The long-term implication of negative events during childhood, including family difficulties, may be relevant not only for their direct effects on life outcomes, but they may also represent some of the underlying causes of social immobility and social exclusion.

Interest in the long lasting impact of events experienced during childhood and/or adolescence on economic outcomes during adolescence and/or adulthood has significantly increased in recent years, possibly due to the reaffirmed importance, demonstrated by studies of children development in determining life outcomes (Cunha and Heckman, 2010), as well as to the increasing availability of long panel datasets or cohort studies. This has resulted in a number of empirical researches focusing on the long-term effect of many aspects of children development, using different econometric techniques. Possibly the most studied issues have concerned the long-term effects of health problems (or disability) and of educational patterns on different outcomes, such as educational achievements, cognitive and non-cognitive development, health and labour market outcomes in adulthood. In this context, Case, Fertig and Paxson (2005) quantify the lasting effects of childhood health and economic circumstances on adult health, employment and socioeconomic status. Lindeboom, Llena-Nozal and van der Klaauw (2006) find that early childhood conditions are important in explaining adult health and socioeconomic outcomes. Smith (2009) investigates the impact of childhood health on adult socio-economic status using information on siblings. Chevalier and Viitanen (2003) investigate the long-run labour market effects of teenage motherhood. Fletcher and Wolfe (2008) examine the effect of mental health during childhood on human capital accumulation, while Glewwe et al. (2001) focus on the relationship between early childhood nutrition and academic achievements. With regard to educational patterns and cognitive/non-cognitive development, Goodman and Sianesi (2005) evaluate the effects of undergoing any early education and of pre-school on cognitive and non-cognitive abilities, educational attainment and labour market performances, Blundell, Dearden and Sianesi (2005) use NCDS to estimate the wage returns to different educational investments using various estimation methods, while Heckman, Stixrud and Urzua (2006) examine the effects of cognitive and non-cognitive abilities on labour market performances and social behavior. Other economists have paid attention to the effect of antisocial behavior or conduct disorder on human capital formation (Koning et al., 2010), labour market outcomes (Healey, Knapp and Farrington, 2004) or both (Le et al., 2005). Slade and Wissow (2007) investigate the role of victimization during childhood on academic performance during adolescence. Other authors have focused on the long-term effect of family environment on adult life outcomes. In this context economists have mainly focused on the effects of family structure changes, due to parents' death or parental divorce, on different life consequences as marital/fertility status, earnings and income (Corak, 2001), education and income (Gruber, 2004) and students' performance (Sanz de Galdeano and Vuri, 2007).

Most of these empirical studies have shown that events during childhood have a considerable impact on economic outcomes in adulthood, even though the adopted econometric models play a role in determining the magnitude and statistical significance of the estimation results.

We are not the first using the family difficulties NCDS data to investigate the long-term effects of family difficulties during childhood. For example, Goodman and Sianesi (2005), estimating the impact of early education, use family difficulties information in a comparative perspective, to highlight the relative importance of pre-school treatment on cognitive and non-cognitive development with respect to family difficulties, father's social class and mother's years of education. Their OLS estimates show that family difficulties are responsible for the greatest negative impact on cognitive and non-cognitive development. Gregg and Machin (2000) examine the relationship between childhood disadvantages, including financial difficulties and father's unemployment, and life outcomes (educational attainments, juvenile delinquency and labour market performances) in early adulthood. Using standard OLS and Logit models, they find evidence that both financial troubles and father's unemployment tend to reduce educational and labour performances and increase contact with the police.

Our paper contributes to the literature focusing on the long-run labour market consequences of family difficulties in childhood in various aspects. First, we examine the labour market outcomes in different points in time of the individuals' adult life to study the evolution of the impact of family difficulties. Second, besides considering the occurrence of at least one family difficulty, we also distinguish by number of problems, to understand if cumulating problems is relevant to determine a stronger disadvantage. Third, we identify nine homogeneous groups of specific family difficulties through principal component analysis to understand whether specific family difficulties act differently on adult labor market outcomes.

Specifically, we identify the following groups: housing, economic (including financial and unemployment), physical difficulties of family members, mental problems of family members, death of parents (mother or father), family disharmony (including parental divorce or domestic tension), in-law-conflict, alcoholism problems of family members and other family difficulties. We use this information to estimate both the effect of a specific problem when it occurs alone and when occurs associated to other problems. Finally, besides using standard econometric models in a comparative perspective, we adopt matching estimators for non-experimental data (Rosenbaum and Rubin, 1983) based on the Conditional Independence Assumption (CIA) to attempt to identify the causal effect of family difficulties on labour market outcomes, as standard econometric techniques are usually based on strong assumptions that possibly undermine the credibility of estimation results in case of their violation. Finally, simulation-based sensitivity analysis is implemented to evaluate the stability of results with respect to possible failures of the CIA (see Ichino et. Al, 2008).

Our empirical analysis uses information from five sweeps of NCDS database. The 1958 sweep (originally titled Perinatal Mortality Survey) and the 1965 sweep provide information about family difficulties at age 7, that is our treatment, and numerous pre-determined variables about family background and individual' s characteristics making the CIA credible. Finally, from 1991, 2000 and 2009 NCDS sweeps, we draw information about labour market outcomes, namely wages and employment probabilities. Besides using standard OLS and logit estimators, we adopt propensity score matching estimators. Specifically, we use three matching methods: Gaussian Kernel Matching (GKM), Epanechnikov Kernel Matching (EKM) and Nearest Neighbor Matching (NNM) that differ in the way they deal with the trade-off between bias and efficiency.

Our findings suggest that propensity score matching results diverge somewhat from those of the standard econometric models, hence their use potentially reduces estimation bias. Overall, we find evidence that family difficulties during childhood decrease both employment probabilities and wages with parameter magnitudes and p values that differ somewhat according to the matching method used. Moreover, effects appear not to decline over the working life. On average, the occurrence of family problems in childhood reduces the chances of being employed by 4.5-5.4 % and employees' hourly wages by about 5.5-8.1%. Moreover we find that the negative effects on the adult labor market outcomes increase with the number of family problems experienced at age 7. Interestingly, specific family problems sometimes appear conjunctly. To take into account this association, we consider both the effect of family difficulties when they appear as the only problem and the effect of family difficulties when a specific difficulty appears associated with other family difficulties. Our estimation results show that while housing and economic problems whatever worsen the adult labor market perspective, illness/disability of family members and family disharmony problems, act significantly only if they are accompanied by other difficulties.

This paper is organized as follows. Section II describes the data. Section III presents the econometric section. Section IV discusses main results. Section V concentrates on sensitivity analysis, and, finally, Section VI concludes.

II. Data

The impact of family difficulties on adult labour market outcomes is investigated using information from the National Child Development Studies (NCDS). The NCDS is a cohort study that follows all UK births in the weeks 3–9 *March 1958*. The main aim of the study is to improve the understanding of the factors affecting human development over the whole lifespan. The NCDS has its origin in the Perinatal Mortality Survey (PMS) that collected information on a cohort of about 17,000 children in different times in their lives (1965, 1969, 1974, 1981, 1991, 1999-2000, 2004-2005 and 2008-2009). The available data reduced considerably since 1991, consisting in about 11,000 observations in the latest sweeps. Several papers have focused on the attrition and selection bias problems in NCDS data. Dearden, et Al. (1997) show that attrition in NCDS has tended to take place among individuals with lower ability and lower educational qualifications. More recently, Hawkes and Plewis's (2006) found that attrition and non-response can be associated with only few significant predictors, supporting the view that the data are still reasonably representative of this population.

We use five sweeps of the NCDS database. From the original 1958 and 1965 sweeps we draw information to identify treated and untreated individuals and suitable covariates to control for non-random selection into treatment, namely family difficulties during childhood. 1991, 2000 and 2009 NCDS sweeps are used to recover information about labour market performances in adulthood, namely employment and wages.

Family difficulties are identifiable using social environmental information gathered when cohort member was seven years old. Differently from many variables contained in the NCDS database, family difficulties variables are derived for completion of the health visitor report (from statutory or voluntary organizations)[1], without questioning of the family, with the aim to determine the social

[1] See the 2nd sweep NCDS questionnaires (1965).

environment in which children were growing up. Family difficulties include housing, financial, unemployment, physical illness or disability, mental illness or neurosis, mental sub-normality, death of child's parent(s), divorce, separation or desertion, domestic tension, in-law-conflict, alcoholism and other difficulties. This information is considered in various ways. First, it has been used as a whole to identify a single and general family difficulties indicator. Second, we have distinguished by number of family difficulties (one, two and three or more), to investigate the existence of a negative cumulative effect. Third we identify homogenous sub-groups of family difficulties to sketch out if they act differently on adult labor market outcomes. We operate a reduction of the original specific sub-groups pairing some of them on the basis of principal component analysis (PCA) and homogeneity. Specifically, PCA identifies five latent factors resuming the information contained in the thirteen original variables (see table 1).

[Table 1 about here]

In some cases we decompose the five groups identified according to their typology, homogeneity and interpretability. This leaves us nine groups: housing, economic (financial and unemployment), physical, mental (mental illness and mental sub-normality), death (death of father and death of mother), family disharmony (divorce/separation and domestic tension), in law conflict, alcoholism and other problems. Since, the latter three groups are small in numbers and/or hard to be interpreted, estimation analysis is carried out just on the first six groups.

NCDS provides a large set of detailed pre-treatment information including those on cohort members and their parents. This richness allows us to identify a number of observable variables affecting both treatments and outcomes, making the CIA credible. With this in mind, we select the following controls: sex of the cohort member, his/her birth weight, not walking alone by 1.5 years, talking by 2 years, wet by night after 5 years, disabling condition at age 7, number of cigarettes smoked prior to pregnancy by the mother of the cohort member, English spoken at home, father's and mother's education, mother's age at the birth of the cohort member, father's social class when the cohort member was 7 years old, parents' marital status, and regional dummies.

The labour market outcomes are employment status and wages at different ages of the subjects (33, 42 and 51 years old). Employment status includes all employees or self-employed, either full-time or part-time. The individual wage is referred to the logarithm of the net hourly pay (at constant prices of 2009) received by an employee. It is calculated using information about the net pay, the period covered and the usual hours (including overtime) worked per week. The resultant hourly wage variable was subjected to top and bottom coding at 1% to reduce bias from outliers, and for the same reason we excluded from our sample individuals declaring to work less than 7 hours per week or more than 84 hours per week.

Since we are interested in examining the evolution of the impact of family difficulties, we focus on individuals for which we have no missing information about the outcomes across the years investigated. This leaves us repeated cross-sectional information on 8008 individuals for the employment equations and 3872 individuals for the wage equations (Table 2 contains descriptive information distinguishing by the total treatment indicator).

[Table 2 about Here]

In the employment equation, 1332 individuals experience at least one family difficulty (totalizing 2094 family problems). This means that the treated group is composed by 1332 individuals when the treatment is "having experienced at least one family difficulty" (Case A). Treated individuals are also distinguished in terms of number of family difficulties experienced. Specifically, we isolate three sub-groups identifying as many specific treatments groups: one family difficulty, two family difficulties, three or more family difficulties (Case B). Table 3 resumes this information.

[Table 3 about Here]

Finally, we have identified nine specific sub-groups of family difficulties. Table 4 informs about their frequency and about their distribution in terms of number of family difficulties. Interestingly, some family difficulties are more likely to be experienced as the only problem, while other family difficulties, when appear, are more likely to be associated with one or more different family difficulties.

[Table 4 about Here]

For example, in about 60% of cases, housing and death family difficulties appear as the only problem of the treated individuals, while this percentage declines to 35% in case of family harmony difficulties, to 28% in case of economic difficulties and just to 4% in case of alcoholism difficulties. For example, when appears in a multiple form, economic problems are more likely to be associated with housing, physical and family harmony difficulties; while family harmony difficulties are more likely to be associated with economic and mental problems[2]. Obviously, the association among different family difficulties opens questions about the identification of the effect of each specific family difficulty. To take into account this problem, we isolate many treatment groups separating single family difficulties from multiple family difficulties. In the latter case, we associate each single family difficulty with one or more different family difficulties. This leaves us eighteen treatment groups, twelve of which are effectively used in our econometric analysis. In fact, the family difficulty “other” is not considered as it is too vague, and difficulties “in-law-conflict” and “alcoholism” are not considered as they are too small groups. Similar considerations are possible for the wage sample, that we do not present for brevity.

Finally, table 5 displays observed average employment probabilities and wages comparing between treated and untreated individuals and referring to the total family difficulties treatment. T-test about the significance of the differentials between the two groups is also reported. Both observed employment and wage differentials remain quite constant across the period under investigation. Specifically, observed employment differential, which corresponds to the unconditional average treatment effect, is about 5% in 1991 and 2000, and about 6% in 2009, while observed log-real wage differential is, respectively, 0.09, 0.11 and 0.10. In all cases, differences are statistically significant at 1% level.

[Table 5 about here]

III. The model

We are interested in estimating the causal effect of family difficulties during childhood on adult labour market outcomes. Where family difficulties are taken as the treatment, the causal effect we wish to estimate corresponds to the average treatment effect on the treated (ATT). Ideally, we would need to compare the adult labour market outcomes of children experiencing family difficulties (the treated) to the same children had they lived in family without any difficulties. However, as we can observe each child only in one state, the outcomes for treated had they not been treated is an unobserved counterfactual. The average treatment effect (ATE) corresponds to the

[2] Specific information about the frequency of the association among different family difficulties are available upon request.

ATT only if the occurrence of any family difficulties is unrelated to outcomes. As we cannot exclude that there exist some factors or characteristics that affect both the occurrence of family difficulties and children outcomes, probably ATT and ATE will differ. An unbiased estimate of ATT can be obtained if treatment satisfies the Conditional Independence Assumption (CIA). In other words, treatments are at random once controlling for a suitable set of covariates. It remains possible that we are not provided with relevant information that affects both treatments and outcomes (selection on unobservables) even though we are confident that the remaining source of selection is substantially reduced as the information provided to us from NCDS is detailed and we are controlling for many channels of indirect correlation (Unconfoundedness Assumption: UA, hereafter).

More formally, it is possible to observe $Y_1|D=1$, the outcome of treated Y_1 if having family difficulties as a child (D=1), and $Y_0|D=0$, the outcome of untreated Y_0 if not having family difficulties as a child (D=0). The difference between the two outcomes corresponds to the ATE:

$$(1)\quad ATE = E(Y_1|D=1 - Y_0|D=0)$$

while we would like to estimate the ATT

$$(2)\quad ATT = E(Y_1|D=1 - Y_0|D=1) = E(Y_1 - Y_0|D=1)$$

That is, the mean effect of experiencing family difficulties rather than not on the children who occurred family difficulties - the impact of treatment on the treated. However, $Y_0|D=1$ is not observable and if impacts are heterogeneous ATE and ATT diverge. Conditioning on an adequate set of covariates, one can remove all systematic differences in outcomes in the untreated state (CIA)

$$(3)\quad (Y_0 \perp D) \mid X$$

The outcome of untreated is independent of the treatment conditional on some set of observed covariates X.

Most of the existing applied studies estimate effects by standard parametric methods like OLS, and logit. However, these methods require strong assumptions on the functional form like linearity and additivity of regressors. The assumption of a linear or logistic function permits data from all observations to be combined into one estimate, but the validity of that estimate is suspect when one deals with people having very different characteristics. We rely on the propensity score matching (PSM) technique firstly proposed by Rosenbaum and Rubin (1983). PSM is a method in which no functional form restrictions on the relation between outcome, treatment, and control variables need be made. This technique matches each treated individual with an untreated individual having observable characteristics such that the probability of being in the treated group is very similar. Therefore, treated observations whose characteristics are not similar to anybody belonging to the control group - falling outside the common support region - are dropped from the analysis[3]. To examine the support condition, we plotted propensity scores of the two groups in Fig. 1. In the first quadrant, the top histogram reports observations who experienced at least a family difficulty (the D=1 group), while the bottom histogram represents those without any family problem in childhood (the D=0 group). The horizontal axis defines intervals of the propensity score and the height (or depth) of each bar on the vertical axis indicates the fraction of the relevant sample with scores in the corresponding interval. Similarly, we reported propensity scores for the case in which the treatment under consideration is represented by the exact number of family difficulties[4]. Fortunately, the Figure 1 shows that in all cases the overlapped region is wide and it is not necessary to eliminate a large number of observations[5].

[Figure 1 about here]

PSM method requires the balancing property to be satisfied. This is achieved when observations with the same propensity score have the same distribution of observable characteristics independently of treatment status. If this property is not satisfied this means that the two groups are too different in terms of observables and additional information would be needed[6]. Obtaining a specification that satisfies the balancing property does not assure us that we are credibly addressing the possible "selection on unobservables". This would be achieved by taking into account all

[3] For a complete discussion on matching methods, see also Dehejia and Wahba (2002).

[4] The plots of propensity scores of the six specific problems (housing, economic, physical, mental, death and disharmony), either when they are the only problems and when accompanied by other problems, suggest similar deductions. They are not reported for brevity but are available upon request from the authors.

[5] The number of observations dropped because not satisfying the common support condition is usually small and does not exceed 16%.

[6] We check that this condition holds by means of the Stata command "pscore" employed by Becker and Ichino (2002) set at default parameters.

relevant factors that affect both family difficulties and labour market outcomes. We are confident that the unobserved selection bias is reduced due to the uniquely rich source of information provided by the NCDS dataset. The dataset contains detailed information on the child condition and characteristics and on parents' characteristics and behaviors, taken from parents and health visitors reports at the time when the child born or was 7 years old. Concerning child, we include covariates containing information on the child's gender, birth weight and on physical, cognitive and non-cognitive abilities (not walking alone by 1.5 years, talking by 2 years, wet by night after 5 years, disabling condition at age 7). Moreover, we account for information on parents' demographic and socio-economic characteristics: mother's age, age-squared, parents' years of schooling, mother's marital status, father's social class, number of cigarettes smoked by the mother prior to pregnancy and the language commonly spoken at home. We are confident that all these factors can be assumed to be unaffected by treatment.

The causal effect we estimate (ATT) corresponds to the *total* effect - the summation of direct and the indirect effects - because we believe it to be more interesting from a public policy perspective.

We expect the direct effect of treatment to have a negative impact on the labour market outcomes. With regard to the indirect effects, on the one hand we expect that family problems may reduce on the human capital accumulation. On the other hand, these problems may trigger children efforts and determination at school and make them achieve higher and/or quicker outcomes at labour market. However, our view is that the net average indirect effect is negative like the direct one. Thus, we expect the total effect to be negative, but we are not able to make prediction on the mid and long term intensity of such effects.

A variety of different methods can be used to implement matching. All methods construct an estimate of the expected unobserved counterfactual for each treated observation by taking a weighted average of the outcomes of the untreated observations. What differs is the specific form of the weights. Though asymptotically all techniques should produce the same results, in finite samples the choice of the PSM estimator can be important as generally a trade-off between bias and variance arises. In order to check that our results are not driven by the kind of PSM technique chosen, we use three widely used methods that deal differently with the trade-off between bias and variance: Gaussian Kernel, Epanechnikov Kernel and Nearest Neighbor Matching (NNM). Gaussian and Epanechnikov Kernel matching can be seen as weighted regressions of the counterfactual outcome on an intercept with weights given by the kernel weights. Weights depend on the distance between each individual from the control group and the treated observation for which the counterfactual is estimated (see Smith and Todd, 2005). One major advantage of these approaches is the smaller variance, which is achieved because more information is used. A drawback of these methods is that also observations that are bad matches may be used. In order to reduce this possible source of bias, we impose the bandwidth of the Epanechnikov Kernel PSM to be quite tight (0.01). This means that we use only a subset of the outcomes of the untreated observations to estimate the unobserved counterfactual of each treated observation. The third method is the most straightforward matching estimator. An individual from the comparison group is chosen as a matching partner for a treated individual that is closest in terms of propensity score[7].

Though we are provided with a large and informative set of pre-treatment variables, the UA might not be considered plausible. To check whether and to what extent obtained results are sensitive to the possible failure of the *UA*, we refer to the sensitivity analysis for propensity-score matching estimator proposed by Ichino, Mealli and Nannicini (2008) and the routine implemented for Stata by Nannicini (2007), based on the initial intuition by Rosenbaum and Rubin (1983) and Rosenbaum (1987). The approach by Ichino, Mealli and Nannicini (2008) relies on the hypothesis that assignment to treatment may be confounded given the set of observable variables but it is unconfounded given observed and an unobservable variable, U.

(4) $Pr(D = 1|Y_0, Y_1, W, U) \; = \; Pr(D = 1|W, U)$

Ichino, Mealli and Nannicini (2008) suggest a method to obtain point estimates of the ATT under different possible scenarios of deviation from the CIA without relying on any parametric model for the outcome. Given the parameters that characterize the distribution of U , it is possible to predict a value of the confounding factor for each treated and control observation and estimate the ATT adding the simulated U to the set of the matching variables. Changing the assumptions about the distribution of U, one can assess the robustness of the ATT to various hypothetical source of failure of the UA.

More formally, let consider a binary outcome like in our study employment status or, if the outcome is continuous, a binary transformation of the outcome with Y1, Y0 $\epsilon\{0,1\}$. The distribution of the unobserved binary confounding variable U can be derived by specifying the parameters

(5) $Pr(U = 1|D = i, Y = j, X) = \; Pr(U = 1|D = i, Y = j) \; \equiv \; pij$

[7] For a detailed discussion, see Caliendo and Kopeining (2008).

With $i, j \in \{0,1\}$, which correspond to the probability that U=1 in each of the four groups defined by treatment status D_i and outcome value Y_j.

As underlined by Ichino, Mealli and Nannicini (2008), the choice of the parameters pij for the distribution of U should be plausible and a good strategy could be to impose a distribution of U similar to the empirical distribution of observable covariates.

Eq. (5) assumes that the distribution of U given D and Y does not vary with X. However, this assumption relying on the irrelevance of X in the simulation of U does not alter the interpretation of the sensitivity parameters. Ichino, Mealli and Nannicini (2008) show that by increasing $(|p01 - p00| > 0)$ and $(|p1. - p0.| > 0)$ the potential confounder has a non-monotonic increasing impact respectively on the untreated outcome and on the selection into treatment disregarding how the confounding factor is correlated with X. Easily interpretable measures of the association between U and Y_0 (outcome effect) and U and D (treatment effect) are the following average odds ratios:

$$\Gamma \equiv \sum_{r=1}^{R} \frac{1}{R} \left[\frac{Pr(Y=1|D=0,U=1,X)/Pr(Y=0|D=0,U=1,X)}{Pr(Y=1|D=0,U=0,X)/Pr(Y=0|D=0,U=0,X)} \right]$$

and

$$\Lambda \equiv \sum_{r=1}^{R} \frac{1}{R} \left[\frac{Pr(D=1|\,U=1,X)/Pr(D=0|\,U=1,X)}{Pr(D=1|\,U=0,X)/Pr(D=0|\,U=0,X)} \right]$$

where R indicates the number of replications, Γ represents the outcome effect and Λ is for the selection effect.

Also standard parametric methods are employed in order to compare results. Depending on the outcome under observation, we use two alternative estimators. We performed logit for employment status and linear regression for the log of hourly wage. The set of covariates corresponds to the one used for estimating propensity score.

We restrict analysis to children participating at all five sweeps in order to compare the same individuals at each point in time and examine changes in effects between mid and long term. Attrition and item non-response reduce considerably usable information. As pointed out by Dearden et Al. (1997), attrition may make under-represented observations with lower ability and lower educational qualifications. It is likely that among the individuals with family problems those who obtain lower labour market outcomes would be those with worse performances at school. For this reason, we can consider our estimates (that are non-corrected for attrition) as conservative.

IV. Estimation results

Our estimation results using Gaussian and Epanechnikov kernel matching and Nearest Neighbor Matching techniques[8] are reported in tables 6-11. As mentioned above, we consider two different labour market types of outcome: employment status and employees log of hourly wages. For each treatment (namely, whether experiencing at least one, exactly one, exactly two, at least three, housing, economic, physical, mental, death and disharmony, as the only or coupled with others, family difficulties) and subjects' age considered (33, 42 and 51 years old), we report estimated average treatment effects of treated (ATT), bootstrapped standard errors, t-statistics, and the number of treated and controls used by each matching technique.

For what concerns the treatment represented by experiencing at least one family difficulty in childhood (Table 6), we find that the estimated ATT is always statistically significant at the 1% level with both Kernel matching estimators with significant parameters ranging between -0.045 and -0.054 for the employment status outcome and between 0.056 and 0.084 for the log hourly wage outcome[9]. We obtain lower parameter values and t-stats using NNM method.

[Table 6 about here]

Turning our view to the treatments represented by whether the subject had i) only one family problem, ii) two or iii) three or more (Table 7), we observe that ATT coefficients are almost always significant at conventional levels and have values increasing in number of problems: i (-0.032/-

[8] Estimations are performed by STATA's commands "attk" and "attnd" employed by Becker and Ichino (2002), set at default parameters but bandwidth at 0.01 in the case of Epanechnikov Kernel, and with options "logit" and "comsup". The latter is enabled to so that ATT estimations only use observations inside the common support. Standard errors are computed using the bootstrap technique with replications set at 500.

[9] Reported coefficients of the log of real wage equations are similar to the percent change in wages due to treatment that can be obtained by a simple transformation: exp(treatment coefficient) - 1. Therefore, the corresponding average wage reduction is comprised in the range between 5.5 and 8.1 %.

0.04), ii (-0.049/-0.060) and iii (-0.07/-0.135) for employment status. This evidence confirms the expected view that more numerous family problems contribute to produce more serious effects in adult labour market outcomes. Considering the wage outcome, results are less statistically significant and the increasing path emerges less clearly but seems confirmed.

[Table 7 about here]

Results from Tables 6 and 7 suggest that family difficulties have long term lasting effects that do not tend to disappear even after more than forty years. Moreover, the estimated ATTs do not show any declining path through the two decades under observation (1991-2009).

When we consider specific family difficulties, we distinguish between (I) the case where the problem is the only attributed to the family or rather (II) it is associated to one or more others. For case (I), we find evidence of a statistically significant negative effect of housing and economic family problems in childhood on adult employment status (Table 8). However, it is interesting to note that results substantially differ when we consider case (II), as reported in Table 9. Not only housing and economic but also physical, mental and disharmony family difficulties show frequent significant parameters. In all cases but economic, we can notice that parameters' values are larger and standard errors smaller in (II) than in (I), resulting in higher T-stats. This finding suggests that if housing and economic problems in a family have long term negative consequences on children, physical, mental and disharmony family problems produce serious negative effects only when the family also experiences other family problems. This result may be explained both in terms of cumulative effect and/or of association effect. On the one hand, the cumulative effect indicates that physical, mental or disharmony problems during childhood do not deteriorate *per se* adult labour market perspective, but they have a negative impact if accompanied by other problems. While a family can challenge effectively one problem, may not succeed when numerous problems appear at the same time. On the other hand, the association effect reveals that the estimated negative effect of physical, mental or disharmony problems may be due to problems (e.g., housing and economic) that are possibly the latent responsible for poor adult labour market outcomes.

With regard to the wage outcome, we find that housing and economic problems have even more intense significant negative effect in percentage terms. We cannot reject the hypothesis that the other problems do not have an impact on wages of children in adulthood. Moreover, comparing results of case (I) and (II), we observe that significant parameters are similar for all specific problems (Tables 10 and 11).

[Tables 8-11 about here]

Now we examine results from regression-based methods to assess whether using standard parametric methods lead to biased estimates and - if it is the case - assess its quantitative relevance. Table 12 shows estimated effects of the treatment variables assessing, in turn, whether experiencing at least one, exactly one, exactly two and three or more family difficulties for all labour market outcomes, years considered. With regard to employment status, we find that all coefficients on treatment status are statistically significant at conventional levels with values ranging between -0.029 and -0.088. The negative effect appears to become more intense as the number of family problems grows. Overall, our evidence on the employment outcome suggests that regression-based methods underestimate the true negative impact as we find slightly smaller parameter values in absolute terms than those obtained with matching methods. When the dependent is the log of hourly wage, the parameters on treatment status are significant at 1% when the treatment is that the family occurred at least one problem or exactly one problem (i). The evidence is mixed in the remaining two cases (ii and iii). The significant coefficients range between -0.065 and 0.12 and are therefore similar to those obtained with PSM. Consistently with our previous findings, such effects seem to last persistently over the entire working lives and do not show any clear trend toward a reduction.

[Table 12 about here]

Considering specific problems as treatments, Table 13 and 14 show standard method estimates of the parameters on the treatments consisting in the cases where (I) only a specific family difficulty occurred and (II) the specific problem was accompanied by others. For what concerns employment outcome, estimated parameters are smaller than with PSM and seem to confirm that, while housing and economic are important either in case (I) and (II), the other problems are statistically significant only in case (II). Moreover for all family difficulties the effect appears more intense in case (II) than in case (I). Results referring to the wage outcome are similar to those obtained with PSM and significant parameters are on average slightly smaller.

[Tables 13 and 14 about here]

V. Sensitivity analysis

As mentioned in the text above, the reliability of previous PSM estimates crucially depends on the plausibility of the UA, which is not testable. The large set of variables we include in the matching model as covariates allow us to be confident we are controlling for the most relevant confounders. Moreover, in what follows we refer to simulation-based sensitivity analysis to assess the reliability of estimated results with respect to hypothetical failures of the UA.

Our sensitivity analysis consists in two alternative strategies. The first approach consists in simulating a confounder whose parameters are imposed to be equal to those of the matching variables. The motivation is that the unobserved confounder U and covariates are likely to have similar parameters of association pij. The second approach allow us to evaluate outcome and selection effects and ATT estimates induced by the simulated confounder for increasing absolute values of d and s. We perform four groups of PSM estimations adding simulated confounders with on turn the following combinations of parameters: 1) d>0 and s>0; 2)d<0 and s<0; 3) d>0 and s<0; 4) d<0 and s>0.

Estimates from such simulation-based sensitivity analysis are obtained by using the Stata routine "sensatt" implemented by Nannicini (2007) and are reported in tables 15 and 16[10]. For the ease of brevity, we consider only sensitivity analysis referred to the case where the treated observations are those whom occurred of at least one family difficulty at the age of 7 and controls are those with no reported difficulty. Moreover we only concentrate on the outcome of employment status and the year of 2009. The adopted PSM technique is the Gaussian Kernel.

[Tables 15 and 16 about here]

[10] The "sensatt" routine simulates a binary confounder with parameters defined on the basis of the two alternative approaches described in the text. The simulated confounder is then treated as an additional regressor in the estimation of the propensity score and in the subsequent computation of the ATT. The procedure is repeated for a large number of simulations of the confounder (that we set at 500) and the final ATT is calculated as the average of the individual ATTs across all the simulations. The standard error is computed as the average variance of the ATT across all the simulations.

Table 15 reports results with the confounding factor calibrated to mimic different observable variables, included in the matching set. The baseline ATT estimate (-0.054) represents the value obtained with no confounder in the matching set. On the subsequent row, the confounder is hypothesized to have the same pij values of the gender variable. In this case, the baseline ATT estimate would result subjected to a positive outcome effect (1.983) and to no selection effect (0.918), resulting in a very small change in ATT (-0.053). Similarly, we proceed in the other rows choosing parameters pij equal to those of the other binary variables[11] in the matching set: birth weight, disabling condition at age 7, wet by night after 5 years, speech talking by 2 years, no walking alone by 1.5 years, marital status of the mother, whether father is employed in manual work, age of the mother, father education. We find that the baseline ATT estimate is very stable as simulated ATTs are very similar and never predict parameter values that diverge more than 7.4 %.
Table 16 shows results with pij imposed such that all combinations of d and s (until 0.4 in absolute terms) are considered. As discussed above, at increasing values of d and s correspond more intense outcome and selection effects, and therefore potentially greater instability on ATTs. In cases 1) and 2) the increase of the absolute values of d and s turns out to produce more intense negative ATT estimates. In cases 3) and 4) the effect is the opposite. In all cases, results seem to remain stable also in presence of intense outcome and selection effects. However, for extremely high absolute values of d and s, the estimated ATTs approach to zero and become even positive coefficients (in particular, in case 3)). How much are such extremely high absolute values of d and s plausible? Looking at the last two columns of Table 15, the correct answer seems to be *very little*, as the actual values of d and s taken from the matching variables are always very small and never exceed 0.16 and 0.15, respectively. We can conclude that even if the unobserved confounding factor had outcome and selection effects larger than those of observed matching variables, it would not cause excessive change in ATT estimates.

VI. Conclusions

This paper focuses on the causal effect of family difficulties at age 7 on adult labour market outcomes - employment and wage - applying the propensity score matching approach to NCDS data.

[11] The variables “age of the mother” and “father education” were not originally binary but they have been transformed for the simulation exercise.

We find that experiencing at least one family difficulty in childhood decreases both employment probabilities and wage in adulthood. Standard econometric techniques and robustness checks by simulation based sensitivity analysis give support to our findings.

We also find that the disadvantage increases as the number of problems also increases, pointing in direction of a negative cumulative effect, and that the negative effect is not declining over the cohort working life.

Interestingly, looking at the effect of specific problems (economic, housing, physical disability of family member, mental disability of family member, death of parent, family disharmony) we find that they do not affect homogenously adult labour market outcomes. On the one hand, if a specific problem is the only problem experienced at age 7, then only housing and economic problems significantly worsen the adult labour market performances. On the other hand, if a problem is associated with other problems, then also the existence of physical or mental family difficulties and family disharmony in childhood negatively affects labour market perspective in the adulthood.

Family difficulties during childhood may have further implications on other socio-economic aspects of the subjects' adult life (e.g., educational attainments, health outcomes and criminal activities) that we have not addressed in this paper. On the other hand, poor labour market outcomes may lead to social exclusion and/or social immobility during adulthood.

Our findings suggest that disadvantaged positions on the labour market, and their consequences, could be partially prevented, paying attention to life development during childhood. Policies aimed to reduce the impact of family difficulties in the early age possibly reduce their direct and indirect long-standing effects. At the same time, it seems that interventions should not be homogenous across family problems during childhood: economic, housing and accumulation of family problems should get specific attention by public policies.

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Table 1. Principal component analysis: identification of homogenous groups of family difficulties

NCDS family difficulty	Our groups	Factor1	Factor2	Factor3	Factor4	Factor5
Housing	Housing	0,0943	0,0333	-0,0910	-0,0796	**0,6586**
Financial	Economic	**0,3978**	0,0241	-0,0934	0,0122	0,1736
Physical illness of family member	Physical	*0,3799*	-0,2457	0,0753	0,1785	-0,0163
Mental illness of family member	Mental	-0,0013	-0,0007	**0,5771**	-0,0170	-0,1647
Mental subnormality of family member	Mental	0,0678	-0,2124	**0,5369**	-0,0234	0,0574
Death of father	Death	0,0623	-0,0764	-0,1654	**0,5994**	0,2091
Death of mother	Death	-0,0555	0,0477	0,0767	**0,6107**	-0,2731
Divorce	Family Disharmony	-0,0744	**0,4672**	-0,2152	0,0790	0,0810
Domestic tension	Family Disharmony	-0,0320	**0,4569**	0,0584	-0,0575	-0,0303
In-law-conflict	In-law-conflict*	-0,2235	0,1839	*0,3615*	-0,0519	0,3027
Unemployment	Economic	**0,4623**	-0,0628	0,0017	-0,0754	-0,0899
Alcholism	Alcholism*	0,2051	0,2725	-0,1140	-0,1512	-0,5034
Other	Other*	-0,0960	0,2040	0,1461	0,3215	0,0565
* not analyzed						

Note. Our elaboration based on NCDS data

Table 2. Descriptive statistics by labour market outcome

	Employment equations				Wage equations			
	Control group (obs. 6676)		Treatment group (obs. 1332)		Control group (obs. 3181)		Treatment group (obs. 601)	
Variable's name	Mean	Std.Dev.	Mean	Std.Dev.	Mean	Std.Dev.	Mean	Std.Dev.
Birth weight	0.949	0.220	0.923	0.267	0.948	0.221	0.932	0.252
English spoken at home	0.752	0.432	0.748	0.434	0.767	0.423	0.745	0.436
Disabling condition at age 7	0.023	0.149	0.056	0.231	0.022	0.146	0.052	0.221
No walking alone by 1.5 years	0.030	0.172	0.043	0.202	0.028	0.165	0.037	0.188
Speech-talking by 2 years	0.812	0.390	0.923	0.267	0.824	0.381	0.923	0.266
Wet by night after 5 years	0.078	0.269	0.133	0.340	0.083	0.276	0.158	0.365
Number of cigarettes prior pregnancy	3.487	5.853	4.857	6.670	3.464	5.762	4.979	6.771
Male	0.481	0.500	0.456	0.498	0.494	0.500	0.479	0.500
Father education	2.988	2.331	2.492	1.961	3.021	2.283	2.511	1.982
Mother education	3.024	2.155	2.733	1.888	3.040	2.073	2.687	1.834
Missing father education	0.265	0.442	0.303	0.460	0.251	0.434	0.304	0.461
Missing mother education	0.252	0.434	0.260	0.439	0.235	0.424	0.265	0.441
Mother's age	26.175	8.117	26.696	7.829	26.250	8.136	26.857	7.836
Mother's age square	751.00	359.35	773.93	379.24	755.24	365.34	782.59	378.37
Missing mother's age	0.051	0.220	0.035	0.183	0.049	0.217	0.035	0.184
Father is manual social class at 7	0.528	0.499	0.681	0.466	0.545	0.498	0.689	0.463
Married	0.926	0.262	0.917	0.276	0.928	0.259	0.915	0.279
North	0.067	0.249	0.079	0.270	0.071	0.256	0.098	0.298
North-West	0.107	0.310	0.128	0.335	0.112	0.315	0.133	0.340
East & West Riding	0.077	0.266	0.074	0.262	0.077	0.267	0.090	0.286
North Midlands	0.073	0.260	0.068	0.252	0.077	0.266	0.077	0.266
Midlands	0.082	0.275	0.103	0.304	0.082	0.274	0.093	0.291
East	0.079	0.270	0.071	0.257	0.073	0.260	0.052	0.221
South-East	0.163	0.369	0.180	0.384	0.150	0.357	0.173	0.379
South	0.059	0.235	0.073	0.260	0.056	0.229	0.055	0.228
South-West	0.061	0.240	0.044	0.204	0.059	0.236	0.040	0.196
Wales	0.048	0.213	0.070	0.255	0.047	0.212	0.068	0.252
Scotland	0.089	0.285	0.110	0.313	0.105	0.306	0.121	0.327

Note. Our elaboration based on NCDS data.

Table 3. Number of family difficulties

<table>
<tr><th></th><th></th><th colspan="2">Case A</th><th colspan="2">Case B</th></tr>
<tr><th>N° of Family Difficulties</th><th>Obs.</th><th>Group</th><th>Obs.</th><th>Group</th><th>Obs.</th></tr>
<tr><td>0</td><td>6.676</td><td>Control</td><td>6.676</td><td>Control</td><td>6.676</td></tr>
<tr><td>1</td><td>845</td><td rowspan="6">Treatment</td><td rowspan="6">1332</td><td>1st Treatment</td><td>845</td></tr>
<tr><td>2</td><td>298</td><td>2nd Treatment</td><td>298</td></tr>
<tr><td>3</td><td>115</td><td rowspan="4">3rd Treatment</td><td rowspan="4">189</td></tr>
<tr><td>4</td><td>63</td></tr>
<tr><td>5</td><td>10</td></tr>
<tr><td>6</td><td>1</td></tr>
</table>

Note. Our elaboration based on NCDS data

Table 4. Distribution of specific family difficulties by number of difficulties

	Number of family difficulties						
	Single difficulty	Multiple difficulties					
	1	2	3	4	5	6	Total
Housing	240	82	50	36	7	1	416
	57.69%	19.71%	12.02%	8.65%	1.68%	0.24%	19.87%
Economic	123	156	92	52	8	0	431
	28.54%	36.19%	21.35%	12.06%	1.86%	-	20.58%
Physical	114	79	36	23	2	1	255
	44.71%	30.98%	14.12%	9.02%	0.78%	0.39%	12.18%
Mental	79	63	32	30	7	1	212
	37.26%	29.72%	15.09%	14.15%	3.30%	0.47%	10.12%
Death	67	26	8	1	3	0	105
	63.81%	24.76%	7.62%	0.95%	2.86%	-	5.01%
Family disharmony	144	129	71	54	9	1	408
	35.29%	31.62%	17.40%	13.24%	2.21%	0.25%	19.48%
In-law-conflict	30	26	15	16	5	1	93
	32.26%	27.96%	16.13%	17.20%	5.38%	1.08%	4.44%
Alcholism	2	8	15	17	3	0	45
	4.44%	17.78%	33.33%	37.78%	6.67%	-	2.15%
Other	46	27	26	23	6	1	129
	35.66%	20.93%	20.16%	17.83%	4.65%	0.78%	6.16%
Total	845	596	345	252	50	6	2094

Note. Our elaboration based on NCDS data

Table 5. Observed employment probabilities and wages

Employment						
	1991		2000		2009	
Group	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
Control	0.818	0.386	0.879	0.326	0.871	0.335
Treatment	0.768	0.422	0.830	0.376	0.812	0.391
t-test H0: $\mu 1=\mu 0$	4.262		4.840		5.725	
Log-Real Wages						
	1991		2000		2009	
Group	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
Control	1.976	0.389	2.057	0.563	2.268	0.438
Treatment	1.885	0.368	1.944	0.523	2.169	0.414
t-test H0: $\mu 1=\mu 0$	5.293		4.555		5.133	

Note. Our elaboration based on NCDS data. Real wages are at constant prices of 2009.

Table 6. Estimation Results. Labour Market outcomes: employment status and log of employees hourly wage. Treatment: Whether the family has at least one of the listed problems. Propensity Score Matching Estimates

		Kernel Gaussian					Kernel Epanechnikov (0.01)					Nearest Neighbor Matching				
Outcomes	*year*	*treat.*	*contr.*	*ATT*	*s.e.*	*t*	*treat.*	*contr.*	*ATT*	*s.e.*	*t*	*treat.*	*contr.*	*ATT*	*s.e.*	*t*
employment	*1991*	1332	6015	**-0.045**	0.013	-3.516	1332	6015	**-0.039**	0.013	-2.962	1332	1315	-0.032	0.020	-1.577
	2000	1332	6015	**-0.045**	0.011	-3.903	1332	6015	**-0.044**	0.011	-3.902	1332	1315	**-0.034**	0.017	-2.032
	2009	1332	6015	**-0.054**	0.012	-4.691	1332	6015	**-0.049**	0.012	-4.008	1332	1315	-0.024	0.018	-1.327
wage	*1991*	601	2874	**-0.068**	0.015	-4.45	601	2874	**-0.056**	0.015	-3.769	601	556	***-0.047***	0.027	-1.712
	2000	601	2874	**-0.084**	0.023	-3.7	601	2874	**-0.065**	0.02	-3.275	601	556	-0.039	0.038	-1.042
	2009	601	2874	**-0.073**	0.02	-3.69	601	2874	**-0.056**	0.016	-3.456	601	556	-0.022	0.031	-0.71

Note: Our elaboration based on NCDS data. Propensity score matching estimations are performed by means of the STATA commands attk and attnd using default parameters and options “logit”, “comsup” and, in the case of Kernel Epanechnikov PSM, options epan and bwidth(0.01) are added to the attk command. Statistically significant at 1 and 5 % are reported in bold; significant at 10% in bold and italic. *T-stats* are obtained by using standard errors bootstrapped with 500 replications (*s.e.*).

Table 7. Estimation Results. Labour Market outcomes: employment status and log of employees hourly wages. Treatments: whether the family has either one, two, or three or more family problems. Propensity Score Matching Estimates.

			Kernel Gaussian					Kernel Epanechnikov (0.01)					NNM				
Outcomes	*Treatments*	*year*	*treat.*	*contr.*	*ATT*	*s.e.*	*t*	*treat.*	*contr.*	*ATT*	*s.e.*	*t*	*treat.*	*contr.*	*ATT*	*s.e.*	*t*
employ-ment	1 Problem	*1991*	845	6002	**-0.038**	0.014	-2.698	845	6002	**-0.032**	0.016	-2.041	845	913	-0.027	0.025	-1.067
		2000	845	6002	**-0.038**	0.013	-2.911	845	6002	**-0.035**	0.014	-2.565	845	913	-0.023	0.020	-1.158
		2009	845	6002	**-0.040**	0.014	-2.831	845	6002	**-0.032**	0.014	-2.318	845	913	***-0.041***	0.022	-1.878
	2 Problems	*1991*	298	6589	**-0.055**	0.027	-2.023	298	6589	***-0.050***	0.025	-1.953	298	352	-0.057	0.041	-1.383
		2000	298	6589	**-0.052**	0.023	-2.280	298	6589	**-0.054**	0.024	-2.259	298	352	***-0.060***	0.034	-1.754
		2009	298	6589	**-0.058**	0.023	-2.514	298	6589	**-0.049**	0.023	-2.148	298	352	-0.037	0.036	-1.027
	3 or more Problems	*1991*	189	5629	**-0.075**	0.033	-2.274	189	5629	**-0.075**	0.031	-2.402	189	227	***-0.089***	0.051	-1.730
		2000	189	5629	**-0.073**	0.028	-2.571	189	5629	**-0.070**	0.031	-2.267	189	227	-0.071	0.044	-1.627
		2009	189	5629	**-0.131**	0.033	-3.947	189	5629	**-0.125**	0.035	-3.567	189	227	**-0.135**	0.048	-2.818
wage	1 Problem	*1991*	391	2780	**-0.070**	0.018	-3.878	391	2780	**-0.061**	0.020	-3.053	391	374	-0.053	0.033	-1.601
		2000	391	2780	**-0.104**	0.027	-3.831	391	2780	**-0.092**	0.029	-3.190	391	374	-0.048	0.046	-1.051
		2009	391	2780	**-0.076**	0.021	-3.591	391	2780	**-0.061**	0.023	-2.660	391	374	-0.059	0.038	-1.541
	2 Problems	*1991*	139	3149	***-0.060***	0.035	-1.734	139	3149	-0.047	0.034	-1.387	139	135	-0.079	0.057	-1.394
		2000	139	3149	-0.054	0.044	-1.220	139	3149	-0.042	0.047	-0.898	139	135	-0.055	0.076	-0.725
		2009	139	3149	**-0.078**	0.040	-1.980	139	3149	-0.062	0.039	-1.587	139	135	-0.016	0.070	-0.225
	3 or more Problems	*1991*	71	2879	**-0.140**	0.044	-3.159	71	2879	***-0.087***	0.047	-1.830	71	81	-0.103	0.077	-1.342
		2000	71	2879	***-0.123***	0.065	-1.907	71	2879	-0.074	0.066	-1.132	71	81	-0.146	0.109	-1.340
		2009	71	2879	**-0.109**	0.053	-2.069	71	2879	-0.078	0.060	-1.288	71	81	-0.118	0.088	-1.343

Note. Our elaboration based on NCDS data. Propensity score matching estimations are performed by means of the STATA commands attk and attnd using default parameters and options logit and comsup. Reported coefficients of the log of real wage equations are similar to the percent change in wages due to treatment that can be obtained by a simple transformation: exp(treatment coefficient) - 1. *T-stats* are obtained by using standard errors bootstrapped with 500 replications (*s.e.*). Statistically significant at 1 and 5 % are reported in bold; significant at 10% in bold and italic. Real wages are at constant prices of 2009.

Table 8. Specific family difficulties. Employment status. Only one problem.

		Kernel Gaussian					*Kernel Epanechnikov (0.01)*					*NNM*				
		treat.	*contr.*	*ATT*	*s.e.*	*t*	*treat.*	*contr.*	*ATT*	*s.e.*	*t*	*treat.*	*contr.*	*ATT*	*s.e.*	*t*
Housing	*1991*	240	6518	**-0.056**	0.027	-2.086	240	6518	-0.038	0.027	-1.405	240	295	***-0.073***	0.044	-1.666
	2000	240	6518	**-0.048**	0.024	-2.002	240	6518	-0.038	0.026	-1.485	240	295	***-0.071***	0.036	-1.954
	2009	240	6518	-0.018	0.024	-0.734	240	6518	-0.006	0.024	-0.249	240	295	-0.017	0.038	-0.447
Economic	*1991*	123	5667	-0.101	0.039	-0.734	123	5667	***-0.079***	0.040	-1.972	123	150	***-0.111***	0.062	-1.782
	2000	123	5667	-0.049	0.034	-1.446	123	5667	-0.046	0.035	-1.335	123	150	-0.047	0.048	-0.982
	2009	123	5667	**-0.136**	0.043	-3.138	123	5667	**-0.127**	0.040	-3.171	123	150	**-0.158**	0.061	-2.568
Physical	*1991*	114	6624	0.008	0.035	0.244	114	6624	0.017	0.038	0.450	114	133	0.038	0.064	0.590
	2000	114	6624	-0.043	0.034	-1.266	114	6624	-0.036	0.036	-1.007	114	133	-0.001	0.059	-0.025
	2009	114	6624	0.027	0.028	0.960	114	6624	0.043	0.031	1.401	114	133	0.061	0.056	1.096
Mental	*1991*	79	5383	-0.012	0.043	-0.282	79	5383	-0.020	0.047	-0.429	79	95	-0.020	0.074	-0.273
	2000	79	5383	-0.047	0.041	-1.165	79	5383	-0.053	0.041	-1.297	79	95	-0.050	0.063	-0.787
	2009	79	5383	-0.027	0.042	-0.625	79	5383	-0.025	0.040	-0.617	79	95	-0.037	0.065	-0.568
Death	*1991*	67	6171	-0.072	0.053	-1.371	67	6171	-0.081	0.058	-1.398	67	86	***-0.145***	0.086	-1.687
	2000	67	6171	0.018	0.041	0.441	67	6171	0.006	0.045	0.129	67	86	0.040	0.071	0.558
	2009	67	6171	-0.048	0.045	-1.071	67	6171	-0.040	0.052	-0.769	67	86	-0.093	0.075	-1.237
Disharmony	*1991*	144	6534	-0.027	0.033	-0.808	144	6534	-0.046	0.033	-1.392	144	172	-0.063	0.055	-1.143
	2000	144	6534	-0.051	0.032	-1.588	144	6534	***-0.057***	0.033	-1.746	144	172	-0.031	0.047	-0.655
	2009	144	6534	-0.054	0.033	-1.625	144	6534	-0.055	0.034	-1.594	144	172	-0.022	0.048	-0.456

Note: Our elaboration based on NCDS data. Propensity score matching estimations are performed by means of the STATA commands attk and attnd using default parameters and options "logit", "comsup" and, in the case of Kernel Epanechnikov PSM, options epan and bwidth(0.01) are added to the attk command. Statistically significant at 1 and 5 % are reported in bold; significant at 10% in bold and italic. *T-stats* are obtained by using standard errors bootstrapped with 500 replications (*s.e.*).

Table 9. Specific family difficulties. Employment status. A problem associated with others.

		Kernel Gaussian					*Kernel Epanechnikov (0.01)*					*NNM*				
		treat.	*contr.*	*ATT*	*s.e.*	*t*	*treat.*	*contr.*	*ATT*	*s.e.*	*t*	*treat.*	*contr.*	*ATT*	*s.e.*	*t*
Housing	*1991*	176	5400	**-0.086**	0.034	-2.497	176	5400	**-0.089**	0.036	-2.473	176	200	***-0.089***	0.051	-1.741
	2000	176	5400	-0.054	0.031	-1.749	176	5400	***-0.061***	0.033	-1.829	176	200	-0.063	0.043	-1.469
	2009	176	5400	**-0.100**	0.032	-3.152	176	5400	**-0.097**	0.033	-2.929	176	200	**-0.099**	0.047	-2.105
Economic	*1991*	308	6617	**-0.087**	0.025	-3.502	308	6617	**-0.083**	0.026	-3.196	308	432	***-0.074***	0.041	-1.784
	2000	308	6617	**-0.078**	0.024	-3.274	308	6617	**-0.072**	0.025	-2.939	308	432	**-0.081**	0.036	-2.283
	2009	308	6617	**-0.124**	0.026	-4.792	308	6617	**-0.115**	0.025	-4.515	308	432	**-0.101**	0.037	-2.741
Physical	*1991*	141	5211	**-0.106**	0.037	-2.832	141	5211	**-0.104**	0.039	-2.654	141	161	-0.072	0.059	-1.212
	2000	141	5211	-0.047	0.033	-1.447	141	5211	-0.042	0.034	-1.225	141	161	-0.030	0.051	-0.586
	2009	141	5211	**-0.109**	0.037	-2.953	141	5211	**-0.103**	0.039	-2.657	141	161	**-0.115**	0.054	-2.103
Mental	*1991*	133	5311	***-0.071***	0.038	-1.885	133	5311	***-0.064***	0.037	-1.756	133	154	0.012	0.062	0.201
	2000	133	5311	**-0.087**	0.035	-2.485	133	5311	***-0.074***	0.038	-1.935	133	154	-0.055	0.056	-0.980
	2009	133	5311	**-0.086**	0.035	-2.452	133	5311	***-0.067***	0.04	-1.665	133	154	**-0.120**	0.054	-2.225
Death	*1991*	38	6253	***-0.134***	0.076	-1.773	38	6253	-0.083	0.08	-1.039	38	49	0.048	0.113	0.427
	2000	38	6253	-0.115	0.07	-1.635	38	6253	-0.077	0.069	-1.109	38	49	-0.105	0.098	-1.074
	2009	38	6253	-0.107	0.071	-1.51	38	6253	-0.101	0.077	-1.314	38	49	-0.156	0.105	-1.479
Disharmony	*1991*	264	6568	-0.03	0.026	-1.178	264	6568	-0.029	0.028	-1.016	264	321	0.008	0.042	0.192
	2000	264	6568	**-0.067**	0.027	-2.486	264	6568	**-0.066**	0.027	-2.423	264	321	-0.059	0.041	-1.454
	2009	264	6568	**-0.087**	0.026	-3.404	264	6568	**-0.076**	0.029	-2.609	264	321	***-0.069***	0.038	-1.787

Note: Our elaboration based on NCDS data. Propensity score matching estimations are performed by means of the STATA commands attk and attnd using default parameters and options "logit", "comsup" and, in the case of Kernel Epanechnikov PSM, options epan and bwidth(0.01) are added to the attk command. Statistically significant at 1 and 5 % are reported in bold; significant at 10% in bold and italic. *T-stats* are obtained by using standard errors bootstrapped with 500 replications (*s.e.*).

Table 10. Specific family difficulties. Wage. Only one problem.

		Kernel Gaussian					*Kernel Epanechnikov (0.01)*					*NNM*				
		treat.	*contr.*	*ATT*	*s.e.*	*t*	*treat.*	*contr.*	*ATT*	*s.e.*	*t*	*treat.*	*contr.*	*ATT*	*s.e.*	*t*
Housing	*1991*	118	2678	**-0.084**	0.033	-2.572	118	2678	***-0.061***	0.035	-1.749	118	123	-0.033	0.059	-0.552
	2000	118	2678	**-0.152**	0.045	-3.355	118	2678	**-0.118**	0.048	-2.447	118	123	-0.067	0.084	-0.801
	2009	118	2678	**-0.104**	0.04	-2.577	118	2678	***-0.072***	0.04	-1.832	118	123	-0.002	0.066	-0.029
Economic	*1991*	52	2592	**-0.102**	0.043	-2.357	52	2592	-0.061	0.046	-1.323	52	55	-0.028	0.079	-0.362
	2000	52	2592	***-0.122***	0.07	-1.749	52	2592	-0.067	0.07	-0.957	52	55	-0.068	0.116	-0.587
	2009	52	2592	**-0.103**	0.05	-2.063	52	2592	-0.043	0.056	-0.772	52	55	0.012	0.096	0.123
Physical	*1991*	51	2514	-0.071	0.059	-1.192	51	2514	-0.057	0.062	-0.921	51	52	-0.039	0.096	-0.412
	2000	51	2514	0.004	0.062	0.065	51	2514	0.024	0.069	0.343	51	52	0.118	0.121	0.973
	2009	51	2514	-0.082	0.059	-1.392	51	2514	-0.065	0.065	-0.997	51	52	0.033	0.112	0.293
Mental	*1991*	32	2412	***-0.089***	0.052	-1.735	32	2412	**-0.108**	0.05	-2.178	32	34	***-0.184***	0.1	-1.839
	2000	32	2412	-0.156	0.146	-1.068	32	2412	-0.116	0.135	-0.854	32	34	**-0.418**	0.187	-2.238
	2009	32	2412	-0.1	0.075	-1.343	32	2412	2412	-0.126	0.078	32	34	***-0.234***	0.129	-1.822
Death	*1991*	31	1517	-0.067	0.079	-0.854	31	1517	-0.014	0.093	-0.148	31	31	0.089	0.116	0.766
	2000	31	1517	-0.195	0.15	-1.3	31	1517	-0.17	0.157	-1.082	31	31	-0.029	0.187	-0.156
	2009	31	1517	-0.03	0.078	-0.384	31	1517	0.022	0.096	0.23	31	31	0.178	0.143	1.242
Disharm ony	*1991*	68	3125	-0.067	0.042	-1.6	68	3125	-0.065	0.047	-1.38	68	67	-0.059	0.075	-0.79
	2000	68	3125	-0.065	0.058	-1.115	68	3125	-0.064	0.067	-0.953	68	67	0.042	0.118	0.358
	2009	68	3125	-0.027	0.051	-0.534	68	3125	-0.026	0.056	-0.467	68	67	0.041	0.093	0.437

Note. Our elaboration based on NCDS data. Propensity score matching estimations are performed by means of the STATA commands attk and attnd using default parameters and options logit and comsup. Reported coefficients of the log of real wage equations are similar to the percent change in wages due to treatment that can be obtained by a simple transformation: exp(treatment coefficient) - 1. *T-stats* are obtained by using standard errors bootstrapped with 500 replications (*s.e.*). Statistically significant at 1 and 5 % are reported in bold; significant at 10% in bold and italic. Real wages are at constant prices of 2009.

Table 11. Specific family difficulties. Wage. A problem associated with others.

		Kernel Gaussian					*Kernel Epanechnikov (0.01)*					*NNM*				
		treat.	*contr.*	*ATT*	*s.e.*	*t*	*treat.*	*contr.*	*ATT*	*s.e.*	*t*	*treat.*	*contr.*	*ATT*	*s.e.*	*t*
	1991	71	2416	**-0.106**	0.048	-2.214	71	2416	**-0.097**	0.047	-2.065	71	72	-0.021	0.075	-0.283
Housing	*2000*	71	2416	**-0.141**	0.067	-2.095	71	2416	**-0.118**	0.067	-1.757	71	72	-0.051	0.108	-0.47
	2009	71	2416	-0.081	0.052	-1.57	71	2416	-0.061	0.057	-1.069	71	72	-0.008	0.088	-0.094
	1991	128	2881	**-0.103**	0.03	-3.432	128	2881	**-0.074**	0.032	-2.323	128	132	-0.056	0.047	-1.199
Economic	*2000*	128	2881	**-0.102**	0.046	-2.223	128	2881	-0.057	0.05	-1.155	128	132	-0.003	0.079	-0.044
	2009	128	2881	**-0.132**	0.038	-3.45	128	2881	**-0.105**	0.04	-2.604	128	132	**-0.114**	0.065	-1.747
	1991	60	2456	**-0.105**	0.052	-2.002	60	2456	-0.064	0.054	-1.184	60	57	-0.027	0.086	-0.31
Physical	*2000*	60	2456	-0.050	0.066	-0.756	60	2456	0.003	0.069	0.038	60	57	0.030	0.117	0.258
	2009	60	2456	-0.036	0.058	-0.61	60	2456	-0.002	0.065	-0.029	60	57	0.086	0.103	0.833
	1991	60	2358	***-0.103***	0.056	-1.849	60	2358	-0.077	0.064	-1.211	60	67	-0.070	0.093	-0.753
Mental	*2000*	60	2358	-0.036	0.074	-0.492	60	2358	-0.008	0.079	-0.102	60	67	-0.003	0.121	-0.022
	2009	60	2358	-0.070	0.06	-1.16	60	2358	-0.049	0.069	-0.712	60	67	-0.021	0.103	-0.205
	1991	16	1805	-0.112	0.109	-1.024	16	1805	-0.108	0.11	-0.982	16	16	0.098	0.172	0.573
Death	*2000*	16	1805	-0.17	0.178	-0.956	16	1805	-0.246	0.165	-1.489	16	16	0.074	0.255	0.289
	2009	16	1805	-0.106	0.132	-0.805	16	1805	-0.156	0.131	-1.186	16	16	0.161	0.199	0.808
	1991	110	3096	-0.052	0.04	-1.295	110	3096	-0.052	0.038	-1.358	110	112	0.014	0.064	0.223
Disharmony	*2000*	110	3096	0.016	0.051	0.309	110	3096	0.051	0.054	0.944	110	112	0.105	0.099	1.063
	2009	110	3096	-0.059	0.042	-1.405	110	3096	-0.038	0.047	-0.818	110	112	0.005	0.073	0.066

Note. Our elaboration based on NCDS data. Propensity score matching estimations are performed by means of the STATA commands attk and attnd using default parameters and options logit and comsup. Reported coefficients of the log of real wage equations are similar to the percent change in wages due to treatment that can be obtained by a simple transformation: exp(treatment coefficient) - 1. *T-stats* are obtained by using standard errors bootstrapped with 500 replications (*s.e.*). Statistically significant at 1 and 5 % are reported in bold; significant at 10% in bold and italic. Real wages are at constant prices of 2009.

Table 12. Results from standard estimation methods. Total problems

		Employment Status			Log Hourly Wage		
		1991	2000	2009	1991	2000	2009
at least one family difficulty	*coeff*	-0.036*	-0.036*	-0.043*	-0.065*	-0.080*	-0.070*
	t-stat	(-3.22)	(-3.78)	(-4.45)	(-3.99)	(-4.03)	(-3.71)
	R2 (p/a)	0.105	0.054	0.032	0.193	0.18	0.152
	Obs	8008	8008	8008	3782	3782	3782
1 Problem	*coeff*	-0.029**	-0.030*	-0.030**	-0.066*	-0.094*	-0.070*
	t-stat	(-2.17)	(-2.64)	(-2.56)	(-3.42)	(-3.97)	(-3.15)
	R2 (p/a)	0.107	0.054	0.03	0.191	0.184	0.154
	Obs	7521	7521	7521	3572	3572	3572
2 Problems	*coeff*	-0.046**	-0.041**	-0.043**	-0.034	-0.031	-0.068***
	t-stat	(-2.17)	(-2.40)	(-2.44)	(-1.09)	(-0.82)	(-1.85)
	R2 (p/a)	0.107	0.056	0.029	0.19	0.182	0.153
	Obs	6974	6974	6974	3320	3320	3320
3 Problems or more	*coeff*	-0.055**	-0.051**	-0.088*	-0.120*	-0.092***	-0.073
	t-stat	(-2.16)	(-2.50)	(-4.46)	(-2.74)	(-1.73)	(-1.46)
	R2 (p/a)	0.112	0.06	0.034	0.187	0.178	0.151
	Obs	6865	6865	6865	3252	3252	3252

Note: Our elaboration based on NCDS data. Reported coefficients of the log of real wage equations are similar to the percent change in wages due to treatment that can be obtained by a simple transformation: exp(treatment coefficient) - 1. R2 (p/a) is the pseudo or adjusted squared R when the outcome is employment status (logit) or wage (robust OLS), respectively. T-stats are obtained by using standard errors bootstrapped with 500 replications. Real wages are at constant prices of 2009. Statistically significant at 1, 5 and 10 % are reported with *, **, ***, respectively.

Table 13. Results from standard estimation methods. Specific problems. Employment status

		Employment Status					
		Only one problem			*More problems*		
		1991	*2000*	*2009*	*1991*	*2000*	*2009*
Housing	*coeff*	-0.032	-0.032***	-0.006	-0.076*	-0.046**	-0.072*
	t-stat	(-1.39)	(-1.66)	(-0.30)	(-2.75)	(-2.09)	(-3.36)
	R2 (p/a)	0.111	0.057	0.029	0.109	0.059	0.031
	Obs	6916	6916	6916	6852	6852	6852
Economic	*coeff*	-0.073**	-0.033	-0.086*	-0.066*	-0.055*	-0.085*
	t-stat	(-2.40)	(-1.22)	(-3.54)	(-3.22)	(-3.35)	(-5.30)
	R2 (p/a)	0.111	0.057	0.032	0.108	0.06	0.035
	Obs	6799	6799	6799	6984	6984	6984
Physical	*coeff*	0.024	-0.023	0.047	-0.078*	-0.03	-0.068*
	t-stat	-0.68	(-0.83)	-1.38	(-2.83)	(-1.24)	(-3.01)
	R2 (p/a)	0.111	0.058	0.031	0.114	0.06	0.033
	Obs	6790	6790	6790	6817	6817	6817
Mental	*coeff*	-0.025	-0.05	-0.022	-0.049***	-0.059**	-0.054**
	t-stat	(-0.59)	(-1.59)	(-0.65)	(-1.71)	(-2.48)	(-2.21)
	R2 (p/a)	0.111	0.06	0.031	0.113	0.059	0.032
	Obs	6755	6755	6755	6809	6809	6809
Death	*coeff*	-0.065	0.015	-0.049	-0.077	-0.070***	-0.073***
	t-stat	(-1.46)	-0.35	(-1.34)	(-1.60)	(-1.72)	(-1.66)
	R2 (p/a)	0.109	0.055	0.027	0.111	0.056	0.028
	Obs	6743	6743	6743	6714	6714	6714
Disharmony	*coeff*	-0.036	-0.050**	-0.046***	-0.025	-0.054*	-0.068*
	t-stat	(-1.18)	(-2.08)	(-1.85)	(-1.12)	(-3.03)	(-3.87)
	R2 (p/a)	0.11	0.056	0.029	0.109	0.055	0.03
	Obs	6820	6820	6820	6940	6940	6940

Note: Our elaboration based on NCDS data. Reported coefficients of the log of real wage equations are similar to the percent change in wages due to treatment that can be obtained by a simple transformation: exp(treatment coefficient) - 1. R2 (p/a) is the pseudo or adjusted squared R when the outcome is employment status (logit) or wage (robust OLS), respectively. T-stats are obtained by using standard errors bootstrapped with 500 replications. Real wages are at constant prices of 2009. Statistically significant at 1, 5 and 10 % are reported with *, **, ***, respectively.

Table 14. Results from standard estimation methods. Specific problems. Log of Hourly Wage

		Log Hourly Wage					
		Only one problem			*More problems*		
		1991	*2000*	*2009*	*1991*	*2000*	*2009*
Housing	*coeff*	-0.067**	-0.111*	-0.076***	-0.100**	-0.116**	-0.068
	t-stat	(-1.97)	(-2.69)	(-1.93)	(-2.30)	(-2.20)	(-1.34)
	R2 (p/a)	0.187	0.185	0.153	0.191	0.186	0.154
	Obs	3299	3299	3299	3252	3252	3252
Economic	*coeff*	-0.096***	-0.120***	-0.058	-0.079**	-0.087**	-0.109*
	t-stat	(-1.89)	(-1.96)	(-1.00)	(-2.42)	(-2.19)	(-2.88)
	R2 (p/a)	0.19	0.188	0.157	0.192	0.185	0.156
	Obs	3233	3233	3233	3309	3309	3309
Physical	*coeff*	-0.055	-0.016	-0.075	-0.090***	-0.055	-0.026
	t-stat	(-1.08)	(-0.25)	(-1.27)	(-1.90)	(-0.96)	(-0.47)
	R2 (p/a)	0.189	0.183	0.155	0.19	0.185	0.154
	Obs	3232	3232	3232	3241	3241	3241
Mental	*coeff*	-0.119***	-0.084	-0.124***	-0.106**	-0.001	-0.058
	t-stat	(-1.85)	(-1.09)	(-1.68)	(-2.23)	(-0.02)	(-1.06)
	R2 (p/a)	0.189	0.185	0.156	0.189	0.182	0.152
	Obs	3213	3213	3213	3241	3241	3241
Death	*coeff*	-0.063	-0.084	-0.009	-0.109	-0.119	-0.104
	t-stat	(-0.95)	(-1.06)	(-0.13)	(-1.19)	(-1.08)	(-1.00)
	R2 (p/a)	0.184	0.18	0.151	0.184	0.18	0.151
	Obs	3212	3212	3212	3197	3197	3197
Disharmony	*coeff*	-0.058	-0.105***	-0.024	-0.046	-0.012	-0.047
	t-stat	(-1.31)	(-1.95)	(-0.46)	(-1.28)	(-0.28)	(-1.15)
	R2 (p/a)	0.183	0.178	0.149	0.181	0.175	0.149
	Obs	3249	3249	3249	3291	3291	3291

Note: Our elaboration based on NCDS data. Reported coefficients of the log of real wage equations are similar to the percent change in wages due to treatment that can be obtained by a simple transformation: exp(treatment coefficient) - 1. R2 (p/a) is the pseudo or adjusted squared R when the outcome is employment status (logit) or wage (robust OLS), respectively. T-stats are obtained by using standard errors bootstrapped with 500 replications. Real wages are at constant prices of 2009. Statistically significant at 1, 5 and 10 % are reported with *, **, ***, respectively.

Table 15. Sensitivity Analysis I. Potential confounders like observed variables

	p11	p10	p01	p00	ATT	outcome effect	selection effect	change %	p1.	p0.	d= p01-p00	s= p1.-p0.
baseline	0.00	0.00	0.00	0.00	-0.054							
confounder like												
male	0.49	0.33	0.5	0.34	-0.053	1.983	0.918	-1.85	0.46	0.48	0.16	-0.02
birth weight	0.93	0.9	0.95	0.93	-0.053	1.59	0.652	-1.85	0.92	0.95	0.02	-0.03
disabling condition at 7	0.05	0.06	0.02	0.04	-0.052	0.563	2.579	-3.70	0.06	0.02	-0.02	0.04
wet by night after 5 years	0.14	0.11	0.08	0.08	-0.053	0.971	1.803	-1.85	0.13	0.08	0.00	0.05
speech talking by 2 years	0.92	0.94	0.82	0.79	-0.055	1.218	2.801	1.85	0.92	0.81	0.03	0.11
no walking alone by 1.5	0.04	0.07	0.03	0.04	-0.054	0.779	1.43	0.00	0.04	0.03	-0.01	0.01
marital status mother	0.92	0.92	0.93	0.93	-0.054	0.93	0.894	0.00	0.92	0.93	0.00	-0.01
father's manual work	0.68	0.7	0.52	0.57	-0.050	0.805	1.918	-7.41	0.68	0.53	-0.05	0.15
age mother	0.5	0.52	0.51	0.54	-0.054	0.888	0.96	0.00	0.50	0.51	-0.03	-0.01
father education	0.1	0.06	0.2	0.15	-0.050	1.464	0.408	-7.41	0.09	0.19	0.05	-0.10

Note: Our elaboration based on NCDS data. Simulation-based sensitivity analysis based on observed variables in the matching set. Employment status. Year 2009. Treatment: experiencing at least one family difficulty in childhood. PSM technique: Gaussian Kernel. Estimates obtained by using the STATA 11 routine implemented by Nannicini “sensatt”. Replications set at 500. Options logit and comsup added.

Table 16. Sensitivity Analysis II. Potential confounders by increasing absolute values of d and s

1) d>0 and s>0

	ATT	s.e.	Out. Eff.	Sel. Eff.	ATT	s.e.	Out. Eff.	Sel. Eff.	ATT	s.e.	Out. Eff.	Sel. Eff.	ATT	s.e.	Out. Eff.	Sel. Eff.
	s=0.1				s=0.2				s=0.3				s=0.4			
d=0.1	**-0.056**	0.001	1.487	1.491	**-0.059**	0.002	1.509	2.257	**-0.063**	0.003	1.49	3.583	**-0.07**	0.004	1.52	7.142
d=0.2	**-0.059**	0.001	2.432	1.517	**-0.066**	0.002	2.42	2.278	**-0.076**	0.003	2.427	3.628	**-0.087**	0.004	2.453	6.501
d=0.3	**-0.063**	0.002	4.643	1.534	**-0.074**	0.002	4.617	2.311	**-0.089**	0.003	4.6	3.638	**-0.106**	0.004	4.623	6.359
d=0.4	**-0.065**	0.002	15.546	1.5	**-0.08**	0.003	15.573	2.259	**-0.101**	0.003	15.782	3.499	**-0.124**	0.003	15.828	5.96

2) d<0 and s<0

	ATT	s.e.	Out. Eff.	Sel. Eff.	ATT	s.e.	Out. Eff.	Sel. Eff.	ATT	s.e.	Out. Eff.	Sel. Eff.	ATT	s.e.	Out. Eff.	Sel. Eff.
	s=-0.1				s=-0.2				s=-0.3				s=-0.4			
d=-0.1	**-0.059**	0.001	0.299	0.503	**-0.068**	0.002	0.298	0.305	**-0.08**	0.003	0.299	0.2	**-0.091**	0.004	0.299	0.133
d=-0.2	**-0.061**	0.001	0.157	0.609	**-0.071**	0.002	0.157	0.397	**-0.086**	0.003	0.159	0.263	**-0.102**	0.003	0.158	0.174
d=-0.3	**-0.064**	0.002	0.097	0.644	**-0.076**	0.002	0.097	0.428	**-0.094**	0.003	0.096	0.283	**-0.113**	0.003	0.098	0.181
d=-0.4	**-0.066**	0.002	0.064	0.654	**-0.082**	0.003	0.064	0.436	**-0.103**	0.003	0.065	0.277	**-0.126**	0.003	0.064	0.161

3) d>0 and s<0

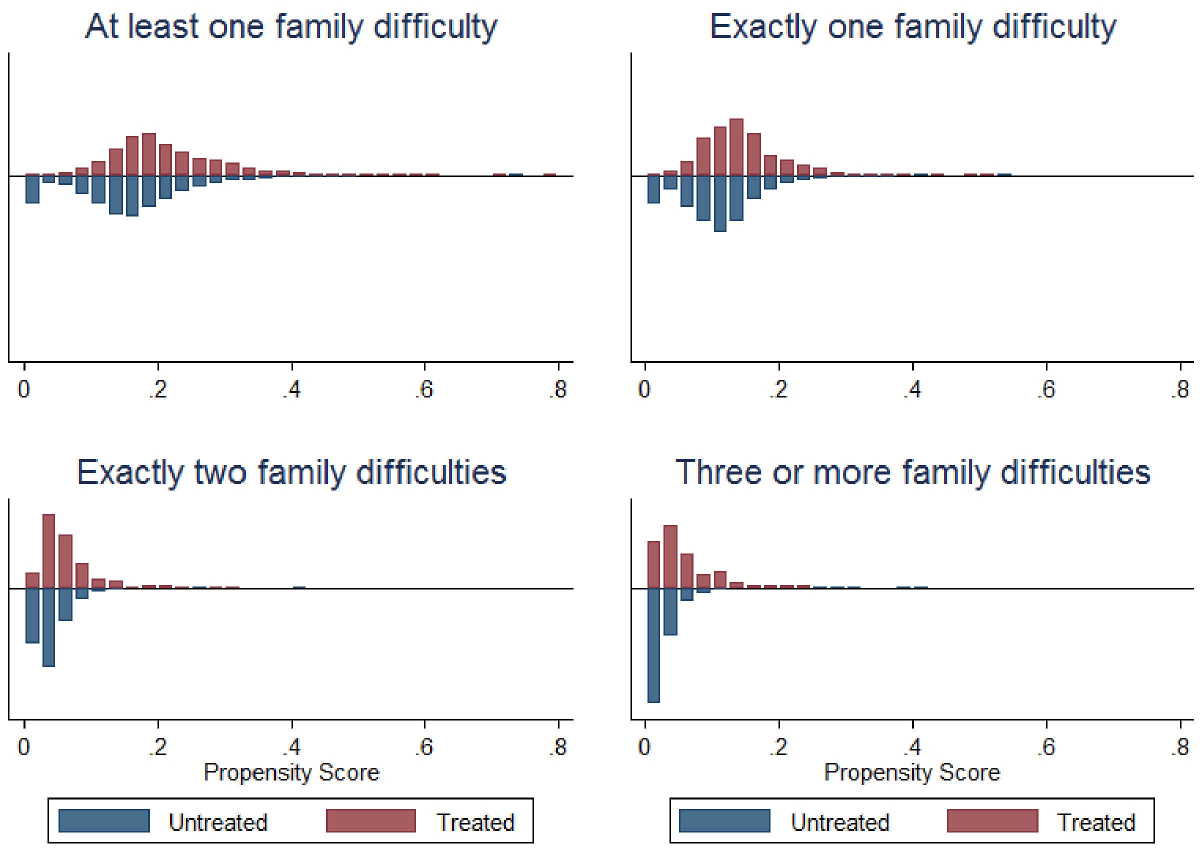
	ATT	s.e.	Out. Eff.	Sel. Eff.	ATT	s.e.	Out. Eff.	Sel. Eff.	ATT	s.e.	Out. Eff.	Sel. Eff.	ATT	s.e.	Out. Eff.	Sel. Eff.
	s=-0.1				s=-0.2				s=-0.3				s=-0.4			
d=0.1	**-0.048**	0.001	1.897	0.559	**-0.039**	0.003	1.918	0.347	**-0.03**	0.004	1.906	0.229	**-0.021**	0.006	1.896	0.153
d=0.2	**-0.043**	0.002	3.083	0.553	**-0.027**	0.004	3.09	0.351	**-0.01**	0.005	3.085	0.232	**-0.021**	0.006	1.896	0.152
d=0.3	**-0.039**	0.003	4.745	0.577	**-0.019**	0.004	4.697	0.368	**0.003**	0.005	4.671	0.255	**0.032**	0.007	4.683	0.162
d=0.4	**-0.037**	0.003	7.059	0.599	**-0.011**	0.005	6.983	0.383	**0.021**	0.006	7.049	0.254	**0.052**	0.007	7.029	0.17

4) d<0 and s>0

	ATT	s.e.	Out. Eff.	Sel. Eff.	ATT	s.e.	Out. Eff.	Sel. Eff.	ATT	s.e.	Out. Eff.	Sel. Eff.	ATT	s.e.	Out. Eff.	Sel. Eff.
	s=0.1				s=0.2				s=0.3				s=0.4			
d=-0.1	**-0.049**	0.001	0.529	1.916	**-0.042**	0.002	0.53	7.585	**-0.04**	0.003	0.66	4.839	**-0.035**	0.004	0.669	7.223
d=-0.2	**-0.042**	0.002	0.53	7.585	**-0.042**	0.002	0.53	7.585	**-0.022**	0.003	0.325	24.232	**-0.017**	0.003	0.441	8.153
d=-0.3	**-0.044**	0.002	0.215	1.543	**-0.03**	0.002	0.214	2.626	**-0.014**	0.003	0.215	5.635	**0.001**	0.003	0.272	8.501
d=-0.4	**-0.042**	0.002	0.143	1.479	**-0.025**	0.003	0.144	2.304	**-0.001**	0.003	0.064	5.971	**0.016**	0.004	0.144	8.978

Note: Our elaboration based on NCDS data. Simulation-based sensitivity analysis based on combinations of increasing absolute values of d and s. Employment status. Year 2009. Treatment: experiencing at least one family difficulty in childhood. PSM technique: Gaussian Kernel. Estimates obtained by using the STATA 11 routine implemented by Nannicini “sensatt”. Replications set at 500. Options logit and comsup added.

Figure 1. Propensity scores by number of family difficulties



Note. Our elaboration based on NCDS data.