Impact of child disability

on mothers' and fathers' employment trajectories in Italy

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Abstract

This paper investigates how the disability of a child affects employment trajectories and the labour market performance of mothers and fathers. Leveraging comprehensive Italian administrative data, we first match parents having a child with or without a disability employing propensity score matching techniques and then compare their labour market outcomes using an event study design. Our preliminary results underscore a pronounced and statistically significant downturn in income levels and active participation in the labour market for parents with a child with a disability. Remarkably, this adverse impact lingers over time and manifests as markedly more severe for mothers than fathers.

Introduction, Research Question, and Motivation

There is scattered evidence showing that the disability of a child affects the life and well-being of family members, shaping their life course and employment trajectories. Parents may experience adverse physiological and psychological effects, such as higher levels of anxiety, stress, and uncertainty (Yamaoka et al., 2016; Scherer et al., 2019), and they may have fewer resources, time, and energy to pursue employment (Busch & Barry, 2007; Leiter et al., 2004).

This project represents the first study of the effects of child disability on mothers' and fathers' labour market outcomes in the Italian context using a population approach and rich administrative data, and it builds upon and contributes to several strands of literature in sociology and economics.

First, this study, having a strong focus on the gendered impact of child disabilities on parents' labour market outcomes, contributes to the growing body of research on child penalties. Despite

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gender inequalities rapidly falling over the last century, a large share of the remaining gender disparities in the labour market can be explained by motherhood (e.g. Angelov et al., 2016; Bertrand, 2020). Several scholars pointed to a significant and highly persistent child penalty on the labour market outcomes of women relative to men, both on the intensive and the extensive margin in different settings (Kleven et al., 2019a, 2019b; Angelov et al., 2016). Similarly, Casarico and Lattanzio (2022) have investigated the impact of motherhood on the labour market outcomes of women, comparing the career trajectories of women with and without children. While the growing literature in this field has stressed the role of parental preferences in magnifying or reducing the child penalty, the potentially crucial role of children's differential medical and care needs has been so far overlooked.

Second, this study also contributes to the body of literature focusing more specifically on families with a disabled child, which the lack of appropriate and sufficiently complete data has so far often restricted to the analysis of small non-representative samples, in most cases focusing on a specific type of disability. The existing literature shows negative associations between offspring's disability and mothers' employment and full-time work (Lu & Zuo, 2010; Gordon et al., 2007; Porterfield, 2012; Wasi et al., 2012). Specifically, it has been found that having a disabled child leads mothers to reduce their working hours or exit the labour market (Powers, 2001; Olsson & Hwang, 2006; Stabile & Allin, 2012, among others). These effects have been shown to depend on the severity of the child's disease (Hauge et al., 2013) and to be stronger for single and less educated parents (Vinck and van Lancker, 2019). On top of further corroborating the findings mentioned above by looking at the near-universe of the benefit recipients in the Italian context, by exploiting the panel nature of our data, we aim at assessing the impact of child disability on the career advancements of parents, which has so far been virtually unexplored.

This study has two primary objectives. First, it aims to assess the influence of child disabilities on the employment paths of parents. It seeks to determine if caring for a disabled child, compared to caring for a healthy child, leads to a decreased likelihood of employment for both mothers and fathers. Additionally, the study will explore whether it results in reduced earnings due to more frequent or extended periods of absence or part-time work and whether it impacts the likelihood of attaining higher-level positions.

Second, while the data on fathers may be less comprehensive than that on mothers, the study will draw from existing research on the concept of "child penalties" and investigate how gender differences play a role in the effects of caring for a disabled child. Specifically, it will examine whether the additional caregiving responsibilities for a disabled child affect mothers and fathers differently and whether this gender disparity can be attributed to variations in earning potential between fathers and mothers.

In Italy, a country characterized by its robust familial welfare system where families bear the primary responsibility for caring for children and non-independent/ill family members, the additional caregiving needs of a child with a disability are likely to significantly influence parents' employment decisions and outlook. This makes Italy an especially pertinent backdrop for investigating this issue.

Data

We carry out our analyses using several INPS archives on workers' records. INPS data are matched employer-employee administrative records for the universe of workers in the Italian non-agricultural private sector.

The INPS data serves as an ideal source for addressing our research question. First, the worker annual registers contain the entire work and pay history of each individual and allow us to observe for the universe of workers employed in the private sector various critical variables, including annual gross earnings, the number of weeks and days worked in a year, the type of contract (full-time or part-time, and permanent or temporary), broad occupation categories (apprentice, blue-collar, white-collar, middle manager, executive), and periods of absence (e.g., maternity or sick leave). Second, in a separate archive, we can observe demographic information on each employee, such as year of birth, gender and region of residence. Third, from the maternity leave claim register, we can identify mothers and, when a partner is indicated in their maternity claim, their partners. Finally, to identify mothers or fathers of disabled children, we can rely on the Social Security register. Crucially, these parents receive a monthly disability allowance, characterized by a specific lump sum amount (i*ndennità di accompagnamento*)[5], regardless of their annual income. Although

[5] A disability allowance (indennità di accompagnamento) consists in a cash benefit, paid out monthly (for 12 months) by INPS, that targets individuals who are not able to accomplish the essential activities of daily living (ADLs) and require constant assistance. Over time there have been some adjustments in the amount provided, for example in 2002 the monthly allowance was

these data are not directly related to any health information and are not informative on the specific type of disability, the eligibility criteria to receive this specific allowance ensure that we are identifying children with a severe disability.

Matching these different registers, we are able to reconstruct the complete longitudinal career history of private sector workers who had their first child between 2005 and 2015, from five years before and up to 15 years after the birth of their first child.

Empirical Analysis

The comparison between mothers with and without a disabled child relies on the assumption that the emergence of disability is an exogenous event, essentially occurring at random. However, examining the pre-birth and pre-conception characteristics of these two groups of women, it becomes evident that the birth of a child with a disability was not an exogenous event.

Table 1 reports the means and p-values of the t-test of standardized differences in means for a set of variables measured in the year before conception on the two full samples of women. These two groups are significantly different in every dimension considered, including the outcomes measured at t-1. Overall, these figures point to the fact that the birth of a child with a disability is, on average, more likely to occur in mothers with lower socioeconomic status.

Table 1 - Mothers' predetermined characteristics

	Non Disab	Disab	P-val
Age at first job	21.46	21.77	-.3054711***
Age at conception	32.46	32.12	.3358535***
Part-time contract	0.362	0.397	-.0349975***
Permanent contract	0.835	0.789	.0459907***
Total earnings	17604	14078	3526.306***
Weeks worked	36.06	32.02	4.032412***
Weekly wage	435	389	46.05838***
Blue collar	0.323	0.431	-.1084843***
White collar	0.581	0.482	.0998326***
Managers	0.018	0.010	.0078343***
Apprentices	0.076	0.074	.0020629*
Other positions	0.002	0.003	-.0012455***

equal to 426.09 Euros, whereas in 2021 it reached 522.10 Euros. Any citizen residing permanently in Italy and in possession of the health requirements is eligible for it, regardless of their annual income and age. In case of children, the formal request is done by one parent (usually the mother), who is also the recipient of the monthly allowance.

There are various ways to rationalize this: for example, women (or families) who undergo a higher number of prenatal tests and visits or women more inclined to voluntary pregnancy interruptions may be less likely to have a child with a disability, and it is reasonable to expect that these characteristics may be correlated with socioeconomic status. Furthermore, it is reasonable to hypothesize that certain behaviours (e.g., diet or smoking before or during pregnancy) correlate with socioeconomic status and the likelihood of having a child with a disability.

While this is an important result in itself, highlighting disability as an element that exacerbates inequalities, for the purposes of our analysis, this makes clear the need to perform matching to identify an appropriate control group.

We have thus conducted exact matching by year of conception and propensity score nearest neighbor matching, which includes all the variables presented in Table 1, as well as the mother's province of birth and residence.

Once obtained this balanced sample of women, to estimate the impact of child disability on their labour market trajectories both on the extensive margin (e.g., employment status) and on the intensive margin (e.g., part-time contracts, leaves, weeks worked), we will employ an event study design centred at the birth of the first child (with a similar approach to the one of Kleven et al., 2019b, and Casarico & Lattanzio,2022).

After restricting our sample to women who had a child in the period 2005-2015, we will separately estimate child penalties for women with a non-disabled child and women with a disabled child (D= 0,1) a wide set of labour market outcomes through the following equation:

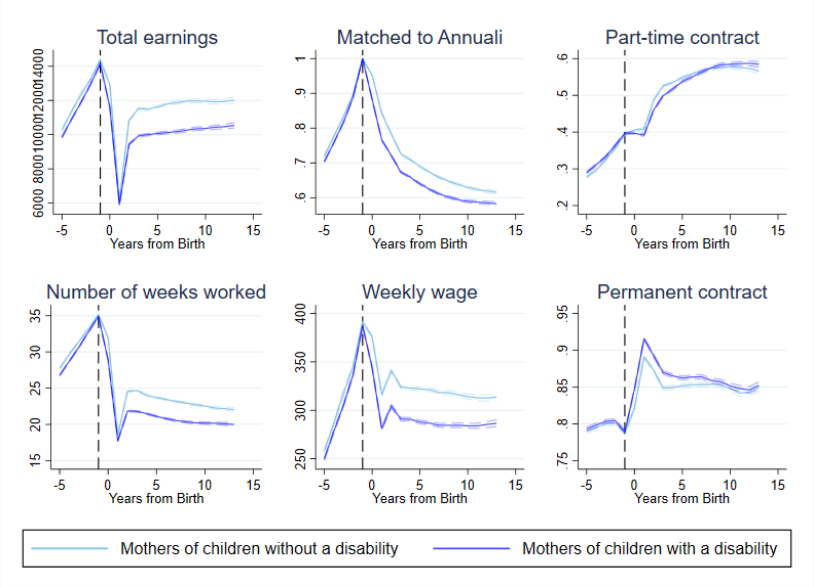
$$Y^D{}_{ist} = \sum_{k \neq -1} \beta^D{}_k \cdot I(k = t) + \alpha_i \cdot X_i + \theta_{age} + \delta_s + \varepsilon^D{}_{ist}$$

where $Y^D{}_{ist}$ is a labour market outcome in year s, for woman i, at event time t; X_i is a set of individual controls; θ_{age} and δ_s are age and time fixed effects. More intuitively, this strategy boils down to a comparison between mothers of a disabled child and mothers of a non-disabled child). The comparability and the causal interpretation of the parameters are bolstered by the fact that we are matching mothers on their pre-birth career and predetermined characteristics.

Preliminary findings

As mentioned above Table 1 shows that the two groups of mothers, with a healthy and disabled child, are very different, highlighting a clear selection issue. Mothers with a disabled child are clearly more disadvantaged even before having their child, being less likely to have a permanent job, earning less, having lower-level occupations. By matching on pre-birth characteristics, we overcome any selection issue, but it is anyway important to acknowledge such differences because they are signal of a cumulative disadvantage process that may lead to increasing inequality during an individual's life course.

Figure 1 - Event study estimates of the impact of a first child with or without a disability on female labour market outcomes



Notes - The plots report event study coefficients, $\beta^{D}{}_{k}$ from equation (1), separately for mothers of children with and without a disability. Confidence intervals at 95 percent level are obtained from worker-level cluster-robust standard errors.

Figure 1 shows the trends of the main outcomes in the two groups. As the plot shows, matching on pre-conception characteristics is sufficient to ensure that the pretrends are very similar in the two groups and that a visible difference emerges after childbirth.

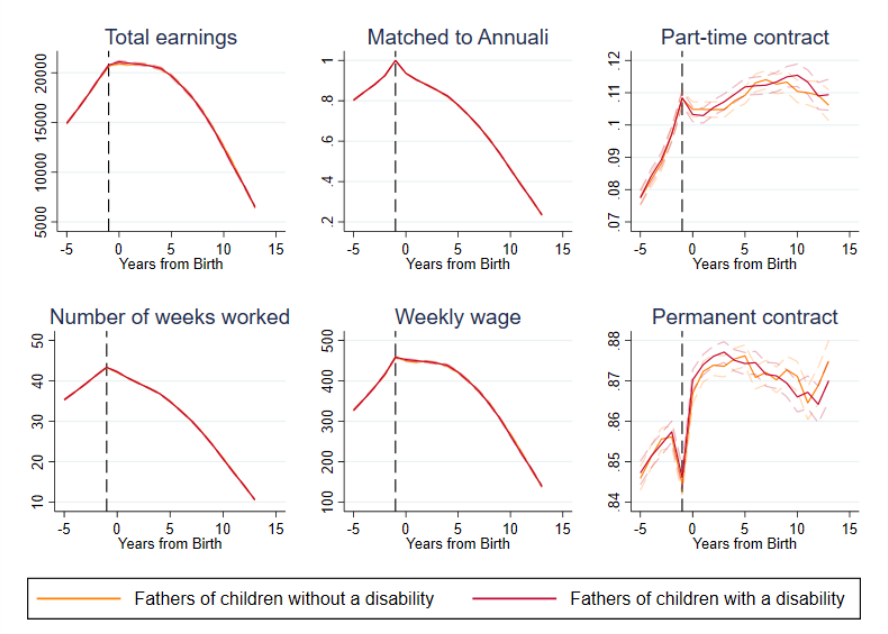
When examining the diverse labour market outcomes in the years following the birth of their first child, the data reveals that both groups of women experience the so-called *child penalty*. However, it becomes evident that mothers of children with disabilities bear a significant and persistent *extra penalty*. Specifically, mothers of children with disabilities exhibit a reduced likelihood of being employed, as indicated by their matching to annual worker registers. Furthermore, they tend to

have lower overall labour earnings, stemming from both a reduced number of weeks worked and a lower weekly wage. Generally, these extra penalties seem to stem from three main aspects: the extensive margin of labour supply (pertaining to employment), the intensive margin of labour supply (related to weeks worked), and the wage rate. Notably, the fact that these effects do not fade out before the end of our sample period suggests that this additional penalty might endure far beyond our observed data, potentially impacting women throughout their entire working lives.

The peculiar trend in the probability of having a permanent contract (bottom right plot), with a sharp increase for both groups of women, could reflect reverse causality, for instance in the case of women timing their fertility according to the transition from a temporary to a fixed-term contract. Yet, the fact that this increase is more pronounced for mothers of children with disabilities could possibly suggest a form of compensation by employers. This is a dimension we seek to explore with further analysis.

In a similar spirit, although data for fathers may be more selected and not as complete as for mothers, in Figure 2 we report the estimated child penalties for the fathers that we can identify.

Figure 2 - Event study estimates of the impact of a first child with or without a disability on male labour market outcomes



Notes - The plots report event study coefficients, $\beta^{D}{}_{k}$ from equation (1), separately for mothers of children with and without a disability. Confidence intervals at 95 percent level are obtained from worker-level cluster-robust standard errors.

The plots consistently convey the message that for fathers, whether their first child has a disability or not does not exert a statistically significant impact on any of the observable labour market outcomes.

Conclusions and Next Steps

While our initial findings are meaningful, revealing statistically significant and large reduction in income levels and active labour force participation among mothers with disabled children, we intend to conduct further analyses in the coming months.

Firstly, we are currently exploring various dimensions of heterogeneity in the identified effects. For instance, we will examine variations based on geographical regions or areas of the country. This is particularly relevant considering that Italy, with its robust familistic welfare system, exhibits significant geographical heterogeneity in the strength of family ties and the efficacy of welfare programs. We will also explore other dimensions, such as industry sectors and individual characteristics.

Secondly, leveraging the richness and comprehensiveness of the INPS administrative data, we will develop and assess additional outcomes. These may include changes in employment status, shifts in industry sectors, the probability of career advancements, the quantity of leave taken, and overtime hours worked.

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