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Targeting fertility and female participation through the income tax

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ABSTRACT

We evaluate the effect of a 2003 reform in the Spanish income tax on fertility and the employment of mothers with small children. The reform introduced a tax credit for working mothers with children under the age of three, while also increasing child deductions for all households with children. Theoretically, given the interplay of these two components, the expected effect of the reform is ambiguous on both outcomes. We find that the combined reforms significantly increased both fertility (by almost 5%) and the employment rate of mothers with children under three (by 2%). These effects were more pronounced among less-educated women. In addition, to disentangle the impact of the two reform components, we use an earlier reform that increased child deductions in 1999. We find that the child deductions affect mothers' employment negatively, which implies that the 2003 tax credit would have increased employment even more (up to 5%) in the absence of the change in child deductions.

1. Introduction

Most OECD countries have experienced substantial increases in female labor-market participation over the past few decades, accompanied by a persistent decline in fertility rates.[2] However, a striking feature of these stylized facts is the large cross-country disparity in the relationship between female participation and fertility. Traditionally, the cross-country correlation between fertility and female participation was negative (such that countries with high female participation tended to have low fertility, and vice versa). More recently, however, this pattern has been reversed (Ahn and Mira, 2002).

Spain is one of the countries with record low levels of fertility coupled with persistently low female participation rates. Spain has one of the lowest female employment rates in the OECD, at 45% in 2002, compared with, for example, 66% in the US and the UK, 67% in Canada and 73% in Sweden. Spain has also experienced a substantial decrease in fertility rates in recent decades (see De la Rica and Ferrero, 2003). Between 1976 and 1999, the fertility rate in Spain decreased from 2.70 children per woman to 1.07. Spain also has one of the lowest total fertility rates among the OECD countries, at 1.25 in 2002, compared, for example, with two in the US or 1.6 in the UK.[3]

As a means of countering this dual problem, the Spanish government introduced some tax reforms in 2003 that addressed both, low female participation and low fertility. First, a reform in the income tax potentially encouraged fertility by substantially increasing child deductions. It substantially raised standard tax deductions for households with children (and it further increased them per additional child) and increased yearly supplements per child under the age of three from 300 to 1200 euros. Second, mothers' participation was targeted through the introduction of a new tax credit of 1200 euros per year for mothers with children under the age of three, conditional on employment.

The objective of this paper is to understand the effectiveness of this policy change in increasing female employment and fertility. At first glance the two policy objectives seem conflicting. We might expect that if women are encouraged to work they will be less likely to have children (and vice versa). From a theoretical point of view, the simultaneity of the two reform components would lead to an ambiguous effect on both fertility and employment.

We first estimate the overall effect of the 2003 reform on both fertility and mothers' employment and find a strong positive effect on each. Second, we investigate the potential dampening effects on employment from targeting fertility simultaneously with participation.

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[2] Between 1970 and 1995, average female participation increased from 45 to 62% in OECD countries, while fertility fell from 2.4 to 1.6 children per woman.

[3] See Table 1 in Azmat and González (2008) for female participation and fertility rates in OECD countries.

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Using a 1999 reform, we are able to take advantage of significant changes in child deductions that took place in the *absence* of a tax credit contingent on work. We use this earlier reform to estimate the effect of child deductions on employment and use it to proxy for the effect of the 2003 changes in child deductions. By removing this effect, we are able to estimate the employment effect of the tax credit component of the 2003 policy.

Overall, we find that the policy had substantial effects on the employment (and participation) of mothers with children under the age of three, the target group. We estimate that their employment rate increased significantly, by almost one percentage point (a two-percent increase given the average employment rate of 47%), as a result of the reform. This effect was particularly pronounced in the low-education group. This is in line with the results in Sánchez-Mangas and Sánchez-Marcos (2008), who investigate the short-run participation effects of the 2003 Spanish tax credit.

We also find a significant effect of the 2003 reform on fertility. We estimate that the birth rate increased by about three births per 1000 women as a result of the policy change, a 5% increase. Our results suggest that both of the reform components encouraged fertility. The effect is found to be more pronounced for younger, less-educated women with no previous children.

Finally, when we net out the potential dampening effect of increased child deductions on mothers' employment, we find that the increase in employment among mothers with young children would have been as high as 2.3 percentage points as a result of the tax credit (and in the absence of the accompanying child deductions), a five-percent effect.

The results from this paper highlight two important issues. First, the pursuit of both goals (increasing fertility and female participation) is potentially problematic. The dual problem is prevalent in several countries, and trying to target one without offsetting the other is challenging. Second, we find that in this specific setting, it appears that the particular combination of the tax credit contingent on work and the increase in child deductions was successful in the two dimensions, increasing both fertility and the participation of mothers with young children.

There is a large and growing literature that analyzes the relationship between fertility decisions and female labor-market participation (see Mincer, 1963 for an early key contribution). The simultaneity of these decisions has motivated a number of studies that estimate them jointly.[4]

Our goal is more specific: We are interested in understanding the effect of a tax reform on fertility and female participation, as well as the possible interactions of the different policy components. There is also a large literature on the effectiveness of tax-related policy reforms on either fertility (Whittington et al., 1990; Whittington, 1992; Baughman and Dickert-Conlin, 2003; Milligan, 2005; Laroque and Salanie, 2005, 2008; Brewer et al., 2008) or participation (Eissa and Leibman, 1996; Meyer and Rosenbaum, 2001; Blundell et al., 2005; Francesconi and Van der Klaaw, 2007; Sánchez-Mangas and Sánchez-Marcos, 2008).[5] Like us, Sánchez-Mangas and Sánchez-Marcos (2008) focus on the Spanish tax reform of 2003. While they concentrate on short-run participation effects (including only two years post-reform), we use a longer sample period to analyze the impact on both fertility and employment. In addition, we take advantage of an earlier tax reform to disentangle the effects of the two policy changes that took place at the same time in 2003.

More recently, there has been some interest in looking at the effect of policy reforms on both, fertility and employment. For example, Francesconi and Van der Klaaw (2007) analyze the effect of a tax credit reform (contingent on employment in the household) in the UK on employment and, additionally, look to see if it had any further effect on fertility decisions. Our analysis of the 2003 tax reform in Spain is, however, complicated by the fact that there are two simultaneous components targeting fertility and participation. In turn, there are direct and indirect effects from each component on the two decisions.

The remainder of the paper is organized as follows. Section 2 describes Spain's 2003 reforms in the income tax. We lay out some simple theoretical predictions for how this policy change could potentially affect female labor supply and fertility incentives. We also discuss the 1999 reform in child deductions. Section 3 introduces the data and methodology. We first present how we estimate the net effect of the 2003 reform on fertility and employment and then explain how we use the 1999 reform to help disentangle the (theoretically ambiguous) effects of the 2003 reform. Section 4 discusses the main results. The final section summarizes and discusses our findings.

2. The Spanish Income Tax Reforms

In this section, we briefly describe the Spanish tax system and the main changes that have taken place in recent years. We focus on the potential effects of these reforms on fertility and female employment (Section 2.1). In Section 2.2, we outline a simple framework that highlights the different channels through which child deductions and a tax credit, conditional on mothers' employment, could affect both outcomes.

In light of this framework, in Section 2.3 we discuss the potential effects of the 2003 reform. We consider the different channels through which this reform could have affected employment and fertility. The expected effects are complicated by the fact that both components of the reform could potentially have affected both outcomes directly, but also through potentially conflicting indirect effects.

Finally, in Section 2.4 we describe the 1999 reform which also increased child deductions, but did not include the tax credit component. We will exploit this earlier reform to disentangle the effect of the 2003 increases in deductions from the effect of the new tax credit.

2.1. The Spanish income tax and recent reforms

In the Spanish income tax system, an individual's or household's tax liability is calculated by subtracting certain “reductions” from gross earnings and then applying the corresponding tax rate to each bracket of taxable income. The main reduction, the “personal” reduction, is universal, while the second is a function of earnings, and the third, the “family deduction,” is a function of the number and ages of the children.[6] These child deductions were increased in both 1999 and in 2003, as shown in Table A1.

Before 1999, each child gave rise to a tax credit (unconditional on mothers' employment) of the specified amounts, increasing with the number of children. The tax credit implied that a certain amount was subtracted from the tax liability, after applying the corresponding rate to taxable income. Starting in 1999, the tax credits became deductions, such that the specified amounts were subtracted from taxable income *before* applying the corresponding tax rate. The

[4] The earlier studies followed a static approach that focused on completed births (Becker, 1960). More recently, the life-cycle approach has focused on using the timing and spacing of births over the lifetime span (Hotz and Miller, 1988; Francesconi, 2002; Attanasio et al., 2008). For the specific case of Spain, De la Rica and Ferrero (2003), Gutierrez-Domenech (2008) and Alba et al. (2009) are examples of recent studies that analyze the fertility and participation relationship.

[5] See Del Boca and Locatelli (2006) for a survey.

[6] For married couples, both joint and individual tax filing are possible. The reductions and tax scale are the same in both cases. This implies that two-earner households find it advantageous to file separately, while one-earner households benefit from joint filing.