

**A Quantitative Exploration of the Optimal Design of Child Care  
Subsidies in a Mirrleesian Environment**

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**Extended Abstract**

Public involvement in child care provision is a hotly debated issue. Rosen (1996) strongly advocates against public subsidies. Becker and Posner (2005) express a similar view and argue that the provision of child care services is best left to the market without public intervention. A contrary view is given in two recent books by Currie (2006) and Waldfogel (2006), who give a number of arguments for publicly subsidized child care. OECD has taken a strong interest in the subject with several projects on child care and two large reports (OECD 2001, 2006). OECD has also given some member countries strong advice to increase public funding of child care. Not only is public child care debated. In many countries it is a common phenomenon and it seems to be on the rise. In the Nordic countries publicly financed child care is widespread. In Sweden 85% of children in ages 2-5 are in child care.<sup>1</sup> To a substantial part (80-85%) this child care is publicly financed. According to Blau and Currie (2006) the majority of children in the U.S. are cared for many hours per week by adults other than their parents and school teachers. Blau and Currie state that one third of the costs of child care for children under 6 are paid for by government subsidies. According to the OECD 2001 report, for a number of member countries a vast majority of children is in some form of care outside the home.

Clearly, publicly subsidized child care is a common phenomenon. One may ask why? What are the rationales? If one comes to the conclusion that it is a good thing to subsidize child care a second question arises. What is the best way to subsidize child care?

There are several types of questions and answers. First, why might it be beneficial with care of children outside the home in child care centers? An obvious answer is that it

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<sup>1</sup> Calculated from tables 62 and 500 in Statistisk Årsbok 2003.

makes it possible for both parents to work.<sup>2</sup> This is also a major argument given in the 2006 OECD report. Another common argument is that it is a means to improve child outcomes; in particular for children with a poor social background.<sup>3</sup> A further argument is that child care can be a means to increase fertility and improve the demographic composition.<sup>4</sup> Even if one accepts that care at child care centers might be of value it still does not follow that child care should be subsidized with public funds. For example, if child care outside the home is needed in order for females to work, it does not follow that it should be subsidized.

The argument for public subsidies that Currie (2006) and Waldfogel (2006) focus on is that child care is beneficial for the children, in particular children from low income families. This view is also supported by recent empirical evidence by Havnes and Mogstad (2010, 2011). It is implicit in their argument that many parents either do not have the financial means to buy good quality child care or knowledge of the benefits descending from child care of good quality. Public intervention is therefore needed. The OECD 2006 report pushes a similar argument. The report argues that child care has public good aspects. The human capital formation in children is not only of interest for the parents but for the whole society. It is a fairly accepted view that primary education should be publicly financed. There are those who argue that the rate of return to society in investment in the human capital of children is larger the younger the children are (Carneiro and Heckman (2003)). An implication of this argument would be that it is more important with public funding of child care than public funding of primary education. However, the benefits of subsidized child care are not undisputed. Baker et al. (2008) find a negative short run effect of child care on children's noncognitive development. Of great interest are of course the long run effects. Havnes and Mogstad (2011), using Norwegian data, is one of few studies that analyze the long term effects of subsidized child care. The find that "...subsidized child care has large positive effects on children's adult outcomes measured in their early 30s. This is true with regard to both education and labor market attachment, as well as welfare dependency". In a companion a paper (Havnes and Mogstad, 2010), they report that there is large heterogeneity in effects. The positive effects are particularly large for individuals below the median.

A somewhat different argument is that publicly financed child care can be an alternative to the EITC to support families with children. Publicly financed child care affects

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<sup>2</sup> This is studied by, among others, Blau and Robins (1988), Gustafsson and Stafford (1992), Ribar (1995) and Powell (2002).

<sup>3</sup> There is a fairly large literature on this topic. The US literature is summarized in Blau and Currie (2006). See also Currie (2006) and Waldfogel (2006).

<sup>4</sup> See, for example, OECD (2011).

the budget constraints of secondary earners in a way similar to the EITC. So one could wonder which of the two, EITC or publicly finance child care, is the most efficient way to support families with children.

In his review of the books by Currie (2006) and Waldfogel (2006), Smolensky (2007) emphasizes that, even if there are arguments for subsidizing child care, one should also take into account the deadweight losses of the taxes that finance the subsidies. A similar remark can be found in Baker et al. (2008). However, there is a strand of the public finance literature pushing the opposite argument, namely that public provision of child care can help mitigating the informational problems (self-selection constraints) that are a major hindrance when one wants to use an income tax to redistribute from high- to low-productivity agents. According to this argument, publicly provided child care *decreases* the efficiency losses of taxation. This is a mechanism emphasized in Blomquist et al. (2010).<sup>5</sup>

In this paper we focus on two of the above mentioned rationales for public support of child care. The first is that public provision of child care might help mitigating the self-selection constraint in an optimal taxation problem, the second is the public good argument as expressed by OECD (2006) and Currie (2006) and Waldfogel (2006).

The public good argument goes as follows. A person can be interested in the human capital formation in other children than his/her own for purely selfish reasons. For instance, if high quality child care implies that a smaller proportion of kids will become criminals and/or be on social welfare as adults, this is a benefit to the person. If high quality child care improves the future productivity and earnings of kids, including those suffering from a poor family background, this means that the tax base will be larger and, for a given size of public expenditures, taxes lower. This is also a benefit to the person. Of course, some citizens might also have a purely altruistic concern for the human capital of other persons' children. Whether the concern about the human capital of other persons' children is because of selfish or altruistic reasons, one can model this by including in the individuals' utility function a term reflecting the human capital of children in general or, if we believe high quality child care is an important input in human capital formation, the average quality level of child care. But this means that the average quality of child care, or the children human capital formation, is a public good. Left to private initiative, there will be under-provision. Public provision might then be efficiency-enhancing.

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<sup>5</sup> Blackorby and Donaldson (1988), Besley and Coate (1991), Blomquist and Christiansen (1995, 1998, 1999), Boadway and Marchand (1995), and Cremer and Gahvari (1997) are a few studies illustrating the argument that the public provision of certain private goods can help mitigating self-selection constraints.

In this paper we assume that a given amount of money is set aside to support families with (small) children. In a Mirrleesian optimal tax setting, we then investigate which is the best way to use the given amount of money by focusing on the relative merits of four different ways to subsidize child care: tax deductibility, refundable tax credits, voucher and public provision. For the first three cases we consider both universal and means tested (income-dependent) instruments.

As described in Currie (2006) and Waldfogel (2006), in the US several instruments are simultaneously used. The Child and Dependent Care Tax Credit (CDCTC) is a tax credit with some caps in terms of how large expenses can be credited. The amount credited also depends on income. The CDCTC is not refundable, which implies that families with low incomes and low taxes do not benefit much from this tax credit. The DCAP works like tax deductibility. There is also the Child Care Development Fund, which is a price subsidy program, directed towards low income people. Eligible parents pay 30% of the cost. The Head Start program is directed towards disadvantaged children and can be characterized as a (means tested) public provision scheme. Thus, a wide range of subsidy forms are in use. We will investigate to what extent they differ in terms of effectiveness in increasing the quality of child care and decreasing the deadweight losses of the income tax.

In previous studies of public provision of private goods one has used models where the publicly provided good can vary in only one dimension, quantity or quality. These studies have been informative and provided useful insights. However, in order to study the optimal design of child care subsidies it is important to take into account both the quantity and quality dimensions. One reason is that, if both quality and quantity can vary but only expenditures can be observed by the tax authority, the same amount of private expenditure on child care services can be achieved by several combinations of quality and quantity, and this is a crucial feature in an optimal tax framework where incentive-compatibility constraints plays a key role in the design of optimal public policies.

The quality of child care actually consumed depends on both demand and supply side conditions. There have been quite a few studies of how supply measures affect the child care market. There are also studies of demand. The present paper takes an optimal taxation approach. Implicitly we assume that there is a fixed supply schedule for child care. This is in our model represented by a fixed price function, which shows the hourly cost of child care of various quality levels.

To analyze the efficiency of the instruments described above we develop a theoretical model where parents, in addition to deciding on their labor supply and the time spent with

their children, choose both the quantity and the quality of child care services. We then quantitatively explore the relative effectiveness of the various ways to subsidize child care when the government is simultaneously optimizing a nonlinear income tax.

Most children are brought up in families with two parents. In some countries parents are taxed separately whereas in other countries they are taxed jointly. In our simulations we consider a system of joint taxation, which is the default way to tax couples in the US, and we calibrate the wage distribution to the US wage distribution for women in ages 25-45.

We present numerical results both for the case where individuals only get utility from the child care arrangement that their own child gets and for the case where individuals also get utility from the type of child care arrangement other children get. When there are no externalities the only role for child care subsidies is to mitigate self-selection constraints. For this case our preliminary results show that tax deductibility is the best way to subsidize child care and public provision is the least efficient instrument. Moreover, making the instruments means-tested does not seem to deliver significant welfare gains compared to the case when the instruments are income-independent. On the other hand, when child care consumption generates positive external effects, i.e. when agents have as a goal that all children should have access to good quality child care, then public provision becomes the best way to subsidize child care.

The theory we develop is largely meant to be normative. However, we could also see if it makes sense as a positive theory. The prediction would then be that countries with large social cohesion where individuals care of the child development in general would use public provision whereas countries with less social cohesion would rather use tax deductibility or (non-refundable) tax credit. It is a common view that the Nordic countries are characterized by large social cohesion, whereas social cohesion in countries like US or UK is much weaker. According to our model the Scandinavian countries would use public provision whereas US and UK would rely more on tax deductibility or non-refundable tax credit. This is exactly what we observe.

The rest of this paper is organized as follows. To present some of the basic ideas, in Section 2 we present a simplified version of the model and provide an analytical characterization of the welfare properties of various schemes which are used in real-world economies to subsidize child care expenditures. Section 3 describes the simulation approach, calibrated on US data, that we employ to evaluate the various subsidy schemes in terms of their social welfare effects. The results of our simulations are presented in Section 4. Finally, Section 5 offers concluding remarks.

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