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Fiscal policies for subsidising the users of formal and informal childcare in Belgium

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INTRODUCTION

The demand for childcare outside the home has increased as a consequence of the demographic and social changes of the last two decades. The most relevant factors creating pressures on the demand for childcare are the increasing participation of women in the labour force, the development of new family models and the need to find a balance between family and work. (Organization for Economic Co-operation and Development 2001). Regardless of labour market changes, concern about the quality of childcare services provision has increasingly prominent on the research and policy agenda, because day-care quality matters more than day care as such when it comes to child well-being and development (Hayes, Palmer, & Zaslow 1990) (NICHD Early Child Care Research Network 1999). In fact, during the nineties research showed that early childhood education can be an important tool for fostering the development of young children, particularly in deprived or minority groups (Leseman 2002). Duncan and Giles write that children receiving high-quality care are less likely to be arrested or have teenage pregnancies and are more likely to find employment (Duncan Alan & Giles Christopher 2002). Finally, concern about childcare has been rising as a consequence of new political attitudes to welfare in general. In the US and in Europe, childcare is increasingly seen as a policy instrument to foster welfare-to-work policies.

Governments' concern about childcare issues can be seen as a response to these demographic and social changes, but also as a reaction to the specific characteristics of the childcare market. From this point of view, government intervention in the childcare market is justified by the existence of market imperfections and distributional concerns.

The existence of asymmetries of information on the childcare market has been widely proven. Walker argues that, because producing high-quality childcare is costly, if high-quality providers cannot set fees corresponding to their costs they will exit the childcare market. As a consequence, an adverse selection problem will appear and childcare markets will only be composed of low-quality providers (Walker 2001). Regulations on the quality of care provided in childcare facilities may solve this problem. These regulations exist in many countries and divide the supply of childcare services into formal (regulated) and informal (non-regulated) care. Although quality standards and the level of supervision of the formal childcare providers vary from country to country, most formal day-care must be registered with a governmental organisation. Setting quality regulations may affect fees and access to childcare facilities. Firstly, because fees reflect the costs incurred during the production of high-quality childcare, tariffs set by formal childcare providers are expected to be higher than tariffs in the informal sector. As a consequence, low-quality providers can participate in the childcare market as an alternative to the more expensive forms of care. Secondly, without any further government intervention, poor families will only be able to purchase low-quality childcare services from informal providers. This point will be discussed later on.

Another information asymmetry arises between the providers and the purchasers, because parents have less information about childcare quality than the providers do. In this case, moral hazard appears when providers do not provide high quality, but still charge higher fees. As Mocan argues, there is less evidence of moral hazard than of adverse selection in the childcare market (Mocan 2001). One reason for this is that, if the government monitors childcare providers, incentives to "cut corners" on quality may be smaller in the presence of penalties (exclusion

from the formal sector). Nevertheless, this only covers “regulated institutions” (formal care) and implies that the government’s supervision is effective

Another important justification of government intervention in the childcare system is its distributional impact, between men and women or between rich and poor. In fact, as high-quality care enhances children's abilities, families that cannot afford these services will lose potential benefits, such as being better prepared to enter the formal schooling system (Leseman 2002). This was in fact the main reason for early public subsidy to childcare in Belgium at the beginning of the 19th century in order to prevent mortality among infants and toddlers of manual-working mothers (Dubois, Humblet, & Deven 1994). In the US, Head Start has been an important public programme providing several services to children from poor families (Currie 1995). As mentioned, studies have also shown that children coming from low-income families that avail of high-quality childcare institutions are less involved in delinquent activities (Duncan Alan & Giles Christopher 2002).

Distributional concerns also refer to gender distribution. In the context of a policy that aims to facilitate access to the labour market, distributional concerns arise between men and women. One major concern for policy-makers is to reduce differential labour market access barriers between men and women (Blau & Robins 1988a). Blau and Robins showed that childcare prices represent an important constraint on women’s access to the labour force (Blau & Robins 1988a). Another reason for expanding access to high-quality childcare services is to allow one-parent households to cope with work responsibilities and the care needs of young children. In a recent study of lone parents and their childcare needs, it was clearly stated that in countries where affordable quality care is available, women’s participation rate in the labour force is higher. One example of such a policy is France, where the employment rate of lone mothers reached 82% in the mid 1990s. On the other hand, lone parents in the UK tend to care for their own children, as the availability of good, affordable care is very limited. The UK’s employment rate for lone parents is about 42%, almost half the participation rate in France (Martin Claude & Vion Antoine 2002).

When measuring the efficiency of the subsidy system one must analyse how well the policy objective is being attained and how subsidies are distributed among the target population. However, if efficiency is attained, this does not in itself imply that the subsidy system is equitable. Meyer and Heintze argue that inadequate resource allocation may result from setting “complex eligibility rules combined with scarce resources”. These authors have argued that the equity of the childcare subsidy system depends on how resources are distributed to those most in need, covering families who will benefit from the subsidies and giving equal benefits to families with similar levels of need (Meyers & Heintze 1999). Benefiting those most in need is related to the vertical equity of the system and benefiting equally families with the same needs is related to its horizontal equity. Governments may use a variety of instruments to subsidise childcare. In this paper we focus on the equity level of achieved by subsidising childcare through tax-based policies.

Setting and enforcing minimum childcare quality standards is one key regulatory mechanism used by policy-makers to improve the quality of care. Nevertheless, this has no impact on families’ access, as only high-income households will be able to purchase high-quality care. In addition, Governments can subsidise day care either through

subsidising demand or through the providers. Policy-makers can use direct subsidies to the providers to reduce the costs of producing high-quality care. In this case, fees should reflect the subsidy levels and parents would incur smaller costs for childcare services. One important issue when direct subsidies are distributed to childcare providers is that of policy-makers' restrictions on fees. In some countries, like the US, the UK, or Australia, public provision of childcare is restricted to lower-income families (Organization for Economic Co-operation and Development 2001). But in countries like France, Belgium, and the Netherlands, where all families regardless of socio-economic background can avail of publicly funded childcare, fees are means-tested (Portet Maria Isabel & Lorant 2002).

Demand-side subsidies can take the form of vouchers or of tax relief. Vouchers are given to parents so that they can pay for services that otherwise they would not be able to afford in the private sector. This is the case in Australia, where Child Care Benefit is granted to parents as a per-hour amount if they use formal care¹. The percentage that can be claimed over the per-hour amount depends on an income scale. (Family Assistance office 2002).

Tax reliefs are divided into tax deductions and tax credits. A tax deduction corresponds to deducting childcare expenses from taxable income and a tax credit corresponds to deducting childcare expenses from taxes. In the US, tax deductions are more frequent than tax credits (Mitchell & Stoney 1997). The tax deduction of childcare expenses is being increasingly used in many countries and it is becoming one of the most important mechanisms for subsidising childcare expenditure (Portet Maria Isabel & Lorant 2002). OECD countries like Belgium, the Netherlands, France, and Australia allow parents to deduct a portion of their childcare expenses. Nevertheless, formulas and restrictions affecting the deductible amount vary from one country to another. As suggested by Portet and Lorant, these differences related to the availability of other types of subsidy and deducting childcare expenses from taxable income can be compared with deducting work-related expenses. This point will be developed below.

Determining which subsidy is best adapted to targeting childcare quality, equity in the provision of childcare, or employment is a controversial issue for both policy-makers and academics. In fact, some studies have proved that once a target has been chosen and a subsidy has been implemented, a negative impact on the other policy concerns may arise.

When considering the impact on quality of the tax deduction of childcare expenses, Blau and Hagy show that it allows parents to reduce the childcare costs associated with being employed independently of the quality of the childcare purchased.

Regardless of the quality issue, the most controversial issue about the tax deduction of childcare expenses is whether or not it is an equitable measure. Blau shows that in the US the Child Care Tax Credit is regressive through the lowest quintile of the income distribution, given that the tax deduction is non-refundable. Nevertheless, the system is progressive through the rest of the income distribution, thanks to the decreasing amount of credit that can be claimed

¹ Formal care can be provided by an approved facility and by registered providers. Approved care includes long day care, family day care, before and after school care, vacation care, some occasional care, and some in-home care. Registered care is paid to relatives, nannies etc. The carer is registered with the Family Assistance Office. (Portet Maria Isabel & Lorant 2002)

with increments in the gross income (Blau 2000). Most authors suggested that the equity impact of the tax deduction of childcare expenses depends on whether or not it is refundable and on whether the deductible amount is negatively related to the family's income (Altschuler Rosanne & Schartz Amy 1996;Blau 2000;Duncan Alan & Giles Christopher 2002;Gentry & Hagy 1995).

The use of vouchers instead of the tax deduction of childcare expenses allows parents to reduce their out-of-pocket payments. Experience in the UK and in Australia shows that vouchers are effective in allowing parents to reduce their childcare expenses and in improving the quality of care purchased (Organization for Economic Co-operation and Development 2001). However, it may be argued that the impact on quality depends on restricting the use of vouchers to providers who respect quality standards. In terms of equity, vouchers are equitable if their amount has a negative relation to income.

As we have mentioned, some subsidies may be better suited to attain certain policy objectives but may at the same time create distortions in terms of other childcare issues. Predicting and correcting these unexpected effects should be consider by policy-makers. As stated in the OECD report *Starting Strong*, "equitable access" to childcare services can be achieved by subsidising both the demand and the supply. Finding the right balance between provider- and consumer-based subsidies should reduce negative externalities, while both efficiency and equity will be achieved in the childcare subsidy system.

The purpose of this work is to analyse the equity of the tax deduction of childcare expenses in Belgium. In the course of the analysis, it will be emphasised that this is a demand-side instrument used by the federal government to reduce parents' expenses. We analyse carefully how the independent operation of federal childcare policies (subsidising consumers) and of the Communities' childcare policies (subsidising providers) may affect the range of action and the equity of the tax deduction of childcare expenses. In the absence of coordination between consumer- and provider-based policies, market failures in the childcare market will be enhanced, creating further inequalities. In 2000, daily tax deduction for childcare increased by 2,5EUR. Such changes allow us to estimate the impact of such a demand-side subsidy on socio-economic equity.

ANALYSING THE CHILDCARE SUBSIDY SYSTEM IN BELGIUM

Overall organisation

In Belgium, responsibility for early childhood education is mostly in the hands of the Flemish Community and the French Community. Each community has its own education system as well as its own institutions. After the country's federalisation, two institutions, one corresponding to each of the communities, were created in order to replace the National Bureau for Childhood. On the Flemish side, the Child and Family Bureau -Kind en Gezin (KG)- was established in 1984 "to look after the life chances, the well-being and the health of the child"(Laevers 2000). On the French side, the Birth and Childhood Bureau -Office de la Naissance et de l'Enfance(ONE) was set up in 1983 to ensure children's well-being both inside and outside the home. (Office de la Naissance et de l'Enfance 2002).

Both institutions are in charge of registering formal childcare, controlling and enforcing quality standards, and providing subsidies to some childcare centres or to family day care. In Belgium, formal childcare providers must fulfil the quality requirements of the Birth and Childhood Bureau (ONE) or the Child and Family Bureau (KG). Regulated institutions can be subsidised by the Communities, and, in such cases they must apply an income-related scale to set the fees charged to parents. Subsidised childcare providers receive between 70% to 80% of their total running costs. Families can apply to avail of publicly-funded childcare regardless of their income. Other forms of care, such as parental or informal care, are not subsidised by the Communities. It is estimated that public provision of child day care caters for about 30% of the young children needing day care (European Commission Network on Childcare 1996).

The Federal government's involvement in subsidising the childcare systems takes the form of tax deductions of childcare expenses. The childcare tax deduction in Belgium allows parents with taxable earnings² to deduct a portion of their childcare expenses, if the childcare provider is registered. The deductible portion of the childcare expenses is independent of the household income. Until 1999, parents could deduct up to 80% of their childcare expenses, subject to a ceiling of 8.7 euro per day. In 2000 a new law raised the ceiling to 11.2 euro. In 2001 the percentage of deductible childcare expenses changed from 80% to 100%, always subject to the 11.2 euro daily limit. The tax deduction is non-refundable and so only families with positive tax liabilities can benefit from this subsidy. Families who do not claim the deduction of childcare expenses can claim an additional exemption on income taxes. Exemptions are set in the Belgium fiscal system as a portion of income that is not taxed. Families with children receive an exemption depending on the number of children. If they have dependents under three years old and do not claim the tax deduction of childcare expenses they are entitled to an additional exemption. In 1994 the amount exempted was 272EUR, from 1995 to 1999 it increased to 297EUR and in 2000 it was 322EUR. From 2001, parents will be able to claim an exemption of 430EUR if they do not claim deductible childcare expenses. The tax deduction

² Taxable earnings include salaries, benefits, pensions, and other non-exceptional revenues.

of childcare expenses and the income exemption for families not using formal care correspond to two different fiscal techniques. Table 1 shows how both mechanisms are calculated.

Table 1: How the tax deduction of childcare expenses and the exemption are calculated

How to compute taxes	Deduction of childcare expenses	Exemption on income
1. Computing global taxable income	Taxable Income - Deductible childcare expenses	
2. Taxes on global taxable income	Applying the taxation rate on the global taxation income	
3. Computing exemption		Sum of all exemptions including an additional exemption for each child under 3 years old when parents do not claim the deduction of childcare expenses
4. Computing taxes on exemptions		Applying the taxation rate on the exemption
5. Taxes due	Taxes on the global taxable income - Taxes calculated on the exempted income	
6. Fiscal Benefit	Marginal taxation rate on the global income * deductible childcare expenses	Marginal taxation rate on the exemption * Exemption for children under 3 years when parents do not claim childcare expenses

In the first case, the tax deduction of childcare expenses reduces the taxable income. The family's fiscal benefit is then calculated as the marginal tax rate multiplied by the deductible amount of childcare expenses. In the second case, the benefit from the exemptions is calculated in two steps. Exemptions reduce tax payments and not taxable income. To calculate the reduction in taxes, regular taxes on the family's income are calculated. Then the exemption amount is used to compute the taxes that will not be paid by the family. The real tax payments are equal to the difference between taxes on the family's income and taxes on the exemptions. The family's fiscal benefit from the exemption granted when no childcare expenses are deducted is equal to the marginal tax rate (on the exemption) multiplied by the exempted amount. For two-parent households with two children, one of them under three years old, the marginal tax rate on the exemption is 30%. This implies that the fiscal benefit from the exemption is equal to 96 EUR in 2000. This tax reduction will be granted for a family with a taxable income of 15 000EUR or 30 000EUR a year, implying that the measure does not take account of the fact that some families may be in more need of the government's help. The average fiscal benefit for a family claiming the deduction of childcare expenses is equal to 500EUR for the year 2000.

Both measures should help families to reduce the cost of raising young children, independently of the type of care used. Wheelock and Jones argue that childcare policies should bear in mind that parents look for quality, affordability, and choice. This implies that allowing more flexible instruments to subsidise parents' choices, such as the use of informal and parental care, must play a part in solving the "childcare deficit". Nevertheless, the non-refundability of the subsidy and the fact that this amount cannot replace the revenue loss when one of the parents

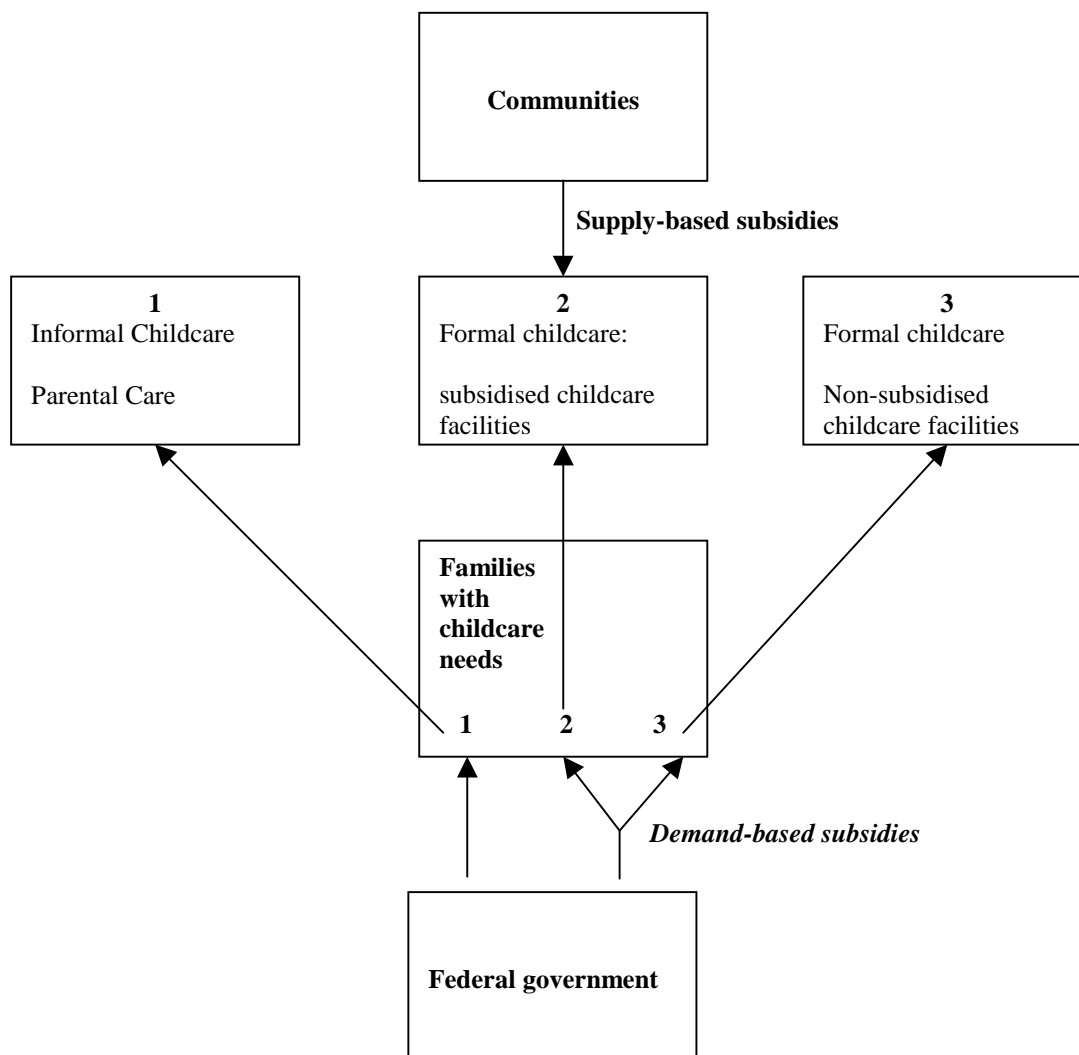
stays at home, imply that the government's policy is only useful if it addresses the need to subsidise both formal and informal care.

Analysis from the subsidies childcare policies in Belgium

To analyse the effectiveness and equity of the childcare subsidy system we must analyse how the public resources are allocated. Figure 1 describes how subsidies are allocated. We define three types of childcare users in terms of their access to subsidised childcare facilities:

1. **Combining demand and supply subsidies:** Families availing of subsidised childcare facilities and claiming tax deductions
2. **Supply-based subsidies:** Families using non-subsidised childcare and claiming tax deductions
3. **Supply-based subsidies:** Families using informal or parental care and claiming tax exemption.

Figure 1: Description of the childcare subsidy system in Belgium



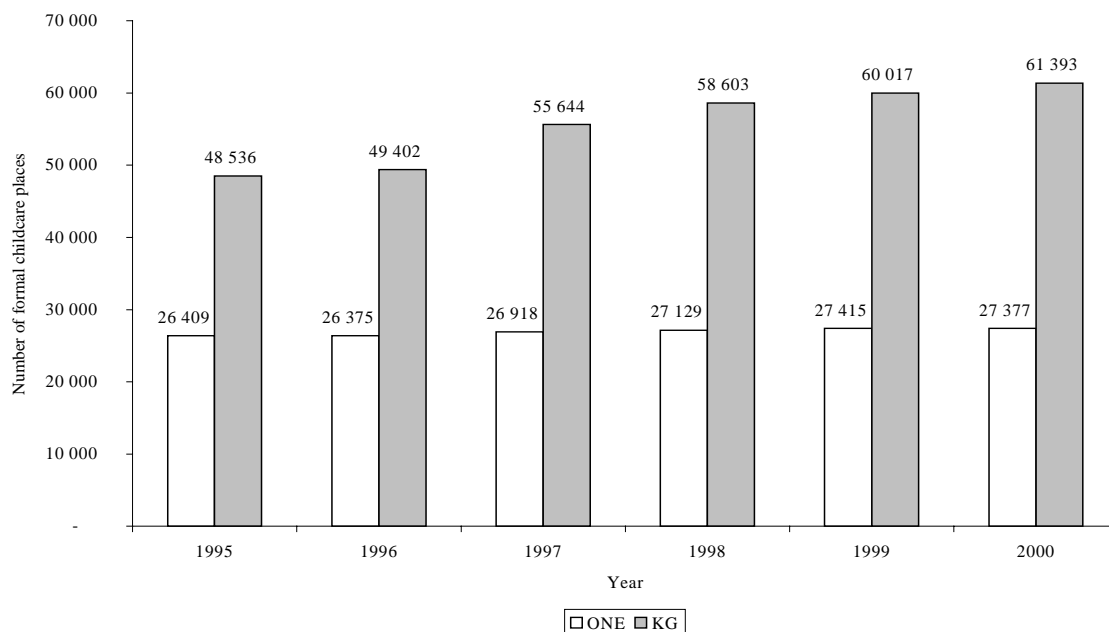
Combining demand and supply subsidies: Families availing of subsidised childcare facilities

An important feature of the childcare subsidy system in Belgium is that access to subsidised childcare facilities is not restricted to a specific income group. The Child and Family Bureau (KG) and the Birth and Childhood Bureau

(ONE) set fees according to an income scale. This shows the Communities' concern for allowing equitable access for all families with childcare needs. In recent years, the biggest problem faced by KG and ONE is that of meeting the increasing demand for formal childcare. In fact, parents who want to use formal care must be registered in long waiting lists before finding a childcare place. Waiting time is, on average, 10 months and around 60% of parents (Lorant 1999a) find it hard or very hard to get access to a facility (Lorant 1999b).

Since 1995 the supply of formal childcare places increased 3.7% in the French Community and 26.5% in the Flemish Community. Figure 2 shows the evolution of childcare places since 1995. Between 1995 and 2000 the subsidised childcare places in the French Community grew 2.9% and the non-subsidised childcare places 6.1%. For the same period the growth of subsidised childcare places in the Flemish Community grew 25.8% and the non-subsidised childcare places 28.0%. It is important to note that the growth of non-subsidised supply of formal care was bigger than from the subsidies childcare places. We may say that the increasing demand for childcare places has been partially covered by the private sector. This has a strong distributional effect given that tariffs for non-subsidised facilities are market-based, and only high-income families may be able to pay them. Low and middle-income families will be more exposed to long waiting lists in the subsidised sector, and this may be an incentive to purchase informal care.

Figure 2: Evolution of the formal childcare places in the French Community and the Flemish Community



Source: The Child and Family Bureau (KG) (<http://www.kindengezin.be/> Jaarverslag)
Reports: Jaarverslag 2000, Jaarverslag 1999, Jaarverslag 1998, Jaarverslag 1997 and 10 jaar Kind en Gezin
 Childhood Bureau (ONE) <http://www.one.be/pub/rap.htm>
Reports: Rapport Annuel 2000

Supply-based subsidies: Families using non-subsidised formal childcare

As described above, the supply of non-subsidised formal care has increased as a response to increasing childcare needs. However, fees are high, restricting access to wealthy families. Parents using this type of care may benefit from the tax deduction of childcare expenses. Although this subsidy may have a great impact on those families, this does not allow low and middle-income households to avail of private childcare facilities. One alternative policy, in

order to make it possible for more families to purchase formal care in the non-subsidized sector, is to issue vouchers. This has been implemented in Australia and Finland. Even if the policy objective in each country is very different, this instrument allows parents to have a wider choice when purchasing childcare.

Supply-based subsidies: Families using informal and parental care

The Belgian federal government allows parents to claim an exemption for each child under three years old when no childcare expenses are deducted. Although the fiscal benefit may not be greater than 100EUR a year, most countries do not allow families who do not use formal childcare to make any deduction. In the UK, subsidies are restricted to families who pay for childcare (Duncan Alan & Giles Christopher 2002). As already mentioned, this is a non-refundable measure and is independent of families' income. Although this is a direct subsidy for the use of informal and parental care, we cannot argue that it represents an incentive for the use of those types of care, given that it may not cover the costs of a parent who stays at home. Nevertheless, allowing some fiscal benefit independently of the type of care can be seen as a transfer from families without dependents to families with children.

The analysis of equity issues in Belgium may seem complex, taking into account that we must analyse the relations between three different types of childcare users. Nevertheless, knowing that equity depends on how resources are allocated to families with childcare needs, a global perspective on the childcare subsidy system may be achieved. First, we must compare families using formal care in the subsidised and non-subsidised networks. Given that the deduction of childcare expenses cannot give low and middle-income families access to the private network, to avoid inequities they must be able to purchase childcare services in the subsidised network. Second, we must determine the extend to which families using informal care may be able to avail formal childcare. In fact, inequities will arise between formal and informal childcare users if access to the formal network depends on families' socio-economic status.

Our analyses of the subsidised childcare network in Belgium will be restricted to the tax deduction of childcare expenses. Although this will only provide partial information about the equity of the overall system, it will clarify the importance of the Federal government's role in reducing parents' childcare expenses.

DATA AND METHODOLOGY

The data used is a sample of the overall tax claims of those households having dependent children less than four years of age or having claimed a tax deduction for children under four years of age. The database (IPCAL) is provided by the Institut National de Statistiques for the 1994-2000 fiscal years, corresponding to the earned incomes of 1993-1999. A few number of observations had to be deleted from the file because of invalid information. The numbers of tax declarations before and after validation are provided in the following table.

Table 2. Number of observations.

Fiscal Year	Number of households	Excluded cases	Final observations	% Excluded
1994	292228	347	291881	0.119
1995	285345	4295	281050	1.505
1996	279029	331	278698	0.119
1997	271267	877	270390	0.323
1998	276612	342	276270	0.124
1999	273644	350	273294	0.128
2000	264801	345	264456	0.130

The fiscal database contains information about yearly net and gross income, family structure, yearly childcare deductible expenses, and yearly tax payments. It must be noted that no information is available neither on real expenditures nor on the effective utilization of day care.

When analysing the impact of the tax deduction of childcare expenses we must bear in mind that families not availing of formal care are entitled to an exemption on income. Although our main concern is to see if the tax deduction of childcare expenses is equitable, we must not ignore the fact that the exemption may reduce the inequities between families with dependents. In fact, inequities must be measured for all families with dependents and for families using formal care. Under the first heading, the exemption and the tax deduction of childcare expenses must be measured as one policy, benefiting households with young children. Under the second heading, we try to analyse whether families in the formal care sector are equitably benefiting from the tax deduction of childcare expenses.

We performed three separate analyses to evaluate the equity of the federal government policy for families with children under three years of age. We assume that target population may be one of the following : a) all families with dependents, b) all families with dependents and non-parental care need, c) all families using formal daycare. This classification is of outmost importance. If use of formal daycare is only related to preferences than assessing group c) is most relevant. However, it is very likely that use of formal daycare is influence by the availability and cost of daycare. As a consequences, assessing equity in groups a) and b) are required.

First, we considered the impact of the tax deduction of childcare expenses and the exemption for all taxpayers with young dependents below the age of 4. This allowed us to understand the distribution of the fiscal benefit among **all families with dependents**.

However, the previous analysis disregards the fact that some households do not need non-parental daycare or prefer parental care. As a consequence, we carried out the analysis, in a second step, with **all families with dependents and having care needs**. We assumed needs of daycare arises when two-parents households had both labor-income or when single parent households received work-related income. Although it may be argued that all families with dependents have care needs, we assumed that households where parental care can be provided do not incur costs associated with the “need” to acquire care services. In particular we must consider that these families will purchase childcare services either in the formal or informal sector. We make this analysis bearing in mind that the resources for subsidising childcare are limited and that policy-makers need to target the potential users of non-parental childcare.

In the latter two cases, the range of action of the tax deduction of childcare expenses is highly restricted by the access to formal care. If families cannot avail of the formal childcare sector they will not be able to profit from this subsidy, and as the exemption represents only a small benefit, some inequities will arise between families with dependents.

Third, we analyse how the **users of formal care** profit from the tax deduction of childcare expenses. This provides us with information on how equitable is the instrument within the users of formal care. This third latter analysis assumes that the use of formal care is exogenous.

The impact of the deductibility of childcare expenses and the exemption should be measured in terms of vertical and horizontal equity in the reduction of tax payments. As a matter of fact, because parents receive the subsidy for their childcare expenses through the fiscal system, it is necessary to measure to what extent this may affect the post-tax distribution of income.

Some authors have argued that the progressivity of the deduction of childcare expenses depends on the limits set to the proportion of deductible childcare expenses with respect to the family’s income. (Altschuler Rosanne & Schartz Amy 1996). There are three reasons why we can argue that the distribution of the tax benefit is not vertically equitable in Belgium. Firstly, the amount that can be deducted from the childcare expenses does not depend on the household's income. Secondly, fees in the subsidised “crèches” are set according to income, so we would expect that parents deducting a higher amount of their childcare expenses have higher income. Thirdly, because the tax benefit depends on the marginal taxation rate, families with higher income obtain greater benefit from the deduction of childcare expenses. Fourthly, low income families prefer the use of informal childcare which cannot be deducted from taxable income

To evaluate the equity of the tax-based policies for families with young children in Belgium we measured the horizontal and vertical equity using the methodology of Aronson and Lambert (Aronson J. & Lambert P. 1994). They isolate the horizontal, vertical, and reranking effects of taxation on the distribution of income by differentiating several Gini and Concentration indices. Because parents receive the subsidy for childcare expenses through the fiscal system, it seems appropriate to explore the effects of the policies by analysing two scenarios. In the first

scenario, childcare expenses are not deductible and thus parents face higher tax payments. In this case, parents are not allowed to claim exemptions on their income. The second scenario includes the deduction of childcare expenses and the exemption.

The Aronson and Lambert methodology breaks down the total redistributive effect (*RE*) of taxation into three components: vertical equity obtained by treating equals equally (*V*), horizontal equity loss for the unequal treatment of equals (*H*), and the loss from reranking households differently in the pre-tax and post-tax income distribution (*R*). Further explanation of these components will be offered below. The breakdown is based on classifying the population by “groups of equals” and analysing whether the taxation system treats the individuals in each group equally (horizontal equity) and whether individuals in different groups are treated unequally (vertical equity).

The gain in equity due to the taxation system *RE* is then the difference between G_x and G_{x-t} . The Gini Index (*G*) measures the average income difference within the population. It takes values from zero to one. When the Gini Index equals to zero it means that all individuals have the same income. On the contrary if the Gini Index equals to one, all the income in the economy belongs to one individual. When the taxation system is progressive, G_x is bigger than G_{x-t} , given that taxes are set such that the difference in family income is smaller after tax.

$$RE = G_x - G_{x-t}$$

RE ranges from -1 to 1. If *RE* is negative the taxation system is regressive and worsens the distribution of income. If *RE* is positive the taxation system is progressive and improves the distribution of income. In the eventuality *RE*=0, then tax is considered as proportional.

If taxes are set equitably, different households with different income levels will pay different amounts of taxes. In this case, the three types of inequalities affect the redistributive index *RE*. The breakdown is expressed as follows:

$$RE = V - H - R$$

V captures the gain that would have existed if equals had been treated equally by the taxation system. In this case we compute what would have happened if all individuals belonging to a group paid the same amount of taxes. *V* is calculated as the difference between the pre-tax Gini coefficient and the post-tax Gini coefficient (G_b). The Gini Index (G_b) captures the distributional impact of taxes on the income distribution when each individual pays the group's average tax. *V* varies from -1 (regressive) to 1 (progressive). When *V* is not equal to zero it means that equals pay different taxes.

$$V = G_x - G_b$$

H captures the total loss of treating groups with equal pre-tax income unequally. *H* is calculated as the weighted sum of the Gini coefficient on post-tax income, for each group that is equal pre-tax. The weight of each group is calculated as the square of the number of individuals in each group divided by the square of the total population, multiplied by the average post-tax income group and divided by the average post-tax income. *H* takes only positive values. When *H* equals zero there is no differential treatment in any of the groups.

$$H = \sum \left[\frac{N_j^2 \mu_j}{N^2 \mu} \right] G_j$$

where

N_j = population for group j

N = total population

μ_j = average post-tax income for group j

μ = average post-tax income for the whole population

G_j = post-tax Gini coefficient

Finally the Atkinson-Plotnick index of reranking R captures the effect of individuals being re-ranked from pre-tax to post-tax distribution. R takes only positive values. R is calculated as:

$$R = G_{x-t} - C_{x-t}$$

where C_{x-t} is the concentration index for post-tax income.

The IPCAL database gives us exact information on taxable income, deductible childcare expenses, and total tax payments. However, we do not have information on the childcare tax credit. We calculate the fiscal benefit from deducting childcare expenses as:

$$FB^i = D^i * T_m^i$$

where:

FB^i is the fiscal benefit obtained by deducting the childcare expenses for each household i

D^i is the deductible amount of childcare expenses that can be deducted for each household i

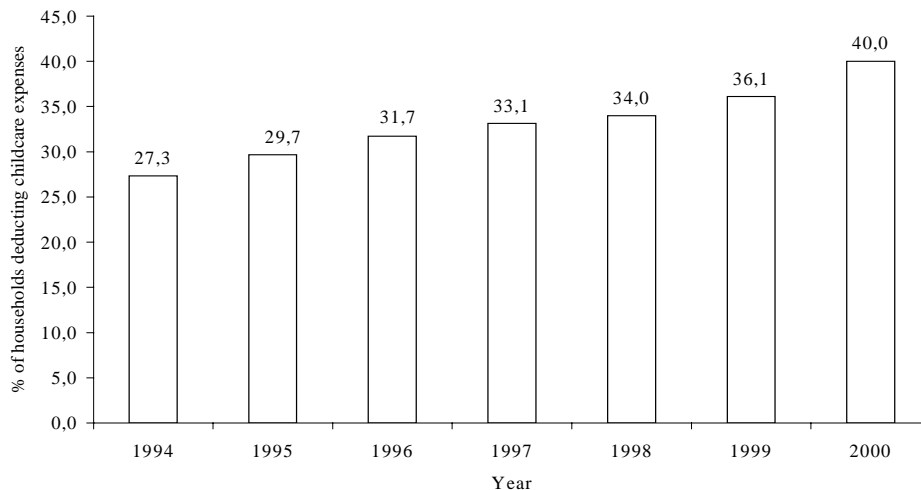
T_m^i is the marginal taxation rate for each household i.

DESCRIPTIVE ANALYSIS OF THE TAX-BASED POLICIES

To understand how the use of formal childcare has evolved over recent years we calculate the number of households that use the tax deduction of childcare expenses. Although this does not give us any information about the number of hours that the child attends a care institution, nor the actual fee paid, it gives us enough information to analyse whether households have access to formal care.

The percentage of households using the deduction of childcare expenses has increased from 27.3% in 1994 to 40.0% in 2000, which has led to an increment in the government's expenditure (revenue loss) on childcare subsidies. (Figure 3)

Figure 3: Evolution of the percentage of households claiming the tax deduction of childcare.



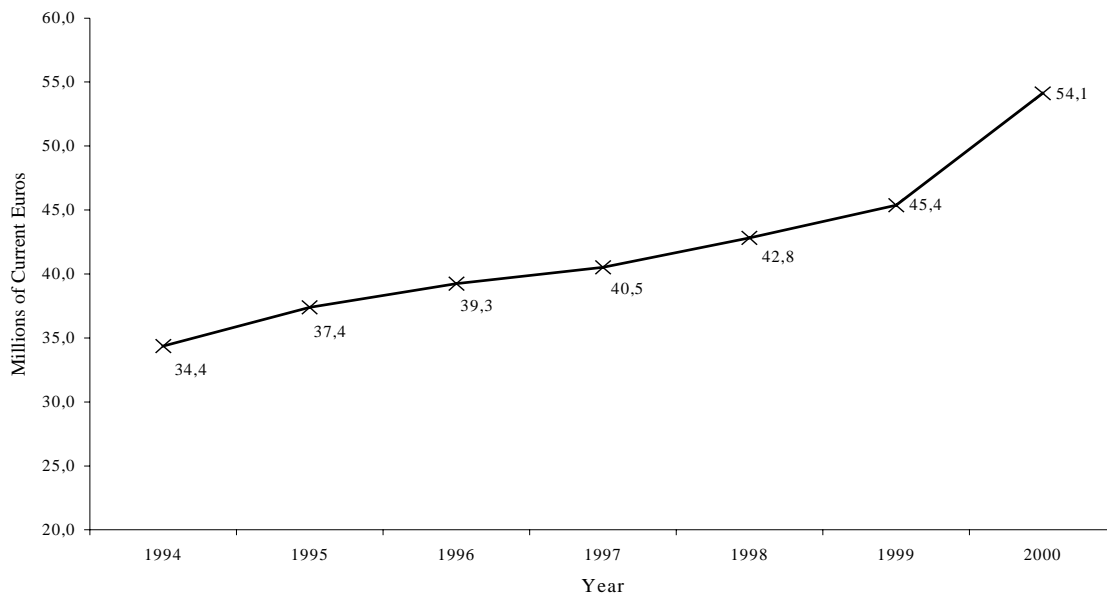
Sources: Tax base IPCAL (sample of the overall tax claims including those with dependent children under four years of age). Own calculations.

Although there has been during the period studied, the increase between 1999 and 2000 was bigger than the average of the period. In fact the growth in the percentage of households claiming the tax deduction in 2000 was 10.8% while between 1994 and 1999 the average growth accounted for 5.7%. We mentioned that in 2000 the federal government changed the ceiling on the childcare deduction. In order to identify into which extent this had an impact on the percentage of households claiming the credit we projected its expected value using the linear trend between 1994 and 1999. We found that the expected growth on the percentage of households claiming the tax deduction in 2000 was 37.8%. If we compare this value with the real growth in 2000 (40.0%) the difference of 2.2% represents the impact of the ceiling change on the percentage of families claiming the credit.

In recent years, the revenue loss for the childcare tax programme increased from 34.4 million euro in 1994 to 54.1 million euro in 2000. Until 1999, the yearly increment was around 5% and can be related to the evolution of the use of formal childcare. More striking is the increase in the government's loss between 1999 and 2000: 19.28%. As mentioned this is the consequence of the trend in the use of formal childcare, and also of the first change in the tax deduction limit (Figure 4). More striking is the increase in the government's loss between 1999 and 2000: 19.28%.

As mentioned this is the consequence of the trend in the use of formal childcare, and also of the first change in the tax deduction limit.

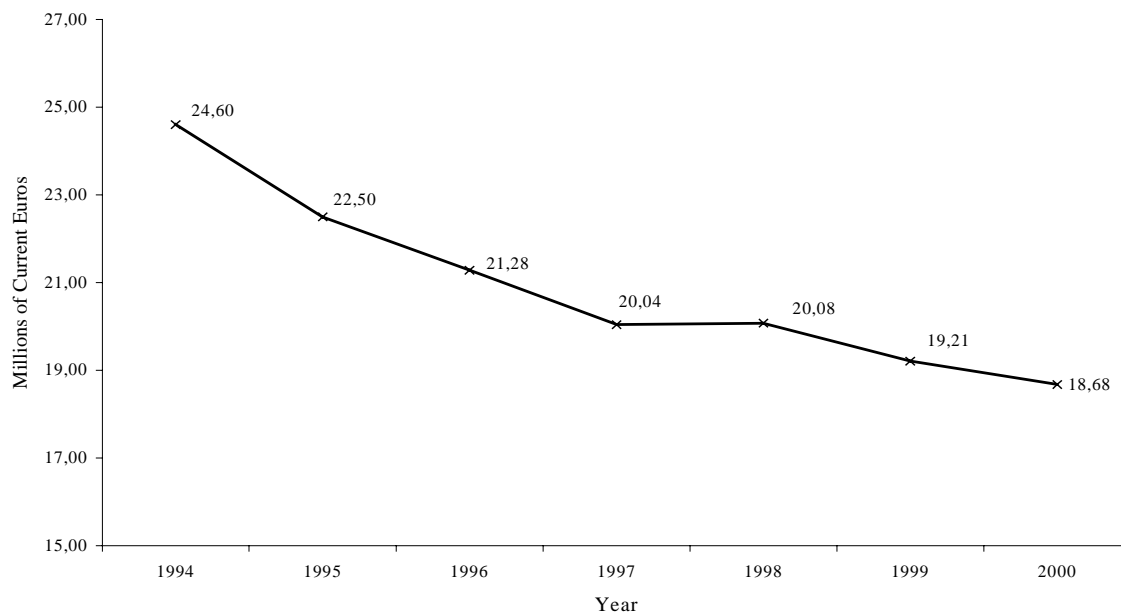
Figure 4: Evolution of the revenue loss from the tax deduction of childcare expenses.



Sources: Tax base IPCAL (sample of the overall tax claims including those with dependent children under four years of age).
Own calculations.

The government's loss from granting the exemption is smaller than from the tax deduction of childcare expenses. As already mentioned, families' fiscal benefit from the exemption is much smaller than from the tax deduction of childcare expenses. The revenue loss from the exemption has decreased as a consequence of the increase of the deducting childcare expenses (Figure 5).

Figure 5: Evolution of the revenue loss from the exemption



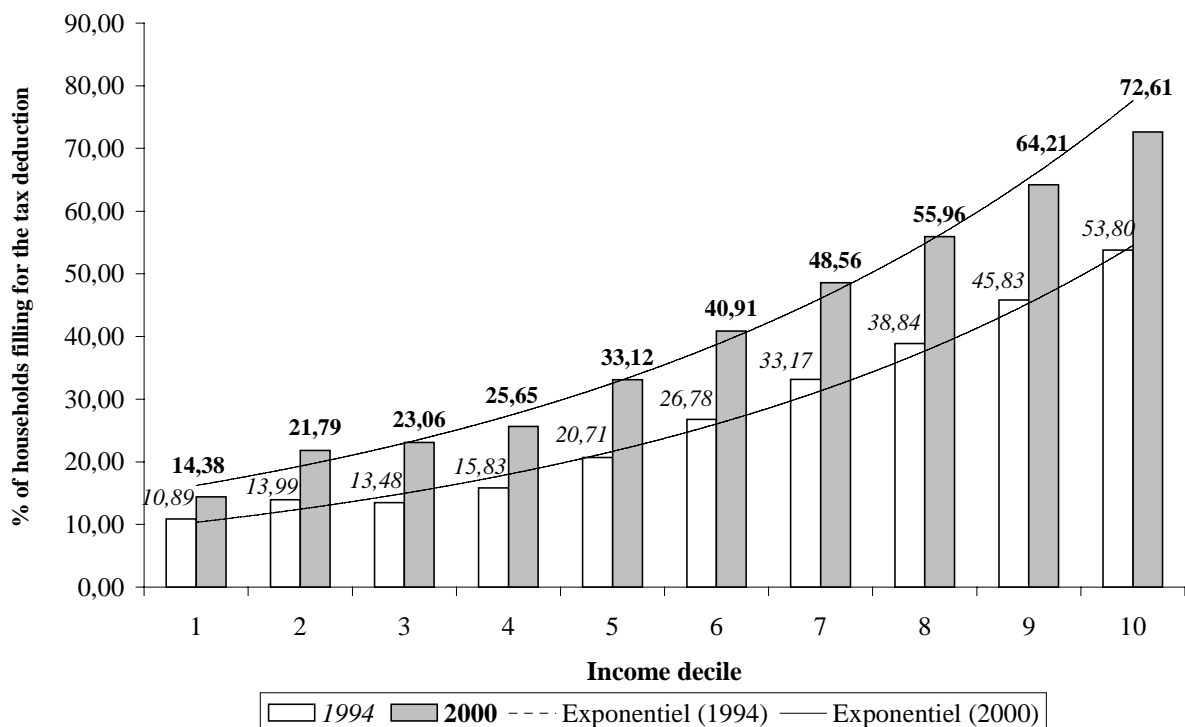
Sources: Tax base IPCAL (sample of the overall tax claims including those with dependent children under four years of age).
Own calculations.

As already mentioned, two aspects show the increasing importance of the deduction of childcare expenses in Belgium. On the one hand, there has been an increasing trend in the percentage of households claiming the tax deduction. On the other hand the important increase in 2000 shows that modifying the deductible ceiling has an impact on the percentage of households claiming the tax deduction.

Descriptive analysis of the use of the tax deduction by income decile

An important aspect of the childcare tax deduction is how it evolves with respect to income. Some authors have argued that subsidy progressivity is attained only if the deductible amount decreases with income. (Gentry & Hagy 1995) (Altschuler Rosanne & Scharz Amy 1996) Taking this into account, we would expect to find that the tax deduction in Belgium is regressive, given that the deductible amount only depends on a daily maximum. To understand how the tax deduction operates at different levels of income, we calculated the percentage of households that have deductible childcare expenses in each decile (line percentage).

Figure 6: Percentage of households claiming the childcare tax deduction in each income decile.

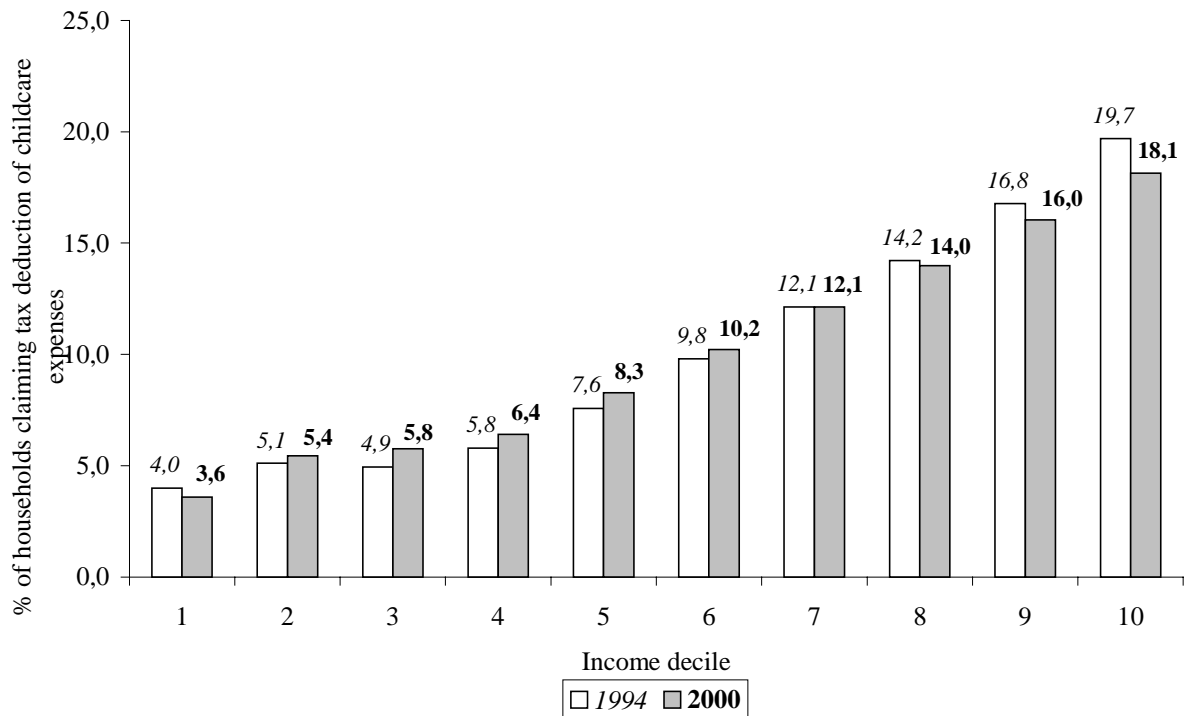


Sources: Tax base IPCAL (sample of the overall tax claims including those with dependent children under four years of age). Own calculations.

Firstly, we notice from Figure 6 that there has been an increase in the percentage of households claiming the tax deduction in all income deciles. This implies that households have increased the use of formal care regardless of their income. Secondly, the percentage of families in each income decile that claim the tax deduction increases exponentially with income. This implies that if we set a policy to increase the use of formal care without focusing on a particular income group, the percentage of households that will effectively use more formal care will increase with income. Thirdly, the growth in the percentage of households using the tax deduction from families belonging to the

income deciles 2 to 6 was bigger than 50%. Fourthly, in 1994 the households in income deciles one to six made below-average use of the tax deduction (the average was 27.3%). In 2000 households with below-average use of the tax deduction (40,0%) belonged to income deciles one to five. This suggests that the use of the childcare tax deduction has had a positive evolution with respect to income.

Figure 7: Evolution of the share of households claiming the childcare tax deduction by income decile.



Sources: Tax base IPCAL (sample of the overall tax claims including those with dependent children under four years of age). Own calculations

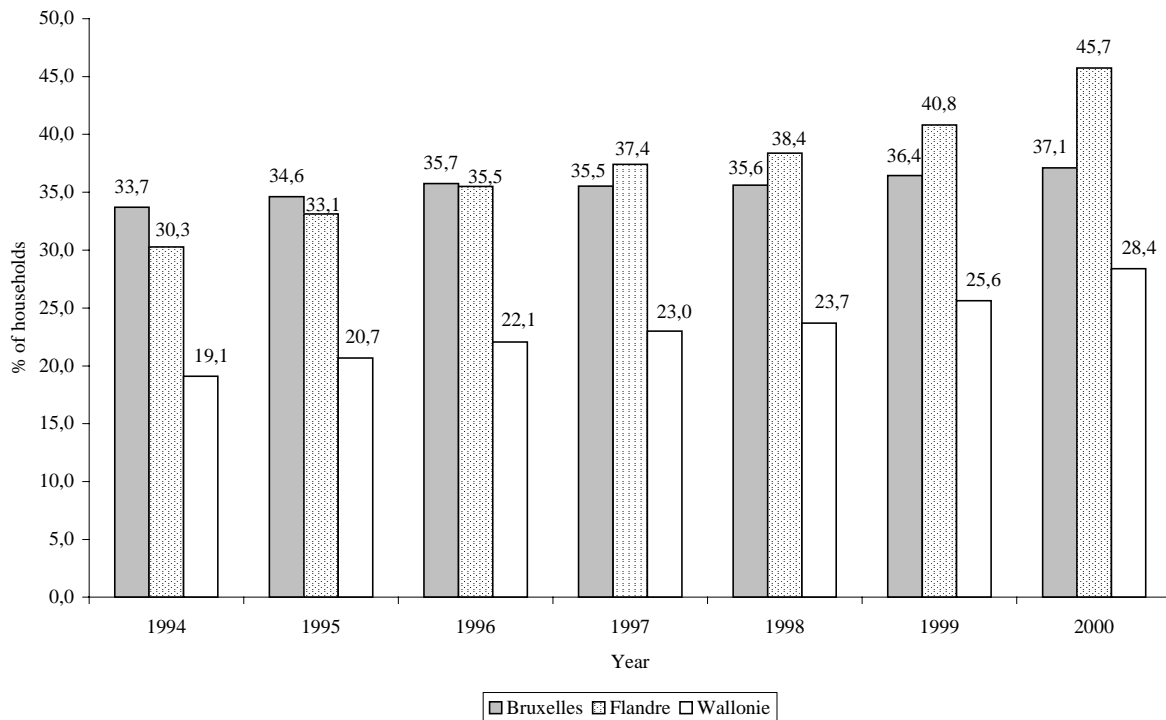
Analysing we notice that households belonging to income deciles two to six presented an increased share in the use of the childcare tax deduction. However, households belonging to income deciles one, eight, nine, and ten decreased their share. Although this implies that middle-income families increased their use of the credit, 60% of the total number of households using the deduction of childcare expenses still belong to the upper part of the income distribution (income deciles seven to ten).

When we analyse the evolution of the use of the tax deduction of childcare expenses by region, important differences emerge. Figure 8 shows the results by region. We notice that the percentage of households using the tax deduction childcare expenses in Flanders increased from 30.3% in 1994 to 45.7% in 2000. In Wallonia, the number of households claiming the deduction of childcare expenses increased from 19.1% in 1994 to 28.4% in 2000. Finally, for Brussels the average percentage of households claiming the deduction of childcare expenses stayed almost constant, rising from 33.7% in 1994 to 37.1% in 2000. The differences between the regions may depend on the availability of childcare places and on their socio-economic characteristics.

A possible explanation for these regional differences is that the growth of the offer of formal childcare places varies greatly from Flanders to Wallonia. As we mentioned, in Flanders the number of available childcare places grew 26.49% while in Wallonia its growth accounted for 2.9%. In this case the use of the tax deduction of childcare expenses may be restricted to the availability of childcare places.

A second possible explanation is that given the unemployment's rate in Wallonia is bigger than in Flanders, families use more parental care and informal care.

Figure 8: Evolution of the percentage of households claiming the deduction of childcare expenses by region



Sources: Tax base IPCAL (sample of the overall tax claims including those with dependent children under four years of age). Own calculations

THE FISCAL BENEFIT FOR FAMILIES WITH DEPENDENTS

As mentioned, because parents receive the subsidy for childcare expenses through the fiscal system, it seems appropriate to explore the effects of the policies by analysing two scenarios. In the first scenario, childcare expenses are not deductible and thus parents face higher tax payments. In this case, parents are not allowed to claim exemptions on their income. The second scenario includes the deduction of childcare expenses and the exemption. To compute the effect of the tax deduction of childcare expenses we must compare both scenarios. In this case differentiating the different indices will provide us with the information on the impact on equity of the deduction of childcare expenses.

We present the results for $RE^2 - RE^1$, $V^2 - V^1$, $R^2 - R^1$, and $H^2 - H^1$. Interpretation must be done carefully given that we must compare both scenarios at the same time and this is not as straight forward as comparing them apart.

Firstly, the difference between the **redistributive indices** $RE^2 - RE^1$ shows the impact on **global impact on equity** of including the tax-policies for families with dependents. If $RE^2 - RE^1$ is positive the distribution of income is improved through the use of the tax deduction of childcare expenses and the exemption. On the contrary, if $RE^2 - RE^1$ is negative the tax-based policies worsens the distribution of income.

Secondly, the difference between the **vertical equity indices** $V^2 - V^1$ shows the impact **on the vertical equity** of including the tax-policies for families with dependents. If $V^2 - V^1$ is positive gains in the vertical equity are created through the use of the tax deduction of childcare expenses and the exemption. On the contrary, if $V^2 - V^1$ is negative the tax-based policies worsens the vertical equity.

Thirdly, the difference between the **loss in horizontal equity indices** $H^2 - H^1$ shows the impact **on the horizontal equity** of including the tax-policies for families with dependents. If $H^2 > H^1$ implies that the use of the tax deduction of childcare expenses and the exemption increases the horizontal inequities. Then if $H^2 - H^1$ is positive the tax-base policies worsen the distribution of income. On the contrary, if $H^2 < H^1$ gains on the horizontal equity are obtained by using the tax deduction of childcare expense and the exemption.

Fourthly, the difference between the **reranking indices** $R^2 - R^1$ shows if the tax-policies for families of the pretax and post-tax rankings. If $R^2 > R^1$ implies that the use of the tax deduction of childcare expenses and the exemption increases the reranking from the pretax to the post-tax distribution of income. Then if $R^2 - R^1$ is positive the tax-

base policies worsen the distribution of income. On the contrary, if $R^2 < R^1$ reranking is reduced by using the tax deduction of childcare expense and the exemption. Table 3 presents the complete interpretation of the signs of $RE^2 - RE^1, V^2 - V^1, R^2 - R^1$ and $H^2 - H^1$

Table 3: Interpretation of the signs of $RE^2 - RE^1, V^2 - V^1, R^2 - R^1$, and $H^2 - H^1$ with respect to the impact of the tax deduction of childcare expenses and the exemption on the distribution of income.

	Improves the distribution of income if:	Worsens the distribution of income if:
$RE^2 - RE^1$	Positive	Negative
$V^2 - V^1$	Positive	Negative
$H^2 - H^1$	Negative	Positive
$R^2 - R^1$	Negative	Positive

Results for the all households with dependents.

As shown in Table 4, the Gini index including the deduction of childcare expenses (G_{x-t}^2) is bigger than without the use of the tax deduction and the exemption (G_{x-t}^1). This implies that these subsidies worsen the distribution of income and as a consequence, RE is smaller under the use of the tax-based policies. It is important to mention that, because the deduction of childcare expenses is relatively small with respect to total tax payments, the effects on RE are small. Two aspects must also be mentioned. Firstly, between 1995 and 1999 the difference between the two redistribute indices ($RE^2 - RE^1$) showed a tendency to decrease. The decreasing tendency of the negative impact of the deduction of childcare expenses between 1994 and 1999 may be a consequence of the increment of the increasing use of the childcare tax deduction by middle-income families. Secondly, comparing 1999 and 2000 we find that an increase in the inequity created by tax-based policies rises on 0.016%. This may be the consequence of the new daily maximum that can be deducted (it rose from 8.7 EUR to 11.2EUR).

Table 4: Gini coefficients and RE for all households with dependents (%)

Year	Gini Index on gross Income G_x	Gini Index on the net income (No tax Deduction) G_{x-t}^1	Gini Index on the net income (With tax Deduction) G_{x-t}^2	Without Tax Deduction RE^1	With Tax Deduction RE^2	Impact on equity of the tax-based policies $RE^2 - RE^1$
1994	28,12	21,98	22,00	6,14	6,12	-0,017
1995	27,04	21,32	21,35	5,72	5,69	-0,031
1996	29,06	22,84	22,87	6,22	6,19	-0,024
1997	29,97	23,62	23,64	6,36	6,33	-0,022
1998	30,37	24,02	24,05	6,35	6,33	-0,021
1999	30,70	24,31	24,33	6,39	6,37	-0,016
2000	31,53	24,93	24,96	6,60	6,57	-0,032

Comparing each term of the decomposition of ($RE^2 - RE^1$), we find that the inequality loss from the deduction of childcare expenses comes from an increase in the vertical inequality. As a matter of fact, $V^2 - V^1$ is smaller than zero, this shows that the inequity due to the deduction of childcare expenses is due to the fact that the tax benefit increases with income. On the other hand, negative values of the differences on $H^2 - H^1$ and $R^2 - R^1$ imply that the loss on equity caused over the horizontal equity and on the reranking is reduced. When using the tax deduction of childcare expenses and the exemption, families in the same income group are more equally treated by the taxation system.

Table 5: Decomposition of RE, V, H, and R : all households with dependents.

Year	Vertical impact on equity $V^2 - V^1$	Reranking impact on equity $R^2 - R^1$	Horizontal impact on equity $H^2 - H^1$
1994	-0,021	-0,002	-0,002
1995	-0,035	-0,001	-0,002
1996	-0,029	-0,003	-0,002
1997	-0,028	-0,003	-0,003
1998	-0,027	-0,003	-0,003
1999	-0,023	-0,004	-0,003
2000	-0,039	-0,004	-0,003

Results for households with childcare needs

When analysing the results for households with childcare needs we arrive at similar results to those found for all households with dependents. Firstly, between 1995 and 1999 the difference between the two redistribute indices ($RE^2 - RE^1$) showed a tendency to decrease. Secondly, comparing 1999 and 2000 we find that an increase in the inequity created by tax-based policies rises on 0.022%.

Table 6: Gini coefficients and RE for households with childcare needs

Year	Gini Index on gross Income G_x	Gini Index on the net income (No tax Deduction) G_{x-t}^1	Gini Index on the net income (With tax Deduction) G_{x-t}^2	Without Tax Deduction RE^1	With Tax Deduction RE^2	Impact on equity of the tax-based policies $RE^2 - RE^1$
1994	25,66	20,20	20,21	5,46	5,45	-0,011
1995	24,39	19,40	19,43	4,99	4,96	-0,032
1996	26,58	21,05	21,08	5,53	5,50	-0,024
1997	27,38	21,77	21,79	5,62	5,59	-0,024
1998	27,90	22,24	22,26	5,66	5,64	-0,017
1999	27,97	22,29	22,30	5,68	5,67	-0,008
2000	28,94	23,02	23,05	5,93	5,89	-0,030

Comparing each term of the decomposition of ($RE^2 - RE^1$), we find that the inequality loss from the deduction of childcare expenses comes also from an increase in the vertical inequality. On the other hand, negative values of the differences on $H^2 - H^1$ and $R^2 - R^1$ imply that the loss on equity caused over the horizontal equity and on the reranking is reduced. These values are smaller than in the precious case implying that the impact on equity of the tax-based policies is less important for families with childcare needs.

Table 7: Decomposition of of RE, V, H, and R : households with childcare needs.

Year	Vertical impact on equity $V^2 - V^1$	Reranking impact on equity $R^2 - R^1$	Horizontal impact on equity $H^2 - H^1$
1994	-0,012	-0,001	0,000
1995	-0,003	0,030	-0,001
1996	-0,025	-0,002	0,000
1997	-0,027	-0,001	-0,002
1998	-0,020	-0,001	-0,001
1999	-0,011	-0,001	-0,002
2000	-0,033	-0,001	-0,001

Results for those households deducting childcare expenses.

Here we are concerned with the equity impact of the fiscal benefit on families claiming the tax deduction of childcare expenses. First we notice that, the difference between the redistribution indices ($RE^2 - RE^1$) is positive from 1994 to 2000. Because the coefficient RE shows how much redistribution is achieved by the taxation system, given that RE^2 is greater than RE^1 , including the tax deduction of childcare expenses improves the income distribution for families who use formal childcare. Furthermore, between 1995 and 1999, this difference increased constantly. In 1995 RE^1 was smaller than RE^2 by 0.09% and in 1999 this difference was 0.148%. This tendency changed between 1999 and 2000, with the difference between the two indexes changing from 0.148% in 1999 to 0.145 in 2000.

The finding that the tax deduction of childcare expenses enhances equity in income distribution may seem paradoxical, taking into account that the income level does not restrict the deductible amount. This could, however, be related to the tariffs set by formal childcare providers. In the subsidised childcare sector, KG and ONE set fees according to income scales. If we consider that the deduction of childcare expenses improves the income distribution it means that the fiscal benefit is equally distributed among these families. This result may be explained by analysing the average fee and the maximum amount of childcare expenses that can be deducted. In the French Community the average daily fee paid for a subsidised childcare place in 2000 was around 9.76EUR. In the Flemish Community the average daily fee amounted to 11.46EUR. Knowing that in 2000 the maximum deductible amount was set at 8.9EUR per day, we can say that in the subsidised sector at least half of the families benefited from claiming the maximum deductible amount. In the private sector, fees are normally set above the maximum fee in the subsidised sector. This value is over 18EUR in both Communities. Because of this, we may say that all families availing of non-subsidised formal childcare facilities will benefit from the maximum deductible amount. We may conclude that more than half of all the families using formal care benefits from claiming the ceiling amount.

Table 8: Gini coefficients and RE for households claiming the tax deduction of childcare expenses

Year	Gini Index on gross Income G_x	Gini Index on the net income (No tax Deduction) G_{x-t}^1	Gini Index on the net income (With tax Deduction) G_{x-t}^2	Without Tax Deduction RE^1	With Tax Deduction RE^2	Impact on equity of the tax-based policies $RE^2 - RE^1$
1994	23,95	18,83	18,73	5,13	5,23	0,102
1995	22,09	17,52	17,43	4,57	4,66	0,090
1996	24,72	19,51	19,39	5,21	5,33	0,115
1997	25,60	20,17	20,04	5,43	5,56	0,132
1998	25,65	20,34	20,21	5,31	5,44	0,139
1999	26,15	20,79	20,64	5,36	5,51	0,148
2000	27,28	21,68	21,54	5,59	5,74	0,145

As we already mentioned, between 1999 and 2000 the difference between RE^2 and RE^1 decreased. The reduction of 0.003% implies that the deduction of childcare expenses became less equitable in 2000 than it was in 1999. In fact, given that the deductible ceiling had changed from 6.9EUR to 8.9EUR, only families paying more than 6,9EUR will have benefited .

When analysing the decomposition of $(RE^2 - RE^1)$ we notice that an improvement on the vertical equity as well as a reduction on the horizontal equity loss and reranking loss exist when including the tax deduction of childcare expenses. In the previous cases, the vertical equity was negatively affected and only a small improvement in the horizontal equity and on the reranking was produced through the use of the deduction of childcare expenses and the exemption.

Table 9: Decomposing of RE, V, H, and R: households claiming the tax deduction of childcare expenses

Year	Vertical impact on equity $V^2 - V^1$	Reranking impact on equity $R^2 - R^1$	Horizontal impact on equity $H^2 - H^1$
1994	0,0920	-0,004	-0,006
1995	0,0820	-0,003	-0,005
1996	0,1050	-0,003	-0,007
1997	0,1200	-0,003	-0,009
1998	0,1290	-0,002	-0,008
1999	0,1370	-0,003	-0,008
2000	0,1350	-0,002	-0,008

In order to have a better idea of the impact of the ceiling reform on the distribution of childcare expenses, we calculated the Gini coefficient of the tax deduction of childcare expenses. Table 10 shows the results. As expected, the Gini coefficient deteriorates in 2000, implying that the raising of the ceiling for deductible childcare expenses had a negative impact on the equity of this subsidy. We note that between 1994 and 1999 the Gini index decreased, and so we can say that the deduction of childcare expenses became more equitable. In fact, knowing that the percentage of families claiming the deduction of childcare expenses increased, we may say that this subsidy is highly equitable between families in the formal childcare sector. This tendency is reversed in the 2000 figures, and there is a regression on the equity results obtained, as the Gini index indicates that for 2000 the equity of the deduction of childcare expenses is worse than for 1994.

Table 10: Gini coefficient for the tax deduction of childcare expenses

year	Households with tax deduction
1994	13,15
1995	12,55
1996	12,95
1997	12,54
1998	12,16
1999	12,01
2000	13,55

The deduction of childcare expenses: regional variations

Taking into account the fact that the evolution of households claiming the deduction of childcare expenses has varied greatly according to region, we calculated the Gini Index on the tax deduction of childcare expenses for Wallonia, Flanders, and Brussels.

Table 11: Gini Index on the deduction of childcare expenses by region

Year	Belgium	Wallonia	Flanders	Brussels
1994	13,15	12,67	13,28	13,92
1995	12,55	12,95	13,04	14,20
1996	12,95	12,92	12,89	14,43
1997	12,54	12,26	12,49	13,69
1998	12,16	12,23	11,94	13,94
1999	12,01	12,33	11,83	13,88
2000	13,55	12,92	13,52	16,05

We note that the Gini index for Brussels is the highest of the three regions. This implies that the tax deduction of childcare expenses is more unequally distributed in Brussels than in the rest of the country. In Flanders, between 1994 and 1999, the use of the tax deduction of childcare expenses became more equitable. If we compare the Flanders index evolution with that of Wallonia, we find that, although in 1994 the tax deduction was more equitable in Wallonia, the improvement in equity in Flanders was such that by 1998 the tax deduction became more equitable in this region. This may be very much related to the importance in the widespread use of formal care in Flanders. In fact, Figure 6 shows that use of the deduction of childcare expenses increased more in Flanders than in Wallonia. Although Wallonia's Gini index decreased until 1998, from 1999 a loss of equity appeared. This geographical difference in the use of the tax deduction of childcare expenses raises a lot of questions. In fact, this shows that because two different childcare policies are adopted by the Communities, and because there is no coordination with Federal government policies, inequities may be pushed aggravated on a regional basis.

CONCLUSION

The issues

The demand for childcare outside the home has increased as a consequence of the demographic and social changes of the last two decades. Families look for high quality and affordable childcare. However, without any regulation the childcare market creates a trade-off between quality and affordability. This has an impact on equity, as it affects the relative access to childcare facilities of rich and poor families and also affects the equitable participation in the labour force of men and women. Accordingly, Government intervention in the childcare market is justified, as it is the only way to reduce these inequities.

Determining which subsidy is best adapted to targeting childcare quality, equity in the provision of childcare, or to reducing barriers to entrance to the labour force is a controversial issue for both policy-makers and academics.

In Belgium, Federal government involvement in subsidising the childcare systems takes place through the use of tax deductions of childcare expenses. For families not claiming the tax deduction, the government has introduced an exemption for each child under three years old. The two instruments affect different types of users of childcare, the first benefiting families in the formal childcare network and the second families using informal or parental care.

Main findings

As already mentioned, the use of the tax deduction of childcare expenses is restricted to families using formal care. We found that the percentage of families with young children claiming this subsidy increased constantly from 27.1% in 1994 to 40.0% in 2000. In terms of the government's revenue loss, in 1994 it accounted for 34.4 million euro, with yearly increases of around 5% up to 1999. In 2000 the increase represented more than 9 million euro, a growth of 19%. Although this increment depends on the tendency to growth in the use of formal care, it is clear that the modification of the deductible ceiling affected the amount that families claimed.

A second aspect regarding the use of formal care is that it varies greatly according to region. Between 1994 and 2000 there was very slight increase in the use of the tax deduction for households living in Brussels. In Wallonia the increase in the percentage of families claiming the tax deduction of childcare expenses amounted to 9.3%. In Flanders the percentage of families claiming the tax credit increased by 15.4%. Such regional differences should be related to the regional level of employment and to the availability of formal childcare where tax deduction can be used. Future research will shed light on such issue.

To analyse the equity of these tax-based policies for subsidising childcare we used the method of decomposition of the Gini Index by Aronson and Lambert. This allowed us to compare the impact on the distribution of income of the tax policies. We divided our analysis into three groups, the first of which included all families with young children. Three results must be mentioned for this group. Firstly, we found for this group that the tax-based policies (the tax

deduction and the exemption) worsened the distribution of income. This negative impact affects vertical equity, in other words, the fiscal benefit from the deduction of childcare expenses and the exemption increases with income. Secondly, the tax-based policies had a small positive impact on horizontal equity. This implies that within the same income groups all families benefited equally from the tax-based policies. Thirdly, from 1995 to 1999 there was a reduction in the inequity of the tax-based policies amounting to 0.0012%, which meant that the policies became less inequitable. This tendency changed in 2000, when the use of the tax-based policies increased the inequity by 0.0016%.

The second group we studied was made up of families with childcare needs. We defined this group by trying to identify families in the informal sector where parental care cannot be provided. To this end, parents having work-related incomes were considered as not being able to care for their children. Using this specific group implies that policies to subsidise childcare are related to the employment status of the parents. As we will discuss later, other perspectives may be used to define childcare policies. For this group we found similar results as for that made up of all families with dependents under three years old. Firstly, the tax-based policies had a negative impact on equity for families with childcare needs. Secondly, from 1995 to 1999 a reduction in this inequity of 0.0024% shows that the tax-based policies became more effective in achieving equity for families with childcare needs. This was a consequence of the increase in the use of formal care. Thirdly, in 2000 the change in tax policies led to a rise in the inequity of 0.0022%.

We observed that tax-based policies had inequitable outcomes for the two groups analysed. Nevertheless, the reduction of the inequities from 1995 to 1999 implies that more families benefited from these policies. As we mentioned, the increase in the percentage of families claiming the tax deduction of childcare expenses may be the reason for this improvement. At this point it must be said that this implies that the tax deduction of childcare expenses is more equitable when access to formal childcare is made available to all families with childcare needs.

Finally, we analysed the impact on equity of the tax deduction of childcare expenses for those families who deduct them. We found that existence of the tax deduction improved the distribution of income. We observed that the gains in equity from 1995 to 1999 increased from 0.09% to 0.148%. In this case, both vertical and horizontal equity were improved by the availability of the tax deduction of childcare expenses. This result may be explained by analysing the average costs and the maximum amount of childcare expenses that can be deducted. In the French Community the average daily fee paid for a subsidised childcare place in 2000 was around 9.76EUR. In the Flemish Community the average daily fee came to 11.46EUR. As in 2000 the maximum deductible amount was set at 8.9EUR per day, we can say that in the subsidised sector at least half of the families benefited from claiming the maximum deductible amount. In the private sector, fees are normally set above the maximum fee charged in the subsidised sector, which implies that families buying childcare from private providers are restricted to deducting the ceiling amount. In 2000 a slight decrease in the equity gain attributable to the tax deduction of 0.003 shows that the modification of the ceiling had a negative impact on equity.

We computed the Gini Index on the fiscal benefit from tax deduction of childcare expenses. We found that in 1994 the difference amounted to 13.15%. This implies that, although the policy made the distribution more equitable,

there was a difference in the average gain for families from the tax deduction. This difference decreased constantly until 1999, when it amounted to 12.01%. In 2000, the Gini Index increased to 13.55, implying that the average difference within households from the fiscal benefit was higher than in 1994. Once again, this is a consequence of the modification of the ceiling on the deductible amount.

This study suggests that the tax deduction of childcare expenses improves equity among users of formal day care, and worsens equity among all families with young children.

A second aspect regarding the use of formal care is that it varies greatly according to region. To establish how the evolution of the fiscal benefit changed in each region, we calculated the Gini Index for Brussels, Flanders, and Wallonia. We observed that the Gini Index for Brussels was the highest of the three regions. This implies that the fiscal benefit is more unequally distributed in Brussels than in the rest of the country. In Flanders, between 1994 and 1999, the equity gains from the tax deduction of childcare expenses became more equitable. If we compare the development of the Flanders index with that of the Wallonia index, we find that, although in 1994 the fiscal benefit was more equitably distributed in Wallonia, the improvement in equity in Flanders was such that by 1998 the gains from the tax deduction became more equitable in this region. This may be related to the extent of the availability of formal childcare places in Flanders, as only families using formal care can claim the tax deduction of childcare expenses. As already mentioned, the increase in the percentage of families claiming the tax deduction was the highest for this region. Although Wallonia's Gini Index decreased until 1998, from 1999 a loss of equity appeared.

The equity of the tax deduction of childcare expenses depends greatly on the relation between the deductible amount and the fees paid by parents. In fact, we may say that this policy improves equity when the maximum deductible amount is set around the average fee paid by parents. On the other hand, given that fees in the subsidised sector are set according to income, those families paying less than the average fee will benefit less from the tax deduction of childcare expenses. Nevertheless, as the change in the deductible amount introduced in 2000 allows families to deduct 100% of their childcare expenses, this will have a positive effect for all families regardless of their income level.

Limitations

The first limitation to our study is that we are unable to differentiate the fiscal benefit obtained by families in the subsidised and non-subsidised networks. This does not allow us to analyse how the availability of childcare in the public and private sector may be influenced by demand-based subsidies.

Secondly, as we have no information on hours of attendance at childcare facilities, we are unable to calculate whether the tax deduction of childcare expenses gives parents an incentive to place their children in childcare facilities for longer periods of time.

Thirdly, we are unable to evaluate possible inequities arising from others sources of funding for childcare facilities, such as the Communities' subsidies and direct payments by parents. This has two major implications. On the one

hand, the Community resources used to subsidise childcare facilities come from indirect taxes, which are generally regressive. This may have a negative impact on the redistributive indices *RE*, thus creating greater inequalities. On the other hand, direct payments affect low-income families more than high-income families and their impact on equity may also be negative.

Fourthly, we are unable to compute how the use of the tax deduction of childcare expenses and the subsidies to providers improve affordability in the subsidised network. An important question arises given that low-income families cannot avail of the private childcare network and their only chance to get formal care is in subsidised facilities. So it is very important to make a deeper analysis of which families use subsidised childcare facilities.

The tax deduction of childcare expenses is a controversial issue, not only in terms of equity but also because of its impact on the quality of the childcare services purchased by families. When we consider the impact on quality of the deduction of childcare expenses, a much less optimistic picture emerges. Blau and Hagy show that the deduction of childcare expenses can be used to reduce the childcare costs associated with being employed, independently of the quality of the childcare purchased. In fact, the deduction of childcare expenses will lead employed parents to buy more hours of care and decrease the quality of care demanded (Blau & Hagy 1998).

On the other hand, the tax deduction of childcare expenses has been associated with policies focusing on employment. If we consider that parents need to make use of out-of-home care in order to be able to enter the labour force, childcare costs should be treated as work-related expenses. From this point of view, the deduction of childcare expenses is justified. The effectiveness of this subsidy to employment has been widely proven. (Blau & Robins 1988b; Duncan Alan & Giles Christopher 2002; Michalopoulos, Robins, & Garfinkel 1992; Phillips 2002). However, the reduction of childcare expenses through other subsidies seems to be also very effective in terms of employment. In the US, programmes based on provider-oriented policies (Head Starts) allow families on the social security system to increase their income by entering the labour force. In France, the high employment rate of lone mothers is a consequence of the availability of low-cost high-quality care in the subsidised sector.

Finally the geographical difference in the use of the tax deduction of childcare expenses raises a lot of questions. In fact, this shows that because two different childcare policies are adopted by the Communities, and because there is no coordination with Federal government policies, inequities may be exacerbated on a regional basis. As stated by the OECD in its recent report, coordination between provider- and consumer-based policies is the key to achieving an equitable subsidised childcare system.

Utility

Improving equity on the subsidies childcare system in Belgium is not a simple task given the lack of co-ordination between the Federal government and the Communities. At the Federal level, the tax deduction of childcare expenses should be set according to the impact on equity for families using formal care. Nevertheless, this implies setting different policies for each of the communities given that each of them uses different scale fees within the subsidised childcare network.

When considering that the subsidy on the demand side has been modified, the Communities may be tempted to modify the fee-scale used in the subsidised childcare facilities : within a federalized competitive institutional structure, the final equity of child care expenses is influenced by both the fee scale established by the Communities and by the tax deduction of the Federal Government. Is the recent 2000 modification of the tax deduction of child care requiring an adaptation of the fee scale ? The answer to this question requires a cautious assessment of several elements which are beyond the scope of the present research : trade-off between policy objectives such as efficiency, quality, choice and equity as well as the adverse effects of changing a fee scale among the different targeted groups. Nevertheless, some tentative points can be raised.

First, from the results in this study, we showed that the tax deduction of childcare expenses is relatively redistributive among the users of formal care. This can be due to the ceiling which is set around the average fee paid by the parents. True, the recent modification of the ceiling increased the inequities among the users of formal care. However, such change was slight and geographically concentrated in Brussels, suggesting that regional issues are at play (local supply, labour market and regional income).

Second, among some groups, there is no strong relationship between the fee-scale applied by the Communities and the fiscal benefit: for example, families with numerous dependents or with only one dependent would pay the same fee while the former would not be able to claim those expenses in its fiscal claim. The two instruments are not tailored on the same income definition and family structure. If the Communities modify the fee-scale taking into account this loss and set higher tariffs, they must clearly identify which families benefited from the fiscal ceiling changes. In the French community families with a monthly net income above of 1293EUR may be able to benefit from the ceiling change. However not all families with a monthly net income above of 1293EUR can benefit from the tax deduction given that some may not have positive tax liabilities.

Thirdly, as we mentioned, the tax deduction of childcare expenses worsens equity among all families with young children. This result shows that the use of the tax deduction of childcare expenses may enhance inequities that are created from the restriction on the access to formal childcare. This implies that the tax deduction may be highly equitable if families are able to fulfill their childcare needs in the formal childcare network. At this point, two different policy questions should be solved. Firstly, given that the provision of formal childcare depends on the subsidies and private network, the Communities should be concern on regulating equitable access to formal care facilities. This implies that families not able to purchase childcare on the private sector should be able to fulfill their childcare needs in the subsidies facilities. Secondly, when setting policies on the provision of formal childcare, the Communities should analyse the factors that affect the evolution of the demand for childcare. In fact, it is extremely important to consider the demographic changes as well as the family's preferences for the different childcare types. A recent study in the UK showed that parents consider that the best alternative to replace parental care is the care provided by the grandparents(Wheelock J & Jones Katharine 2002). This implies that families will not use formal care if grandparents can care for their grand children. We strongly encourage policy-makers to consider that setting a specific childcare policy should be done to allow families to access high quality childcare and that this may include some forms of informal care as well as parental care.

Finally, the impact of the second modification of the tax deduction implemented in 2001 (scrapping the 80% limitation on the deductible amount) could not be assessed here. As we showed in a previous report, such measure could improve or worsen the redistribution of the tax benefit. This needs to be assessed.

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