Family Tax Policy with Heterogeneous Altruistic Households

L. Granelli

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Lucia Granelli[†]
IRES, Université catholique de Louvain[*]

Abstract

This paper presents a general equilibrium model, with overlapping generations and heterogeneous altruistic households. Taking into account the heterogeneity of households allows one to develop an alternative framework to explain why empirical estimations find pro-nativist fiscal subsidies to have only a small aggregate effect on the fertility rate of an economy, while fiscal subsidies have a larger effect on the fertility of the households who are their beneficiaries, as generally highlighted by theoretical models on fertility decisions. On the basis of this framework, different policy experiments are performed. First, an increase in pro-nativist fiscal subsidies is targeted only to the households having the lowest initial level of labour income; second, an increase in pro-nativist fiscal subsidies is generalized to all the groups of households; and, third, a change in the tax rate on the inter-generational transfers left by households with the highest labour income is assessed as a policy tool alternative to the use of pro-nativist fiscal subsidies.

1 Introduction

This paper contributes to further explain the small effect of pro-nativist fiscal policies on fertility. Granelli (2016) reconciles the conclusion of the micro-econometric literature on pro-nativist fiscal policies, where such policies have a positive but small effect on fertility (Whittington et al. (1990); Georgellis and Wall (1992); Milligan (2005); Crump et al. (2011)), and the theoretical macroeconomic literature, where fertility has been usually considered to be elastic with respect to macroeconomic shocks (Jones and Schoonbroodt (2010); Jones and Schoonbrodt (2016); Sobotka et al. (2011); Pailhé and Solaz (2012)). In this work, two additional reasons leading pro-nativist fiscal policies to have a small effect on fertility are developed, notably the existence of aggregation effects and of the asymmetry of taxation.

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[†] Corresponding author: Lucia Granelli, IRES, Université catholique de Louvain, Collège Léon Dupriez, Place Montesquieu 3, boite L2.06.01, 1348 Louvain-la-Neuve, Belgium. E-mail: lucia.granelli@uclouvain.be.

Granelli (2016) considers only the case of homogeneous households. Exploiting agents' heterogeneity, this paper allows pro-nativist fiscal subsidies to change with the level of income of the households benefiting from such subsidies. As a result, first, this paper shows that the small effect of pro-nativist fiscal policies estimated by the empirical literature can be interpreted as the aggregate effect of those policies. This aggregate effect averages out the larger effect for the households at the bottom of the income distribution and the absence of their effect for the households having a higher level of income. Second, this paper investigates the possibility to use the taxation of inter-generational transfers as an alternative policy to influence households' fertility choices. This policy experiment allows one to better understand the consequences of the asymmetry of a fiscal policy, given that the taxation of inter-generational transfers targets only the group of households having a higher income. In this second case, pro-nativist fiscal subsidies may have a small effect on the overall fertility rate not due to the existence of aggregation effects, but because of the targeted group of households.

The consideration of heterogeneous households in a model of endogenous fertility has been already discussed in the economic literature. Many papers with endogenous fertility have evaluated the effects of fiscal policies on fertility (Eckstein and Wolpin (1985); Bental (1989); Cigno (1995); Apps and Rees (2004); Apps and Rees (2007); Apps and Rees (2010)). More recently, some authors have also highlighted the importance of considering households' heterogeneity in this debate. In particular, Guner et al. (2014) assess the relationship between households' taxation and households' characteristics, including income and number of children. Keane and Rogerson (2015) find that individual characteristics are a key determinant of adult households' choices, such as fertility, marriage and labour market participation. In the same vein, Greenwood et al. (2003) develop a framework where adult households decide about labour, marriage, divorce, and fertility. They assess the effect of the child tax credit program at play in the USA and they conclude that this type of fiscal subsidy fails to improve the well-being of the society. Incentivizing households to have larger families, the per-child resources for each household decrease so that the well-being of future generations becomes lower rather than higher. However, as discussed in Granelli (2016), this finding is at odds with the empirical papers that have studied the effect of pro-nativist fiscal policies on fertility, as these papers have found a positive, but small, effect of these policies on fertility.

In this work, a model with heterogeneous households is used to explain why pro-nativist fiscal subsidies do not strongly affect the size of families, while having a positive effect on poorer households. This result is obtained by developing a general equilibrium version of a Barro-Becker dynastic model, where altruistic households choose their level of fertility along with their level of consumption, savings, allocation of time, and inter-generational transfers. The model is calibrated setting the inter-temporal elasticities similar to Granelli (2016), where the value of the elasticity of fertility is matched with the pro-nativist fiscal subsidies estimated by

the empirical literature. As in Seshadri and Roys (2014), an increase in households' income following a permanent increase in pro-nativist fiscal policies has, on average, a limited effect on the fertility rate. Only poorer households increase their fertility rate starting from the period after the immediate positive effect of the policy shock and, then, gradually align this rate to the one of richer households.

This paper analyses also the relationship between inter-generational transfers and fertility. The introduction of heterogeneous agents allows one to group households by income and to subject different groups of households to different kinds of taxes. The present work assumes that, while all groups of households are subject to labour income taxation, only the group having the highest labour income is subject to inter-generational transfer taxation. The asymmetry of inter-generational transfer taxation offers an additional example to study the effect of fiscal policies on fertility and to explain why this effect is small.

Different papers have already highlighted the existence of a relationship between inter-generational transfers and fertility (Prinz (1990); Cigno and Rosati (1992); Rosati (1996); Boldrin et al. (2015)). A first strand of literature - including Becker and Barro (1988), Barro and Becker (1989) and Alvarez (1999) - has pointed out fertility choices as a mechanism through which altruistic parents reduce the inter-generational persistence of wealth and increase social mobility. In particular, these authors find a positive correlation between wealth and the number of children, with bequests being equal for each child and independent from the number of children. More recent papers, instead, have highlighted the inconsistency between the findings of that first strand of literature and the inter-generational persistence of wealth. For example, Cordoba et al. (2016) have developed a calibrated version of a Barro-Becker dynastic altruistic model of fertility choice and have embedded it into a Bewley framework of idiosyncratic risk. As a result, they find a significant inter-generational persistence of wealth due to the choice of richer families to have fewer children and higher inheritance rates.

This work hence evaluates if a change in the taxation of inter-generational transfers for the group of richer households can constitute an alternative policy with respect to a pro-nativist fiscal subsidy. A higher taxation on the inter-generational transfers of richer households is found to increase their fertility rate and to decrease their inter-generational transfers. However, similarly to what Cordoba et al. (2016) highlighted, these changes in fertility and inter-generational transfers remain contained. This result is due to the richer households' choice to decrease their level of consumption and to continue to endow future generations with some capital, notwithstanding the increase in taxation of inter-generational transfers.

The rest of the paper is structured as follows. Section 2 develops the model underpinning the

results in the sections of the paper illustrating the consequences of the policy shocks simulated. Section 3 provides the calibration for the parameters and variables of the model. Section 4 assesses the effects on fertility of different changes in the pro-nativist fiscal policy introduced in the model of Section 2. Section 5 studies the introduction of inter-generational transfer taxation as possible mean to influence fertility. Section 6 concludes.

2 Model

In this paper we use a general equilibrium model with overlapping generations, which is an extension of Granelli (2016). There are three types of households, distinguished by an exogenous ability type, x. The different level of ability translates into different levels of income, so that low ability type households have also a lower labour income, medium ability type households have a medium labour income, and high ability type households have the highest level of labour income. Moreover, within each group of households, each generation lasts for 20 years so that households live for a total of 80 years. In the second period of their life, when households become adult, they choose their level of fertility and transfers to their children, along with their level of consumption and savings. Households choose their allocation of time, which can be used to work, to enjoy leisure and to provide childcare to their own children. Becoming older, the set of choices upon which households can choose becomes smaller. In particular, starting from the third period of their life, when households become older adults, they no longer need to choose their level of fertility, their transfers to children or how much time to dedicate to childcare activities. When they are in their fourth and last period of their life, households only consume what they have previously saved and do not need to take any other decisions.

The maximization problem for the two categories of households is similar to one described in Granelli (2016), but takes into account households' heterogeneity, that is:

$$
\begin{aligned}
U_{0,i} = \quad & \sum_{t=0}^{\infty} (\beta\phi)^t N_{t,i}^{\epsilon} \left\{ A_i + \left[\frac{c_{1,t,i}^{1-\sigma}}{1-\sigma} + \beta \frac{c_{2,t+1,i}^{1-\sigma}}{1-\sigma} + \beta^2 \frac{c_{3,t+2,i}^{1-\sigma}}{1-\sigma} \right] + \zeta \left[\frac{\left(l_{1,t,i} d_{1,t,i}^{\rho}\right)^{1-\psi}}{1-\psi} + \beta \frac{\left(l_{2,t+1,i}\right)^{1-\psi}}{1-\psi} \right] \right\} \\
s.t. \quad & c_{1,t,i} + \frac{c_{2,t+1,i}}{R_{t+1}} + \frac{c_{3,t+2,i}}{R_{t+1}R_{t+2}} + \left(1 - d_{1,t,i}\right) \pi_{t,i} n_{t,i} + \left(1 - \tau_{t,i}^{b}\right) q_{t+1,i} n_{t,i} = \\
& h_{1,t,i} x_{1,t,i} w_t \left(1 - \tau_t\right) + \chi_{t,i} n_{t,i} + \frac{h_{2,t+1,i}}{R_{t+1}} x_{2,t+1,i} w_{t+1} \left(1 - \tau_{t+1}\right) + R_t q_{t,i},
\end{aligned}
$$

where c represents the level of consumption chosen by an adult household of age $a = \{1, 2, 3\}$ and ability type $i = \{1, 2, 3\}$, h, l and d represent the share of time that young adults dedicate respectively to work, leisure and childcare, n the number of children, π the per child cost of childcare, and q the inter-generational transfer that adult households leave to each of their children. In addition, w is the wage rate while $R = 1 + r - \delta$ is the gross interest rate at the net of the capital depreciation rate δ, τ is the tax rate on labour income, τ^b the tax rate on the inter-generational transfer, and χ a fiscal subsidy per child. In terms of parameters of the

maximization problem, σ represents the inter-temporal elasticity of substitution, β the discount factor, A_i the utility constant, ζ the weight attached to time out of work in the utility function, ρ the elasticity of substitution between leisure and childcare, ψ the inter-temporal elasticity of substitution for the time out of work, ϕ the degree of altruism of adult households, and ϵ the discount factor for weighting the utility of future generations with respect to the current generation.

The solution of the maximization problem for each group of household is composed by the Euler equations regulating consumption over the three different periods of their life,

$$c_{1,t,i}^{\sigma} = \frac{c_{2,t+1,i}^{\sigma}}{\beta R_{t+1}}, \qquad c_{2,t+1,i}^{\sigma} = \frac{c_{3,t+2,i}^{\sigma}}{\beta R_{t+2}}.$$

For a given level of ability i, in each period of the households' adult life, there exists a trade-off between present and future consumption. The above Euler conditions regulate such trade-off by equalizing the level of present consumption with the level of consumption in the following period, divided by the discount factor and the interest rate.

Moreover, young adults choose how to allocate their time over different activities as follows,

$$\zeta_i l_{1,t,i}^{-\psi} d_{1,t,i}^{\rho_i(1-\psi)} = \tilde{\lambda}_{t,i} x_{1,t,i} w_t (1-\tau_t), \qquad \zeta_i \rho_i l_{1,t,i}^{1-\psi} d_{1,t,i}^{\rho_i(1-\psi)-1} = \tilde{\lambda}_{t,i} \left[x_{1,t,i} w_t (1-\tau_t) - \pi_{t,i} n_{t,i} \right].$$

In these first order conditions, λ is the Lagrangian multiplier, while π represents the cost of external childcare services that young households need to pay for either working or enjoying leisure. In addition, this cost of external childcare services is assumed to be a linear function, varying with the size of the cohort birth in each period of time t, $\pi_{i,t} = \pi_{0,i,t} + \pi_{1,i} n_{i,t} N_{1,i,t}$. In both equations, the expression on the left-hand-side represents the marginal benefit of an additional unit of leisure ($\zeta_i l_{1,t,i}^{-\psi} d_{1,t,i}^{\rho_i(1-\psi)}$) or time spent with children ($\zeta_i \rho_i l_{1,t,i}^{1-\psi} d_{1,t,i}^{\rho_i(1-\psi)-1}$). The expression on the right-hand-side, instead, represents the marginal cost of leisure or childcare in terms of forgone labour income ($\tilde{\lambda}_{t,i} x_{1,t,i} w_t$), at the net of taxes ($1-\tau_t$) and cost of childcare services ($\pi_{t,i} n_{t,i}$). The skill level ($x_{1,t,i}$) affects the marginal cost of leisure or childcare, as a higher skill level implies a higher level of labour income.

In a similar vein, for older adults, the allocation of time between work and leisure is regulated by the following first order condition,

$$\beta \zeta_i l_{2,t+1,i}^{-\psi} = \tilde{\lambda}_{t,i} \frac{x_{1,t+1,i} w_{t+1} (1-\tau_{t+1})}{R_{t+1}},$$

where the marginal benefit of an additional unit of leisure ($\beta \zeta_i l_{2,t+1,i}^{-\psi}$) is equalized to its marginal cost in terms of lost income ($\tilde{\lambda}_{t,i} \frac{x_{1,t+1,i} w_{t+1} (1-\tau_{t+1})}{R_{t+1}}$).

Lastly, for each group of households, there is also a first order condition regulating fertility decisions,

$$\beta\phi_i n_{t,i}^{-\epsilon}\left[(1-\epsilon)V_{t+1,i}+\tilde{\lambda}_{t+1,i}\left(x_{1,t+1,i}h_{1,t+1,i}w_{t+1}(1-\tau_{t+1})+\frac{x_{2,t+2,i}h_{2,t+2,i}w_{t+2}(1-\tau_{t+2})}{R_{t+2}}\right)\right]$$
$$=\tilde{\lambda}_{t,i}\left[(1-d_{1,t,i})\pi_{t,i}-\chi_{t,i}\right]+\beta\phi_i n_{t,i}^{-\epsilon}\tilde{\lambda}_{t+1,i}\left(c_{1,t+1,i}+\frac{c_{2,t+2,i}}{R_{t+1}}+\frac{c_{3,t+3,i}}{R_{t+1}R_{t+2}}\right),$$

and one for inter-generational transfers,

$$\beta\phi_i\tilde{\lambda}_{t+1,i}R_{t+1}n_{t,i}^{1-\epsilon}=\left(1-\tau_{t,i}^{b}\right)\tilde{\lambda}_{t,i}n_{t,i}.$$

These two conditions are similar to those found in Granelli (2016). Notably, the marginal benefit of an additional child (the left hand side of the first equation) is equal to the sum of the marginal utility and the future labour income of that child. The marginal cost of an additional child is instead given by the cost of external childcare services, net of pro-nativist fiscal subsidies and the value of that child future consumption. At the same time, inter-generational transfers are regulated by the equality between the shadow value of future consumption ($\tilde{\lambda}_{t+1,i}$), discounted by the altruism function ($g(n)=\phi n_t^{1-\epsilon}$), and the shadow value of today's consumption ($\tilde{\lambda}_t$), at the net of taxes on transferred capital ($1-\tau_{t,i}^{b}$).

The above first order conditions are accompanied by the three budget constrains faced by the three generations of adult households. For young adults, consumption ($c_{1,t,i}$), savings ($s_{1,t,i}$), childcare services ($(1-d_{1,t,i})\pi_{t,i}n_{t,i}$), and inter-generational transfers ($\left(1-\tau_{t,i}^{b}\right)q_{t+1,i}n_{t,i}$) need to be compensated by the sum of labour income ($x_{1,t,i}h_{1,t,i}w_t\left(1-\tau_t\right)$), pro-nativist fiscal subsidies ($\chi_{t,i}n_{t,i}$) and transfers received from the previous generation ($R_tq_{t,i}$),

$$c_{1,t,i}+s_{1,t,i}+(1-d_{1,t,i})\pi_{t,i}n_{t,i}+\left(1-\tau_{t,i}^{b}\right)q_{t+1,i}n_{t,i}=x_{1,t,i}h_{1,t,i}w_t\left(1-\tau_t\right)+\chi_{t,i}n_{t,i}+R_tq_{t,i}.$$

For middle-aged and old households, the budget constrains simplify. Only consumption ($c_{2,t+1,i}$) and savings ($s_{2,t+1,i}$) figure among the expenses of middle-aged households, compensated by labour income ($x_{2,t+1,i}h_{2,t+1,i}w_{t+1}(1-\tau_{t+1})$) and savings accumulated when young ($R_{t+1}s_{1,t,i}$),

$$c_{2,t+1,i}+s_{2,t+1,i}=x_{2,t+1,i}h_{2,t+1,i}w_{t+1}(1-\tau_{t+1})+R_{t+1}s_{1,t,i}.$$

For old households, instead, consumption ($c_{3,t+2,i}$) is the only expense to be compensated by savings ($R_{t+2}s_{2,t+1,i}$),

$$c_{3,t+2,i}=R_{t+2}s_{2,t+1,i}.$$

Next to the budget constraints, time constraints for young and old households ensure that working hours, leisure and childcare activities sum up to 1, given that households are endowed

with a unit of time in each period of their adult life.

$$h_{1,t,i} + l_{1,t,i} + d_{1,t,i} = 1, \qquad h_{2,t+1,i} + l_{2,t+1,i} = 1.$$

Moreover, a representative productive firm maximizes its profits as follows

$$\max_{L_t} \Pi_t = F(K_t, L_t) - w_t L_t - r_t K_t,$$

where w_t is the wage rate, r_t the interest rate, while K_t and L_t are respectively the stock of capital and labor at the beginning of period t. The solution to firms' optimization problem sets the price for labour and the price for capital equal to their marginal productivity,

$$w_t = F'_L(K_t, L_t) = z_t(1-\alpha)k_t^{\alpha}, \qquad r_t = F'_K(K_t, L_t) = z_t \alpha k_t^{\alpha-1},$$

where k is the ratio between the amount of capital (K) and labour (L) of the economy, z the total factor productivity and α the capital share of labour.

At the same time, the government sets the tax rate for the economy by respecting its budget constraint,

$$G_t = \sum_i \left[\left(x_{1,t,i} h_{1,t,i} w_t \tau_t - \chi_{t,i} n_{t,i} + \tau^b_{t,i} n_{t,i} q_{t+1,i} \right) N_{t,i} + x_{2,t,i} h_{2,t,i} w_t \tau_t N_{t-1,i} \right],$$

where public spending (G_t) is supposed to be unproductive for sake of simplicity and introduced into the model with the scope of pinning down tax rates at a realistic value. Public spending and pro-nativist subsidies ($\chi_{t,i} n_{t,i} N_{t,i}$) are financed through the revenues coming from labour income taxation ($x_{1,t,i} h_{1,t,i} w_t \tau_t N_{t,i}, x_{2,t,i} h_{2,t,i} w_t \tau_t N_{t-1,i}$) and inter-generational transfers taxation ($\tau^b_{t,i} n_{t,i} q_{t+1,i} N_{t,i}$). Moreover, in the same equation representing the government budget, $N_{t,i}$ is the number of young adult households of type i living at each period t, defined according to the following laws of motion for population,

$$\begin{aligned} N_{t+1,i} &= n_{t,i} N_{t,i}, \\ N_{0,i} &= 1. \end{aligned}$$

At equilibrium, the clearing conditions for the capital and labour market require that both the demand for capital and labour meet their respective supplies,

$$K_{t+1} = \sum_i \left[s_{1,t,i} N_{t,i} + s_{2,t,i} N_{t-1,i} + q_{t+1,i} N_{t+1,i} \right], \qquad L_t = \sum_i \left[x_{1,t,i} h_{1,t,i} N_{t,i} + x_{2,t,i} h_{2,t,i} N_{t-1,i} \right].$$

In particular, savings ($s_{1,t,i} N_{t,i}, s_{2,t,i} N_{t-1,i}$) and inter-generational transfers ($q_{t+1,i} N_{t+1,i}$) accumulated in one period build up the stock of capital for the following period (K_{t+1}), while the

working time supplied by young ($x_{1,t,i}h_{1,t,i}N_{t,i}$) and middle-aged households ($x_{2,t,i}h_{2,t,i}N_{t-1,i}$) matches the firm's demand for labour (L_t).

Also, the resource constraints for the whole economy need to be verified. The total production of the economy is required to be shared among the two productive factors used, that is capital and labour,

$$Y_t = w_t L_t + r_t K_t.$$

At the same time, the total production of the economy $Y = F(K_t, L_t)$ cannot be left unused and hence needs either to be consumed (C_t) or used for public spending (G_t) or invested (I_t)

$$Y_t = C_t + I_t + G_t,$$

where investment is equal to

$$I_t = K_{t+1} - (1 - \delta)K_t,$$

and consumption is defined as

$$C_t = \sum_a C_{a,t} + \sum_i \left[(1 - d_{1,t,i})\pi_{t,i} n_{t,i} N_{t,i}\right],$$

with $C_{a,t} = \sum_i c_{a,t,i} N_{t,i}$ for $a = \{1, 2, 3\}$.

3 Calibration

The model described in Section 2 is calibrated as preliminary step for running the policy experiments of Section 4. The calibration is performed under the assumptions made about the three elasticities of substitution of the model. In particular, the inverse of the Frisch elasticity for the time that adult households spend out of work, ψ, is set equal to 2, both to obtain a corresponding Frisch elasticity equal to $\frac{1}{2}$ and to have non-worked hours to be relatively inelastic with respect to changes in the wage rate for a given constant marginal utility of labour income. The inverse of the inter-temporal elasticity of substitution (IES), σ, is set equal to 0.5, as in Cordoba et al. (2016), while the elasticity of the altruism function with respect to the number of children is set in line with Granelli (2016), with $\epsilon = 2.5$.

As regards the exogenous variables, Table 1 summarizes their values. First, the parameter representing the ability type is set to match the level of income held by the third, sixth and ninth decile of the US household income distribution. Using data from the Current Population Survey of the Census Bureau, this corresponds to set $x = 0.67$ for the group of households having the lowest income ($i = 1$), $x = 2.56$ for the middle group ($i = 2$), and $x = 8.51$ for the

group of households having the highest income ($i = 3$). As a result of this income disparity among different household groups, the personal exemption per dependent child, χ_i, is calibrated equal to 732.80 \$ per year only for the poorest group of households. This value is set using data from the US Internal Revenue Service and Crump et al. (2011), where the personal exemption per dependent child is null for households belonging to sixth and ninth decile of the US income distribution. The value of χ_i is calculated by multiplying the yearly value of the exemption that was equal to 3200 \$ per child in 2005, the length of a generation we use in the model (that is 20 years), and the average tax bill against which this exemption can be deducted. In the same vein, the value of the tax on inter-generational transfers ($\tau^b = 0$) is initially set equal to 0.1% only of the group of households having the highest level of labour income and then doubled in Section 5.

Second, the cost of external childcare paid by young adults is calibrated by matching the figures reported by the of Agriculture (2005). In this publication, the cost of external childcare reflects the household's level of income, as families with higher income ask for childcare services of higher quality. In particular, the total cost of childcare for the children of young households of type $i = 1$ is set equal to 1879.41\$ per year, while the total cost to be paid for external childcare services by young households of type $i = 2$ and $i = 3$ is set, respectively, equal to 3264.71\$ and to 7025.74\$ per year. Such total childcare cost is assumed to be the result of two components. The first is a cost that depends on the size of the cohort born at the same time, $\pi_{1,i} n_i N_{1,i}$. This cost reflects the presence of congestion effects linked to increasing population, as in de la Croix and Gosseries (2012). Although the congestion effect is allowed to differ by household group, the coefficient $\pi_{1,i}$ is assumed equal for all groups, so that $\pi_{1,1} = \pi_{1,2} = \pi_{1,3} = \pi_1$. It is matched with the coefficient of a linear regression obtained using US population data for the period 1935-2013, where the yearly average US population of a year t is considered as a function of the yearly average US population in the previous year $t - 1$. The second component of the total childcare cost is a fixed cost ($\pi_{0,i}$, see Section 2), which is assumed to be related to the group to which young households belong. It is calculated as the difference between the total childcare cost of each group and the first component of the external childcare cost depending on the cohort size.

Lastly, the share of public expenditure out of the total production of the economy is set according to the US national accounting data. Selecting only the part of the US government public expenditures used for military spending, the ratio between this latter, G_t, and the total production of the economy, Y_t, was equal to 5.10% in 2005. Indeed, in this paper, as in Granelli (2016), only the part of public spending dedicated to military spending is considered out of the total amount of the US public expenditure. This choice is made for the sake of simplicity as military spending may be considered an unproductive type of public expenditure. This allows one not to take into account the possible links that in reality may exist between public expenditure and firms' production.

Table 1: Value of exogenous variables

Variable	Value (yearly)
Military spending/GDP	$\frac{G}{Y} = 5.10\%$
$i = 1$	
Skill type	$x_{t,1} = 0.67$
Personal exemption	$\chi_{t,1} = \$\,732.80$
Child cost	$\pi_{t,1} = \$\,1879.41$
Tax on inter-generational transfers	$\tau^b_{t,1} = 0$
$i = 2$	
Skill type	$x_{t,2} = 2.56$
Personal exemption	$\chi_{t,2} = \$\,0$
Child cost	$\pi_{t,2} = \$\,3264.71$
Tax on inter-generational transfers	$\tau^b_{t,2} = 0$
$i = 3$	
Skill type	$x_{t,3} = 8.51$
Personal exemption	$\chi_{t,3} = \$\,0$
Child cost	$\pi_{t,3} = \$\,7025.74$
Tax on inter-generational transfers	$\tau^b_{t,3} = 10\%$

The endogenous variables, whose value is set to calibrate a corresponding parameter, are listed in Table 2. The net real interest rate is set equal to the average of the yearly interest rate on 20-years US treasury bonds, 4.65%. The corresponding discount factor, β, turns out to be equal to 0.6871. Next, the ratio between gross fixed investments and GDP is used to give a value to the depreciation rate. This ratio is equal to 21.19% of the US GDP reconstructed so as to take into account only the expenditures of the three sectors of the model described in Section 2, that is households' consumption, firms' investment and the government spending. Such a ratio corresponds to a value of the depreciation rate equal to 0.8972. Moreover, the share of capital into the US GDP and the productivity per worker are taken from the Penn Word Tables. Respectively, the former is set equal to 0.65 to obtain the value of the labour-capital share, α, equal to 0.35. The latter is set equal to 83400\$, corresponding to a value of the total factor productivity $z = 2.3110$.

Regarding the utility function, using data from the American Time Use survey, we set ζ - that

is the relative weight of time spent out of work - equal to 0.0525, while we set ρ - that is the share of total time young households spend with their children relative to that spent as leisure - equal to 0.5122. In addition, the value of the altruism factor ϕ is calibrated using bequest data coming from Gale and Scholz (1994). In particular, given an amount of inter-vivos transfers equal to 0.32% of total wealth and 2.84% of average income, the value of the parameter ϕ is equal to 0.9185 for the households belonging to group $i = 1$ and $i = 2$, implying a positive ($\phi > 0$) but imperfect ($\phi < 1$) degree of altruism of these young households towards their future generations. Households of the group $i = 3$, instead, have a degree of altruism slightly lower than those of the other two groups (0.8227), as their inter-generational transfers are subject to taxation. Lastly, we allow the constant of the life-cycle utility function (A) to differ between the three groups of households. In particular, it is set equal to -1.9104 for the poorer group of households ($i = 1$), equal to -4.4011 for the second group of households ($i = 2$), and equal to -3.8337 for the richer group ($i = 3$). Notwithstanding the fertility rate is set equal to 1 for all groups of households, having a different constant of the life-cycle utility function allows to take into account the different size of three groups. Notably, the size of the poorest group of households is equal to one-third of the total population ($N_{1,i=1} = 0.3$), while households having the median income correspond to 60% of the total population ($N_{1,i=2} = 0.6$) and richer households to the remaining 10% ($N_{1,i=3} = 0.1$).

Tables 3 and 4 summarize the values of the initial steady state. In a nutshell, households with a higher ability type, $i = 2$ and $i = 3$, consume more over all their life-cycle than households with a lower ability type, $i = 1$. Households with a higher ability type also accumulate more savings and leave a more generous transfer to their children. At the same time, their allocation of time is more biased towards work, as they spend a larger share of the unit of time at their disposal working, both when they are young and middle-aged. They compensate this choice with a lower proportion of time spent as leisure, both when young and middle-aged, as well as with a lower proportion of time spent with their children. These results are in line both with the data of the American Time Use survey and the statistics of the US Department of Agriculture (2005), where households having a higher labour income tend to spend more time at work, enjoy less leisure, spend less time with children, and resort to external childcare services to a larger extent.

Table 2: Matching parameters and matched moments

Matching parameter	Value	Matched Moment	Value (yearly)
Discount factor	$\beta = 0.6871$	20-years interest rate	$r = 4.65\%$
Depreciation rate	$\delta = 0.8972$	Investment-GDP ratio	$\frac{I}{Y} = 21.19\%$
Capital share	$\alpha = 0.35$	Capital share of labor	$w\frac{L}{Y} = 0.65$
TFP constant	$z = 2.3110$	Production per worker	$y = \$\,83400$
Utility relative weight	$\zeta = 0.0525$	Total leisure	$\frac{\sum_i l_i N_{1,i}}{\sum_i (h_i+l_i+d_i)N_{1,i}} = 26.91\%$
Leisure-childcare ratio	$\rho = 0.5122$	Total time spent with children	$\frac{\sum_i d_i N_{1,i}}{\sum_i (h_i+l_i+d_i)N_{1,i}} = 14.30\%$
$i = 1$			
Altruism factor	$\phi_1 = 0.9185$	Bequests-income ratio	$\frac{q_i n_i}{h_i x_i w} = 2.84\%$
Utility constant	$A_1 = -1.9104$	Number of children	$N_{1,i} = 0.3$
$i = 2$			
Altruism factor	$\phi_2 = 0.9185$	Bequests-income ratio	$\frac{q_i n_i}{h_i x_i w} = 2.84\%$
Utility constant	$A_2 = -4.4011$	Number of children	$N_{1,i} = 0.6$
$i = 3$			
Altruism factor	$\phi_3 = 0.8227$	Bequests-income ratio	$\frac{q_i n_i}{h_i x_i w} = 2.84\%$
Utility constant	$A_3 = -8.8337$	Number of children	$N_{1,i} = 0.6$

Table 3: Initial steady state

Variable	Value (20 years)	Value (yearly)
Tax rate on labour income	$\tau = 7.91\%$	-
$i = 1$		
Consumption, young households	$c_{1,ss,i} = 284190.11\$$	14209.51\$
Consumption, middle-aged households	$c_{2,ss,i} = 336878.28\$$	16843.91\$
Consumption, old households	$c_{3,ss,i} = 399334.71\$$	19966.74\$
Saving, young households	$s_{1,ss,i} = 41466.30\$$	2073.32\$
Saving, middle-aged households	$s_{2,ss,i} = 251993.79\$$	12599.69\$
Inter-generational transfers, young households	$q_{ss,i} = 10218.14\$$	510.91\$
Share of time spent at work, young households	$h_{1,ss,i} = 50.49\%$	-
Share of time spent as leisure, young households	$l_{1,ss,i} = 32.09\%$	-
Share of time spent with children, young households	$d_{1,ss,i} = 17.42\%$	-
Share of time spent at work, middle-aged households	$h_{2,ss,i} = 78.60\%$	-
Share of time spent as leisure, middle-aged households	$l_{2,ss,i} = 21.40\%$	-
$i = 2$		
Consumption, young households	$c_{1,ss,i} = 1256428.14\$$	62821.41\$
Consumption, middle-aged households	$c_{2,ss,i} = 1489366.93\$$	74468.35\$
Consumption, old households	$c_{3,ss,i} = 1765492.01\$$	88274.60\$
Saving, young households	$s_{1,ss,i} = 282967.15\$$	14148.36\$
Saving, middle-aged households	$s_{2,ss,i} = 1114085.56\$$	55704.28\$
Inter-generational transfers, young households	$q_{ss,i} = 47678.14\$$	2383.91\$
Share of time spent at work, young households	$h_{1,ss,i} = 61.25\%$	-
Share of time spent as leisure, young households	$l_{1,ss,i} = 25.40\%$	-
Share of time spent with children, young households	$d_{1,ss,i} = 13.35\%$	-
Share of time spent at work, middle-aged households	$h_{2,ss,i} = 84.17\%$	-
Share of time spent as leisure, middle-aged households	$l_{2,ss,i} = 15.83\%$	-

Table 4: Initial steady state, continued

Variable	Value (20 years)	Value (yearly)
$i = 3$		
Consumption, young households	$c_{1,ss,i} = 4580439.98\$$	229022.00\$
Consumption, middle-aged households	$c_{2,ss,i} = 5429642.65\$$	271482.13\$
Consumption, old households	$c_{3,ss,i} = 6436285.46\$$	321814.27\$
Saving, young households	$s_{1,ss,i} = 1272403.02\$$	63620.15\$
Saving, middle-aged households	$s_{2,ss,i} = 4061515.22\$$	203075.76\$
Inter-generational transfers, young households	$q_{ss,i} = 178067.36\$$	8903.37\$
Share of time spent at work, young households	$h_{1,ss,i} = 68.94\%$	-
Share of time spent as leisure, young households	$l_{1,ss,i} = 20.42\%$	-
Share of time spent with children, young households	$d_{1,ss,i} = 10.64\%$	-
Share of time spent at work, middle-aged households	$h_{2,ss,i} = 87.99\%$	-
Share of time spent as leisure, middle-aged households	$l_{2,ss,i} = 12.00\%$	-

4 Policy shocks

4.1 Increasing pro-nativist fiscal subsidy for households having lower income only

In this section, we use the model of Section 2 to run the policy experiments introduced in Section 1. In the first of these experiments, we assume an increase in the pro-nativist fiscal subsidy benefiting the households having lower income only. In particular, it is assumed that $\chi_{t,1}$ increases by 1% of the total public expenditure of the economy (G_t). All the effects of this shock are illustrated in Annex A.

With respect to the initial steady state, the fertility of lower income households increases in the first period following the policy shock (0.6%). This initial increase in the level of fertility, however, is accompanied by an increase in the cost of childcare services, which is a positive function of the level of fertility itself as explained in Section **??**. The increase in the cost of childcare services reduces the effect of the pro-nativist policy on fertility, starting from the second period after the fiscal shock. As a result, the effects of the pro-nativist policy on fertility do not last over time. By contrast, households belonging to the group $i = 2$ and $i = 3$ decrease their level of fertility by 0.1%, as their income is initially reduced by the increase in the tax rate of 2% necessary to rebalance the increased pro-nativist subsidy for lower income households. Due to the decrease in their level of fertility, the cost of childcare services also de-

creases and creates a partial rebound of fertility starting from the second period after the shock.

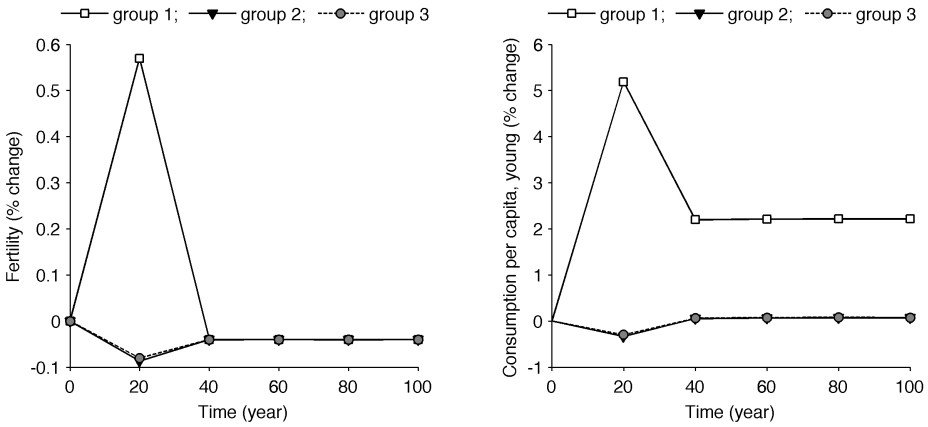

Figure 1: Fertility and consumption of young adults following an increase in the pro-nativist fiscal incentive for the households of group 1 ($i = 1$).

The income effect linked to the pro-nativist shock increases consumption for all the generations of households. Young adults start consuming 5.19% more, immediately after the increase in the fiscal subsidy they receive. Middle-aged and old households increase consumption in the following periods, with middle-aged households increasing their level of consumption by 5.33% and old households increasing it by 5.18%. The same income effect increases also leisure (1%) and time with children (1%) for young households having lower income. At the same time, also middle-aged households with lower income increase the share of their time dedicated to leisure, but by a smaller amount than young households (0.4%).

As in the case of fertility, the reaction of higher income households to the policy shock differs from the one of lower income households. When they are young adults, higher income households decrease their consumption by 0.34% if $i = 2$ and by 0.30% if $i = 3$. After this initial decrease, however, consumption of higher income households gets back to its initial level. When they are middle-aged and old, consumption of higher income households decreases, as the initial drop in their level of consumption is not compensated for by an equal increase in consumption over the following periods of their life. Moreover, as regards time allocation, households with higher income decrease the share of time spent at work and increase the one for leisure and time spent with children by 0.1%, that is by a smaller amount than for households having lower income. This change in the allocation of time is not directly due to the income effect linked to the pro-nativist shock, which targets poorer households only. Rather, this change in the allocation of time is linked to the decrease in the fertility rate and the consequent decrease in the cost of childcare services for higher income households. This latter allows young adults with higher income to maintain the same level of consumption while enjoying more leisure and time with their children. When middle-aged, instead, the allocation of time remains fairly constant

for higher income households, with a very small decrease in the share of time spent at work compensated for by more leisure.

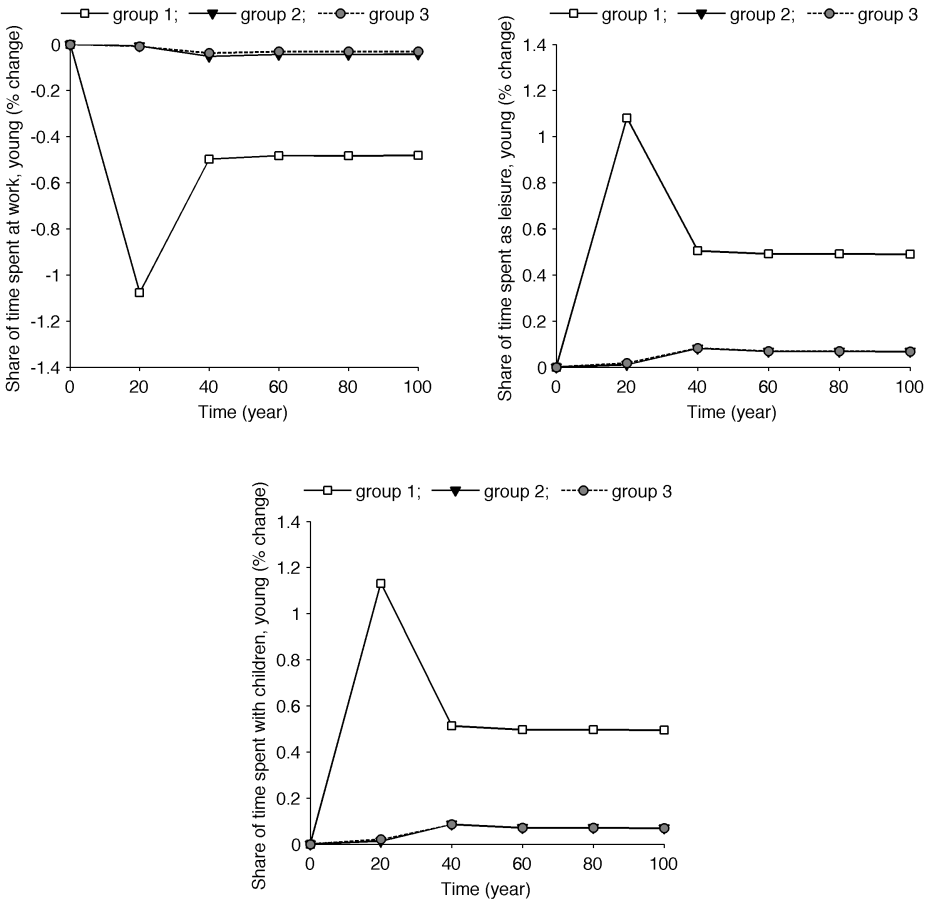

Figure 2: Time allocation of young households after the increase in the pro-nativist fiscal incentive for the households of group 1 ($i = 1$).

Saving choices go in the same direction as consumption choices for all types of households. When they are young adults, lower income households increase their savings by about 50% in the first period after the shock and by 20% in the following periods. When they are middle-aged, instead, they decrease their savings by 5%. Meanwhile, the level of savings remains fairly stable for higher income households, both when these are young and middle-aged adults. As a result, lower income households need to decrease the inter-generational transfers for future generations, given the higher level of fertility, consumption and savings chosen. On the contrary, higher income households increase their level of inter-generational transfers. The decrease in their level of fertility, indeed, allows this group of households to increase their level of inter-generational transfers, while keeping constant their chosen level of consumption and saving.

4.2 Increasing pro-nativist fiscal subsidy for all groups of households

As an alternative policy experiment, the pro-nativist fiscal subsidy is increased by 1% of public expenditure (G_t) for all groups of households, rather than only for the households with the lowest level of income. As for the first policy shock, Annex B provides the complete set of charts illustrating the effect of this second policy option.

Following the increase in the pro-nativist fiscal subsidy, fertility increases by almost 0.5% for the households with the lowest level of income. By contrast, fertility decreases by 0.1% for the households with median income, group $i = 2$, and almost by 0.2% for the group of households with the highest level of income, $i = 3$. These changes in fertility take place notwithstanding an increase in the cost of external childcare for the lowest income households, by 0.06%, and a decreases in this cost for the other two types of households. These changes in fertility, in fact, have to be assessed jointly with the increase in the tax rate needed to balance the government budget. Such an increase in the tax rate, equal to 2.25%, is double relative to the increase required in the policy experiment described above, eliminating any possible positive fertility effect of the higher fiscal subsidy for households with higher income.

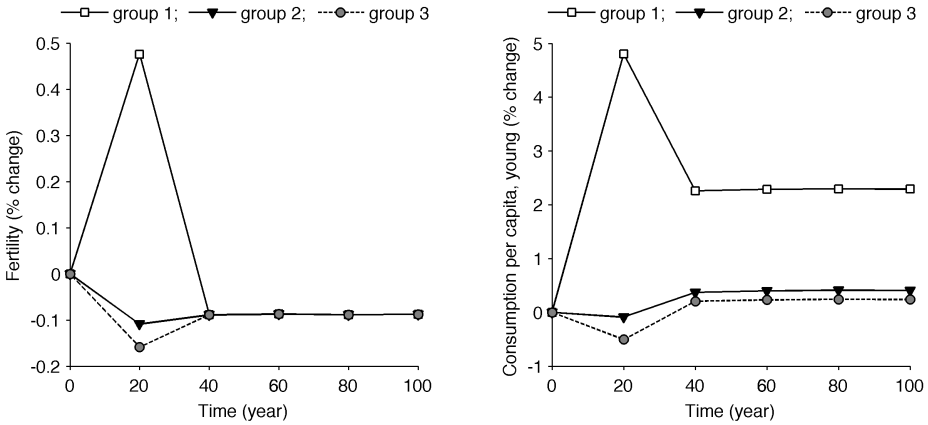

Figure 3: Fertility and consumption of young adults following an increase in the pro-nativist fiscal incentive for both groups of households.

The positive income effect, which accompanies the increase in the pro-nativist fiscal subsidy, leads all groups of households to increase their level of consumption. When young, all groups of households increase their consumption, with those having a higher income ($i = 2$ and $i = 3$) increasing it by 0.07% and those having lower income increasing it by 2.2%. This positive income effect on consumption then decreases with the age of the households. When middle-aged, households with the lowest level of income increase their level of consumption by less than 2%, while households with a higher level of income can only maintain their initial level of consumption after having decreased it in the first period following the policy shock. When

old, households with the lowest income continue to increase their level of consumption, but by 1.8%, while higher income households decrease their level of consumption by 0.5%. In this respect, the fiscal policy at stake can be classified both as a pro-nativist and as a redistributive fiscal policy, given it has stronger effects on the youngest and lowest income households.

The same positive income effect leads young adults to increase the share of their time spent as leisure and the one spent taking care of their children, while the one spent at work decreases. The effect of the policy on the allocation of time goes in the same direction for both lower and higher income households, although the size of this effect is larger for the households with the lowest level of income. In particular, for higher income young adults, the share of time spent at work decreases by 0.15%, while the share of time for leisure and the share of time spent with children increase by 0.2%. For those having a lower income, working time, leisure, and parental childcare decrease all by 0.6%. Besides, for all income groups, the allocation of time for middle-aged households changes in the same direction as for younger households. The size of the change in the allocation of time remains larger for the households with the lowest level of income. These latter decrease their working time by 0.15% and increase their leisure by 0.6%, while higher income households decrease their working time by 0.01% and increase leisure activities by 0.1%.

As in the case of the first policy experiment, households with the lowest level of income ($i = 1$) decrease their inter-generational transfers. These households increase instead the savings for the next period of their life, by 50% just after the policy shock and by 20% afterwards. On the contrary, higher income households are able to increase the inter-generational transfers for their future generations by 10%, if they belong to the group $i = 2$, and by 20%, if they are part of the group $i = 3$. At the same time, higher income households are also able to, at least, keep constant their level of savings. Indeed, average income households increase their savings by 2%, when young adults, and by 5%, when middle-aged adults. Meanwhile, highest income households can only maintain their initial level of savings. Both when they are young and middle-aged adults, savings of highest income households return to their original level over the long run, after having fallen in the period immediately after the increase in the pro-nativist subsidy.

5 Taxation of inter-generational transfers

This section deals with the effects of a change in taxation of inter-generational transfers, considered as a policy tool alternative to a pro-nativist fiscal subsidy. It provides the results of two additional policy experiments, which both affect the value of the tax rate weighting on the inter-generational transfers of the highest income households ($\tau^b_{t,3}$).

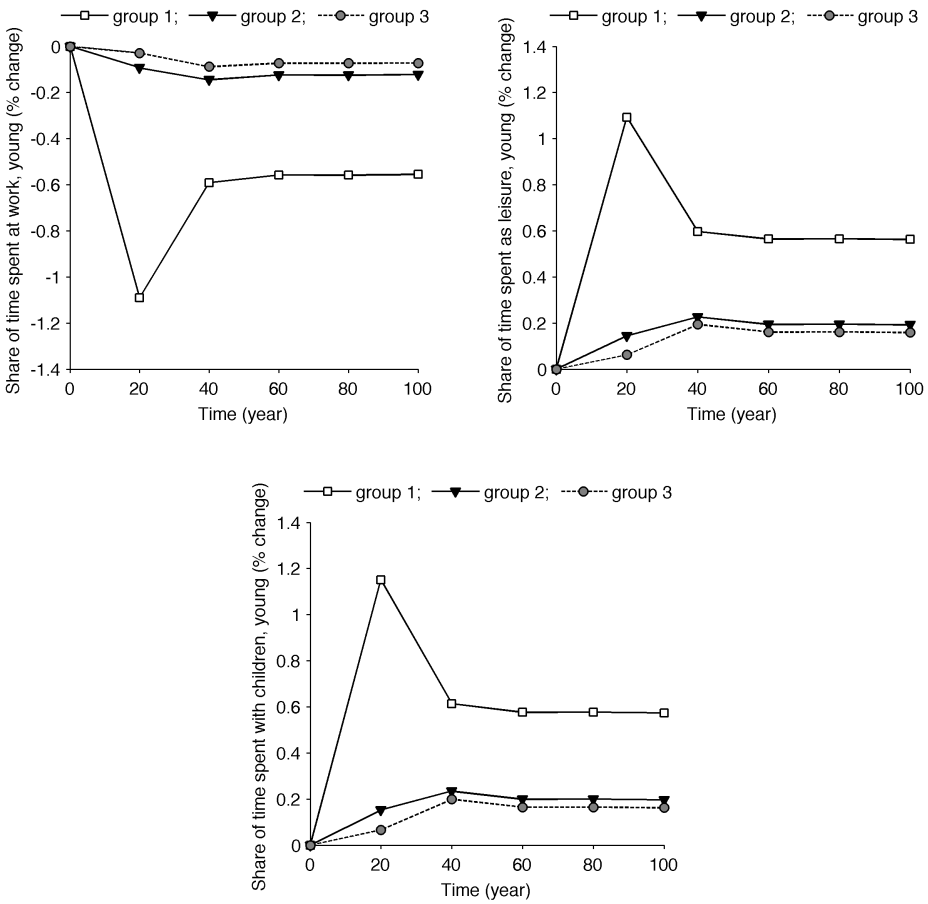

Figure 4: Time allocation of young households after the increase in the pro-nativist fiscal incentive for all groups of households.

As a first policy experiment, the value of $\tau^b_{t,3}$ is doubled, raising it to 20%. All impulse reaction functions are presented in Annex C. Notably, as regards fertility, this increases by 5% for the group of households that is directly targeted by the rise in the tax rate on inter-generational transfers ($i = 3$), while only a very marginal increase can be observed for the other groups of households ($i = 1$ and $i = 2$). These changes in fertility are sustained by a small decrease in the cost of childcare services for the highest income households (0.06%) and by a decrease in the tax rate on labour income (0.5%).

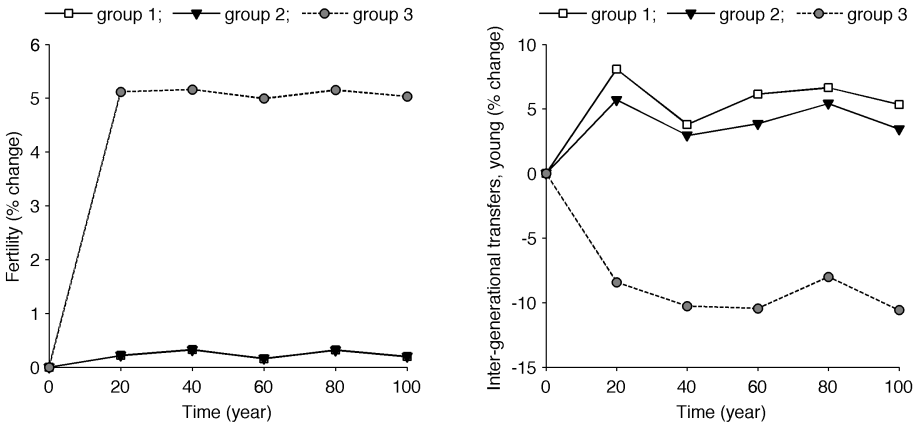

Figure 5: Fertility and consumption of young adults following an increase in inter-generational transfer taxation for the households of group 3 ($i = 3$).

The level of consumption decreases for young households (up to 1%), remains stable at its original level for middle-aged, and increases for old households (up to 1.5%). These changes in consumption happen for all groups of households, with slightly larger values for households having the highest level of income ($i = 3$). Also, all groups of households modify their allocation of time. Indeed, the decrease in the tax rate on labour income cushions the negative effects of the higher inter-generational transfer taxation on the consumption of young households. Meanwhile, it leads them to slightly decrease their share of time spent at work and to increase both leisure and time spent with children. When middle-aged, households decrease the share of time spent at work (up to 0.06%) and increase the one spent as leisure (up to 0.4%). This very limited decrease in working time, allows households not to diminish their level of consumption during their last two periods of adult life.

Saving choices go in the opposite direction of consumption choices for all groups of households. Both young and middle-aged adult households are able to increase their level of savings over the long term, respectively up to 0.6% for young adults and 1.0% for middle-aged adults. The effect of inter-generational transfer taxation, instead, differs for each group of households. Those having a lower income and not being subject to the taxation of their inter-generational transfers increase these latter by 4%, if they belong to the average income group $i = 2$, or by

5%, if they belong to the poorest group of households $i = 1$. These higher inter-generational transfers compensate the stability of their level of fertility and the small increase in savings during their first period of adult life. On the other hand, being subject to a higher level of taxation on their inter-generational transfers, the households with the highest income decrease the transfers to their children by 10%. In this way, they trade off a higher level of fertility in exchange for a higher endowment for future generations.

As a second policy experiment, the value of the tax rate on inter-generational transfers ($\tau^b_{t,3}$) has been doubled as in the first policy experiment. However, this change has been now accompanied by an increase in the pro-nativist fiscal subsidies for poorer households ($\chi_{t,1}$) of equal value. Annex D gathers all charts illustrating the effects of this change.

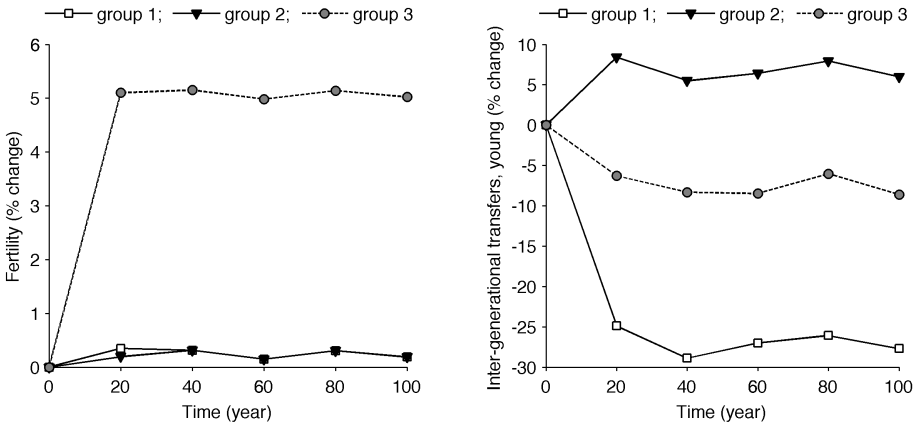

Figure 6: Fertility and consumption of young adults following an increase in inter-generational transfer taxation for the households of group 3 ($i = 3$) and an increase in pro-nativist fiscal subsidy for the households of group 1 ($i = 1$).

The main differences with respect to the previous policy experiment can be observed in the impulse reaction functions of the fertility rate and of the inter-generational transfers (see Figure 6). The 5% increase in the fertility rate of young households with the highest level of income ($i = 3$) is now reinforced by a more significant increase (0.35%) in the fertility rate of the poorest households ($i = 1$). At the same time, the households with the highest level of income as well as those with the lowest level decrease their transfers towards future generations. For the households with the highest level of income, this decrease is less pronounced than in the case of the previous policy experiment, being at 8% rather than 10%. Households with the lowest level of income, instead, behave in the opposite way relative to the previous policy experiment, decreasing by 30% the transfers to their children in place of increasing them by 5%. Inter-generational transfers continue to increase only for average income households ($i = 2$).

No major difference can be found as regards the other variables. Young adults tend to consume

and work less, while enjoying more leisure and time spent with children. Also, young adults' savings for the following periods of their lives increase. Middle-aged households keep their level of consumption stable, decrease the time spent at work and increase leisure. Middle-aged adults increase even their level of savings, which corresponds to an increase in the level of consumption for old households.

6 Conclusions

This paper assesses the effect of a pro-nativist subsidy using an overlapping-generation general equilibrium model, with three different groups of households differentiated by ability type and hence by the initial level of their labour income. In particular, this paper analyses what the effect of an increase in pro-nativist fiscal subsidies is, first, for the poorest group of households only and, second, for all groups of households. As an alternative policy, this work shows also the consequences of an increase in the taxation of inter-generational transfers for the group of households with the highest labour income.

The main results of the paper are as follows. First, the introduction of households' heterogeneity allows one to give a further explanation to the puzzle highlighted by Granelli (2016) and briefly recalled in Section 1. Indeed, when the pro-nativist fiscal subsidy at stake in this paper is increased only for the poorest group of households, the overall effect of the change in this policy is attenuated by the different reactions of the fertility function for the three groups of households. Lowest income households increase their fertility, as they are those who benefit from the increase in the pro-nativist fiscal subsidy. Higher income households decrease their fertility rate, as they are assumed not to receive any pro-nativist fiscal subsidy and to be hit by the increase in the tax rate necessary to balance the budget.

Second, a generalized increase in the pro-nativist fiscal subsidy does not increase the fertility rate of all the three groups of households, but only of those with the lowest level of income. This kind of increase in the fiscal subsidy can be considered also as a redistributive policy, having effects on the consumption and the time allocation of the poorest group of households, beyond a pure pro-nativist fiscal subsidy aimed at increasing the fertility rate of the economy.

Finally, the increase of the tax rate on the inter-generational transfers left by the richer households to their children increases their fertility rate and decreases their inter-generational transfers. Even if subject to higher taxation of their inter-generational transfers, richer households prefer to decrease their level of consumption so as to cushion the decrease in the capital endowment left to future generations. In this sense, the model developed in this paper replicates

the inter-generational persistence of wealth highlighted by the recent literature studying the relationship between fertility decisions and social mobility.

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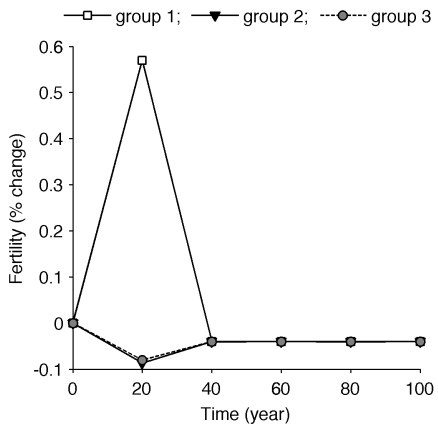
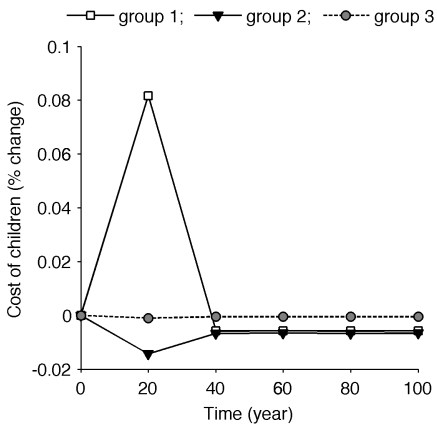
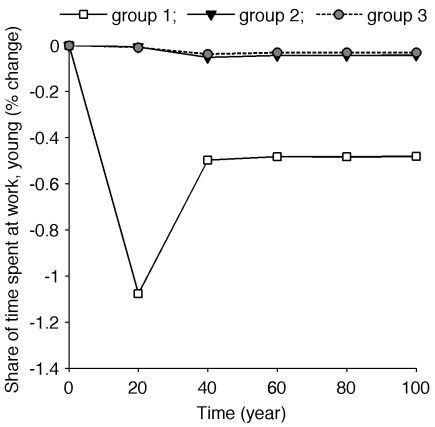
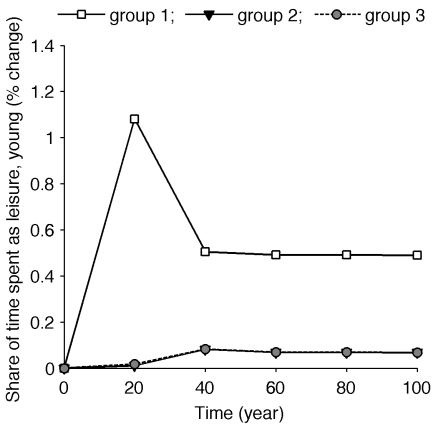
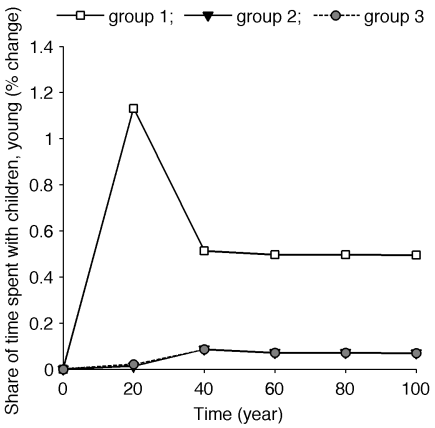
A Effects of an increase in the pro-nativist fiscal incentive only for the poorest group of households

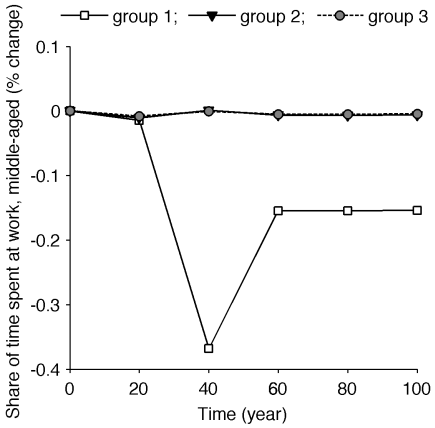


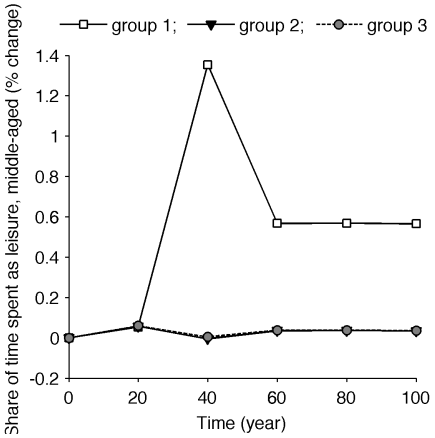


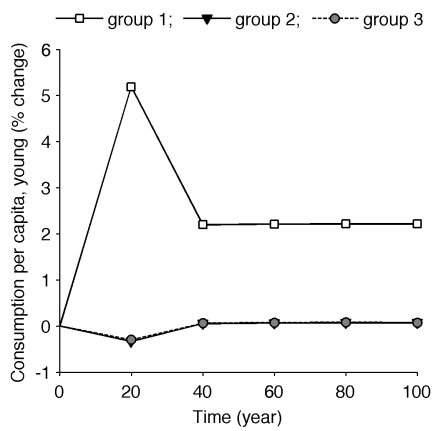

group 1;
group 2;
group 3
Share of time spent at work, young (% change)
0
-0.2
-0.4
-0.6
-0.8
-1
-1.2
-1.4
0
20
40
60
80
100
Time (year)

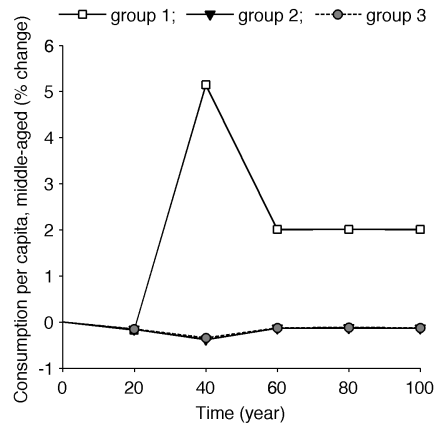

group 1;
group 2;
group 3
Share of time spent as leisure, young (% change)
1.4
1.2
1
0.8
0.6
0.4
0.2
0
0
20
40
60
80
100
Time (year)

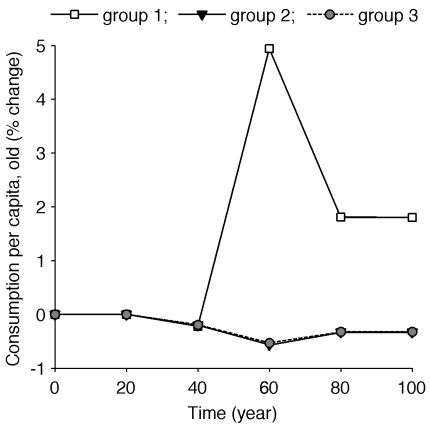

group 1;
group 2;
group 3
Share of time spent with children, young (% change)
1.4
1.2
1
0.8
0.6
0.4
0.2
0
0
20
40
60
80
100
Time (year)

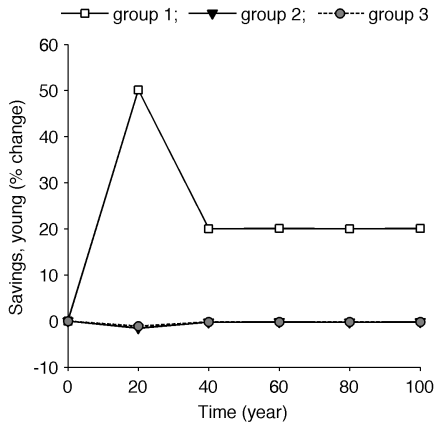

group 1;
group 2;
group 3
Share of time spent at work, middle-aged (% change)
0.1
0
-0.1
-0.2
-0.3
-0.4
0
20
40
60
80
100
Time (year)

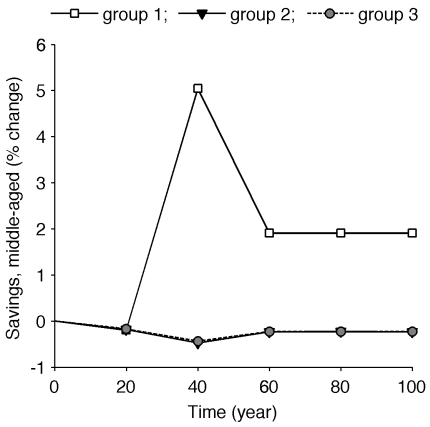

group 1;
group 2;
group 3
Share of time spent as leisure, middle-aged (% change)
1.4
1.2
1
0.8
0.6
0.4
0.2
0
-0.2
0
20
40
60
80
100
Time (year)

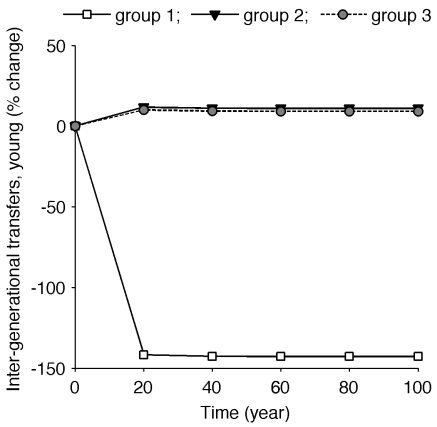

group 1;
group 2;
group 3
Consumption per capita, young (% change)
6
5
4
3
2
1
0
-1
0
20
40
60
80
100
Time (year)

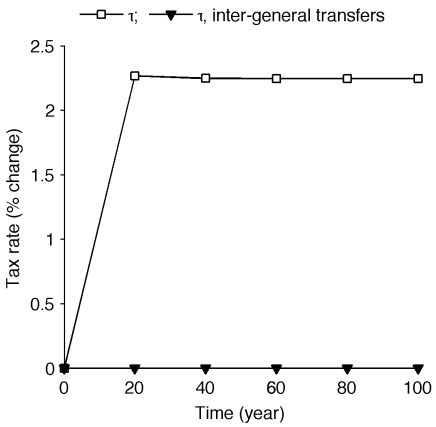

group 1;
group 2;
group 3
Consumption per capita, middle-aged (% change)
Time (year)


group 1;
group 2;
group 3
Consumption per capita, old (% change)
Time (year)

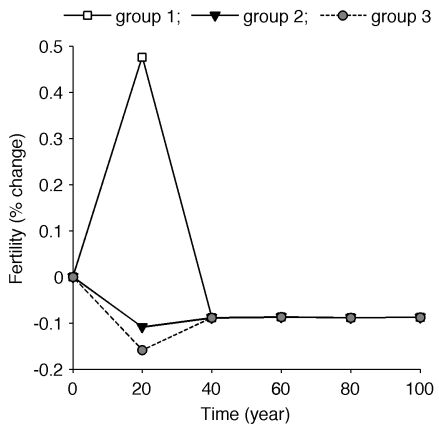

group 1;
group 2;
group 3
Savings, young (% change)
Time (year)

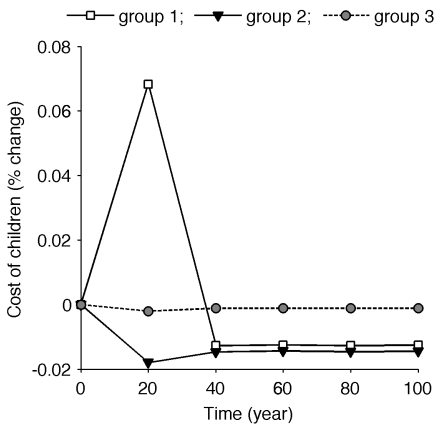

group 1;
group 2;
group 3
Savings, middle-aged (% change)
Time (year)

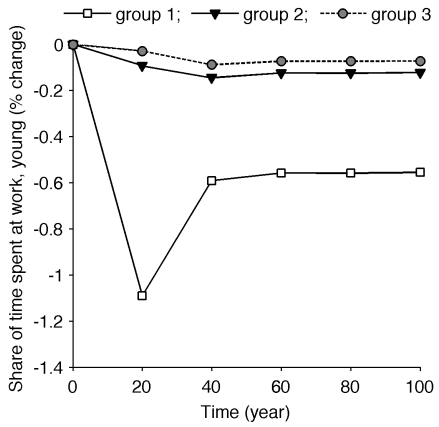

group 1;
group 2;
group 3
Inter-generational transfers, young (% change)
Time (year)

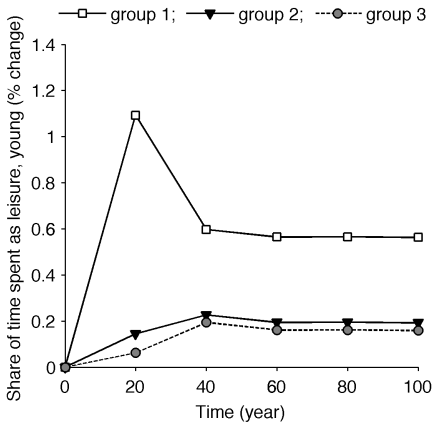

τ;
τ, inter-general transfers
Tax rate (% change)
Time (year)

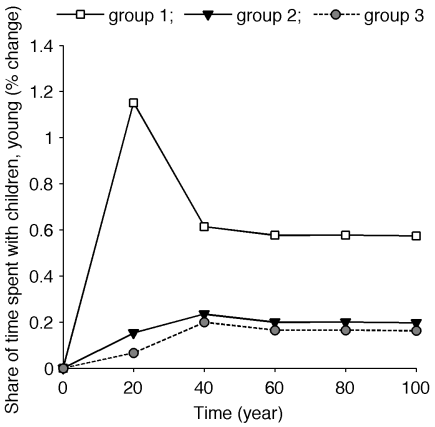
B Effects of an increase in the pro-nativist fiscal incentive for all groups of households

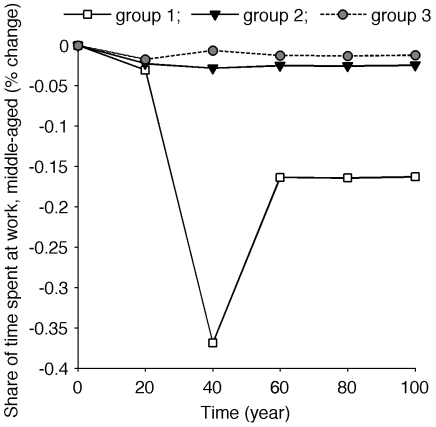


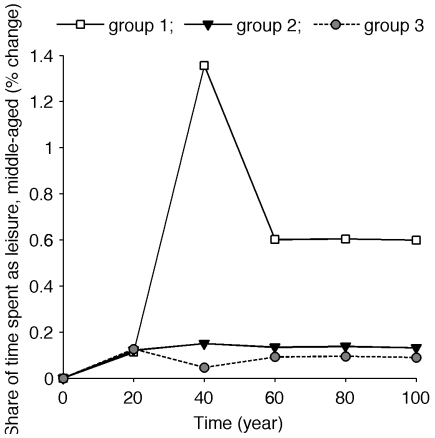


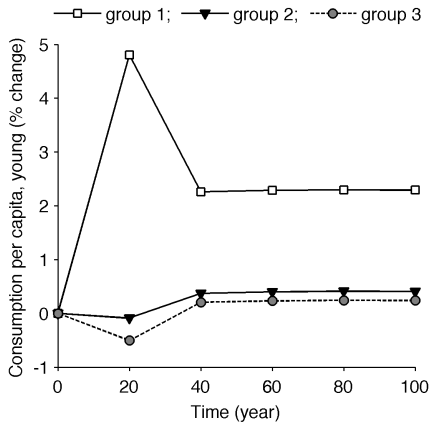


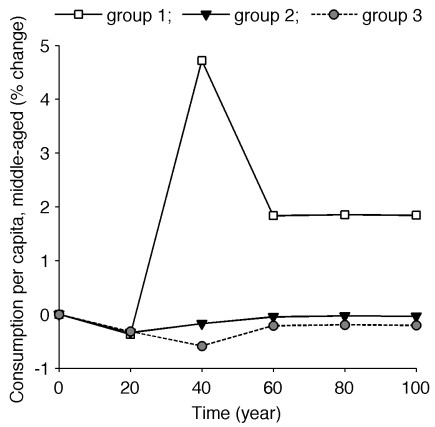


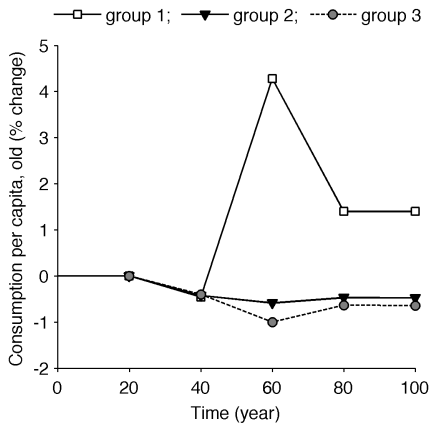

group 1;
group 2;
group 3
Share of time spent with children, young (% change)
1.4
1.2
1
0.8
0.6
0.4
0.2
0
0
20
40
60
80
100
Time (year)

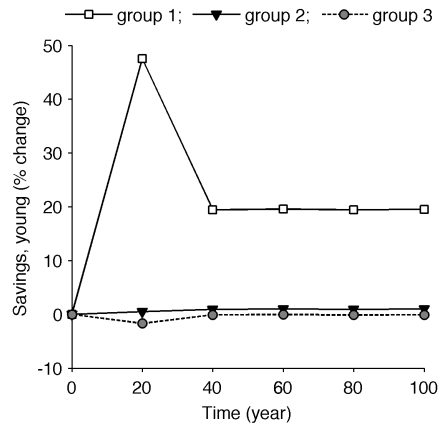

group 1;
group 2;
group 3
Share of time spent at work, middle-aged (% change)
0
-0.05
-0.1
-0.15
-0.2
-0.25
-0.3
-0.35
-0.4
0
20
40
60
80
100
Time (year)

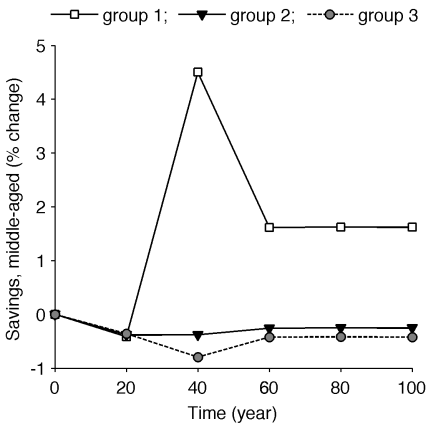

group 1;
group 2;
group 3
Share of time spent as leisure, middle-aged (% change)
1.4
1.2
1
0.8
0.6
0.4
0.2
0
0
20
40
60
80
100
Time (year)

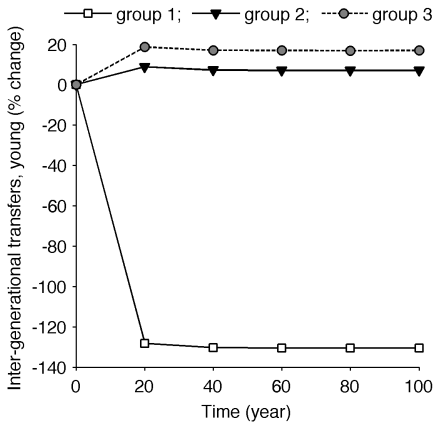

group 1;
group 2;
group 3
Consumption per capita, young (% change)
5
4
3
2
1
0
-1
0
20
40
60
80
100
Time (year)

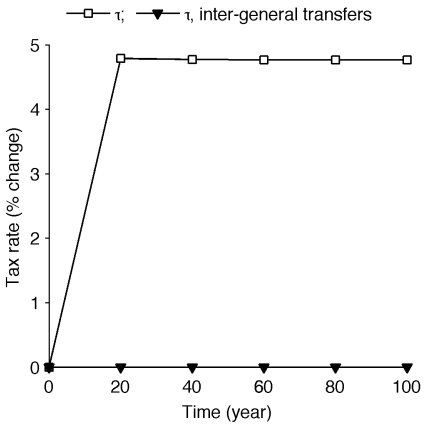

group 1;
group 2;
group 3
Consumption per capita, middle-aged (% change)
5
4
3
2
1
0
-1
0
20
40
60
80
100
Time (year)


group 1;
group 2;
group 3
Consumption per capita, old (% change)
5
4
3
2
1
0
-1
-2
0
20
40
60
80
100
Time (year)

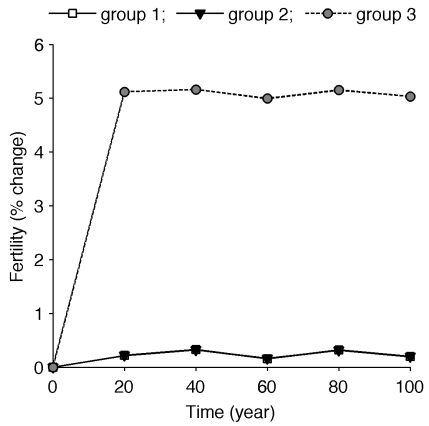

group 1;
group 2;
group 3
Savings, young (% change)
50
40
30
20
10
0
-10
0
20
40
60
80
100
Time (year)

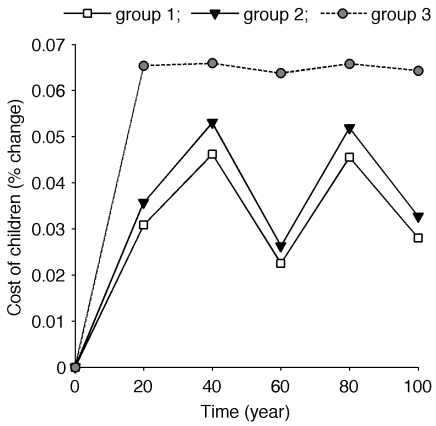

group 1;
group 2;
group 3
Savings, middle-aged (% change)
5
4
3
2
1
0
-1
0
20
40
60
80
100
Time (year)

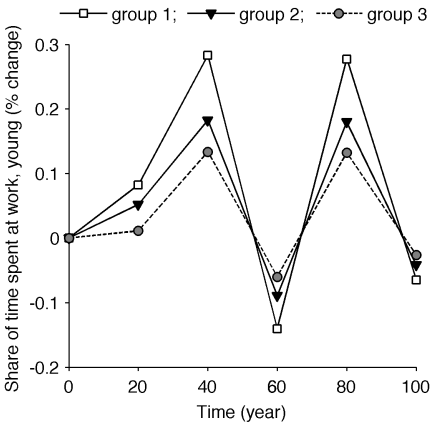

group 1;
group 2;
group 3
Inter-generational transfers, young (% change)
20
0
-20
-40
-60
-80
-100
-120
-140
0
20
40
60
80
100
Time (year)

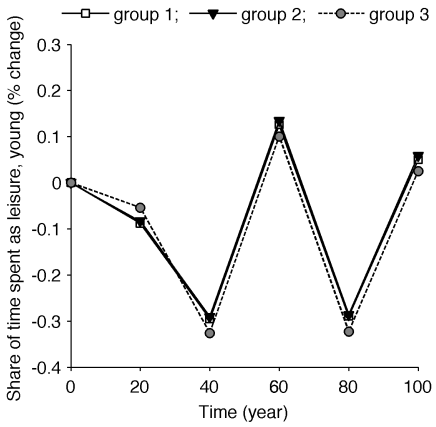

τ;
τ, inter-general transfers
Tax rate (% change)
5
4
3
2
1
0
0
20
40
60
80
100
Time (year)

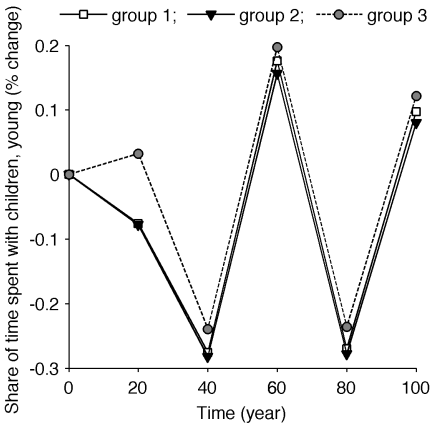
C Effects of an increase in the taxation of inter-generational transfers

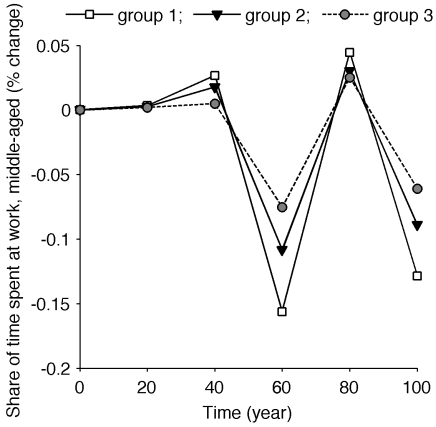


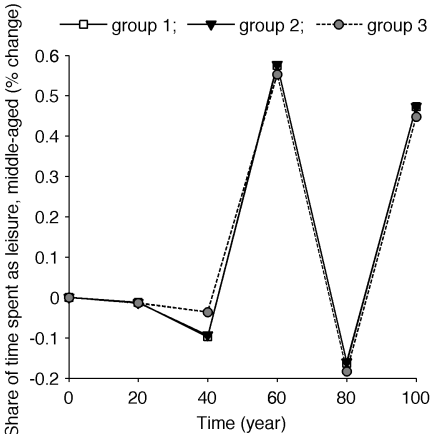


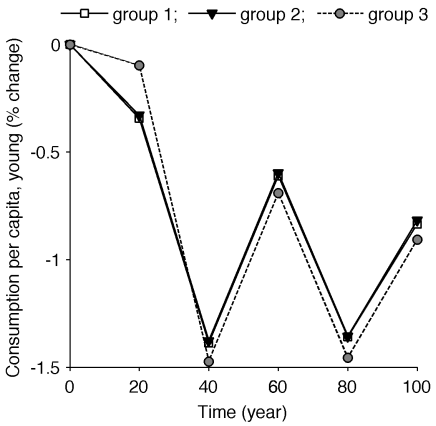


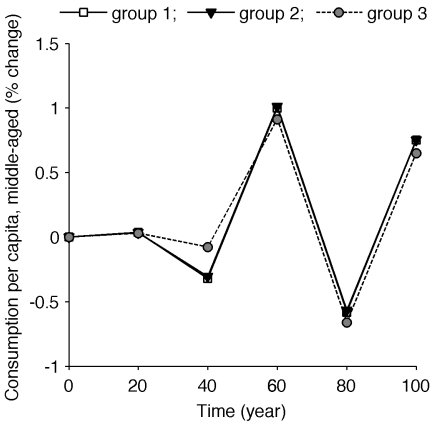


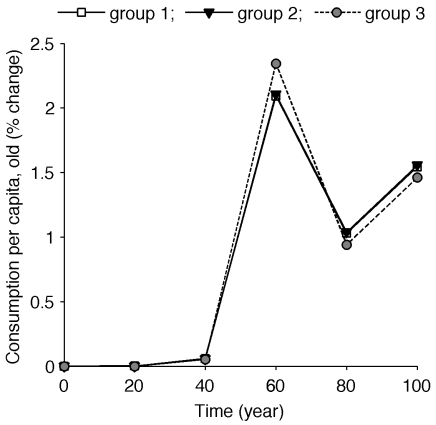

group 1;
group 2;
group 3
Share of time spent with children, young (% change)
0.2
0.1
0
-0.1
-0.2
-0.3
0
20
40
60
80
100
Time (year)

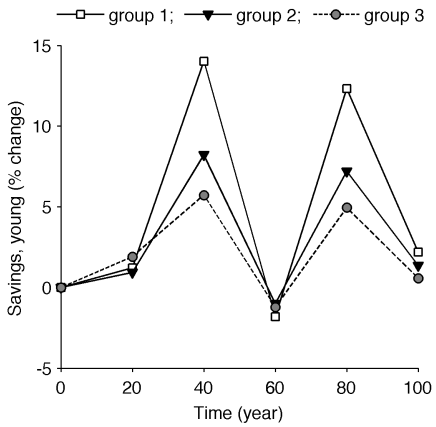

group 1;
group 2;
group 3
Share of time spent at work, middle-aged (% change)
0.05
0
-0.05
-0.1
-0.15
-0.2
0
20
40
60
80
100
Time (year)

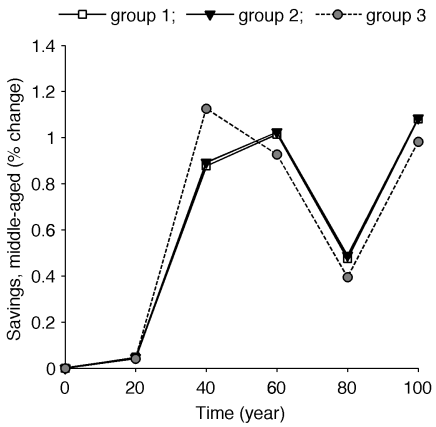

group 1;
group 2;
group 3
Share of time spent as leisure, middle-aged (% change)
0.6
0.5
0.4
0.3
0.2
0.1
0
-0.1
-0.2
0
20
40
60
80
100
Time (year)

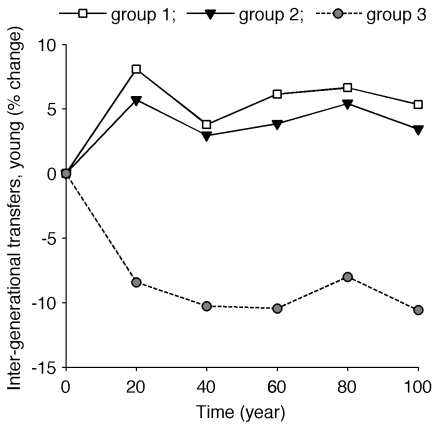

group 1;
group 2;
group 3
Consumption per capita, young (% change)
0
-0.5
-1
-1.5
0
20
40
60
80
100
Time (year)

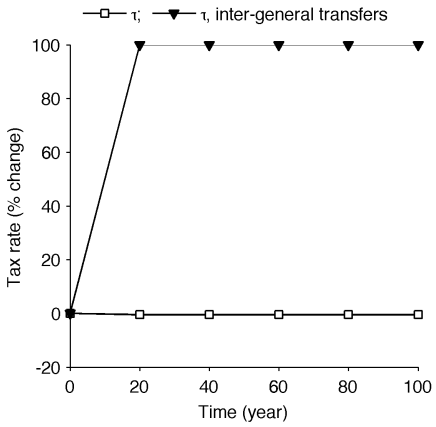

group 1;
group 2;
group 3
Consumption per capita, middle-aged (% change)
1.5
1
0.5
0
-0.5
-1
0
20
40
60
80
100
Time (year)


group 1;
group 2;
group 3
Consumption per capita, old (% change)
2.5
2
1.5
1
0.5
0
0
20
40
60
80
100
Time (year)

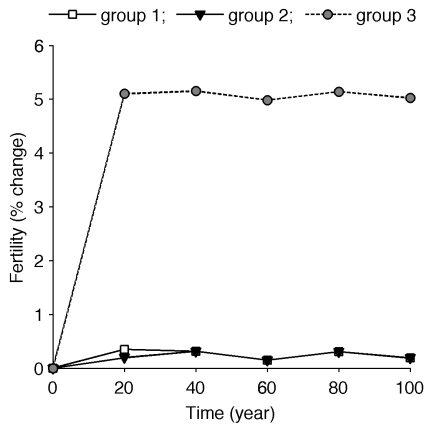

group 1;
group 2;
group 3
Savings, young (% change)
15
10
5
0
-5
0
20
40
60
80
100
Time (year)

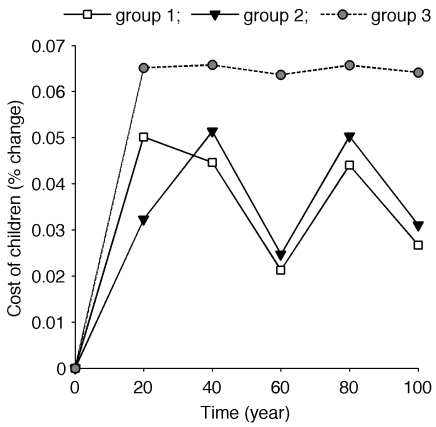

group 1;
group 2;
group 3
Savings, middle-aged (% change)
1.4
1.2
1
0.8
0.6
0.4
0.2
0
0
20
40
60
80
100
Time (year)

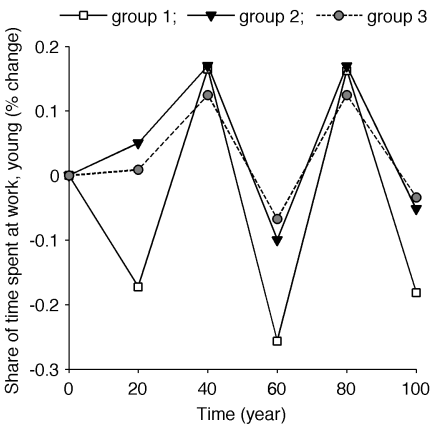

group 1;
group 2;
group 3
Inter-generational transfers, young (% change)
10
5
0
-5
-10
-15
0
20
40
60
80
100
Time (year)

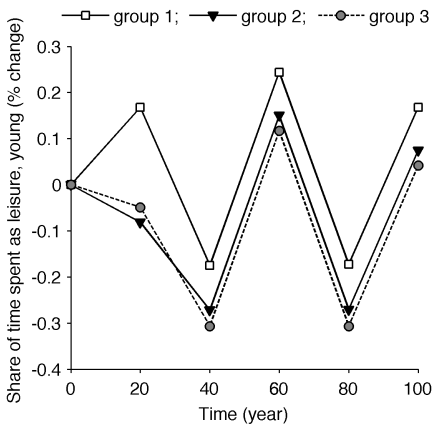

τ;
τ, inter-general transfers
Tax rate (% change)
100
80
60
40
20
0
-20
0
20
40
60
80
100
Time (year)

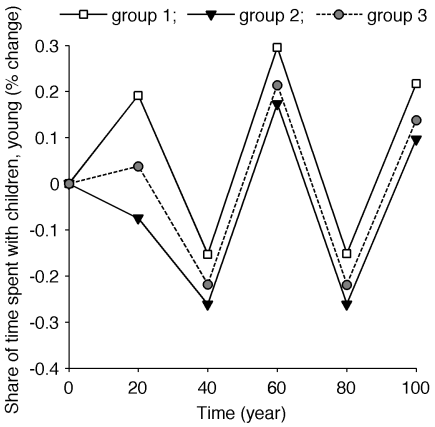
D Effects of an increase in the taxation of inter-generational transfers, accompanied by an increase in the pro-nativist fiscal incentive for the poorest group of households

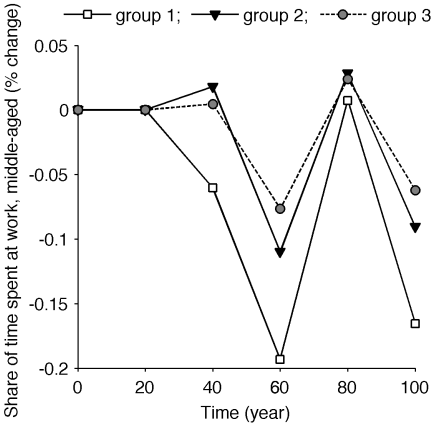


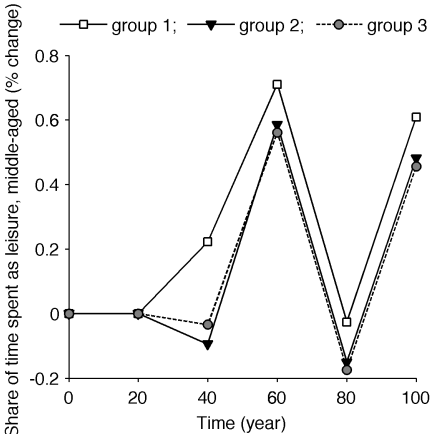


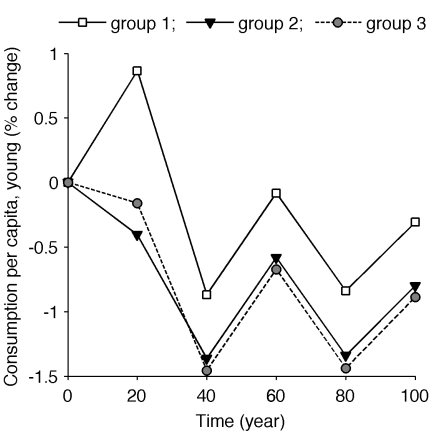


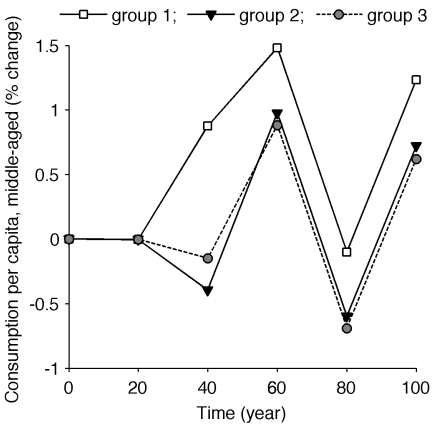


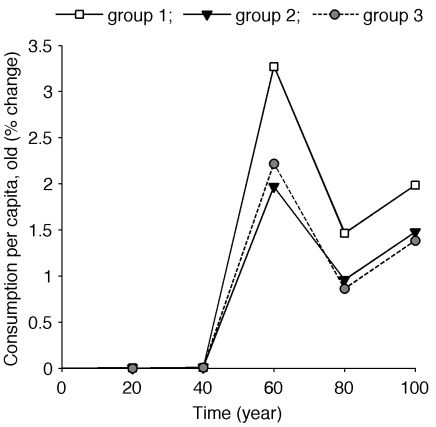

group 1;
group 2;
group 3
Share of time spent with children, young (% change)
0.3
0.2
0.1
0
-0.1
-0.2
-0.3
-0.4
0
20
40
60
80
100
Time (year)

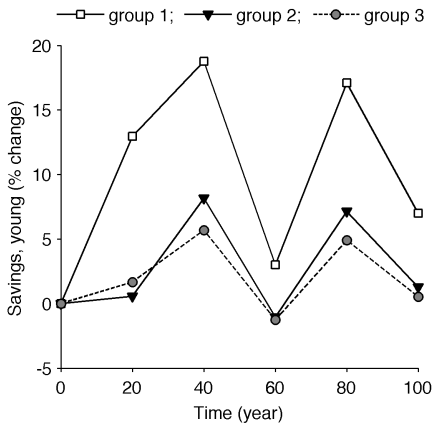

group 1;
group 2;
group 3
Share of time spent at work, middle-aged (% change)
0.05
0
-0.05
-0.1
-0.15
-0.2
0
20
40
60
80
100
Time (year)

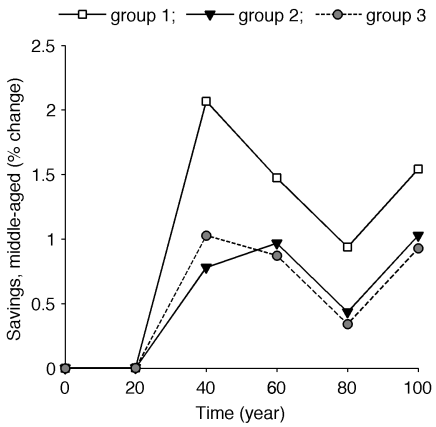

group 1;
group 2;
group 3
Share of time spent as leisure, middle-aged (% change)
0.8
0.6
0.4
0.2
0
-0.2
0
20
40
60
80
100
Time (year)

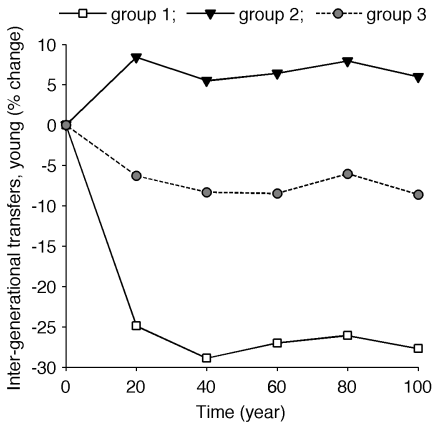

group 1;
group 2;
group 3
Consumption per capita, young (% change)
1
0.5
0
-0.5
-1
-1.5
0
20
40
60
80
100
Time (year)

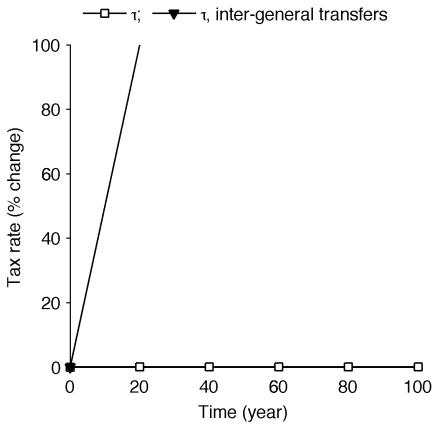

group 1;
group 2;
group 3
Consumption per capita, middle-aged (% change)
1.5
1
0.5
0
-0.5
-1
0
20
40
60
80
100
Time (year)


group 1;
group 2;
group 3
Consumption per capita, old (% change)
3.5
3
2.5
2
1.5
1
0.5
0
0
20
40
60
80
100
Time (year)


group 1;
group 2;
group 3
Savings, young (% change)
Time (year)


group 1;
group 2;
group 3
Savings, middle-aged (% change)
Time (year)


group 1;
group 2;
group 3
Inter-generational transfers, young (% change)
Time (year)


τ;
τ, inter-general transfers
Tax rate (% change)
Time (year)

Institut de Recherches Économiques et Sociales
Université catholique de Louvain

Place Montesquieu, 3
1348 Louvain-la-Neuve, Belgique

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