Laisney, François; Mühleisen, Martin; Staat, Matthias; Vögele, Stefan

Working Paper

Simulation of reforms of direct and indirect taxation for France

ZEW Discussion Papers, No. 92-07

Provided in cooperation with:
Zentrum für Europäische Wirtschaftsforschung (ZEW)

Discussion Paper

Discussion Paper No 92-07

Simulation of Reforms of Direct and Indirect Taxation for France

François Laisney
Martin Mühleisen
Matthias Staat
Stefan Vögele

ZEW

Zentrum für Europäische Wirtschaftsforschung GmbH

Public Finance and Corporate Taxation Series

Simulation of Reforms of Direct and Indirect Taxation for France

by

François Laisney*, Martin Mühleisen**, Matthias Staat*** and Stefan Vögele***

**BETA, Université Louis Pasteur, Strasbourg,*
and Zentrum für Europäische Wirtschaftsforschung (ZEW), Mannheim
***Seminar für Arbeits- und Bevölkerungsökonomie, Universität München*
****Institut für Volkswirtschaftslehre und Statistik, Universität Mannheim, and ZEW*

Abstract

We study the welfare effects of combining the European Commission's proposal for VAT harmonization with different degrees of weakening of the 'quotient familial', a feature of the French system of direct taxation which can be interpreted as aiming at taxing 'equivalised' household income. We compare two approaches to the calibration of the baseline situation and to the simulation of reactions to changes in the tax system. One of these takes fixed costs of work into account. For both we find that a tentative implementation of the Commission's proposal, keeping the low rate unchanged, is favourable to a narrow majority (the status quo is preferred on a number of criteria), but that it results in a high VAT rate in excess of the proposal. While a weakening of the quotient familial brings this rate within the desired bracket, the combined reform appears much less desirable than the pure VAT reform. This goes some way against the notion that the quotient familial constitutes a tax relief which is only significant for richer households.

Acknowledgements

Support from the Deutsche Forschungsgemeinschaft, from the Zentrum für Europäische Wirtschaftsforschung Mannheim (ZEW) and from the SPES project 'The Indirect Taxation of European Households' is gratefully acknowledged. Thorsten Geib provided excellent research assistance. We wish to thank participants to seminars in Heidelberg, Mannheim, Santander and Venice for helpful comments and discussions.

1 Introduction

Several considerations motivated this study. Firstly, Baccouche and Laisney (1990) found the VAT harmonization proposal of the European Commission (move to a structure with two rates only, in the intervals 6.5% ± 2.5% and 16.5% ± 2.5%) to be extremely unfavourable for most French households. This is in line with the conclusions of Lee et al. (1988) for the U.K., but still, the extent of the phenomenon made us wish to reconsider some of the more doubtful assumptions in the Baccouche and Laisney study. These concerned mainly a dissymmetry in the treatment of VAT rates before and after harmonization, the latter being much more approximative. Thus in this study we adopt the same level of precision on VAT rates before and after the reform.

Secondly, the same study indicated that a revenue-neutral implementation of the Commission's proposal would require increasing both the low and the intermediate rate in the prevailing three rate structure. This prompted us to try and combine that reform with a revenue-increasing reform of the system of direct taxation. Anyway, given the discrepancies in the relative importance of direct and indirect taxation in Europe, it appears difficult to discuss harmonization of indirect taxes in isolation from other aspects of the tax systems. The Economist (1991) gives an easily accessible account of the peculiarities of the French tax system.

Thirdly, besides the system of social security contributions, a good candidate for reform examination seems to be the system of 'quotient familial', which basically takes the number of dependent children into account in order to assess the tax liability per 'equivalent adult' in the household. Among OECD countries, that system is specific to France and has often been criticized as a regressive aspect of the tax system: such a tax relief will apparently primarily benefit wealthy families (see e.g. Atkinson et al., 1988, p. 136). On the other hand, that system can be seen as an attempt at assessing tax on a measure of the cost of living rather than on income per se (Conseil des Impôts, 1990, p. 230). We will thus look at the effects of combining the Commission's proposal with different degrees of weakening of the quotient familial.

Finally, very few empirical studies have been devoted to the analysis of tax reforms involving both direct and indirect taxes, whereas progress in that direction is clearly needed. The studies we are aware of are limited in scope: Atkinson et al. (1980) consider male labour supply and take account of reactions over a very narrow range of hours only; Blundell et al. (1986) concentrate mainly on female labour supply; Atkinson et al. (1988) consider the institutional framework in great detail, but do not allow for reactions of the households to variations in the tax parameters. By contrast, we will even be able, in principle, to describe the impact of relative and absolute price changes on labour supply.

For the simulation we will rely on estimates for a complete system of female labour supply and demands for goods estimated on a sample of households based on a married couple. The nature of this selection also contributes to the choice of the kind of reform studied here. For instance, a reform of the system of social contributions would induce labour supply and demand for goods reactions of segments of the population for which we have not yet estimated preference parameters

Our approach will also remain fairly rudimentary, but as we go along we point out different important problems which arise from the joint treatment of demands for goods and labour supply and which should be tackled in detail if we want our models to be realistic. One such problem is that of the fixed costs of work, which have an impact on the participation decision, and vary when indirect taxes are modified.

The paper is organised as follows. In Section 2 we give the theoretical setting, Section 3 presents the outline of the simulation method adopted, Section 4 discusses the details of the reforms we are interested in, and Section 5 comments the simulation results, concentrating mainly on graphical evidence, whereas tables are mostly deferred to an Appendix. Appendix A gives the details of the two strategies followed for calibrating the baseline situation. One of them entails the calibration of fixed costs of work, obtained from the estimated preference parameters in order to bring the model predictions in line with the observed baseline situation. Appendix B gives some information on the elasticities implied by the estimates underlying our simulations. Appendix C gives more extensive results on the simulation than we deem reasonable to include in the body of the text.

2 Theoretical setting

We work in a partial equilibrium framework, using life cycle consistent estimates of preferences derived from household demands and female labour supply under the assuptions of inter-temporal separability and weak separability between male hours and all other demands, including female leisure. We treat male labour supply as fixed (i.e. constrained for all men in the sample). Welfare changes affecting each household are thus fully described in terms of the sub-utility function excluding male labour supply. Up to this point, estimated parameters concerning the commodity demands could be interpreted as resulting from a fairly general Gorman polar form with weak separability between female labour supply and commodity demands, leading to linear Engel curves.[1] We now go a step further in identifying the linear expenditure system, augmented for female labour supply, from the estimated parameters.

The household maximizes the corresponding utility function

$$U(h,q) = \beta_0 \ln(\gamma_0 - h) + \sum_{i=1}^{n} \beta_i \ln(q_i - \gamma_i), \tag{1}$$

where h are hours, q is a vector of demands for goods, γ_0 denotes the maximum time available for allocation between leisure and work, γ_i is the minimum consumption of good i and β is a vector of marginal propensities to spend, along the linearized budget line

$$w(T-h) + p.q = m + wT, \tag{2}$$

or

$$e := p.q = m + wh, \tag{3}$$

where w denotes the marginal wage rate, m denotes net *virtual unearned income* and T female time endowment. This yields the earnings equation

$$wh = w\gamma_0(1-\beta_0) + \beta_0(p.\gamma - m) \tag{4}$$

and the demand equations

$$p_i q_i = p_i \gamma_i + \frac{\beta_i}{(1-\beta_0)}(m + wh - p.\gamma). \tag{5}$$

Using duality and defining:

$$V(p,e) = \ln\{[e - a(p)]/b(p)\}, \tag{6}$$

1 However, one further restriction imposed so far is identity of the marginal budget shares across households.

with

$$a(p) = p.\gamma \text{ and } b(p) = \prod_{i=1}^{n}\left(\frac{p_i}{\tilde{\beta}_i}\right)^{\beta_i}, \text{ with } \tilde{\beta}_i = \frac{\beta_i}{1-\beta_0}, \tag{7}$$

we can rewrite (1) as:

$$U(h,q) = \beta_0 \ln(\gamma_0 - h) + (1-\beta_0)V(p,e) = :W(p,h,e)$$

$$= \beta_0 \ln(\gamma_0 - h) + (1-\beta_0)\left[\ln\left(\frac{e-d}{P}\right) + \sum_{i=1}^{n} \tilde{\beta}_i \ln \tilde{\beta}_i\right], \tag{8}$$

with $d := p.\gamma$ and $P := \prod_{i=1}^{n} p_i^{\tilde{\beta}_i}$.

Comparison of (1) and (8) shows how we can take advantage of two stage budgeting both in estimation and in simulation. Estimation results of (4) and (5) are reported in Blundell et al. (1989). The mean of the estimated labour supply elasticities is 1.0. The estimation procedure takes the existence of job seekers into account and uses grouped hours information rather than relying on the identity between observed and desired hours. In our opinion, the main defect of our labour supply model is that it does not account for fixed costs of work for the non-participants, whether or not they seek work, whereas the costs of work are included in the expenditures of the participants. The estimation of the demand equations takes care of the problem of zero expenditures recurrent in micro data in the following way: For alcohol and tobacco, we assume that purchases coincide with consumption and that households reporting zero expenditures do not consume these goods. Four different regimes of consumption will result from the four corresponding patterns (tobacco: yes/no, alcohol: yes/no). For the other goods we assume that zero expenditures are generated by the 'infrequency of purchase' model. Appendix B shows histograms of the corresponding purchase probabilities and the means of the expenditure elasticities in the four regimes. The assumption of weak separability between leisure and goods was tested for each good separately, and rejected only for food and for transport-and-communication.

3 Simulation method

We first determine the tax revenue in the reference situation, after having calibrated the preferences as described in Appendix A. The calibration is done in order to bring the estimated preference parameters in line with observed behaviour, e.g. participants have to supply positive hours, and with some theoretical requirements, e.g. the concavity of the cost function. This is achieved by calibration of the random preference parameter γ_0. We then simulate behaviour in the baseline situation in order to have a well-defined reference point for comparison with post-reform outcomes.

Two different calibration methods are applied here. Version A relies solely on drawing random values of γ_0 to bring observed and simulated behaviour in line, whereas the extended Version B described below relies on considerations related to the existence of fixed costs of work.

The motivation for taking fixed costs into account is mainly that otherwise some individuals are predicted supplying a very small number of hours, which contradicts observed behaviour (see Cogan, 1981, for a theoretical model and Bourguignon and Magnac, 1990, for an application). This does not appear to be a big problem in our simulations using the model without fixed costs, but there the fundamental asymmetry between the inclusion of fixed costs in the expenses of baseline participants whether or not they retain that status after the reform, and their exclusion for baseline non-participants remains. Yet the main advantages we see in the fixed costs approach to calibration over simply drawing values of γ_0 is that (i) the latter approach distorts preferences more, (ii) the calibrated fixed costs only come into play when a woman changes her status and (iii) approach B allows us to satisfy the constraints of concavity and of compatibility between predicted and observed baseline behaviour for a significantly larger number of households than does approach A.

The fixed costs are set to render the choice of a low number of hours unattractive. Depending on the observation we allow the minimum numbers of hours to vary between 7 and 14 weekly hours. Furthermore we limit the fixed costs to a maximum of 10% of the observed expenses. These are admittedly arbitrary, yet justifiable, assumptions. Less than 5% of those working are observed at less than 15 weekly hours. It is conceivable that someone with high expenses would also spend more on fixed costs of working (choose a more comfortable travel mode, wear more expensive clothes at work, choose more expensive day care for the children, or possibly even be charged more than less wealthy households for the same service, etc.), thus making the dependency of maximum fixed costs on other expenses seemed plausible.[2] (The details of both calibration procedures are given in Appendix A.)

This done, we simulate behaviour in the baseline situation, that is, before any reform takes place. This provides a well-defined reference point for comparison with post-reform outcomes.

Since we have a comprehensive definition of taxes, including social security contributions (benefits are not accounted for here, since we model short-run reactions and the means-tested benefits involve past incomes), and since contributions are shared equally between employers and employees, it will be useful to consider the following definition of direct tax revenue: $\text{DTR}^0 := T + 2C$, where T denotes taxes and C denotes employee contributions. For these calculations we make use of the sampling weights π^i. The details of the determination of VAT revenue are given below.[3]

In order to determine the indirect tax revenue VATR in the reference situation, given that prices inclusive of VAT have been normalized to 1, we evaluate

$$\text{VATR}^0 = 2 \sum_{i,h} \pi^h e_i^h \frac{t_i}{1+t_i} \tag{9}$$

2 It would be clearly preferable to introduce the fixed costs at the estimation stage. In dealing with them in the simulation while disregarding them before, we obviously create an asymmetry between the way parameters have been estimated and the way they are used for simulation.

3 A weakness of this study is that we do not take excises into account. See Smith (1988), Symons and Walker (1988) and Baker et al. (1990) for the relevance of excises in such an exercise and how they can be included. We intend to remedy this shortcoming in future work, but also have the feeling that we address a sufficient number of issues in this study to be forgiven.

where t_i denotes the VAT rate on good i. The multiplicator 2 before the sum sign is motivated by the following consideration: the direct tax reform studied will only affect households with children. Thus, disregarding lone and unmarried parents, the direct tax revenue consequences of this type of reform will be traced more or less correctly on the sample of married couples on which our computations are based. However, the indirect tax changes will affect the whole population, and we make the assumption that the overall VAT revenue from households is roughly twice the revenue from married couples and their dependents.

In order to obtain the post-reform budget line, we assume that the difference between disposable income and expenditure on goods will remain unaffected by the reform. Since we have not modelled saving behaviour, an assumption of this kind is clearly needed. Using a code presented in Dagsvik et al. (1988) which yields the disposable income DI of the household given female hours h, we thus compute $\Delta := \mathrm{DI} - \hat{e}^0$ where $\hat{e}^0$ denotes the estimate of total expenditure on goods obtained from the results of Blundell et al. (1989).

STEP 1: Simulation for direct taxes. Given the definition of a reform which is fully specified in its implications for direct taxes we determine the new budget line using $\hat{e}^1(h) = \mathrm{DI}^1(h) - \Delta$ for $0 \leq h \leq \gamma_0$ and simulate behaviour along this budget line using (8) and setting $P = 1$ for the first iteration. This gives chosen hours, *DTR* and the corresponding sum allocated to expenditure on goods. Note that we assume no kind of indexation of gross wages on P, which would also be a possibility, used for France by Bloch and Maurel (1989) in a macroeconomic exercise.

STEP 2: Simulation for indirect taxes. We suppose that the reform is defined up to one degree of freedom consisting in the choice of one tax rate and we determine that *residual* tax rate in order to ensure revenue neutrality: $\mathrm{VATR}^0 + \mathrm{DTR}^0 = \mathrm{VATR}^1 + \mathrm{DTR}^1$. This results in a new set of prices and thus in new price indices P and d. Steps 1 and 2 are then iterated until convergence is achieved.

4 Reform definition

The reforms we consider here consists in combining different degrees of weakening of the 'quotient familial' system with a version of the proposal of the European Commission for VAT harmonization, with a low rate set at 7% and an upper rate used as residual tax rate. The quotient familial makes marginal tax rates dependent on the demographic structure of the household (supposed here to constitute a single tax unit) in the following way: the household's taxable income R is divided by a number of 'shares' equal to the number of parents present in the household plus half the number of children[4] and the resulting quotient Q is compared to the tax brackets to yield a tax per share which is subsequently multiplied by the number of shares.[5] Thus:

$$Q = \left(2 + \frac{\text{noc}}{\text{qf}}\right), \qquad T = Q\, f(R/Q), \tag{20}$$

where $\text{qf} = 2$ in the baseline situation. *Weakening* that system is achieved by reducing the importance of children by raising the value of the parameter qf used in the calculation of the shares. In this way we hope to be able to design a global revenue-neutral reform while keeping the residual VAT rate in the [13%, 19%] bracket proposed by the Commission.[6] We shall report results for three values of qf: 2, 3 and 1000, the latter approximating a complete suppression of the quotient familial. In order to preserve symmetry in the definition of VAT rates before and after the reform, we adopt an approximation of the rates for the 16 goods included in the study of Blundell et al. (1989), which is retraced in Table 1. There we denote by r, n and m the rates of 1979 (reduced, normal and maximum) and by t the residual rate after reform, which replaces both the normal and the maximum rate.

4 The system prevailing in 1992 is slightly more complicated, but with the data of 1979 that we use, this simple wording is justified.

5 For more details see Dagsvik et al. (1988).

6 This had proved difficult, to say the least, in the study of Baccouche and Laisney (1990).

Table 1: Treatment of tax rates before and after reform

Goods categories	rate before reform	rate after reform
food	r	r
alcohol	n	t
non-alcoholic drinks	n	t
tobacco	m	t
health	r	r
transport and communication *	$(0+r)/2$	$(0+r)/2$
normal services *	n	t
merit services *	r	r
luxury	m	t
clothing and footwear *	n	t
non-durables	n	t
dairy products	r	r
books and journals	r	r
durables *	$(n+m)/2$	t
home energy	n	t
fuel *	n	t

r = reduced rate; n = normal rate; m = increased rate; t = residual tax rate ensuring revenue neutrality.
* denotes the goods categories included in the fixed costs.

5 Simulation results

Table 2 gives the residual VAT rate and the composition of tax and social contributions for each of the three reforms under study. The first column describes the baseline situation, the second corresponds to the Commission's harmonization proposal (indirect taxes only) with labour supply and consumption adjustments by the households. The last two columns show the effect of simultaneously weakening the quotient familial, reducing the share of a child from a half to a third and finally to a thousandth of the share of an adult. All results reported henceforth take the sampling weights into account unless otherwise specified.

We first comment on the upper panel of the table: this corresponds to version A of the calibration, which only relies on random drawings and does not involve fixed costs. The first line shows the resulting residual VAT rate. A comparison of the first two columns shows that labour supply has slightly increased as a consequence of the VAT reform, allowing a marginal drop in the residual VAT rate, from 20.33% to 20.32%. However, both results are much higher than the rate of 18.7% obtained by Baccouche and Laisney for a reduced rate set at 8.5%.[7] Such a high reduced rate proved unfavourable to an overwhelming 98% of the households in their study. This is why we chose here to keep the reduced rate at its baseline value of 7%. The third and fourth columns show how difficult it is to bring the residual VAT rate within the [13%, 19%] bracket proposed by the Commission by playing only with the parameter qf. It appears that one would almost have to suppress the quotient familial altogether to be able to reach that aim, given the choice made for the reduced rate.

The next three lines give the composition of revenue under the different reforms studied. All figures are given in milliards of 1979 Francs. The line headed 'direct taxes' indicates income taxes, the line headed 'social contribution' gives employee contributions and the corresponding figure has to be doubled to obtain the total of social contributions (employer and employee each pay half). The line headed 'VAT revenue' reports twice the VAT revenue from the households used in the simulation, according to the assumption made in Section 3. A gradual change in the balance between direct and indirect taxation can be followed across that block of the table.

The next block of lines shows the percentage of winners in each reform, overall and in each of five categories of households based on the number of children. In contrast with the study of Baccouche and Laisney, we find that a small majority of households benefits from this implementation of the Commission's proposal, and that the winners are more numerous among households with one or two children than among households without children or with three or more children.

7 Baccouche and Laisney also reported a lesser rate of 16.7 when no consumption reaction of households was allowed for, whereas the revenue neutral change to a single VAT rate yielded 12.5% with consumption reactions, but a higher rate of 14.3% without such reactions.

Reducing the impact of the quotient familial drastically reduces the number of winners except in the category of couples without children, and of course in the category of other childless households, which is excluded from our analysis.

Table 2: Summary table for definition and impact of reforms

Version A	status quo	qf = 2[a]	qf = 3	qf = 1000
Residual VAT rate		20.32	19.94	18.84
direct taxes[b]	18585	18588	20118	24364
social security contrib.[c]	17776	17778	17744	17665
VAT	64849	64842	63375	59229
percentage of winners:				
overall		53.1	30.3	27.2
no children		50.5	75.4	95.4
one child		61.5	28.0	12.3
two children		54.7	10.1	4.6
three children		48.7	14.6	6.9
four children or more		29.2	22.3	16.2
Version B	**status quo**	**qf = 2[a]**	**qf = 3**	**qf = 1000**
Residual VAT rate		20.32	19.93	18.82
direct taxes[b]	18582	18588	20145	24374
social security contrib.[c]	17772	17777	17746	17671
VAT	64843	64839	63342	59257
percentage of winners:				
overall		29.2	15.6	15.5
no children		31.9	41.8	67.6
one child		39.1	16.2	4.7
two children		28.9	6.2	1.0
three children		18.8	8.4	2.3
four children or more		3.9	4.6	3.1

a. 20.33 without labour market reactions.
b. milliards of 1979 Francs.
c. employee contributions only: double to obtain total contributions.

The second panel corresponds to the calibration using fixed costs. The lines reporting on the components of tax revenue are similar to those in the first panel. The differences between the entries for the status quo in both panels come from the differences in the resuts of the baseline simulation in the two approaches. Both are based on the same households since we use all households for the computation of tax revenue, with the only restriction that those households for which we have been unable to satisfy either concavity or consistency between observed and predicted behaviour have been kept at the observed hours and expenditure constellation. The only striking difference between the two panels lies in the percentages of winners in the different categories of households: these are much lower in the second panel than in the first, although the relative magnitudes are not reversed. The comparison with the results of Baccouche and Laisney (1990) and the advantages we see in approach B over approach A let us be more confident of the validity of the results in the second panel.

Figures 1A and 1B show the conditional means of welfare changes for the different values of qf, plotted against the household welfare level in the simulated baseline situation.[8] As with the tables, A indicates the basic method of calibration and B the fixed costs approach. All results are based on the exponential of the utility level given by equation (1). Some readers may dislike the thought of basing utility comparisons on a measurement which includes utility for leisure. In a companion study (Laisney et al. 1992) we report results based on utility derived from goods only: these lead to the same qualitative conclusions. Moreover, readers who feel ill at ease with the direct comparison of utility levels and prefers comparisons in terms of a money metric (for caveats concerning that attitude, see e.g. Blackorby et al., 1991) may find some comfort in the fact that, focusing on utility derived from goods only, our measure of utility change is proportional to the change in supernumerary income, as equation (6) shows.

On Figures 1A and 1B it is apparent, if one disregards a few outliers at very high or very low levels of baseline welfare, that the Commission's proposal is regressive for all household types. This regressive character is attenuated when the quotient familial is weakened, and in the case of childless households the conditional mean gain becomes remarkably uniform. But it is also apparent that the global reform

8 The plots have been obtained with a normal kernel smooth with optimal variance parameter.

does not operate a transfer from richer to poorer households, as might have been expected from the idea that a tax relief primarily benefits households paying substantial taxes, that is, wealthier households.

Figures 2A and 2B provide another way to look at these results, by showing generalized Lorenz curves, represented in terms of difference with the baseline situation, for total utility (including leisure). The construction of these figures ignores the sample weights used in the computation of the corresponding tables of Appendix C, which leads to some apparent contradictions. However, the outcome is that the Commission's proposal on its own is the least unfavourable reform; for version A of the calibration method it would even appear as preferable to the status quo for all categories of households except those with four children or more if we did not take sampling weights into account; but it is strikingly regressive, while the others are unambiguously unfavourable, except for childless couples.

Figure 1A: Individual welfare changes as a function of baseline welfare

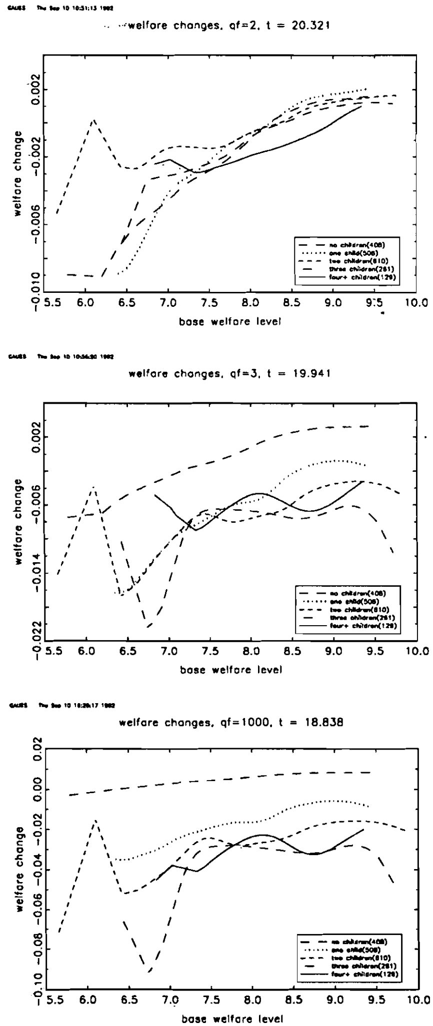


Figure 1B: Individual welfare changes as a function of baseline welfare

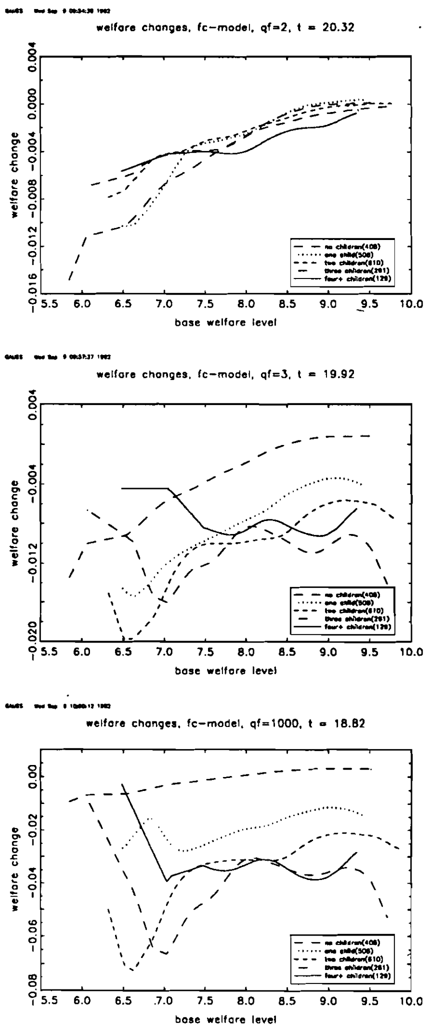


Figure 2A: Generalized Lorenz curves

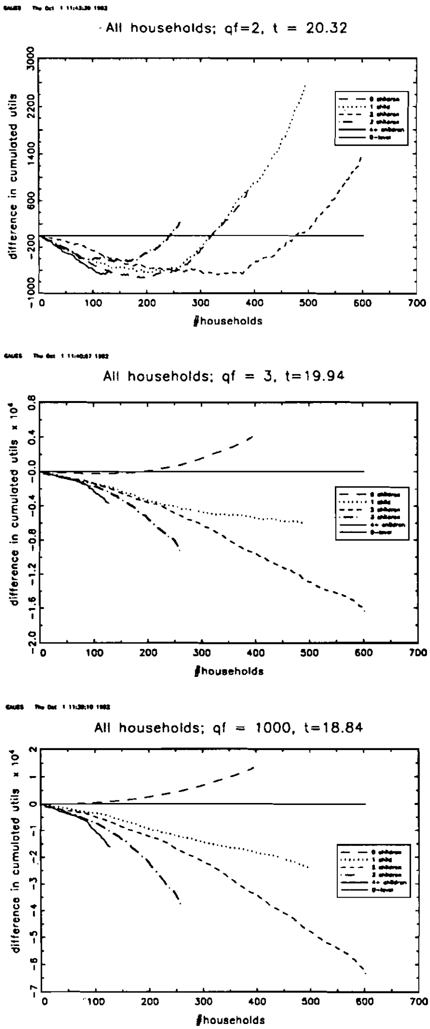
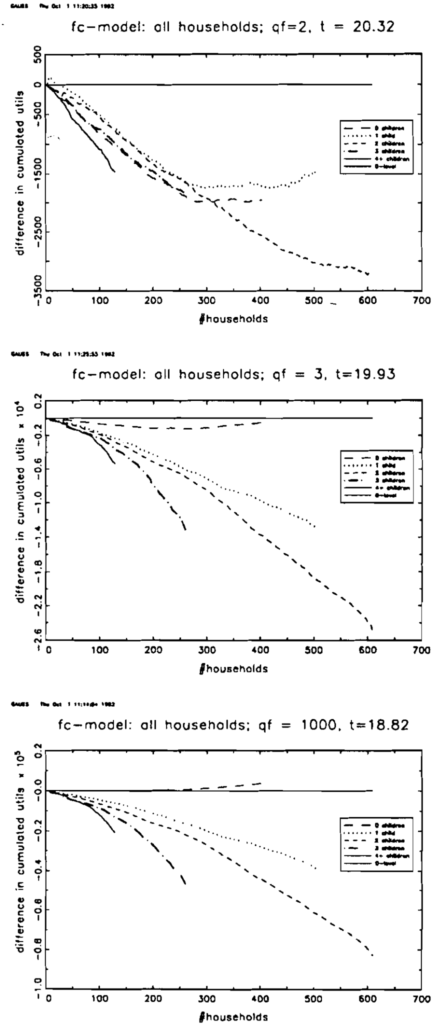


Figure 2B: Generalized Lorenz curves



6 Conclusion

In this analysis of a combination of two reforms, one concerning VAT, one concerning the French system of "quotient familial", we have found the latter to function better than we had expected. This does not mean that we would consider that system as optimal under all circumstances, but we think that the study throws some light on the difficulty of evaluating one aspect of a tax system in isolation from other features that might have to be changed along with it in a feasible global reform.

As concerns the methodological aspects of this study, the results are remarkably robust to the choice of basis for utility (whether or not leisure is taken into account) and to the choice of its measurement (total household utility, utility per head or per consumption unit), showing that there is no need in this instance to bother about finer concepts of equivalence scales. Moreover, the results are mostly insensitive to the choice of approach to the calibration of the baseline situation. One main difference, however, is that the simpler calibration approach A yields a much more optimistic evaluation of the Commission's proposal than former studies or the calibration approach B based on fixed costs do. Furthermore, the latter has the following interesting features: (i) it distorts preferences less than approach A does, (ii) the calibrated fixed costs only come into play when a woman changes her status and (iii) approach B allows us to satisfy the constraints of concavity and of compatibility between predicted and observed baseline behaviour for a significantly larger number of households than does approach A. Thus, in spite of the increased complexity involved and in spite of the questionable arbitrary choices it entails, we do favour the use of the calibration of fixed costs.

Appendix A. Simulation: Preliminary steps

A.1 Adjustment of error terms

Version A: Basic model without fixed costs

We treat preferences as random through the γ parameters and draw errors terms from their estimated distribution in order to obtain a set of predictions for household behaviour in the reference situation which is consistent with the observed behaviour (see also Blundell et al., 1987, and King, 1987). Specifying

$$\gamma_0 = \bar{\gamma}_0 + \frac{\eta}{1 - \beta_0} \quad \text{with} \quad \eta \sim N(0, \sigma^2), \tag{A1}$$

where η is a stochastic component, the hours equation is:

$$h = \bar{\gamma}_0 (1 - \beta_0) + \beta_0 \frac{d - m}{w} + \eta \quad =: \quad h^* + \eta. \tag{A2}$$

Concavity of the cost function requires $m + w\gamma_0 > d$ which expresses that the maximum possible resources (net unearned income plus upper bound on the wife's net earnings) must exceed minimum expenditures and is equivalent with

$$\eta > \underline{\eta} := \left(\frac{d - m}{w} - \bar{\gamma}_0 \right) (1 - \beta_0). \tag{A3}$$

At the same time, we want desired hours $h := h^* + \eta$ to have the right sign for each category, i.e. to be positive for true participants and seekers, and negative for non-seekers.

(i) For the *true participants* (h>0) we compute $\eta := h - h^*$ and in case $\eta < \underline{\eta}$ (which for them is equivalent to $h > \gamma_0$) we 'freeze' the corresponding observation, i.e. we assume invariant behaviour for these households and exclude them from welfare comparisons, retaining them only for the purpose of defining revenue-neutral reforms. We will treat similarly households for which the conditions below can not be satisfied after a given number of draws. Because $m = \hat{e} - wh$ has to be reduced when h changes, $\underline{\eta}$ in (11) appears as a function of η. However, since $\partial\underline{\eta}/\partial\eta \equiv 1$, there is no corrective action available for observations for which $\underline{\eta} < \eta$.

For the *seekers* (women who report zero hours but state that they are currently looking for work) and for the *non-seekers* (or *true non-participants*, which implies that we disregard discouragement) we need to introduce some more notation. The condition that $\gamma_0 > h$ necessary for the computation of the utility level using equation (1) reads for them:

$$\eta > -(1 - \beta_0)\bar{\gamma}_0 =: \tilde{\eta}. \tag{A4}$$

The respective positions of $\underline{\eta}$, $\tilde{\eta}$ and $-h^*$ are given by the sign of $d - m$ (which also determines the sign of the uncompensated wage elasticity of leisure): if $d - m > 0$ we have $-h^* < \tilde{\eta} < \underline{\eta}$, and $\underline{\eta} < \tilde{\eta} < -h^*$ in the opposite case. Thus:

(ii) For the seekers we draw until $\eta > \max[-h^*, \underline{\eta}]$.

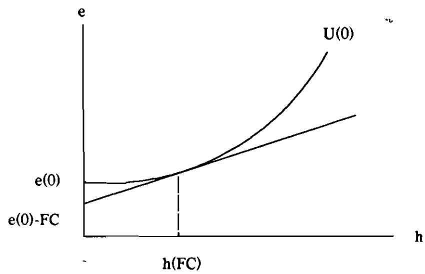
(iii) For the *non-seekers* we should have $\underline{\eta} < \tilde{\eta} < -h^*$. Thus, no correction will be possible in case $d - m > 0$ and the household is frozen. If $d - m < 0$, we draw until $\tilde{\eta} < \eta < -h^*$.

For the seekers we shall assume that the reasons for their inability to find a suitable job remain present after any reform, so that their observed behaviour on the labour market is invariant. But we shall take them into account when analysing welfare implications of the reforms. For the non-seeking non-participants we will assume that they will be able to find a job after the reform if they so wish.

N.B. While w is the same as in Blundell and Laisney (1989), m is recalculated using $m = \hat{e} - wh$ where $\hat{e}$ denotes the estimated total expenditure on goods. Thus we must iterate the procedure for the true participants, possibly requiring new drawings of η.

Version B: Extended model with fixed costs

For the version of the model that accounts for fixed costs in the case of the non-seekers we only have to make sure that $\tilde{\eta} < \eta < -h^* + h(FC)$, where $h(FC)$ denotes the number of hours that, given her fixed costs of work and her preferences, leaves the individual indifferent between non-participation and working $h(FC)$ hours:



$$U(m,0) = U\left(m - FC + \frac{\partial U}{\partial h(FC)} h(FC), h(FC)\right). \qquad (A5)$$

We do not intend to develop a full fixed costs model here. Instead we calculate the fixed costs necessary to keep those women that our model predicts at $0 < h < h(FC)$ from supplying any hours in that interval.

Looking at the above equation the other way round, $FC(h)$ are the fixed costs that satisfy that equation for a given level of h hours. The function above is individual-specific and so will be the fixed costs FC necessary to render a certain number of hours unattractive.

We choose to determine the fixed costs in such a way that, on the one hand, no one will be predicted working less than $h_1 = 7$ weekly hours, and on the other hand, no more than $h_2 = 14$ hours a week will be rendered unattractive by the fixed costs. Exceptions are made, e.g., when $FC(h_1) < \hat{e}/10$, our upper limit for FC. For a few individuals the utility function is not defined at h_1 or h_2 because of either of them being larger than γ_0. The procedure is then adjusted accordingly.

The difference between the two approaches is that in Version A, for some of the non-seekers, we have to draw large (negative) values of η in order to keep them from supplying positive hours in the simulated baseline situation. We are able to work with much more plausible values for η in Version B, the fixed costs model, but at the same time we have to depart from the model underlying the estimation. Yet this disadvantage should not be overemphasized, since the fixed costs only come into play when a woman changes her labour market status. In the simulations we have performed this turns out to concern a few observations only. For all the others, the fixed costs play no role at all. Moreover, Version B allows us to keep more observations for the welfare comparisons: it turns out that we have to "freeze" 46 observations for Version A but only 21 for Version B.[9]

A.2 Simulation of baseline situation for direct taxes

(i) We simulate behaviour taking account of the full budget line in the reference situation, using the preference parameters γ_0 determined in A.1, and for Version B the fixed costs. That is, we maximize (8) along the budget line. If predicted behaviour contradicts observed behaviour, we draw new values for η, larger ones for the seekers and participants, smaller ones for the non-seekers. For participants we take the predicted hours and the corresponding predicted total expenditure as reference and check for concavity again after redefinition of m. Again some iterations may be required here. This done, the preference parameters γ_0 (and for Version B the fixed costs) will retain their value in the sequel.

(ii) Given the $\tilde{\beta}$ and γ parameters and the optimal total expenditure on goods e obtained together with the optimal level of hours, the predicted expenditure on good i in the baseline situation is $\hat{e}_i = \gamma_i + \tilde{\beta}_i(e - d)$. In case $\hat{e}_i < 0$ we replace γ_i with $\gamma_i + \eta_i$, where $\hat{\eta}_i = \text{tol} - \hat{e}_i$ and tol denotes some arbitrarily small number. In order to leave d unchanged we must decrease accordingly the γ coefficients of the other goods. We propose to do this in proportion of the β coefficients. In detail, if $\delta := \sum_{i \in I_-} \text{tol} - \hat{e}_i$, then for $i \in I_+$ we set $\hat{\eta}_i = -\delta\tilde{\beta}_i / \sum_{i \in I_+} \tilde{\beta}_i$. Here again we may have to iterate the procedure since some new negative expenditures may appear in the process. This will converge provided $e > d$ (which has been checked at the outset).

9 In both cases this concerns non-participants with low income and few children.

For Version B the fixed costs are allocated in proportion to the parameters $\tilde{\beta}$ between six categories of goods (transport and communication, normal services, merit services, clothing and footwear, durables and fuel, see Table 1), and modify the corresponding γ parameters (and as a consequence the *d* parameter. For each household we thus end up with two sets of γ and *d* parameters: the baseline set and an alternative set which comes into play if the woman changes her labour market status. The values of the 'minimum expenditures' become higher if a non-participants enters the labour market, lower if a participant quits. In this way Version B allows in principle for the impact of changes in relative prices on the participation decision, whereas Version A does not.

Appendix B. Information on the estimated demand systems

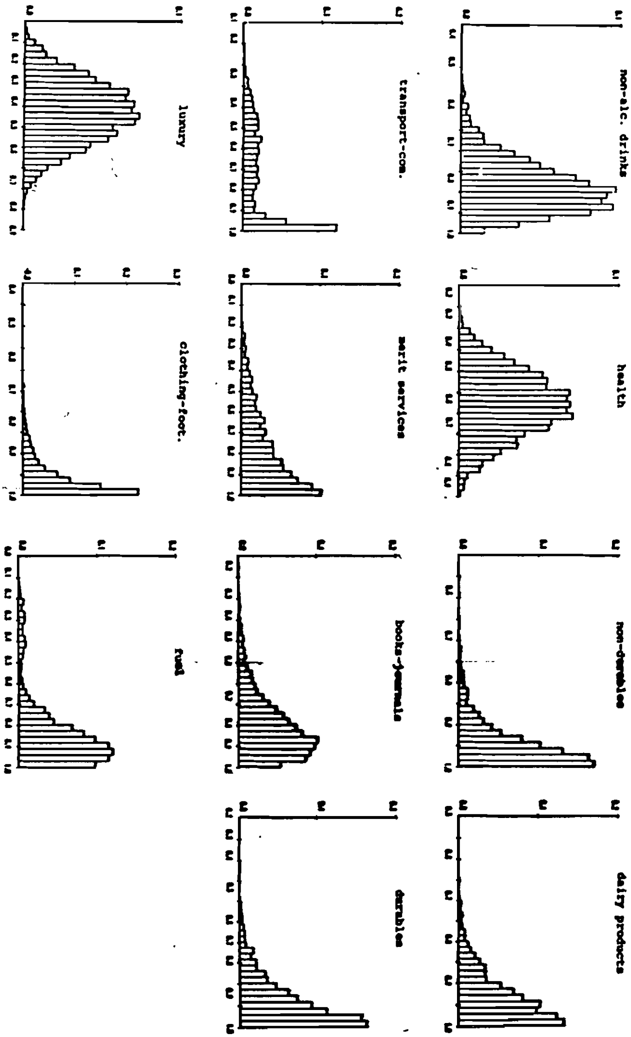


Figure B1
Histograms of predicted purchase probabilities.

Figure 3 displays histograms of predicted purchase probabilities, showing a variety of shapes on which we shall not comment in detail here. Still, notice the strong bimodal character of the distribution for transport-communication: the right peak is connected with Greater Paris. In Table 3 we summarize briefly the information on the distribution of expenditure elasticities for the four regimes which is given in detail in Blundell et al. (1989). Bold entries simply emphasize elasticities above one, and the last column reproduces the VAT rates of the baseline situation. (See footnote to Table 1). Differences in elasticities across regimes come both from differences in budget shares and in marginal propensities to spend. The most striking feature is that the category books-journals is only classified as luxury for the 'smoking and drinking' subsample, and that the merit services have a rather high expenditure elasticity throughout. Health is much more a necessity for the non-smoking and non-drinking subsample than for the rest, which appears to be consistent with intuition.

Table 3: Distribution of expenditure elasticities for the four regimes

Regime 1: alcohol and tobacco

	10%	Median	90%	VAT rate
food	0.11	0.19	0.30	r
alcohol	0.65	0.91	**1.16**	n
non-alcoholic drinks	0.63	0.81	0.92	n
tobacco	0.52	0.70	0.84	m
health	0.94	**1.29**	**2.29**	r
transport-communication	0.72	0.95	**1.74**	(0+r)/2
normal services	0.96	**1.15**	**1.65**	n
merit service	0.92	**1.24**	**2.52**	r
luxury	**1.44**	**1.94**	**3.89**	m
clothing-footwear	0.98	**1.11**	**1.47**	n
non-durables	0.85	**1.01**	**1.27**	n
dairy products	0.43	0.63	0.79	r
books-journals	**1.03**	**1.34**	**1.72**	r
durables	**1.07**	**1.47**	**3.26**	(n+m)/2
home energy	0.25	0.40	0.57	n
fuel	0.41	0.64	**1.48**	n

Regime 2: no alcohol but tobacco

	10%	Median	90%	VAT rate
food	0.16	0.31	0.48	r
alcohol				n
non-alcoholic drinks	0.59	0.81	0.93	n
tobacco	0.48	0.73	0.85	m
health	0.93	**1.29**	**2.42**	r
transport-communication	0.73	0.94	**1.70**	(0+r)/2
normal services	0.93	**1.14**	**1.77**	n
merit service	0.90	**1.19**	**2.95**	r
luxury	0.97	**1.31**	**2.78**	m
clothing-footwear	0.97	**1.12**	**1.53**	n
non-durables	0.81	**1.01**	**1.33**	n
dairy products	0.43	0.64	0.82	r
books-journals	0.57	0.82	**1.01**	r
durables	**1.03**	**1.42**	**3.36**	(n+m)/2
home energy	0.22	0.41	0.59	n
fuel	0.36	0.68	**1.18**	n

Regime 3: alcohol but no tobacco

	10%	Median	90%	VAT rate
food	0.17	0.30	0.47	r
alcohol	0.64	0.91	**1.15**	n
non-alcoholic drinks	0.61	0.80	0.92	n
tobacco				m
health	0.92	**1.25**	**2.28**	r
transport-communication	0.72	0.94	**1.67**	(0+r)/2
normal services	0.97	**1.17**	**1.74**	n
merit service	0.93	**1.25**	**2.55**	r
luxury	0.96	**1.32**	**2.74**	m
clothing-footwear	0.99	**1.12**	**1.55**	n
non-durables	0.82	0.99	**1.24**	n
dairy products	0.46	0.65	0.81	r
books-journals	0.60	0.80	0.99	r
durables	**1.07**	**1.44**	**3.47**	(n+m)/2
home energy	0.23	0.41	0.58	n
fuel	0.40	0.66	**1.19**	n

Regime 4: no alcohol and no tobacco

	10%	Median	90%	VAT rate
food	0.16	0.31	0.47	r
alcohol				n
non-alcoholic drinks	0.63	0.81	0.92	n
tobacco				m
health	0.48	0.65	**1.18**	r
transport-communication	0.71	0.93	**1.66**	(0+r)/2
normal services	0.94	**1.16**	**1.65**	n
merit service	0.89	**1.20**	**2.62**	r
luxury	0.97	**1.26**	**2.36**	m
clothing-footwear	0.98	**1.12**	**1.48**	n
non-durables	0.81	**1.02**	**1.31**	n
dairy products	0.43	0.67	0.82	r
books-journals	0.59	0.80	0.99	r
durables	**1.04**	**1.39**	**2.98**	(n+m)/2
home energy	0.24	0.42	0.59	n
fuel	0.41	0.69	**1.19**	n

Appendix C. Documentation of further results

Tables 4A and 4B show mean and minimum welfare across situations, permitting comparisons from the utilitarian and from the Rawlsian point of view.[10] The lower part of each table presents measures in terms of utility per head and utility per consumption unit, using the INSEE scale: 1 for the first adult, 0.7 for the second, and 0.4 for each child. What emerges from these tables is that the status quo is almost always preferred. The robustness of this result across the basis chosen for utility, across the measure (total household utility, utility per head or per consumption unit) and for both versions of the calibration is striking. Among the implementations of the Commission's proposal, the one that leaves the present system of quotient familial unchanged appears best, except for the mean utility of childless households, for whom qf = 1000 is best. The general picture for Versions A and B is the same. Direct comparisons of the entries is not meaningful due to the differences in the drawings of η.

Tables 5A and 5B show inequality indices based on the usual isoelastic additively separable social welfare function, with the utility per head as argument, since this provided the greatest variation. The results confirm the visual impression obtained from Figures 1 and 2: The reforms studied are regressive both overall and within each of the household groups we have singled out, except perhaps for the group with 4+ children. The new information here is that they all are regressive also within the group of childless households. Furthermore the suppression of the "quotient familial" does worst on this account as well. Again, the results for both versions are virtually identical and differences (for the subgroup with four or more children) are only marginal.

10 Tables labelled "A" report results of Version A of the model. The other tables, labelled "B" give results of the fixed costs version.

Table 4A: Social Welfare Levels: (i) mean

	Situation	status quo	qf = 2 t = 20.32	qf = 3 t = 19.94	qf = 1000 t = 18.84
Utility per household		mean	mean	mean	mean
# children:	all	**8.268**	**8.268**	8.264	*8.253*
	0	8.184	*8.183*	8.185	**8.190**
	1	**8.356**	**8.356**	8.352	*8.344*
	2	**8.284**	**8.284**	8.278	*8.260*
	3	**8.240**	8.239	8.232	*8.208*
	4+	**8.167**	8.165	8.161	*8.139*
head count	all	**2.292**	**2.292**	**2.292**	*2.288*
# children:	4+	**1.238**	**1.238**	**1.238**	*1.234*
cons. unit	all 4+	**3.529**	**3.529**	3.528	*3.523*
# children:		**2.309**	2.308	2.307	*2.301*

(ii) minimum

	Situation	status quo	qf = 2 t = 20.32	qf = 3 t = 19.94	qf = 1000 t = 18.84
Utility per household		mean	mean	mean	mean
# children:	all	**4.773**	*4.769*	*4.769*	4.772
	0	**4.773**	*4.769*	*4.769*	4.772
	1	**6.344**	6.343	6.335	*6.306*
	2	5.654	**5.647**	5.555	*4.899*
	3	**6.409**	6.399	6.402	*6.216*
	4+	**6.829**	6.824	6.825	*6.759*
head count	all	**0.716**	**0.716**	**0.716**	*0.713*
# children:	4+	**0.716**	**0.716**	**0.716**	*0.713*
cons. unit	all	**1.507**	1.506	**1.507**	*1.502*
# children:	4+	**1.507**	1.506	**1.507**	*1.502*

Note: On each line, a bold (italic) entry denotes best (worst) performance

Table 4B: Social Welfare Levels: (i) mean

	Situation	status quo	qf = 2 t = 20.32	qf = 3 t = 19.93	qf = 1000 t = 18.82
Utility per household		mean	mean	mean	mean
# children:	all	**8.316**	8.314	8.310	*8.296*
	0	8.237	*8.235*	8.236	**8.238**
	1	**8.380**	8.379	8.374	*8.364*
	2	**8.346**	8.345	8.337	*8.317*
	3	**8.293**	8.291	8.283	*8.256*
	4+	**8.217**	8.214	8.209	*8.184*
head count	all	**2.307**	**2.307**	2.306	*2.302*
# children:	4+	**1.239**	**1.239**	1.238	*1.234*
cons. unit	all	**3.551**	**3.551**	3.549	*3.543*
# children:	4+	**2.313**	2.312	2.311	*2.303*

(ii) minimum

	Situation	status quo	qf = 2 t = 20.32	qf = 3 t = 19.93	qf = 1000 t = 18.82
Utility per household		min	min	min	min
# children:	all	**5.843**	*5.822*	5.823	5.829
	0	**5.843**	*5.822*	5.823	5.829
	1	**6.490**	6.478	6.479	*6.470*
	2	**6.317**	6.309	6.309	*6.293*
	3	**6.064**	*6.057*	*6.057*	6.058
	4+	**6.482**	*6.477*	6.478	6.481
head count	all	**0.729**	0.728	0.728	*0.726*
# children:	4+	**0.729**	0.728	0.728	*0.726*
cons. unit	all	**1.534**	1.533	1.533	*1.528*
# children:	4+	**1.534**	1.533	1.533	*1.528*

Table 5A: Inequality indices

Household type	η	status quo	qf = 2	qf = 3	qf = 1000
Residual tax rate			t = 20.32	t = 19.94	t = 18.84
All households	0.5	**0.03137**	0.03138	0.03143	*0.03166*
	1	**0.06146**	0.06149	0.06159	*0.06202*
	1.5	**0.09025**	0.09029	0.09042	*0.09103*
	2	**0.11777**	0.11782	0.11797	*0.11873*
	5	**0.26208**	0.26222	0.26280	*0.26351*
No children	0.5	**0.00219**	*0.00221*	*0.00221*	*0.00221*
	1	**0.00477**	*0.00450*	*0.00450*	0.00449
	1.5	**0.00683**	*0.00688*	*0.00688*	0.00687
	2	**0.00929**	*0.00935*	*0.00935*	0.00933
	5	**0.02638**	*0.02657*	0.02656	0.02652
One child	0.5	**0.00160**	0.00162	0.00162	*0.00165*
	1	**0.00325**	0.00327	0.00329	*0.00333*
	1.5	**0.00493**	0.00497	0.00499	*0.00507*
	2	**0.00666**	0.00671	0.00674	*0.00684*
	5	**0.01791**	0.01805	0.01815	*0.01843*
Two children	0.5	**0.00158**	0.00159	0.00160	*0.00165*
	1	**0.00319**	0.00320	0.00323	*0.00333*
	1.5	**0.00483**	0.00485	0.00489	*0.00505*
	2	**0.00650**	0.00653	0.00658	*0.00681*
	5	0.01732	**0.01730**	0.01747	*0.01842*
Three children	0.5	**0.00142**	**0.00142**	**0.00142**	*0.00146*
	1	**0.00284**	0.00285	0.00285	*0.00292*
	1.5	**0.00427**	0.00429	0.00429	*0.00440*
	2	**0.00560**	0.00573	0.00574	*0.00588*
	5	**0.01443**	0.01451	0.01453	*0.01501*
Four or more children	0.5	**0.00567**	0.00568	**0.00567**	*0.00569*
	1	**0.01167**	0.01169	**0.01167**	*0.01171*
	1.5	**0.01803**	0.01806	**0.01803**	*0.01808*
	2	**0.02476**	0.02480	**0.02476**	*0.02483*
	5	0.07315	0.07325	**0.07311**	*0.07329*

Table 5B: Inequality indices

Household type	η	status quo	qf = 2	qf = 3	qf = 1000
Residual tax rate			t = 20.32	t = 19.93	t = 18.82
All households	0.5	**0.03121**	0.03122	0.03127	*0.03149*
	1	**0.06129**	0.06132	0.06141	*0.06181*
	1.5	**0.09023**	0.09027	0.09039	*0.09096*
	2	**0.11808**	0.11813	0.11827	*0.11897*
	5	**0.26805**	0.26820	0.26823	*0.26921*
No children	0.5	**0.00163**	*0.00165*	*0.00165*	0.00164
	1	**0.00330**	*0.00333*	0.00332	0.00332
	1.5	**0.00499**	*0.00504*	0.00503	0.00503
	2	**0.00672**	*0.00678*	*0.00678*	0.00677
	5	**0.01773**	*0.01789*	*0.01789*	0.01787
One child	0.5	**0.00139**	**0.00139**	0.00140	*0.00141*
	1	**0.00280**	0.00282	0.00283	*0.00285*
	1.5	**0.00424**	0.00427	0.00428	*0.00432*
	2	**0.00570**	0.00574	0.00576	*0.00581*
	5	**0.01504**	0.01515	0.01521	*0.01534*
Two children	0.5	**0.00121**	**0.00121**	0.00122	*0.00124*
	1	**0.00243**	0.00244	0.00245	*0.00250*
	1.5	**0.00366**	0.00368	0.00369	*0.00377*
	2	**0.00491**	0.00493	0.00495	*0.00505*
	5	**0.01262**	0.01268	0.01274	*0.01301*
Three children	0.5	**0.00140**	0.00141	0.00141	*0.00144*
	1	**0.00282**	0.00284	0.00284	*0.00291*
	1.5	**0.00426**	0.00428	0.00428	*0.00439*
	2	**0.00573**	0.00575	0.00575	*0.00591*
	5	**0.01498**	0.01505	0.01506	*0.01552*
Four or more children	0.5	**0.00630**	*0.00631*	**0.00630**	**0.00630**
	1	0.01301	*0.01303*	0.01301	**0.01300**
	1.5	0.02015	*0.02018*	0.02014	**0.02013**
	2	0.02773	*0.02777*	0.02771	**0.02769**
	5	0.08200	*0.08210*	0.08190	**0.08179**

Table 6A: Changes in yearly hours supplied, reform qf = 1000
(i) numbers of represented households

	0	1 -1000	1001-1500	1501-2000	> 2000	total
-312	0	0	0	0	10495	10495
-260	0	0	0	0	6579	6579
-208	0	0	3432	5687	23879	32998
-156	0	0	6239	10220	54389	70848
-104	0	2259	16561	16562	131565	166947
-52	0	33027	29491	67101	321354	450973
0	1521988	51697	58514	52174	355986	2040359
52	2645	8927	2451	15376	17356	46755
104	0	0	0	3158	5964	9122
156	0	0	846	813	1232	2891
208	0	0	0	0	0	0
312	0	0	0	0	1854	1845
total	1524633	95910	117534	171091	930644	2839812

(ii) numbers of observations in sample

	0	1 -1000	1001-1500	1501-2000	> 2000	total
-312	0	0	0	0	4	4
-260	0	0	0	0	6	6
-208	0	0	2	2	13	17
-156	0	0	5	7	39	51
-104	0	2	14	14	84	114
-52	0	17	23	45	196	281
0	1055	35	38	34	204	1366
52	2	6	2	10	13	33
104	0	0	0	2	4	6
156	0	0	1	1	1	3
312	0	0	0	0	1	1
total	1057	60	85	115	565	1882

Table 6B: Changes in yearly hours supplied, reform qf = 1000
(i) numbers of represented households

	0	1 -1000	1001-1500	1501-2000	> 2000	total
-312	0	0	0	0	10495	10495
-260	0	0	0	0	6579	6579
-208	0	0	3432	5687	23879	32998
-156	0	0	6239	10220	54389	70848
-104	0	2259	16561	16562	131565	166947
-52	0	29054	29491	67101	321354	447000
0	1565167	50283	56762	52174	355986	2080372
52	2645	8927	2451	15376	17356	46755
104	0	0	0	3158	5964	9122
156	0	0	846	813	1232	2891
208	1414	0	0	0	0	1414
312	0	0	0	0	1845	1845
total	1569226	90523	115782	171091	930644	2877266

(ii) numbers of observations in sample

	0	1 -1000	1001-1500	1501-2000	> 2000	total
-312	0	0	0	0	4	4
-260	0	0	0	0	6	6
-208	0	0	2	2	13	17
-156	0	0	5	7	39	51
-104	0	2	14	14	84	114
-52	0	16	23	45	196	280
0	1082	34	37	34	204	1391
52	2	6	2	10	13	33
104	0	0	0	2	4	6
156	0	0	1	1	1	3
208	1	0	0	0	0	1
312	0		0	0	1	1
total	1085	58	84	115	565	1907

There is virtually no difference between Table 6A and 6B. One might have expected that with the fixed costs version there would have been fewer non-seekers supplying a small number of hours. In fact there are more, and this is a consequence of the fact that less households are 'frozen' in Version B.

Table 7 documents the fixed costs and yearly hours that leave the individual indifferent between working and not working given the fixed costs, for the non-seekers and for the participants. The fixed costs of the latter are only one tenth of what they are for the former: the slope of the indifference curve at $h = 0$ is much steeper for the non-seekers than for the participants (i.e. higher shadow wages of the former).

Table 7: yearly fixed costs (in FF) and $h(FC)$

	Obs.	Mean	Min.	Max.	Std. Dev
non-seekers					
fcost	984	3583	16	15146	2345
$h(FC)$	984	387	52	728	205
participants					
fcost	824	369	8	3223	247
$h(FC)$	824	585	104	728	120

References

Atkinson, A.B., F. Bourguignon and P.A. Chiappori (1988): "Fiscalité et transferts: une comparaison franco-britannique", *Annales d'Économie et de Statistique*, 11, 117-140.

Atkinson, A.B., N.H. Stern and J. Gomulka (1980): "On the Switch from Direct to Indirect Taxation", *Journal of Public Economics,* 14, 194-224.

Baccouche, R. and F. Laisney (1990): "Simulation of VAT Reforms for France Using Cross-section Data", in *Microeconometrics: Surveys and Applications*, eds. J.P. Florens, M. Ivaldi, J.J. Laffont and F.Laisney. Oxford: Basil Blackwell.

Baker, P., S. McKay and E. Symons (1990): "The Simulation of Indirect Tax Reforms: The IFS Simulation Program for Indirect Taxation (SPIT)", *Discussion Paper 90/11, Institute for Fiscal Studies, London.*

Blackorby, C., F. Laisney and R. Schmachtenberg (1991): "Reference-Price-Independent Welfare Prescriptions", *Discussion Paper 91-04, Zentrum für Europäische Wirtschaftsforschung, Mannheim.* Forthcoming in *Journal of Public Economics.*

Bloch, L. and F. Maurel (1989): "Harmonisation européenne des taux de TVA: scénarios macroéconomiques", *Économie et Statistique*.

Blundell, R.W., and F. Laisney (1988): "A Labour Supply Model for Married Women in France", *Annales d'Économie et de Statistique*, 11, 41-71.

Blundell, R.W., F. Laisney and M. Lechner (1991): "Alternative Interpretations of Hours Information in an Econometric Model of Labour Supply", *Discussion Paper 91-01, Zentrum für Europäische Wirtschaftsforschung, Mannheim.*

Blundell, R.W., F. Laisney and M. Ruth (1989): "Estimation of a Complete System of Demands for Goods and Labour Supply for France: Linear Engel Curves and Zero Expenditures", *mimeo*.

Blundell, R.W., C. Meghir, E. Symons and I. Walker (1986): "A Labour Supply Model for the Simulation of Tax and Benefit Reforms" in *Unemployment, Search and Labour Supply,* eds. R.W. Blundell and I. Walker, Chapter 13, pp.267-293. Cambridge: Cambridge University Press.

Blundell, R.W., C. Meghir, E. Symons and I. Walker (1987): "Labour Supply Specification and the Empirical Evaluation of Tax Reforms", *Journal of Public Economics*, 36, 23-58.

Bourguignon, F. and T. Magnac (1990): "Labour Supply and Taxation in France", *Journal of Human Ressources*, 25, pp.358-389

Cogan, J.F. (1981): "Fixed Costs and Labour Supply" *Econometrica*, 49, pp.945-964

Conseil des Impôts (1990): "Onzième Rapport au Président de la République: L'Impôt sur le Revenu", *Journal Officiel de la République Française,* 4153.

Dagsvik, J., F. Laisney, S. Strøm and J. Østervold (1988): "Female Labour Supply and the Tax-Benefit System in France", *Annales d'Économie et de Statistique*, 11, 5-40.

King, M.A. (1987): "The Empirical Analysis of Tax Reforms", chapter 12 in *Advances in Econometrics, Fifth World Congress,* T. Bewley (ed.), vol. II, 61-90. Cambridge: Cambridge University Press.

Laisney, F., M. Mühleisen, M. Staat and S. Vögele (1992): "Simulation of Global Reforms of Household Taxation for France", *forthcoming in Hacienda Pública Española.*

Lee, C. Pearson, M. and S. Smith (1988): "Fiscal Harmonisation: An Analysis of the European Commission's Proposals", *Institute for Fiscal Studies Report Series,* 28.

Smith, S. (1988): "Excise Duties and the Internal Market", *Journal of Common Market Studies,* 27(2), 147-60.

Symons, E. and I. Walker (1988): "The Revenue and Welfare Effects of Fiscal Harmonization for the UK", *Discussion Paper 88/8, Institute for Fiscal Studies, London.*

The Economist (1991): "France Survey", November 23rd, 8-10.