Stop the Grief and Back to Work! An Evaluation of the Government's Plan to Activate Widows and Widowers*

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Abstract:

The Belgian "Generations Pact" contained a measure which aims at removing an inactivity trap for people who benefit from a survivor pension. In this paper we use a sample of administrative data from the "Datawarehouse labour market and social protection" and the microsimulation model MIMOSIS to assess the labour supply effects of this reform proposal. In a first step we estimate a standard discrete choice labour supply model for several subgroups. Subsequently we model the proposed reform in the tax and benefit rules and predict the change in desired labour supply of the targeted group. The proposed reform would have a significant positive effect on the labour supply of widows, but the effects are weak amongst low income survivor pensioners.

JEL Classification: C25, D31, H21, H23, H24, H31, J22.

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INTRODUCTION

The "Generations Pact" ("Pacte de solidarité entre les générations" or "Generatiepact"), formally approved by the Belgian federal parliament on December 23rd 2005, contained a reform proposal for survival pensions. More specifically, it drasticaly changes the rules under which a survival pension can be combined with earned labour income. In this paper we assess the potential labour supply effects and the budgetary cost (including potential feedback effects) of the proposed reform from an ex-ante perspective. The methodology consists of estimating households' preferences with respect to labour supply (i.e. leisure and consumption) under the current legislation. The estimated preference parameters are then used to predict the behavioural adjustment to the change in the legislation. By aggregating this behavioural change over the whole sample and weighting with the sampling weights, we can estimate the expected change in labour supply and expected earning back effects of the reform.

The structure of the paper is as follows: in section 1 we describe the current rules for cumulating labour income and survival pensions and the proposed reform. In section 2 we describe the micro simulation model, the underlying dataset and the selection of the subsamples on which we estimate the labour supply model and on which we calculate the effects of the reform. The econometric structure of the labour supply model itself is the subject of Section 3. Finally, sections 4 and 5 present the estimated impact on employment as well as the budgetary cost of the reform.

1. THE CURRENT LEGISLATION AND THE PROPOSED REFORM

According to the 2001 legislation – the reference year of the data and microsimulation model – a survivor is entitled to the full survival pension if his or her gross labour income is below the bottom threshold of € 14552. Between this first threshold and a second one, equal to to 115% of the bottom one, i.e. € 16735, the benefit is gradually tapered away.[1] The taper rate is equal to the amount of labour income above the bottom threshold divided by this threshold. The taper rate thus gradually increases from 0 to 15% with increasing earnings. Finally, if gross labour income is above the threshold of € 16735, the survivor benefit is completely tapered away.

In fact, the above system implies that the survival pension of eligible survivors is means tested on individual gross labour income because the amount of the benefit is reduced as gross earnings increase. This means testing of the benefit with respect to gross earnings implies strong disincentives to supply labour amongst survival pensioners (at least in the formal sector).

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[1] These rates apply for survival pensioners active as wage earner and below the age of 65 without dependent children. For wage earners below the age of 65 with dependent children these thresholds become € 18189.93 and € 20918.42 (see FOD Sociale Zekerheid (2001), p. 261-262). For survival pensioners active as self employed or 65 or older, still other thresholds apply (see FOD Sociale Zekerheid (2001), p. 249 and 261-262). We do not mention these thresholds here, since our application only focuses on survival pensioners active as wage earner below the age of 65.

The proposed reform aims at removing this disincentive and consists of the following main elements: (i) the application of a *single threshold* to the *sum* of labour income and survival pension; (ii) application of a fixed taper rate of 50% on the amount of income above this threshold to taper away the survival pension. The threshold proposed by the reform amounts to € 23231 for individuals without dependent children and € 26521 for individuals with dependent children.[2,3]

Figures 1, 2 and 3 help to understand the effects of the reform on work incentives. They present budget sets before and after the reform by plotting yearly disposable income on the vertical axis against hours worked per week on the horizontal axis. The dotted line represents the budget line in the baseline; the solid black line is the one for the simulated reform. All variables are expressed in price levels of 2001. Evidently, the budget set can only be drawn for a specific situation. Figures 1 to 3 correspond to the situation of a single survivor pensioner without dependent children and a survivor benefit of € 10000 per year and an hourly wage of respectively € 7, € 13 and € 20.[4]

Inspection of the dotted line in Figures 1 to 3 shows a clear drop in disposable income at some point and hence confirms the inactivity trap in the current system. For low wage workers with a survivor benefit of € 10000 per year, this trap was not very significant since the benefit withdrawal only occurs when working more than the 38 hours of a full time (see Figure 1). But, for medium and high wage workers, with a survivor benefit of € 10000 per year, the inactivity trap occurs within the relevant range of 0 to 38 hours worked per week.

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[2] Note that the thresholds mentioned here, are expressed in prices of 2001 since the data and reference year of the microsimulation model refer to 2001. The original thresholds, expressed in prices of 2006, were € 26200 and € 29910.80. For the conversion of 2006 figures to 2001 figures we used the consumer price index computed by Belgostat (which was 90.27 in January 2001 and 101.81 in March 2006, yielding an index of 1.1278).

[3] Note also that we only mention a single threshold for people with children, although the Generationspact mentions a more generous implementation where the basic amount of people without dependent children would be increased with a fixed amount for each dependent child (see Het Generatiepact (2005), item 40). We chose for a more strict implementation than the system specified in the Generationspact since the Cabinet of the Minister of Pensions pointed out this would be the most likely way of implementing the system (see Cabinet of Pensions (2006), p. 1).

[4] The hourly wage of € 7 is just slightly above the minimum hourly wage (€ 6.92 per hour in 2001). The hourly wage of € 13 corresponds to the sample mean, while the € 20 wage rate corresponds to the 9th decile cutpoint. The survival benefit of € 10000 per year is close to the average survival pension for widows in the wage earner regime (see Table 1 below).

Moreover, we made the following additional assumptions to produce Figures 1 to 4:

1. gross labour income per year is computed as the number of hours worked per week times the gross wage times 52 (i.e. no additional holiday earnings are taken into account);

2. the standard social security contribution rates are applied both to labour income and to pension benefits (i.e. 13.07% and 3.55% respectively);

3. personal income taxes are computed by applying a rate scheme on the sum of the net taxable labour income and the net taxable survival pension, net of the personal tax credit and the tax credit on replacement incomes; professional costs are computed by a lump sum scheme;

4. taxes (without additional crisis surcharges) are set to zero if the credits are larger than the taxes to be paid before application of the credits.

In the simulations of the baseline and of the reform on the real data, however, we do take into account holiday earnings, while employee contributions are computed in a more refined way. We take, for example, into consideration the rebates on low wage social security contributions.

The reform takes away this inactivity trap, since the solid black line in Figure 1 to 3 now monotonically increases with the number of hours worked.[5] The reform might thus induce survival pensioners to enter the labour market or to increase the number of hours worked.

Note, however, that we should not exclude the possibility that some individuals also reduce their labour supply. Take the case depicted in Figure 2 for a survival pensioner with a survival pension of € 10000 and a gross wage of € 13. Not only is his net income after the reform higher when he works full time. It is also well above his net income in the current system for a range of hours below this full time position. That means that, if this individual was working full time before the reform, he now can earn at least as much by working less.

Finally, households can also loose from the reform. Figure 4 shows the budget constraint of a survival pensioner with € 15000 of survivor benefits and a gross wage of € 13. In the range between 11 and 23 hours of labour supply, the post reform budget line is below the one of the current system. Clearly the disincentives to work more than 23 hours disappear for this individual in the new system. But at the same time the relative difference in disposable income level between working part time (i.e. less than 23 hours in this figure) and not working at all, is smaller than before the reform.[6]

The pictures in the above figures are certainly sensitive to the specific choices of level of the survival pension and wage rate. Therefore the tentative conclusions about the potential effects of this reform should certainly not be generalized on the basis of these cases. Quite the contrary. The considered cases illustrate that the behavioural effect of the reform on the labour supply is difficult to predict ex-ante. A genuine ex ante assessment should therefore rest on an analysis for a *representative sample* of individuals (instead of on selected cases). This is where the microsimulation methodology enters the scene. We discuss the microsimulation model and the underlying data in the next section. Moreover we need a model that identifies, for the relevant households in this representative sample, the preferences that drive their labour supply decision. This labour supply model is explained in section 3.

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[5] In Figures 1 to 3 the solid horizontal line identifies the level of disposable income that corresponds whith a gross income of € 23231, i.e. the new threshold for people without dependent children. Above that threshold, 50% of the amount above the threshold is tapered away from the survival benefit. This explains why the slope of the budgetline under the new system is less steep than before. Once the survival benefit is completely tapered away, the slope of the budgetline after the reform changes again. From that point on, the difference in gross income and disposable income is only due to the application of social security contributions and personal income taxes. In Figure 2 and 3 this occurs after respectively 45.5 and 29.7 hours of work per week.

[6] Detailed analysis shows that this range of losses widens when the pension benefit is higher. With a survival pension of € 20000 per year for example, a medium wage survival pensioner will be negatively affected by the reform if he or she works between 5 and 23 hours.

2. THE MICROSIMULATION MODEL AND THE DATA

MIMOSIS is a micro simulation model for the Belgian social security and personal income tax system. It runs on a random sample of 305019 individuals that have been randomly drawn from the National Register. Demographic information from the national register was then merged with the administrative information on labour market status and incomes from the "Datawarehouse Labour Market and Social Protection". The sample is weighted in order to add up to the whole Belgian population. The data refer to the tax benefit year 2001. Therefore, also the legislation that is currently modelled as baseline legislation, is the one of 2001. Currently MIMOSIS models (a) social security contributions, (b) unemployment benefits, (c) sickness and disability benefits, (d) family benefits, (f) personal income taxes and (e) existence minima.[7] Other benefits are not simulated, but are provided directly by the competent administration to the "Datawarehouse". Survivor pensions and other pension benefits for example have been provided by the "Cadastre de pensions" / "Pensioenkadaster".

Provided that a deceased spouse has fulfilled minimum employment and contribution requirements, widows and widowers who have not remarried may claim a survival pension. Table 1 describes the relevant population of widowers (upper part of the table) and widows (bottom part), both at the level of the sample as for the whole Belgian population. The table reveals that in 2001 there are, according to our weighted sample, 133532 widowers and 596532 widows in the Belgian population (first line). Of course, only a fraction of this group is available for work. The second line of both panels in the Table 1 gives the number of widow(er)s who are not disabled, retired or pre-retired. This amounts to only 18418 widowers and 84618 widows, which is about 14% of all widows and widowers.

TABLE 1. WIDOWS AND WIDOWERS

	Not weighted (sample)		Weighted (population)		Average
	Number of cases	Percent	Number of cases	Percent	pension in € per year
			Widowers		
All	1903		133532		-
Available for work	358	100.00	18418	100.00	
Available for work but not affected by the reform[1]	123	34.36	7062	38.34	-
Available for work and affected by the reform[1]	235	65.65	11356	61.66	-
Claiming a survivor benefit:					
- in wage earner scheme	20	5.59	817	4.44	8087
- in self employed scheme	1	0.28	34	0.18	6460
- in civil servant scheme	5	1.40	199	1.08	10799
- not classified	-	-	.	-	-
Entitled to a survivor benefit[2]	209	58.38	10306	55.96	

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[7] The version of the model used in this paper is a preliminary one. The main drawback is that we still miss information about self employment income.

TABLE 1. CONTINUED

	Not weighted (sample)		Weighted (population)		Average
	Number of cases	Percent	Number of cases	Percent	pension in € per year
			Widows		
All	8548		596921		-
Available for work	1710	100.00	84618	100.00	
Available for work but not affected by the				10.69	-
reform³	194	11.35	9046	89.31	-
Available for work and affected by the reform¹	1516	88.65	75572		
Claiming a survivor benefit:					
- in wage earner scheme	1006	58.83	49243	58.19	10548
- in self employed scheme	136	7.95	7547	8.92	6416
- in civil servant scheme	184	10.76	8987	10.62	13088
- not classified	34	1.99	1605	1.9	10218
Entitled to a survivor benefit²	156	9.12	8190	9.68	

Note: *Widows and widowers receiving two or more pensions from different schemes are classified on the basis of the greatest pension, and "weighted" figures have been inflated through sample weights in order to reflect the Belgian population.*

¹ Individuals "not affected by the reform" are widows and widowers not entitled to a survivor benefit.

² Individuals "affected by the reform" are widows and widowers claiming or entitled to a survivor benefit.

³ Entitlement to a survivor benefit has been imputed to all widows and widowers with labour income.

Yet, even this subset is too large as far as the real target group of the reform is concerned. Indeed, some widow(er)s are not entitled to a survivor pension, and hence will not be affected by the reform. In the next line of the table we try to quantify the size of this group. But identification of "non entitlement" is not straightforward because it cannot simply be based on the fact that one does not observe a survival pension in the dataset. There are four potential reasons why one might observe a widow or widower without a survival pension: non entitlement, non take-up, an administrative error in the data, and the fact that the survival benefit was completely tapered away due to high enough labour earnings. To discriminate between these different possibilities we made the following assumptions and proceeded as follows.

First, we have the group of widow(er)s who do not receive a survival pension ànd who are not working. In this case the absence of a survival pension can certainly not be due to a too high labour income. If we are also prepared to assume that administrative data are sufficiently checked (they contain real payments) and that widow(er)s can obtain sufficient information to take-up a survival pension if they are entitled to, there is sufficient ground to classify these widow(er)s as being not entitled to a survival pension. The result is seen in the third line of Table 1. 38% of widowers available for the labour market and 10.6% of widows are classified as not entitled and hence will not be affected by the reform. In absolute numbers this leaves us with a target group of 11356 widowers and 75572 widows.

Second, also for this target group we still have the problem that we do not observe the survival pension the widow(er) is entitled to when it has been tapered away. The next lines of the table therefore distinguish the groups that are effectively claiming the

benefit, and the ones who might be entitled but for whom we do not observe the benefit. The claimants are further disaggregated according to the different schemes under which they are entitled to a survival pension.[8] The average pension received is shown in the rightmost column of the table. For those who are entitled, but where we do not observe a benefit, we imputed the average survival benefit differentiated according to sex of the receiver. The table clearly shows that this imputation is of limited importance for widows: 8190 widows out of the target group of 75572 get an imputed benefit. But it is crucial for men since we impute the average benefit for 10306 widowers out of the target group of 11356.

The reason for this imputation procedure is to be found in our attempt not to underestimate potential negative labour supply responses to the reform. If any, these negative labour supply reactions would be concentrated amongst survival pensioners currently working and not claiming a benefit. Indeed, the reform could induce these pensioners to reduce their labour supply because with the new system this reduction would come at a smaller cost in terms of disposable income than before the reform. In order not to underestimate this effect we preferred being on the safe side by imputing the entitlement to the benefit to widows and widowers who are currently in work and do not claim their benefit due to their high labour income.

With respect to the possible cost of the reform, this imputation is rather conservative. On the one side the cost of the reform before behavioural reactions (the so-called "impact effect") is likely to be overestimated. On the other side, the expected effect on labour supply, and thus the potential earning back effect of the reform is likely to be underestimated. This might be due to an overestimation of the share of working widow(er)s whom we classify as being entitled because they are working. Indeed, it seems not unreasonable to assume that at least some women are working, precisely because they are not entitled to a survivor benefit. Our assumption does not take into account this endogenous selection mechanism which separates widows and widowers into the group of workers and the group of non workers. Therefore in reality we might expect a higher share of widows and widowers who either are not entitled to a survivor benefit, or entitled to very low survivor benefits amongst the group of workers.

As will become clear below, for the purpose of estimating a labour supply model, we will further need to restrict the population that can be modelled. Given the already limited size of the target population in the sample, this would lead to statistical and econometric problems. We therefore decided to estimate the labour supply model on the whole population (including of course widows and widowers entitled to a survivor benefit).

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[8] The rights to a survival pension can be obtained in three different employment regimes: a) as wage earner in the private and/or public sector, b) as self employed and c) as civil servant. For most observed survival pensions, the regime in which the right was generated can be identified with the available data. It is possible to cumulate one's own retirement pension with a survivor benefit. In this case, however, the person is classified as retired.

This boils down to the assumption that preferences of males and females do not depend on their civil status (i.e. on whether married, single, separated or divorced).[9]

The "de facto" composition of the household, however, is assumed to affect the behaviour of the individual that compose it. In most cases widows and widowers live alone and their labour supply can be modelled as the choice of a single individual. In some cases, nevertheless, widows and widowers live in a "de facto" couple with a new partner. In these cases the labour supply of both partners must be modelled as a joint decision.[10] The labour supply models were therefore estimated for three groups separately: single males, single females and couples.[11]

We modelled individuals in working age (18-65) and available for the labour market, i.e. not (pre)retired, nor sick or disabled. Youngsters under the age of 25 who are not employees, self employed or registered as unemployed were assumed to be in full time education and not available for the labour market. Adults over 25, still living with their parents and with an undefined professional status were assumed to be inactive and thus potentially available for the labour market. In modelling labour supply we excluded the self employed, since we have no information on the hours worked. Employees, unemployed and inactives are assumed to be able to modify their labour supply. Couples where one member is assumed to have a flexible labour supply, and the other is either self-employed, sick or retired are not modelled.

There is a residual group of households which is not modelled. The latter includes different types of families and forms of cohabitation: homosexual couples or cohabiting flatmates, brothers and sisters or other relatives sharing a same housing arrangement, and mainly couples with grown up children also available for the labour market. From the labour supply perspective, this group tends to be rather heterogeneous, and the degree of "unity" of the household (i.e. the extent to which the income of one member influences the decisions of the other members) is unknown and/or difficult to deduce. In other words, it is not possible to determine whether labour supply should be modelled as an individual or joint decision. We therefore follow the bulk of the literature on ex-ante evaluations and decide not to model these households.

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[9] A priori we were not able to identify any reason why the preference structure of widows and widowers should be different from those of other individuals, once we control for other observable differences. The assumption is nevertheless difficult to test econometrically. See section 3 for a further discussion.

[10] The unitary setting adopted in this paper does not inspire unanimity amongst economists. Increasingly being questioned by economic theory, it is argued that unitary models are not compatible with methodological individualism that is at the heart of microeconomic theory. Beninger and Laisney (2004) have recently extended the above labour supply model to joint labour supply decisions and intrahousehold welfare allocation. For an application with Belgian data, see Vermeulen (2006).

[11] The term "single" should not be misunderstood: this typology includes also single mothers and single fathers, as well as individuals living with their old parents, who have retired from the labour market. The principal characteristics of single households is that they are composed of only one individual available for the labour market and who does not have a partner.

Table 2 shows the result of these assumptions for the population targeted by the reform. Our modelling strategy allows us to model the labour supply of 68.11% of widowers entitled to a benefit, plus 4.98% of widowers actually claiming it, and of 8.47% of widows entitled to a benefit, plus 55.71% of widows actually claiming it.[12] Hence, we model labour supply for over 73% of widowers and 65% of widows of working age.

TABLE 2. POPULATION TARGETED BY THE REFORM AND MODELLED IN THE LABOUR SUPPLY MODEL

	Males		Females	
	Number of cases	Percent	Number of cases	Percent
Target population	11027	100.00	72208	100.00
Claiming a survivor benefit	721	6.54	64018	88.66
Modelled	549	4.98	40228	55.71
Couples	51	0.46	3790	5.25
Single males	498	4.52	-	-
Single females	-	-	36438	50.46
Not modelled	172	1.56	23790	32.95
Entitled to a survivor benefit	10306	93.46	8190	11.34
Modelled	7510	68.11	6114	8.47
Couples	1294	11.73	666	0.92
Single males	6216	56.37	-	-
Single females	-	-	5448	7.54
Not modelled	2796	25.36	2076	2.88

Table 3 reports some descriptive statistics like household size, age and region for this subsample of modelled widows and widowers. The table also shows the share of households in which a survivor benefit is claimed or not, and disaggregates the hours supplied for the two subgroups. Indeed, the difference in labour supply of benefit claimants and non claimants is striking, both for males and females.

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[12] The relatively high number of widows not modelled (23790 claiming a benefit and 2076 not claiming but entitled out of the total target population of 72208 females) are living in households of the residual typology. This group consists mainly of widows living with grown up children and therefore their labour supply is not modelled.

TABLE 3. DESCRIPTIVE STATISTICS

	Singles		Couples	
	Males	Females	Males	Females
Demographics				
Household size	1.61	1.5	2.59	
Age of male (head)	49.83	-	48.47	
Age of female (head/spouse)	-	53.37	44.77	
Living in Wallonia (%)	27.51	40.27	32.79	
Living in Flanders (%)	66.09	52.07	63.9	
Professional Status				
Employee (%)	58.49	22.97	58.89	31.98
Civil servant (%)	33.54	8.19	20.77	7.65
Unemployed (%)	1.36	1.17	10.22	0.96
Inactive (%)	6.61	67.67	10.13	59.42
Survivor benefit				
Claiming a survivor benefit	7.42	87.12	0.9	67.1
Entitled to a survivor benefit	92.58	12.88	99.10	32.9
% of individuals in a given bracket of labour supply (hours worked per week)				
Claiming a survivor benefit				
From 0 to 5 hours	89.16	80.68	0.00	88.31
From 5 to 15 hours	0.00	2.95	100.00	0.00
From 15 to 25 hours	0.00	14.10	0.00	11.16
From 25 to 35 hours	6.83	1.44	0.00	0.53
From 35 to 45 hours	4.02	0.82	0.00	0.00
More than 45 hours	0.00	0.00	0.00	0.00
Entitled to a survivor benefit				
From 0 to 5 hours	0.82	1.09	18.71	8.4
From 5 to 15 hours	3.02	21.31	3.79	5.49
From 15 to 25 hours	9.36	13.97	3.34	12.76
From 25 to 35 hours	19.37	58.87	20.19	22.12
From 35 to 45 hours	64.11	4.76	53.98	49.89
More than 45 hours	3.31	0.00	0.00	1.35

For single males and single females the labour supply of those not entitled to benefits is zero by construction, since entitlement was imputed in all cases where labour supply income was observed. In the case of couples the labour supply figures include the labour supply of the partners of widows and widowers.

3. LABOUR SUPPLY MODEL

Discrete choice models of labour supply are based on the assumption that individuals in a household i can choose among $J+1$ working hours (non-participation denoted by $J=0$ and J positive hours denoted by $J=1...J$). For each discrete choice j, the net income of household i, denoted C_{ij} (equivalent to aggregate household consumption in a static framework) is computed by tax-benefit micro simulation techniques so that leisure-consumption preferences can be estimated. The approach has become standard practice (see Orsini, 2006) as it provides a straightforward way to account for the nonlinear and nonconvex budget sets of complex tax and benefit systems when modelling individual and joint labour supplies of couples. In the latter case, the number of choices of working hours is given by all possible combinations of each partner's labour supply. Let us consider the case of a couple. The utility V_{ij} derived by household i from making choice j is assumed to depend on a function U of females' and males' leisure Lf_{ij}, Lm_{ij}, disposable income C_{ij} and household characteristics Z_i, and on a random term ε_{ij} :

$$V_{ij} = U(Lf_{ij}, Lm_{ij}, C_{ij}, Z_i) + \varepsilon_{ij} \tag{1}$$

If the error term ε_{ij} is assumed to be identically and independently distributed across alternatives and households according to an extreme value type I (EV-I) distribution, the probability that alternative k is chosen by household i is given by (McFadden, 1974):

$$P_{ik} = \Pr(V_{ik} \geq V_{ij}, \forall j = 0, ..., J) = \frac{\exp U(Lf_{ik}, Lm_{ik}, C_{ik}, Z_i)}{\sum_{j=0}^{J} \exp U(Lf_{ij}, Lm_{ij}, C_{ij}, Z_i)} \tag{2}$$

The likelihood for a sample of observed choices can be derived from expression (2) and maximized to estimate the parameters of the function U.

Since actual working hours are used to define the individual leisure terms, the approach is that of an unconstrained labour supply model in which optimizing individuals freely choose their working hours and face no demand-side constraints.[13] After the reform the individuals eventually modify their labour supply choice without incurring in adjustment costs. These hypotheses are not innocuous and many would argue that they are not very realistic, especially in the framework of the Belgian labour market.

In the following, we assume a quadratic specification of the utility function as in Blundell, Duncan, McCrae and Meghir (2000). Hence, the utility function of a couple has the following form:

$$U_{ij} = \alpha_c C_{ij} + \alpha_{cc} C_{ij}^2 + \alpha_{lf} Lf_{ij} + \alpha_{lm} Lm_{ij} + \alpha_{llf} Lf_{ij}^2 + \alpha_{llm} Lm_{ij}^2$$
$$+ \alpha_{clf} C_{ij} Lf_{ij} + \alpha_{clm} C_{ij} Lm_{ij} + \alpha_{lmf} Lf_{ij} Lm_{ij} - \beta_{mj} - \beta_{fj}. \tag{3}$$

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[13] Bargain et al. (2005) discuss the limitations of not accounting for labour demand constraints. In particular, they show that considering actual hours of labour supply as desired hours of labour supply induces un upward bias in the estimates of labour supply elasticities. The paper, however, also shows that the size of the bias is negligible for population sub-groups which are characterised by relatively high levels of inactivity, as is indeed the case of survivor pensioners.

We assume that preferences vary across households through taste-shifters on income and gender specific leisure coefficients:

$$\alpha_c = \alpha_{c0} + \alpha_{c1}X_1$$
$$\alpha_{lf} = \alpha_{lf0} + \alpha_{lf1}X_2 \tag{4}$$
$$\alpha_{lm} = \alpha_{lm0} + \alpha_{lm1}X_3$$

where X_1, X_2, and X_3 are vectors including age, number of children and elderly in different age classes, region and size of city of residence.

The utility function and the choice probability for a single individual are derived in the same way as above. The only difference is that the structural utility term contains only two variables: consumption and individual leisure:

$$U_{ij} = \alpha_c C_{ij} + \alpha_{cc} C_{ij} + \alpha_l L_{ij} + \alpha_{ll} L_{ij}^2 + \alpha_{cl} C_{ij} L_{ij} - \beta_j \tag{5}$$

with the same taste-shifters on income and leisure coefficients.

We assumed that each individual available to the labour market may supply 0, 10, 20, 30, 40 or 50 hours of labour.[14] The set choice therefore includes 6 alternatives for singles and 36 alternatives for couples.[15]

The household disposable incomes corresponding to the different working time alternatives have been computed with MIMOSIS assuming a fixed hourly wage. For the individuals active in the labour market we determined the gross wage by dividing gross labour income by the number of contractual hours, two variables which are both registered by the Datawarehouse. For the unemployed and inactives, we first tried to reconstruct their gross hourly wage by retrieving the last recorded hourly wage for those who had been active on the labour market before as wage earner. If both current and past labour market information was lacking, we assumed the individual could at least obtain the minimum hourly wage (€ 6.92 in 2001). We had to make this assumption for 22% of the sample on which the labour supply model was estimated. However, and not surprisingly, for the sample of widows and widowers in working age and receiving a survival pension (and not self employed), the imputation was necessary for 62% of the individuals.[16]

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[14] The introduction of possible labour supply above the legal maximum of 38 hours a week for a single full time job reflects the possibility of a combination of multiple part time jobs. That people in practice do combine multiple jobs in the Belgian labour market is illustrated in Vermandere and Stevens (2002).

[15] For sensitivity analysis we also estimated a model with intervals of 5 hours and a simple model with non participation, part-time work and full-time work. Results were very stable across the different specification. The predicting power of the model based on 5 hours intervals, however, was slightly weaker, while the discretization with inactivity, part-time and full-time did not always capture the irregularities in the budget constraint.

[16] We are aware that the standard procedure to impute missing wages, is to estimate a wage equation (either a linear regression or a Heckman two stage wage equation). However, since one of the crucial explanatory variables of the wage equation, level of education, is missing we could not fall back on this technique.

We follow Van Soest (1995) and also introduce dummy variables (β_j) in the labour supply model. These are supposed to capture non monetary characteristics of the jobs: flexibility, working environment, working conditions and relative availability (i.e. the associated search costs). In particular we included one dummy for regular part-time (20 hours per week), one dummy for full-time position (40 hours per week) and one dummy for the irregular working time (i.e. 10, 30 or 50 hours per week).

Detailed estimation results of the coefficients are omitted for reason of space, but are available in Decoster, Orsini and Van Camp (2007). Once the coefficients were estimated, we calibrated the model to reproduce the observed baseline, i.e. the observed labour supply before the introduction of the reform. This was done by drawing a series of random terms (12 for singles and 144 for couples) from the relevant error distribution (extreme value type I). We retained those error terms that, added to the structural utility term, yielded a maximum random utility term corresponding to the observed baseline choice. The calibration was repeated until we obtained 100 series of valid draws. For a detailed explanation of the calibration method, and its theoretical consistency the reader is referred to Creedy and Kalb (2005).

We then used MIMOSIS to recompute the set of disposable incomes post reform and to recompute the structural utility terms corresponding to the post reform budget constraint. By adding the previously drawn random terms to the new structural utilities, and averaging up over the 100 draws we were able to compute, for each household, the post reform probability of supplying labour at the predefined levels.

4. EMPLOYMENT EFFECTS OF THE REFORM

Table 4 shows the employment effects of the proposed reform. We distinguish between the participation effect (counting who is working) and the number of hours worked. The latter is expressed in FTE (Full Time Equivalent positions). We show the result for each of the four categories separately. The two rightmost columns of the table contain the results for the whole population.

As is clear from the bottom line in the two columns at the right, the reform can be expected to increase the labour supply by 837 FTE positions. The increase in participation plays an important role in explaining this increase, as 603 survival pensioners are predicted to enter the labour market. This result is hardly surprising. For many widows and widowers income when working and thus utility is higher after than before the reform. In particular, for several survivor pensioners the utility when working (some positive hours) is now higher than the utility of not working. This induces a movement into employment amongst survivor pensioners who formerly preferred not to work. This shows that in the pre reform scenario, survival pensioners entitled to a benefit preferred not to enter the labour market, rather than working short hours. The reform in fact does not change the shape of the budget constraints when working short part time. The switch from inactivity, directly to full time is probably

associated with the fixed costs of labour supply or to the different non monetary characteristics of part time and full time positions, which make part time and marginal part time relatively less attractive than full time positions.

TABLE 4. PREDICTED CHANGE IN HOURS WORKED AND EMPLOYMENT RATE (IN %) AFTER THE REFORM

| | Singles | | | | Couples | | | | All households | |
| | Males | | Females | | Males | | Females | | | |
	Hours	Partici-pation	Hours	Partici-pation	Hours	Partici-pation	Hours	Partici-pation	Hours	Partici-pation
Before the reform										
Total	5882	6287	8729	12603	4487	4847	1920	2446	21019	26182
Average	22.4	63.0	7.8	29.8	26.2	74.6	11.2	37.6	16.15	46.8
After the reform										
Total	5857	6293	9512	13132	4504	4857	1984	2503	21856	26785
Average	22.3	63.1	8.5	31.0	26.3	74.7	11.6	38.5	16.17	47.2
Net effect										
Total	-26	7	782	529	17	10	64	57	837	603
Average	-0.1	0.1	0.7	1.2	0.1	0.1	0.4	0.9	0.02	0.4

Total hours supplied are expressed in Full Time Equivalent (FTE), i.e. total number of hours divided by 38, the standard number of hours worked in a week in a full time position.
Total participation is expressed in units, i.e. number of individuals in employment.
Average hours represents the average weekly duration of work in the sub sample. Average participation represents the share of the sub sample in employment.

Inspection of the effects for the four different subgroups shows that the additional employment is almost entirely coming from widows living in single households (782 FTE positions) and to a lesser extent from widows with a survival pension living with a partner (64 FTE positions). The reform can thus broadly be described as a reform targeting the female population in general and the female population living in single households in particular. The increase in labour supply of males in couples corresponds to just about 17 units, a figure that could be expected not to be significantly different from zero, while single males - the group that had the highest pre reform employment rate (amongst benefit claimants) - decrease their labour supply by about 26 FTE positions. At the same time however, participation increases.

Clearly the reform induces two movements: a movement towards an increase in labour supply (or even participation for the formerly inactive) and a movement towards a decrease in labour supply amongst the full time working population. The reduction of labour supply amongst the population at work can easily be explained. The benefit withdrawn when working is much smaller after the reform. Compared to the prereform situation, this makes the difference between disposable income when working 35 or 30 hours and when working 40 hours much smaller after the reform. Therefore, survivor pensioners working full time may be more willing to gain some extra leisure since after the reform it comes at the cost of a smaller decrease in disposable income compared to the prereform situation.

In the next five tables (Tables 5 to 9) we further disaggregate the net effects in increases and decreases of labour supply. In each of these tables we have, for reference purposes, included a column which is labeled "target group". This column displays the values (for the variable under consideration in each respective table) for all households with one widow or widower entitled to a survivor pensioner (although not always currently claiming it), whose labour supply has been modelled and who belong to the group under consideration (e.g. an age group in Table 5).

Table 5 shows the relative contribution to the net labour supply effects for different age groups. The size of the male labour supply effect is far too small to single out any particular trend. In the following discussion we will therefore only focus on the female labour supply. The movement into the labour market is concentrated amongst the females aged between 45 to 55 (an increase of 577 FTE's), and to a lesser extent amongst women aged 55 to 65 (an increase of 262 FTE's). The strongest movement out of the labour market also comes mainly from the widows aged 45 to 55 (minus 72.6 FTE's). Yet, the net effect for this age group remains positive and accounts for more than half of the total increase in labour supply.

TABLE 5. CHANGE IN HOURS SUPPLIED (EXPRESSED IN FTE'S) BY AGE BRACKET

| Age bracket | Males | | | | Females | | | |
	Target group[1]	Increase	Decrease	Net	Target group[1]	Increase	Decrease	Net
Age≤35	862	0.8	6.3	-5.5	2423.0	21.0	17.2	3.8
35<age≤45	2948	26.3	14.1	12.1	7467.0	207.6	33.4	174.2
45<age≤55	5252	40.5	50.2	-9.7	17388.0	577.4	72.6	504.8
55<age≤64	3300	26.6	27.2	-0.7	20256.0	262.2	62.7	199.5

(1) This column shows labour supply in the baseline, expressed in FTE's. The other columns show changes w.r.t. the baseline.

Table 6 disentangles the labour supply effect according to hourly wage. As is clear from the female part of the table, the biggest positive contribution obviously comes from the medium-low-skilled i.e. from the widows with imputed or current minimum wage up to € 12 /hour. In particular more than half the total net increase in labour supply (485 FTE) comes from widows with wages between the minimum wage and € 10/hour. Much of the reduction in labour supply, on the other hand, comes from widows with an hourly wage in the range from €16 to €18 or higher. As was already clear from Figure 4, this group may be negatively affected by the reform if the level of the pension is sufficiently high. With other words, in case of full time participation, the reform does provide an incentive to reduce labour supply for highly skilled widows. As expected, for very high wage levels the incentive to withdraw from the labour market is smaller than for medium-high wages.

TABLE 6. CHANGE IN HOURS SUPPLIED (EXPRESSED IN FTE'S) BY HOURLY WAGE BRACKET

Wage bracket[1]	Males				Females			
	Target group[2]	Increase	Decrease	Net	Target group[2]	Increase	Decrease	Net
w_{min}	1064	13.3	0.0	13.3	23226.0	39.7	0.5	39.2
$w_{min}<w<10$	1784	26.5	6.1	20.4	10118.0	508.6	22.8	485.8
$10<w\leq12$	1848	20.5	5.0	15.5	4953.0	331.2	4.7	326.5
$12<w\leq14$	2621	29.4	16.0	13.4	2779.0	93.0	51.6	41.4
$14<w\leq16$	1141	0.5	26.5	-26.1	2072.0	47.4	21.0	26.5
$16<w\leq18$	857	1.5	14.3	-12.8	1939.0	22.4	40.6	-18.2
$18<w$	3047	2.5	29.9	-27.4	2447.0	25.8	44.7	-18.8

(1) w_{min} is the legal minimum wage in 2001, i.e. € 6.92/hour.
(2) This column shows labour supply in the baseline, expressed in FTE's. The other columns show changes w.r.t. the baseline.

It is also interesting to see how the system of incentives provided by the reform varies with the level of the survivor benefit. This is shown in Table 7. The largest increase in labour supply comes from widows with survivor benefits ranging from € 6000 to € 14000 per year. Almost 228 FTE positions, however, come from the group of widows with a survivor pension in the range of € 10000 to € 12000. Negative responses, i.e. reductions in labour supply, are mainly coming from widows with survivor pensions exceeding € 14000 per year.

TABLE 7. CHANGE IN HOURS SUPPLIED (EXPRESSED IN FTE'S) BY LEVEL OF THE SURVIVOR PENSION BENEFIT

level of the survivor pension (sp) in € per year	Males				Females			
	Target group[1]	Increase	Decrease	Net	Target group[1]	Increase	Decrease	Net
$0<sp\leq4000$	222	2.5	0.0	2.5	2704	34.8	0.0	34.8
$4000<sp\leq6000$	178	0.3	0.0	0.3	2293	74.9	0.3	74.6
$6000<sp\leq8000$	7707	52.5	84.4	-32.0	7005	185.8	12.9	172.9
$8000<sp\leq10000$	1434	0.6	4.5	-3.9	6325	156.9	1.3	155.6
$10000<sp\leq12000$	1750	33.0	6.0	27.0	16545	352.2	123.7	228.5
$12000<sp\leq14000$	646	2.0	2.3	-0.3	6714	173.9	6.7	167.2
$14000<sp$	425	3.3	0.6	2.6	5948	89.7	40.9	48.7

(1) This column shows labour supply in the baseline, expressed in FTE's. The other columns show changes w.r.t. the baseline.

Table 8 disaggregates inflows and outflows by quintile of equivalised disposable income of the household. The equivalence scale was the square root of household size. As far as labour supply is concerned, the first quintile is nearly unaffected. The largest increase in labour supply comes from the 4th quintile (+442.6 FTE) and to a lower extent from the 3rd quintile (+249.1). The majority of the outflow, on the other hand, is found in the 5th quintile (-124.8 FTE).

TABLE 8. CHANGE IN HOURS SUPPLIED (EXPRESSED IN FTE'S) BY INCOME QUINTILE

Quintile of equivalised disposable income [1]	Target group[2]	Males			Females		
		Increase	Decrease	Net	Increase	Decrease	Net
1	2145	0.0	0.0	0.0	44.1	0.0	44.1
2	6614	16.1	0.0	16.1	114.8	0.0	114.8
3	14869	41.7	5.4	36.4	257.9	8.7	249.1
4	19055	11.3	29.9	-18.6	494.9	52.4	442.6
5	11565	25.0	62.6	-37.6	156.5	124.8	31.7

(1) Households with self employed have been excluded. Equivalence scale is the square root of household size.

(2) This column shows labour supply in the baseline, expressed in FTE's. The other columns show changes w.r.t. the baseline.

Summarizing tables 5 to 8, we may broadly identify the characteristics of the survivor pensioner who is most likely to respond positively to the reform: a widow, not living with a partner, aged between 45 and 55, with a medium to low hourly wage, but a rather high survivor benefit which places her in the higher end of the income distribution. The strongest negative effects, on the other hand, are likely to come from elderly medium to highly skilled women (wage ranging from € 16 to € 18 per hour and above), with high survivor benefit (over € 14000 per year) and household disposable income in the top of the distribution.

Finally, Table 9 shows how disposable income is modified by the reform both without and with behavioural adjustments. The table shows the number of households who experience either an increase or a decrease in disposable income. The upper two panels give the number of gainers and losers in a static framework, i.e. for unchanged labour supply. The bottom two panels show the same picture when taking into account the behavioural reaction. We disentangle the numbers by quintile of equivalised disposable income and by size of the percentage change in disposable income subdivided in 6 brackets: (0,5], (5,10], (10,15], (15,20], (20,25] and (25,∞]. The numbers in each cell can be compared with the number in the column "target group" which gives the number of households affected by the reform in this particular group. Note that the definition of this target group is different between the static case (upper part) and the part where the labour supply reaction is taken up (bottom part). In the static case, the target groups consists of all households who experience a change in disposable income at their labour supply in the baseline. When we include the change in labour supply, the reference group consists of all households who

are affected by the reform in some segment of their budget constraint, irrespective of their labour supply in the baseline. In other words it is the sum of households for which the system of incentives is modified by the reform.

Without behavioural reaction, the losers from the reform are clearly concentrated in the upper quintile, and the size of the loss is always less than 15%. The significant benefits (more than 15% increase in disposable income) are spread between the second and the fourth quintile, with the highest concentration being in the third quintile. The very lowest quintile is not affected by the reform.

TABLE 9. NUMBER OF GAINERS AND LOSERS BY QUINTILE OF DISPOSABLE INCOME AND BY SIZE OF GAIN OR LOSS

Quintile of equivalised disposable income [1]	Target group [2]	Size of gain or loss in % of disposable income					
		(0,5]	(5,10]	(10,15]	(15,20]	(20,25]	(25,∞]
Gainers (before behavioural reaction)							
1	0	0	0	0	0	0	0
2	296	0	50	25	119	51	34
3	3345	772	543	354	485	239	412
4	6121	1222	1304	1066	309	309	0
5	5508	2225	945	307	0	51	51
Losers (before behavioural reaction)							
1	0	0	0	0	0	0	0
2	296	17	0	0	0	0	0
3	3345	455	85	0	0	0	0
4	6121	1665	170	76	0	0	0
5	5508	1329	394	206	0	0	0
Gainers (after behavioural reaction)							
1	2145	608	206	0	0	0	103
2	6614	1287	596	265	51	85	34
3	14869	4592	1991	740	298	393	309
4	19055	5466	3540	569	600	309	103
5	11565	6480	1277	308	153	0	0
Losers (after behavioural reaction)							
1	2145	0	0	0	0	0	0
2	6614	161	34	51	34	0	25
3	14869	1628	290	51	0	0	0
4	19055	2657	170	308	103	0	0
5	11565	1197	452	0	103	206	0

(1) Households with self employed have been excluded. Equivalence scale is the square root of household size.

(2) The number of affected households (the "target group") is different between the panels without and with behavioural reaction. In the static case (without reaction on labour supply) the group consists of all households experiencing a change in disposable income for given labour supply. When taking into account the behavioural response, the traget group consists of all households whose budget constraint is modified, irrespective of their labour supply in the baseline.

When including changes in disposable income coming from the reform and from behavioural change, the structure of the financial gains has a less clear pattern. Mostly, however, the reform affects widows and widowers in the third, fourth and fifth quintile positively. Interestingly, the first quintile now also shows significant increases in disposable income. The strongest reductions in disposable income are concentrated in the two top quintiles.

Note that we confined our analysis with the behavioural model to a description of labour supply changes and of changes in disposable income. This should not be confused with a *welfare* evaluation of the reform. A priori a decrease in disposable income may be associated with both decreases and increases in the level of welfare, and vice versa. The distribution of financial gains and losses should therefore be interpreted with caution, as a reduction in disposable income does not mean a reduction in welfare, and vice versa.

5. BUDGETARY COSTS

We finally turn to the budgetary costs of the reform. In Table 10 we show some budgetary aggregates (employees' and employers' social security contributions, gross social benefits and personal income tax) in the baseline and the changes triggered by the reform. We show both the changes without and with behavioural reactions taken into account.

TABLE 10. BUDGETARY AGGREGATES AND GROSS LABOUR INCOME WITHOUT
AND WITH LABOUR SUPPLY EFFECTS BEFORE AND AFTER THE REFORM
(IN MILLION € PER YEAR)

	Baseline	Change in reform situation w.r.t. baseline	
		no behavioural change	with behavioural change
Single Males			
Gross labour income	216.1	0.0	-1.6
Employees' SSC	28.3	0.3	0.1
Employers' SSC	49.7	0.0	-0.1
Social benefits	52.7	10.1	10.6
Personal Income Tax	61.7	3.7	3.3
Single Females			
Gross labour income	252.2	0.0	16.4
Employees' SSC	76.5	0.3	2.2
Employers' SSC	58.1	0.0	5.9
Social benefits	818.2	10.2	6.6
Personal Income Tax	195.9	0.0	0.0
Couples			
Gross labour income	189.3	0.0	1.5
Employees' SSC	27.8	0.1	0.3
Employers' SSC	50.5	0.0	0.6
Social benefits	96.3	3.7	3.4
Personal Income Tax	56.7	1.5	1.9

TABLE 10. CONTINUED

	Baseline	Change in reform situation w.r.t. baseline	
		no behavioural change	with behavioural change
Others			
Gross labour income	774.6	0.0	0.0
Employees' SSC	132.0	0.2	0.2
Employers' SSC	216.5	0.0	0.0
Social benefits	625.9	7.4	7.4
Personal Income Tax	252.8	2.8	2.8
Total			
Gross labour income	1432.2	0.0	16.4
Employees' SSC	264.6	0.9	2.7
Employers' SSC	374.9	0.0	6.4
Social benefits	1593.1	31.4	28.0
Personal Income Tax	567.0	8.0	8.0
Cost of the reform		**22.6**	**10.8**

The bottom of the table displays the effect for all four modelled groups. The cost of the reform is in the order of € 22.5 million, if we do not take into account behavioural reactions. This cost is mainly driven by a net increase in spending on social benefits. Although some households actually lose from the reform, a larger number of households benefit from the redefinition of the thresholds and are now entitled to larger survivor pension. However, income taxation and to a lesser extent social security contributions levied on gross survivor benefits partially reduce the cost of the reform.

However, if we allow pensioners to flexibly adjust their labour supply to respond to the new system of incentives, the budgetary cost is almost halved. The increase in hours worked generates an increase in gross labour income of € 16.4 million, i.e. almost € 1600 per month per FTE. Note that this figure corresponds to an hourly wage of about € 9.98 (i.e. the hourly wage of a medium/low skilled worker). The decomposition by subgroups confirms that this is mainly due to the increase in labour supply of single widows. The reduction in labour supply of single widowers shows up as a decrease in gross labour income for this group.

Compared to the situation without labour supply reaction, the increase in employment generates an increase in SSCs both of employees and employers (1.8 and 6.4 million € respectively) and a negligible increase in personal income tax. Moreover, expenditures on gross social benefits will go down once we allow for behavioural reactions: given the less stringent rules for cumulating labour and pension income, in fact, survival pensioners are now ready to lose part of the full entitlement and combine it with income from work. The net effect is a budgetary cost of € 10.8 million.

Let us recall that these figures are punctual estimates, and we do not provide a confidence interval. These could be generated by bootstrapping from the estimated distribution of the parameters. However, given the size of the movements out of the labour market, it could be reasonably expected that both the employment effect and the budgetary effect are significantly positive. The pool of individuals which could contribute negatively (i.e. reduce their labour supply) is in fact very small and already overestimated by our "conservative" imputation procedure. Assuming somewhat lower reactions amongst non claiming employed widows and widowers and a more or less equal response amongst the survivor pensioners currently not modelled, it is likely that the cost of the reform would be further reduced.

CONCLUSION

The proposed reform eliminates a disincentive to work faced by widows and widowers entitled to a survival pension. Under the current system, a worker has no incentive to supply an amount of hours that would bring his/her labour income over the upper threshold, since this would result in an income loss.

The proposed reform eliminates the income loss, by lowering the withdrawal rate and conditioning the means test on the sum of gross labour income and survivor benefit. Moreover, the upper threshold disappears, thus avoiding a sudden drop of the survivor benefit.

The new budget constraints present a moderate slope in the previous "trap-range". Ex ante it is difficult to predict the effects of the reform: it depends on the relative weight of substitution and income effect, as well as on the distribution of the target population over the budget constraint. Survival pensioners supplying labour at full time or over time may indeed decide to reduce their labour supply, without having to suffer an all too large income drop. On the other hand, inactive survival pensioners and survival pensioners who were supplying work at part-time or marginal part-time levels in order not to lose the benefit entitlement, could now decide to increase their labour supply without suffering major income losses.

According to our estimates, the targeted population responds well to the change of incentives. Total hours worked could increase by over 800 units in FTE. This figure is not that impressive in absolute terms, but it should be brought to mind that the targeted population is indeed quite small. Moreover, the budgetary cost of this activation policy is modest (and yet overestimated). Clearly, the reform of survivor benefit can be broadly described as a "making work pay" policy, in as far as it aims to make work financially more attractive. The cost of these activation policies tends to be very high. Orsini (2006) reviews different activation policies in EU countries. The cost per job created is often in the range of € 100000 to € 200000 per year. In the case of the survivor pension, the cost is just about € 13000 per year. The reform has a positive effect given that the pool of workers which is likely to respond negatively is small: only about 20% of the sample of widows

is working more than part-time. In the case of widowers the percentage is much higher, about 66%, but very few will reduce labour supply following the reform. The proposed reform is therefore a good example of how labour supply may be increased with a minor budgetary cost by simply removing disincentives to work built in the tax benefit system.

Recently, the minister decided to postpone the implementation of the reform. On the one hand, the policy was originally meant to primarily activate survivor pensioners with a low survivor benefit and low disposable income. However, the biggest net effect in terms of labour supply, is clearly not coming from this group. On the other hand, the reform also implies a loss in disposable income for some survivor pensioners. Such a "political cost" must then be weighted with the potential benefits of the reform in terms of labour supply. Finally, as argued by the minister, survivor benefits need to be profoundly rethought as an instrument of social protection in a society where increasing female employment and family instability are rapidly outdating the single male breadwinner model. The final decision was therefore to propose in the legislation to come, a more ambitious reform of the survivor benefits, to be implemented in the general framework of the individualization of social security rights.

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APPENDIX

FIGURE1. ANNUAL DISPOSABLE INCOME IN THE BASELINE AND REFORM SYSTEM (€ OF 2001)WITH A SURVIVAL PENSION OF € 10000, GROSS WAGE OF € 7 AND NO DEPENDENT CHILDREN
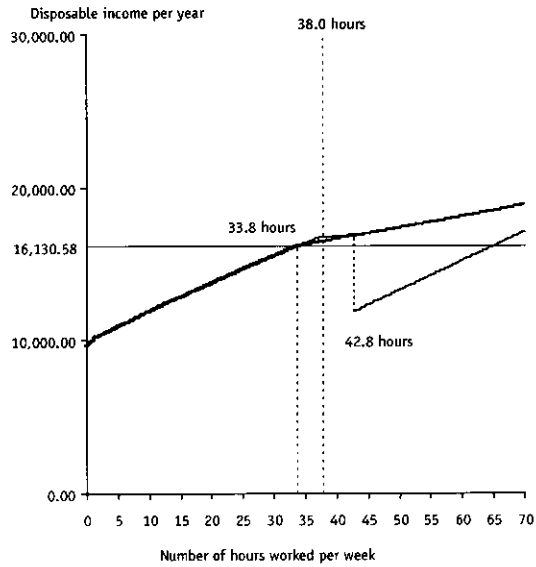
Disposable income per year

38.0 hours

30,000.00

20,000.00

16,130.58 — 33.8 hours

10,000.00 — 42.8 hours

0.00

0 5 10 15 20 25 30 35 40 45 50 55 60 65 70

Number of hours worked per week

FIGURE 2. ANNUAL DISPOSABLE INCOME IN THE BASELINE AND REFORM SYSTEM (€ OF 2001)WITH A SURVIVAL PENSION OF € 10000, GROSS WAGE OF € 13 AND NO DEPENDENT CHILDREN
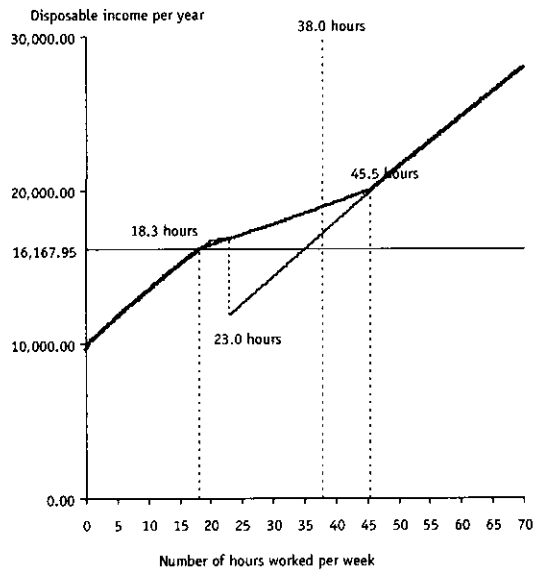
Disposable income per year

38.0 hours

30,000.00

45.5 hours

20,000.00

18.3 hours

16,167.95

23.0 hours

10,000.00

0.00

0 5 10 15 20 25 30 35 40 45 50 55 60 65 70

Number of hours worked per week

FIGURE 3. ANNUAL DISPOSABLE INCOME IN THE BASELINE AND REFORM SYSTEM
(€ OF 2001)WITH A SURVIVAL PENSION OF € 10000, GROSS WAGE
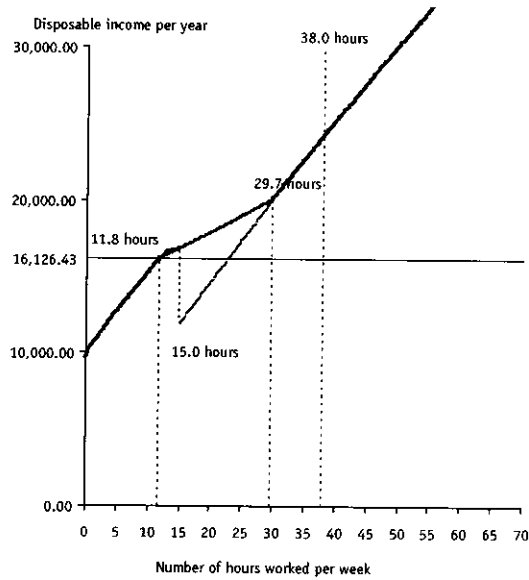OF € 20 AND NO DEPENDENT CHILDREN

FIGURE 4. ANNUAL DISPOSABLE INCOME IN THE BASELINE AND REFORM SYSTEM
(€ OF 2001)WITH A SURVIVAL PENSION OF € 15000, GROSS WAGE
OF € 13 AND NO DEPENDENT CHILDREN

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