They compare a quadratic specification with the more restrictive linear specification and the more flexible specifications based on third, fourth and fifth order polynomials. They conclude that the linear specification is too restrictive and that a quadratic function is sufficient in order to estimate the relevant economic parameters. A more flexible form is preferred from a statistical point of view, but the resulting labor supply elasticities and the consequences from tax changes do not differ significantly.

The data give information on various types of unemployment benefits. However, this only holds for those persons who are actually unemployed. Unemployment benefits depend on labor history and age and have a limited duration (at most five years for persons above the age of 40). Due to the static nature, labor history is not available in the model. We therefore only take into account the social assistance a household receives when household income (excluding family allowances) is below the official poverty line. As a consequence, unemployment benefits are ignored.[3] On the other hand, other income (including family allowances) has been included. The income of other household members has been left out of consideration. This implies that labor supply of children living with their parents does not depend on the parents' earnings and labor supply of parents is independent from the children's earnings.

Following Van Soest (1995), utility maximization has been approached by replacing the actual choice set by a finite number of points. Utility maximization takes place by finding the best point in this finite set. To that end we do not need to require that the tax system and benefits system is piecewise linear or convex. The specification allows for incorporation of fixed costs of working. In this way, we also avoid the critique by MaCurdy et al. (1990) that the range of elasticities that can be obtained are limited by constraints on the chosen labor supply model. As we maximize utility over a finite set, we do not need to rely on tangency conditions or duality theory and do not need to base the model upon the Kuhn-Tucker conditions. Since the error term (see below) follows a continuous distribution, the probability that more points have optimal utility is zero. So, a unique solution exists and this solution is coherent.

We normalize the full-time working week at 40 hours. For both single and joint decision makers we use eleven points ($n=11$). These correspond with no working (0 hours) and working for 4, 8, 12, ..., 40 hours, respectively. Joint decision makers maximize their joint utility function on the basis of the hours worked by both partners. If both are not involuntary unemployed, their joint choice set consists of 121 points: each partner can work during 0, 4, 8, 12, ..., 36 or 40 hours and all combinations are feasible. Net income y now is the sum of the labor income of both plus possible additional income and / or social assistance minus income tax payments and social insurance contributions.[4] If one of both partners is involuntary unemployed, utility is maximized over the set of working hours, under the restriction that the unemployed partner does not work. In this case, we only have a choice set of 11 instead of 121 points.

Finally, we introduce fixed costs of working (fcw). Models without fixed costs of working generally underpredict the number of non-workers and overpredict the number of (small) part-time jobs. One way to repair this is the inclusion of fixed costs of working; see Van Soest (1995). This makes not working more attractive than

[3] Sensitivity analyses shows that this assumption hardly affects the results.
[4] The net income has been derived from the gross wage using standard tax-deductable items.

working a few hours per week. We model the fixed costs as a combination of individual and household characteristics (Z_1, ..., Z_r) and a constant:

$$fcw = d_0 + d_1Z_1 + ... + d_rZ_r \qquad (3.6)$$

One has to bear in mind that we do not have any specific information with respect to these fixed costs. This means that we introduce these as an unobserved latent variable. This variable refers to both actual costs (like travel costs and costs of day care) and immaterial costs (like factors that limit the acceptation of a paid job; think of time and search costs). We cannot distinguish between these components in the model. As explanatory variables we use the same variables that were used as taste shifters, except the economic climate indicators. Instead of these latter variables, we include time dummies. The development in the parameter values of these time dummies reflects social developments that affect these fixed costs (in a positive or negative way). One can think of the availability of child care facilities inside or outside the workplace, travel costs, time costs of traffic congestion, and so on.

The fixed costs are incorporated in the utility function by replacing income y_j by $y_j - fcw_j$ if individual j works.

GEV I errors have been added to the utility values of all alternatives in the finite choice set. The errors can be considered as the random part of the evaluation of each alternative. Various reasons can be mentioned here. A first interpretation is the presence of unobserved job characteristics. Secondly, they can be considered as comparable to optimization errors. In this way non-zero probability has been given to choices that are not optimal for any value of the random preference term. This might occur in a non-convex or discontinuous budget set, where some points on the budget frontier may result in low household income in comparison with adjacent points. Thirdly, it facilitates simulated maximum likelihood estimation by smoothing the approximation of the likelihood. In this way, the incorporation of the error term can be seen as a smoothing device; see e.g. Keane and Moffitt (1998). We now get:

$$u(v_j) = U(v_j) + e_j, \quad j=0, ..., n \qquad (3.4)$$

This is similar to a multinomial logit model. The probability that an individual chooses alternative j, conditional on wage rate, tax and benefit rules, exogenous variables and random preferences has now been given by:

$$P\{j\} = exp\ \{U(v_j)\} / ?_k\ exp\{U(v_k)\},\ j=0, ..., n \qquad (3.5)$$

The probabilities for persons without a partner can be determined in an analogous way.

3.4. Minimum wage

We apply the gross legal minimum (youth) wage M. In practice the applied minimum may deviate from the legal minimum wage. One reason for this is that the legal minimum wage refers to the amount to be paid per week and the weekly number of hours in a full-time job differs over branches. Another reason is the existence of salary scales, of which the lowest wages are above the minimum wage. Moreover, it is possible that firms pay less than the minimum wage as a consequence of illegal practices or ignorance. We therefore introduce T^*, the minimum wage rate that is relevant for the employer. This variable will not be observed in practice. We assume

that its logarithm depends on the logarithm of the gross legal minimum wage, the level of education and an error term following a normal distribution with mean 0 and standard deviation s_t^{educ}. We now can determine the probability that the individual's productivity is above the minimum wage that is of importance for the employer. For each level of education we have: $P(ln\ F^* > ln\ T^* | ln\ F^*) = F([ln\ F^* - a + \beta\ ln\ M] / s_t)$, in which F equals the distribution function of the standard normal distribution. This implies that we allow the possibility of offering a job to someone with productivity below the legal minimum wage. It also allows the possibility of not offering a job to a person with productivity above the minimum wage. The probability of a job offer increases with productivity and decreases with the minimum wage relevant for the employer.

3.5. Productivity, preferences and minimum wage

On the basis of the foregoing we are able to derive the following probabilities for each individual:

1. the probability that a person will be prepared to work against the legal minimum wage or the market wage, if higher; in this case his or her reservation wage (R^*) is below the maximum of the legal minimum wage rate and the offered wage rate W^*: $R^* < max(M, W^*)$
2. the probability that a person's productivity (as required by the employer) is above the minimum wage relevant for the employer: $F^* > T^*$.

This gives us the following four possibilities:

1. $R^* > max(M, W^*), F^* < T^*$ (A+P)

The individual has a reservation wage above the maximum of the legal minimum wage and the market wage. Therefore he or she will not be prepared to work: the poverty trap (A) applies. Productivity is below the minimum wage relevant to the employer, so that the productivity trap (P) also applies.

2. $R^* > max(M, W^*), F^* \geq T^*$ (A)

The individual has a reservation wage above the maximum of the legal minimum wage and market wage. Therefore he or she will not be prepared to work and the poverty trap (A) applies. Productivity is above the minimum wage relevant to the employer: the productivity trap does not apply and the individual is voluntary unemployed.

3. $R^* \leq max(M, W^*), F^* < T^*$ (P)

The individual has a reservation wage below the maximum of the legal minimum wage and his or her market wage. The poverty trap therefore does not apply. However, productivity is below the minimum wage relevant to the employer, so that the productivity trap (P) applies. This person is involuntary unemployed.

4. $R^* \leq max(M, W^*), F^* \geq T^*$ (W)

The individual has a reservation wage below the maximum of the legal minimum wage and his or her market wage. The poverty trap therefore does not apply. Productivity is above the minimum wage relevant to the employer and the productivity trap does not apply. This person will work (W).

We now determine for each person for each group the probability that s/he is in that group. The poverty trap has been considered here in a broad sense. Usually this concerns people who enjoy a benefit and do not want to work. Here, it also refers to, for example, persons who do not receive any benefit, but do not work at all, because their partner has a sufficiently high income or assets are large enough to live from.

3.6. Estimation

The model has been estimated using all observations in the sample with the exception of those who are not available for the labor market (see section 2). We apply simulated maximum likelihood. This is among other things due to the point that unobserved wages for unemployed persons have been replaced by predictions. The prediction errors will be substantial. One possibility is to integrate out the disturbance term of the wage equation in the likelihood. However, this may be computationally burdensome in case of partners. We therefore approximate this integral by a simulated mean. For each individual whose wage is unknown, we take R draws from the distribution of the error term(s) in the wage equation(s) and compute the average of the R likelihood values, conditional upon the drawn error. This estimator is a special case of smooth simulated maximum likelihood. It is asymptotically equivalent to maximum likelihood for large R, see Hajivassiliou and Ruud (1994). Our results have been based upon $R = 10$. In former applications using similar models it appeared that this is enough to get reliable estimates; see Van Soest (1995) and Van Soest and Das (2001).

4. Results

In this section the estimation results have been shown. Estimation refers to the period 1990-2000. In the tables we distinguish between joint decision makers (persons with a partner) and single decision makers (persons without a partner: singles, single parents and children living at their parents, et cetera). The model has been estimated simultaneously, albeit seperately for joint (45,094 observations) and single decision makers (11,615 observations). The loglikelihood amounts to –86,152.60 for joint decision makers and –25,297.27 for single ones.

4.1. Productivity and market wage rate

The wage rate is determined by the productivity (as valued by the firm), the labor market situation and a normally distributed error component; see Table 4.1 for the estimation of the log hourly wage rate. The table shows that productivity increases by level of education. Maximum productivity is reached at the age of 51 years for men with a partner. Thereafter productivity decreases very slowly. Productivity at the age of 60 is only one percent below maximum productivity. For the other persons the maximum productivity has been reached at the age of 40 years. The productivity of these groups declines a bit faster. At the age of 60 it is 5% below the maximum for married women and 9% for singles.

Table 4.1: The estimates for the wage equation (ln)

	Men joint		Women joint		Men single		Women single	
	est.	t-val	est.	t-val	est.	t-val	est.	t-val
Constant	-8.317	-21.58	-7.035	-17.15	-20.469	-40.27	-20.112	-38.79
Ln (age)	5.890	28.18	5.399	23.00	12.742	43.41	12.477	42.12
Ln (age) **2	-0.750	-26.14	-0.734	-22.20	-1.724	-40.66	-1.697	-40.24
D edl 2	0.043	6.09	0.032	3.74	0.078	4.33	0.092	4.85
D edl 3	0.185	31.96	0.264	31.75	0.212	11.60	0.312	17.08
D edl 4	0.402	51.80	0.491	48.09	0.367	17.43	0.518	23.76
D edl 5	0.528	53.93	0.634	38.42	0.366	15.77	0.657	23.08
D edl 6	0.228	17.03	0.269	13.57	0.257	7.091	0.314	7.35
Dummy 90	0.107	---	0.161	---	0.181	---	0.090	---
Dummy 91	0.110	---	0.165	---	0.070	---	0.115	---
Dummy 92	0.102	---	0.156	---	0.228	---	0.181	---

Dummy 93	0.077	---	0.133	---	0.389	---	0.428	---
Dummy 94	0.030	---	0.033	---	0.173	---	0.126	---
Dummy 95	0.025	2.53	0.007	0.60	0.056	---	-0.006	---
Dummy 96	-0.013	---	0.001	---	0.032	1.81	0.014	0.88
Dummy 97	-0.021	-2.75	0.008	0.81	0.039	2.05	0.014	0.76
Dummy 98	-0.035	-3.68	-0.022	-1.65	0.077	3.07	0.028	1.23
Dummy 99	-0.001	-0.04	-0.023	-1.13	0.150	4.29	0.082	2.35
Dummy 00	0.099	6.03	0.043	2.00	0.093	2.48	0.145	3.92
Unempl rate	-1.220	-2.24	-1.047	-1.55	0.161	0.15	3.153	3.08
Business cycle	-0.326	-0.98	0.957	2.23	11.295	16.09	13.54	18.71
s_F	0.250	---	0.250	---	0.250	---	0.250	---
s_{me}	0.285	400.65	0.388	331.87	0.338	157.10	0.361	180.70

D edl x = dummy for level of education x (1=lowest, 5=highest, 6=unknown)

When the economic climate deteriorates, it is straightforward that productivity is underestimated by the firm: the firm will be careful and will try to prevent from overestimating productivity. Therefore, we expect a negative impact of the unemployment rate and a positive effect of the business cycle.[5] This has been found for female joint decision makers. For male joint decision makers the sign for the business cycle indicator is negative, but insignificant, whereas single decision makers have the wrong sign for the unemployment rate. However, both economic indicators have to be taken into account simultaneously. For realistic combinations of the two indicators (e.g. the realizations) this results in decreasing employer's reservation wages when the economic climate deteriorates. The variance of the error component has been set in such a way that the model reproduces the observed wage distribution as good as possible. The estimated values for s_{me}, the standard errors of the measurement error in the observed wage rates are rather large.

4.2. Utility function

Table 4.2 gives the parameter estimates for the utility function. The coefficients on the squared hours terms and the interaction terms of hours and income cannot be interpreted separately. The combination of both determines the elasticities of hours worked; see below. A negative coefficient on an interaction of an exogenous variable with hours implies a positive effect on the marginal utility of leisure and, as a consequence, a negative effect on labor supply. This, for example, holds for the number of children up to and including 3 years of age for joint decision makers. The marginal utility of leisure is larger, the larger the number of children in this age bracket. So, young children negatively affect the labor supply of both men and women with a partner. For older children this only holds for the female partner. The presence of children – and in particular young children – also negatively influences the labor supply of single mothers. High-educated men with a partner have a somewhat lower labor supply as compared to married or cohabiting men with low or middle education. For women with a partner the reverse holds.

The unemployment rate and the economic climate indicator also affect utility. Both have of course to be looked at simultaneously. But, the picture is different for men and women. These economic indicators imply a positive impact on working hours for men and a negative impact for women. Discouragement effects might play a role for women, whereas men are apparently inclined to work extra hours during economic bad times.

[5] We use the *Conjunctuurindicator* of the CPB Netherlands Bureau for Economic Policy Analysis.

Table 4.2: Utility function, estimation results

	Men joint		Women joint		Men single		Women single	
	est.	t-val	est.	t-val	est.	t-val	est.	t-val
h_x^2	0.890	43.35	-0.339	-30.45	0.287	18.95	0.2865	18.95
$y * h_x$	-0.020	-18.57	0.001	1.23	-0.007	-2.59	-0.0074	-2.59
$h_m * h_f$	-0.101	-24.87	-0.100	-24.93				
y^2	0.507	19.59	0.507	19.59	0.508	12.20	0.508	12.20
h_x *								
Constant	-31.579	-9.30	-6.975	-3.00	-26.23	-17.06	-26.23	-17.06
D woman							3.19	7.23
D single parent					-0.35	-2.43	-0.556	-5.78
D living at parent					0.42	6.16	0.092	1.49
Ln (age)	17.124	9.189	7.917	6.08	14.768	16.69	13.795	15.26
Ln (age) **2	-2.514	-9.93	-1.467	-8.07	-2.065	-16.26	-2.065	-16.26
# children 0-17							-0.104	-1.88
D pres. child 0-5	-0.010	-0.14	-0.387	-7.22			-0.415	-3.86
# children 0-3	-0.170	-3.73	-0.586	-14.49				
# children 4-11	0.041	1.35	-0.208	-7.70				
# children 12-17	0.144	5.05	-0.290	-15.26				
Age yngst child	-0.083	-4.10	-0.218	-13.51				
Idem **2	0.009	4.36	0.017	11.21				
D edl 45	-0.212	-6.42	0.525	18.13				
Unempl rate	4.166	3.31	-0.565	-0.582	0.094	0.05	-5.48	-3.71
Business cycle	0.144	0.08	0.802	0.603	3.002	1.11	-1.41	-0.67

h = number of hours worked (x=m(ale), f(emale)); y =income; D = dummy; D edl x = dummy for level of education x (1=lowest, 5=highest, 6=unknown)

The estimation results for the fixed costs of working persons can be found in Table 4.3. Most striking is the negative impact of children on the fixed costs of women with a partner. However, notice that table 4.2 shows a negative impact of the presence of children on labor supply. In combination with those values, the impact of children appears to be negative (as we implicitly assume that the smallest job exists of 4 hours). The coefficients in table 4.3 have to be interpreted as scale factors. We also see that high-educated men with a partner have significant lower 'starting' costs than low- and middle-educated ones. This partially compensates for the negative effect found in table 4.2.

Table 4.3: Fixed costs of working, estimation results

	Men joint		Women joint		Men single		Women single	
	est.	t-val	est.	t-val	est.	t-val	est.	t-val
Constant	270.799	6.31	161.517	8.40	-44.58	-3.03	-44.575	-3.03
D woman							7.200	1.83
D single parent					-1.14	-0.87	-3.098	-4.53
D living at parent					1.29	1.73	0.267	0.45
Ln (age)	-150.52	-6.42	-78.543	-7.55	20.45	2.49	16.888	2.05
Ln (age) **2	20.781	6.52	9.946	6.99	-1.89	-1.66	-1.892	-1.66
# children 0-17							0.786	2.28
D pres child 0-5	-0.443	-0.46	-1.045	-3.04			1.859	3.04
# children 0-3	-0.205	-0.32	-1.222	-4.82				
# children 4-11	0.585	1.40	-0.226	-1.41				
# children 12-17	0.460	1.18	-1.262	-8.17				

Age yngst child	-0.142	-0.51	-0.911	-7.80				
Idem **2	0.008	0.28	0.067	6.27				
D edl 45	-2.010	-4.82	0.250	1.08				
Dummy 1990	0.319	---	3.680	---	3.877	----	4.889	---
Dummy 1991	0.308	0.40	3.717	17.82	3.365	4.75	5.118	12.68
Dummy 1992	1.086	1.47	2.630	11.52	3.107	4.32	4.912	12.24
Dummy 1993	0.912	1.14	2.224	7.35	3.333	3.88	4.536	8.93
Dummy 1994	3.039	4.18	1.340	4.73	3.374	4.45	3.514	7.65
Dummy 1995	3.503	4.97	1.068	4.01	3.161	4.55	3.980	9.60
Dummy 1996	2.125	2.94	0.569	1.96	2.032	2.64	2.889	6.31
Dummy 1997	1.360	1.88	0.706	2.50	1.926	2.446	2.926	6.38
Dummy 1998	0.381	0.52	0.334	1.14	2.220	2.78	3.230	7.31
Dummy 1999	1.148	1.52	0.515	1.55	3.005	3.41	3.279	6.44
Dummy 2000	-0.088	-0.11	0.128	0.38	-0.879	-0.91	1.441	2.62

D = dummy; D edlx = dummy for level of education x (1=lowest, 5=highest, 6=unknown)

4.3. The distribution of T^*

As said before we model T^* as a (linear) function of M and we assume that $(F^* - T^* \mid F^*)$ follows a lognormal distribution with mean 0 and standard deviation s_t^{educ}. We do not distinguish between men and women, only between single and joint decision makers. The estimation results have been shown in table 4.4. The estimated values for s_t^{educ} are rather large and indicate that the minimum wage that is relevant for the firm substantially deviates from the legal minimum wage. Or, in other words, the legal minimum wage affects the probability of receiving a job offer, but this is not the only determining factor.

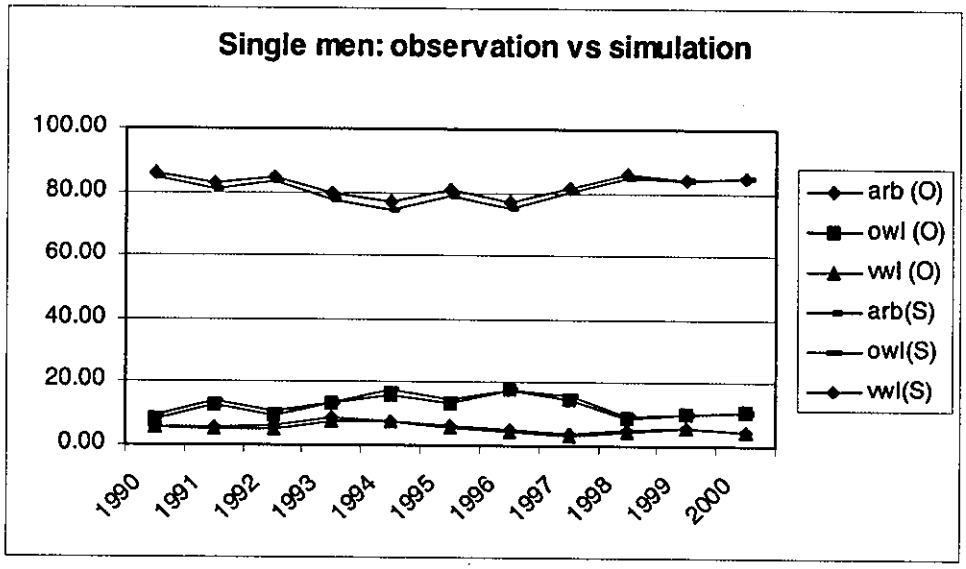
*Table 4.4: Estimation results for ln T**

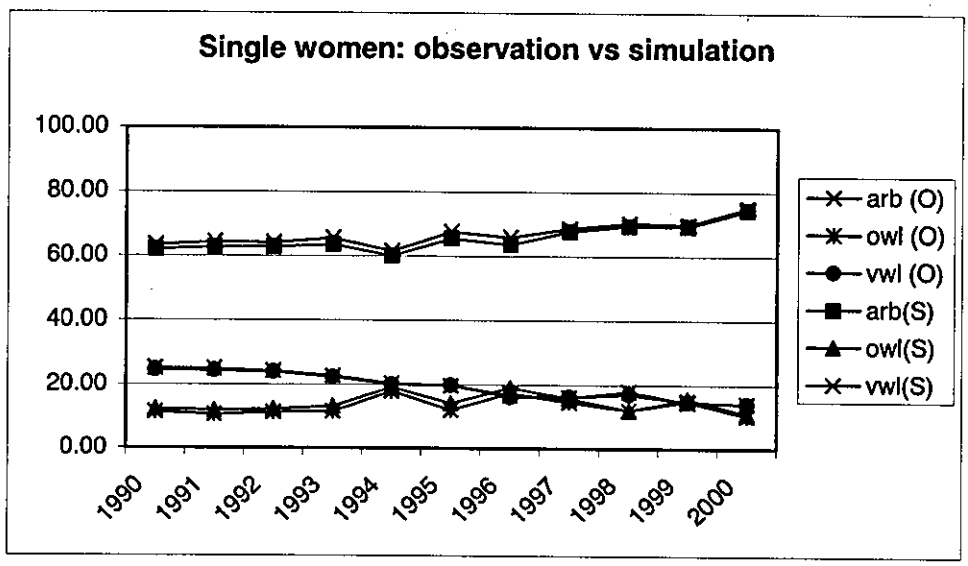
	Joint decision makers		Single decision makers	
	Estimate	t-value	Estimate	t-value
D edl 126	0.666	5.11	0.875	13.02
D edl 3	1.070	8.68	0.893	11.34
D edl 45	2.662	163.05	2.085	6.80
Wmin*D edl 126	0.735	14.24	0.636	17.13
Wmin*D edl 3	0.617	12.55	0.699	19.34
Wmin*D edl 45	0	---	0.283	2.25
s_t D edl 126	0.237	33.83	0.441	14.28
s_t D edl 3	0.237	46.55	0.327	18.55
s_t D edl 45	0.356	43.31	0.357	16.26

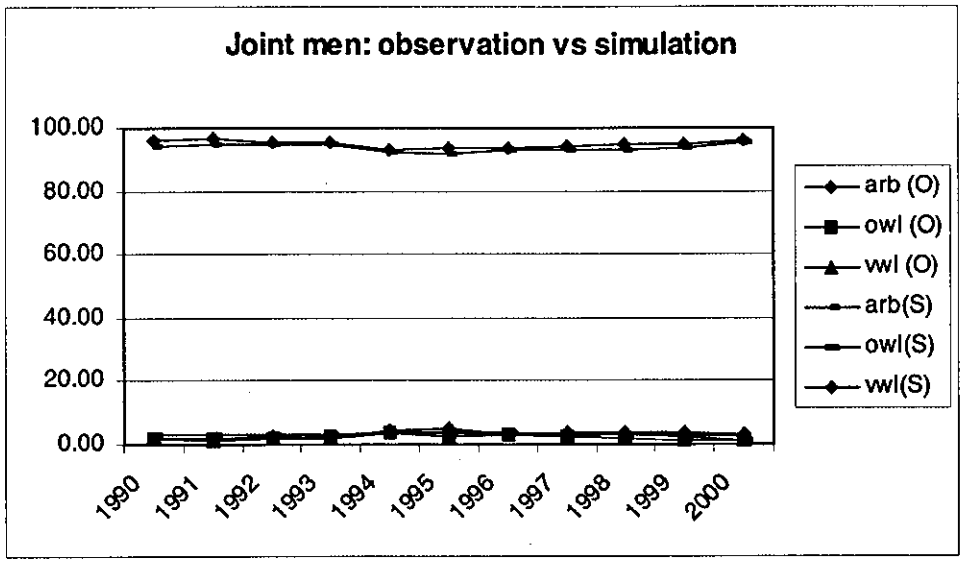
D edl x = dummy for level of education x (1=lowest, 5=highest, 6=unknown)

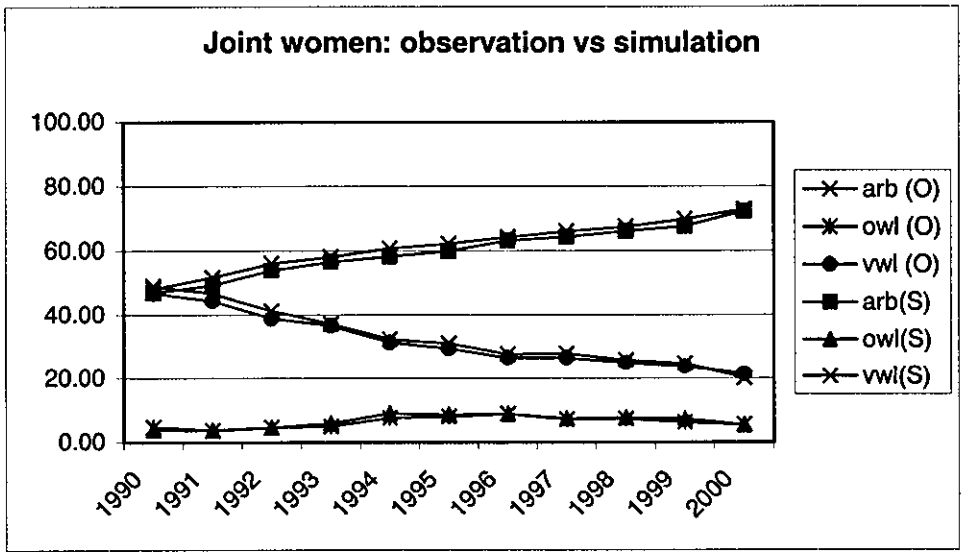
In order to give an indication of the strength of the model, figure 4.1 shows the observed and simulated distribution over the states working, voluntary and involuntary unemployed for four groups. It appears that the model reflects the development over time very well. This holds in particular for joint female decision makers, who show a large increase in participation.

Figure 4.1: Observed (O) versus simulated (S) distribution for working (arb), VWL and OWL (in %)









4.4. Elasticities

The labour supply and minimum wage elasticities resulting from the model have been given in Tables 4.5 (participation), 4.6 (hours) and 4.7 (hours by subgroups in 2000). The labour supply elasticities are the highest for joint female decision makers, followed by single female decision makers. The elasticities are small for both single and joint male decision makers. Table 4.7 shows that with respect to the level of education, labour supply elasticities generally are highest for low-educated persons and lowest for high-educated ones. Looking at age groups, we find an increasing elasticity by age for women. Elasticity is also the highest for older men, but middle-aged men show a lower elasticity in comparison with young men..

Table 4.5: Labour supply elasticities and minimum wage elasticity for various years w.r.t. participation

	1990	1995	1998	2000
1. Labour supply elasticity				
M joint	0.031	0.059	0.043	0.038
F joint	0.235	0.179	0.131	0.157
M single	0.075	0.075	0.072	0.080
F single	0.178	0.152	0.125	0.149
2. Minimum wage elasticity[1]				
M joint	-0.115	-0.109	-0.082	-0.037
F joint	-0.250	-0.355	-0.234	-0.158
M single	-0.238	-0.317	-0.226	-0.238
F single	-0.353	-0.381	-0.270	-0.248

[1] Holding benefits constant.

An increase of the wage rate by 10% would increase participation in 2000 among women by 1.57% (joint decision makers) and 1.49% (singles), respectively. For men, this is 0.38 and 0.80%, respectively.

Table 4.6: Labour supply elasticities and minimum wage elasticity for various years w.r.t. hours worked

	1990	1995	1998	2000
1. Labour supply elasticity				
M joint	0.043	0.065	0.058	0.050
F joint	0.389	0.282	0.265	0.336
M single	0.106	0.103	0.096	0.120
F single	0.276	0.259	0.251	0.363
2. Minimum wage elasticity[1]				
M joint	-0.115	-0.108	-0.082	-0.036
F joint	-0.217	-0.307	-0.206	-0.123
M single	-0.234	-0.309	-0.219	-0.225
F single	-0.339	-0.365	-0.255	-0.229

[1] Holding benefits constant.

The elasticities for labor supply with respect to hours are partially in line with previous findings using the SEP-data. For example, Van Soest and Das (2001) report an own wage elasticity of 0.08 for married and cohabiting men against 0.7 for married and cohabiting women. The former one is close to our results, but we find a considerably lower elasticity for female joint decision makers. For singles, Euwals and Van Soest (1999) report an elasticity of 0.15 (men) and 0.22 (women), respectively.[6] The wage elasticities for labour supply (with respect to the hours decision) deviate for female joint decision makers and single men from the elasticities used by the CPB Netherlands Bureau for Economic Policy Analysis (CPB). The latter uses elasticities of 1.0 and 0.25, respectively. However, the CPB elasticities are based on estimation results and literature overviews that refer to the mid 1980s. Our estimates are more in line with findings for other countries applying more recent data. For example, Blundell, Duncan and Meghir (1998) report wage elasticities for married

[6] The elasticities for single perons and lone parents have been weighted.

and cohabiting women in the UK which vary between 0.13 (for women whose youngest child is 11 years or older) and 0.37 (for women whose youngest child is 3 or 4 years old). For childless married and cohabiting women, the elasticity amounts to 0.14. Scutella (2000) finds an elasticity of 0.30 for married women in Australia. For the US, Zabel (1993) reports elasticities for married women (using different types of models) that vary between 0.1 and 0.6. For Germany, based on data for 2000, Bonin et al. (2002) report for women (single and joint decision makers together) an elasticity of 0.27.

Table 4.7: Labour supply elasticities w.r.t. number of hours worked for various groups in 2000

	M joint	F joint	M single	F single
All	0.050	0.336	0.120	0.363
Low-educated	0.092	0.479	0.093	0.493
Middle-educated	0.053	0.392	0.134	0.352
High-educated	0.012	0.216	0.129	0.245
Age < 30 years	0.016	0.154	0.092	0.090
Age 30-45 years	0.013	0.348	0.031	0.438
Age > 45 years	0.121	0.499	0.209	0.752

The minimum wage elasticity is negative. An increase of the minimum wages by 1% would decrease the number of employed hours in 2000 by 0.05 to 0.1% for men and over 0.3% for women. This is below the findings by Van Soest (1989) and Van den Berg and Ridder (1997 and 1998), but corresponds with the level assumed by the CPB (0.1).

5. Simulation of policy measures

5.1. Description of policy measures

The model can be used to estimate the effects of various possible labor market instruments on employment. Here, we look at the impact of the following ten alternatives.

1. The impact of the Specifieke Afdrachtkorting (SPAK), a wage costs grant

The *Specifieke Afdrachtkorting* (SPAK) aims at maintaining and creating low paid labor by means of a decrease of the labor costs for the employer. The SPAK affects employment via a lowering of the labor costs and, consequently, lowers the productivity trap. Employers receive a reduction on the taxes and social security contributions to be paid for employees who earn less than 115% of the statutory minimum wage. The SPAK has been introduced in 1996. It amounted to € 538 on an annual basis in 1996. It has been increased in 1997 and 1998. From 1998 it amounts to about 10% of the wage costs at the minimum wage level. In 2000 it was € 1836. In the years 2003-2005 it will be abolished.

2. The introduction of an Earned Income Tax Credit (EITC) on an hourly basis

An EITC influences the net labor income and affects the labor supply decision in this way, or the poverty trap. Here, we introduce (in stead of the SPAK) an EITC that amounts to € 1000 for full-time working persons earning less than 115% of the legal

minimum wage. This amount has been lowered in a linear way to € 0 for persons earning 150% of the legal minimum wage. This measure has the same costs as the SPAK (€ 0,9 billion)

3. An increase of the tax allowance for workers
An alternative for the EITC is a general increase of the tax allowance for working persons. Using again € 0.9 billion as a starting-point, each working person receives a net amount of € 165 per annum. This again combats the poverty trap.

4. A change in the social assistance benefit
Lowering the social assistance benefit (without decreasing the legal minimum wage) will make work pay better and, consequently, will lower the poverty trap. We discuss the impact of a decrease of the social assistance benefit by 5%.

5. A change in the minimum wage combined with a change in the social assistance benefit
In this alternative we lower both the social assistance benefit and the legal (gross) minimum wage by 5 %. This policy measure both affects the poverty trap and the productivity trap.

6. A higher tax exemption for working couples and single parents with young children
The poverty trap is in particular of importance for persons with young children. One way to combat this is to increase the tax exemption for working parents with young children. To that end we introduce an extra tax exemption of net € 1,560 per annum for women when children younger than 12 years are part of the household and half this amount if the youngest child is between 12 and 17 years of age. The amount only holds if the single parent or both parents are working for at least 20 hours per week. The total cost of this measure also amount € 0.9 billion.

7. A higher child allowance for all, or only for working persons
Actually, a higher child allowance for working persons has the same effects as a higher tax exemption for households with children, albeit that the exemption now depends on the number of children present in the household. As a consequence, one might expect a higher participation rate of women with (young) children as compared to alternative 6. We apply the same conditions: the higher child allowance only holds if the single parent or both parents are working for at least 20 hours per week. The increase of the child allowances has been set to 70%, giving again additional costs of € 0.9 billion.

8. A higher compensation for childcare
The high costs of childcare are often seen as one of the major limitations for partners with young children to participate both. Here we look at the impact of a decrease of the childcare costs of 25%. To that end we include the results of a reduced form model for the costs of childcare costs; see Appendix A. We also discuss a weekly subsidy of € 28 per child aged 0 to 3 years and € 14 per child between 4 and 12 years of age for full-time working wives (and proportionally lowered amounts for part-time working wives) under the condition that the single parent or both parents are working for at least 20 hours per week. The total costs of the latter measure again amount to € 0.9 billion

9. A change in the social assistance earnings test and income test for the unemployment benefit

An alternative to make work pay better is to apply the earnings test less strictly. As an example we look at a policy in which the social assistance benefit is not lowered by 100% of the labor income, but by only 75%. In another variant labor income is lowered by 90%. In addition, the income test for the unemployment benefit has been adjusted in an analogous way.

10. More restrictive requirements for persons with a social assistance or an unemployment benefit.

As we do not explicitly model job arrivals, we are not able to include the effect of sanctions for unemployed persons who show low efforts with respect to finding a job. To get some insight in the possible impact of sanctions we reduce the social assistance or unemployment benefit for persons who have proportionally high changes to get offered a job. This has been implemented by lowering the benefit by 25% for singles whose probability that the firm's reservation wage (F^*) is larger than the minimum wage costs (T^*) is 90% and by 10% when the probability amounts to between 80 and 90%. For joint decision makers the discount amounts to 25% if $P\{F^*>T^*\}$ is larger than 90% for both partners, 17.5% if the probability is larger than 90% for one partner and between 80 and 90% for the other partner and equals 10% if $P\{F^*>T^*\}$ is between 80 and 90% for both partners.

5.2. Simulation results

The impact of these 10 policy measures is shown in table 5.1 – 5.3. Table 5.1 shows the impact on both the number of persons that participates and the number of full-time jobs in 2000. This table also shows the impact of the economic climate on the results. To that end we take the economic situation mid 2002 as a starting-point. The proportional impact for various subgroups (single and joint decision makers, men, women, educational and age groups) can be found in table 5.2. For example, the SPAK results in an increase of 17,000 full-time jobs. This implies an increase of total employment by 0.24%. Among married and cohabiting women (Fj in the table), employment increases by 0.37%. So, the proportional impact amounts to (0.37/0.24) = 1.5 for this group. Analogeously, the impact for persons aged 30 to 45 years of age is 0.6 as for this group employment increases by 0.14%. Table 5.3 shows the impact of the policy measures on the productivity and poverty trap.

The SPAK results in an increase of the number of employees by 30,000 in 2000. The employment gain in full-time equivalent jobs amounts to 17,000. These persons were involuntary unemployed before, as the SPAK resists the productivity trap. Women, people younger than 35 years of age and low-educated persons profit most from the SPAK. The total costs of the SPAK amounted to about 0.9 billion euro in 2000. If this amount had been used to implement an EITC or an extra tax allowance for workers, the employment gain would be smaller. The EITC increases participation by 12,000 persons in 2000. However, the EITC also affects the hours decision. As a consequence, the employment gain in terms of full-time equivalents is larger, to wit 14,000. Low-educated persons have the largest advantage of the EITC, married men and high-educated persons the lowest. The impact of the extra tax allowance is smaller. Participation increases by 6,000 persons and employment increases by 8,000 full-time equivalent jobs. This measure is in particular attractive to older persons. Again, married men hardly profit from the measure. Both the EITC and extra tax allowance tackle the poverty trap. However part of the group has a too low

productivity, which results in an increase of the number of involuntary unemployed persons (the productivity trap). The costs per created full-time job are rather high in 2000. An extra job created by the SPAK costs € 53,000; for the EITC the costs of an extra full-time job amount to € 64,000 and for the extra tax allowance even € 112,000.

Table 5.1: Effect of policy measures on employment in 2000 and in 2000 using the economic climate of mid 2002: participation (Nrs) and equivalent fulltime jobs (Hrs) in thousands, total costs (in billion €) and the costs per extra job in thousands of euros (K€).

Policy measure	2000 (Nrs)	2000 (Hrs)	Econ climate 2002 (Nrs)	Econ climate 2002 (Hrs)	Costs 2000	Per job 2000
1. Impact SPAK	+30	+17	+62	+38	0.9	K€ 53
2. EITC	+12	+14	+15	+18	0.9	K€ 64
3. Tax allowance	+6	+8	+8	+10	0.9	K€ 112
4. Social assistance – 5%	+8	+12	+9	+11		
5. Minimum wages and social assistance – 5%	+44	+35	+50	+38		
6. Tax exemption young children	+19	+31	+20	+30	0.9	K€ 29
7. Child all. workers +70%	+18	+31	+21	+28	0.9	K€ 29
8. Childcare costs -25%	+9	+10	+5	+6	0.2	K€ 42
Subsidy per worked hour	+29	+28	+28	+27	0.9	K€ 32
9. Less strict earnings test	–6	–19	–5	–17		
(25 resp. 10%)	–4	–9	–2	–8		
10. More strict rules	+29	+38	+22	+28		
Impact economic climate 2002	–262	–243				

A lowering of the social assistance benefit by 5% tackles the poverty trap. It results in an increase of employment by about 8,000 persons and a bit higher increase in full-time equivalents. In combination with a decrease of the minimum wage by also 5%, the employment gain is much larger. Now, participation grows by 44,000 persons and in terms of full-time jobs the gain amounts to 35,000 jobs. About one tenth of these were before voluntary unemployed persons, the remaining part refers to former involuntary unemployed persons. The lower social assistance results in particular in employment gains for single women and to a lower extent single men, low-educated persons and older people. The combination of a lower social assistance and a lower minimum wage especially improves employment among singles and young people.

The extra tax exemption for single parents who work at least 20 hours per week and families with children, where both partners also work at least 20 hours per week each, results in an extra employment of almost 20,000 persons (in full-time equivalents 31,000 jobs). The resulting costs per extra (full-time) job are € 29,000. An alternative is to raise child allowances by 70% for those persons who meet the aforementioned hours restriction. The impact of this measure is about the same. Raising or lowering child allowances unconditionally hardly affects employment.[7] Also subsidizing

[7] Not included in the tables.

childcare costs affects employment in an only limited way. Lowering these costs by 25% results in an increase of employed persons by less than 10,000 persons.[8] All these measures are advantageous to women with a partner in particular and, to some extent, to low-educated persons. Young persons benefit most from the lower childcare costs, whereas the tax exemption for young children and child allowances are proportionally more beneficial to middle-aged persons.

Table 5.2: The (full-time equivalent) employment effect (All) and the relative effects specified by subgroups (see text)

Policy measure	All	Mj	Fj	Ms	Fs	Education			Age		
	*1000					L	M	H	Y	M	O
SPAK	17	0.3	1.5	1.0	1.6	2.6	0.7	0.0	2.5	0.6	0.7
EITC	14	0.3	1.4	1.6	1.7	2.1	0.9	0.2	1.3	0.9	1.1
Tax allowance	8	0.3	1.3	1.1	1.6	1.2	1.0	0.8	0.5	0.8	1.7
Social assistance –5%	12	1.0	0.2	1.9	3.2	1.4	1.1	0.5	1.3	0.4	1.7
Soc.ass+min.wages–5%	35	0.7	0.6	2.4	2.5	1.3	1.2	0.3	1.9	0.7	1.0
Tax exempt yng children	31	0.1	1.9	0.0	1.8	1.2	1.1	0.7	0.7	1.5	0.5
Child all workers +70%	31	0.1	2.0	0.0	1.4	1.2	1.0	0.8	0.2	1.6	0.5
Child care costs –25%	10	-0.2	2.6	0.0	0.3	1.2	1.0	1.0	1.5	1.4	0.0
Child care costs/hour	28	-0.3	2.4	0.0	1.1	1.1	1.1	0.8	0.7	1.7	0.1
Soc. ass earn test –25%	-19	1.1	0.3	0.8	3.0	1.3	1.0	0.8	0.7	0.5	2.0
More strict rules	38	0.8	0.4	1.4	3.5	1.4	1.0	0.6	0.3	0.6	2.0
Economic climate 2002	-243	-0.1	0.4	4.3	4.3	1.1	1.0	0.9	2.3	0.7	0.8
SPAK based on economic climate 2002	38	0.1	0.8	2.8	3.5	2.4	0.8	0.1	3.4	0.5	0.5

Mj = male joint decision makers; Fj = female joint decision makers; Ms = male single decision makers; Fs = female single decision makers;
Level of education: L = low; M = middle; H = high;
Age group: Y = up to 30 years of age; M= 30 up to 45 years of age; O = 45 years and over.

A larger impact of childcare subsidies on participation has been found by linking the subsidy to the number of children and the number of hours worked by the wife. A weekly subsidy of € 28 per child aged 0 to 3 years and € 14 per child between 4 and 12 years of age for full-time working wives (and proportionally lowered amounts for part-time working wives) increases participation by 29,000 persons. However, the employment gain is about the same as for the tax exemption and higher child allowance for working families (about 30,000 full-time jobs). As the total costs of this measure again amount to € 0.9 billion, an extra full-time job also costs about K€ 30 in 2000. This measure is more beneficial with respect employment of middle-aged women and middle-educated women (as compared to the lowering of child care costs by 25%). All these policy measures with respect to the costs of young children tackle the poverty trap. Also here, part of the group that is prepared to work now has a too low productivity, which results in an increase of the number of involuntary unemployed persons (the productivity trap). This amounts to about 10% of the group that now is prepared to participate.

A less strict earnings test (income test) with respect to social assistance results in a decrease of employment. If it is allowed to keep 10% (25%) of other income, the

[8] The low impact of changing child care costs on employment is in accordance with findings by Dobbelsteen et al. (2000) who report an insignificant impact of lower child care costs on employment.

number of employed persons declines by 4,000 (6,000); in full-time equivalents the loss amounts to 9,000 (19,000) jobs. This measure actually strengthens the poverty trap. The impact is the largest for single women, low-educated persons and older people.

The reduction of the social assistance benefit for persons with a high probability that their productivity exceeds the minimum wage costs (indicated by 'more strict rules') tackles the poverty trap. It results in an increase of the number of employed persons by 29,000 in 2000. Also, part-time employment is promoted by this measure: the number of jobs in full-time equivalents increases by over 38,000 in 2000. Singles, low-educated persons and older people are most sensible to this measure.

Table 5.3: The impact of labor market measures and conditions on employment, the poverty trap and the productivity trap in 2000 (participation)

	Employment	Poverty trap	Productivity trap
SPAK	+30,000	0	–30,000
SPAK and economic climate 2002	+62,000	0	–62,000
EITC	+12,000	–14,000	+2,000
Tax exemption	+6,000	–6,500	+500
Social assistance –5%	+8,000	–9,000	+1,000
Social assistance + min. wages –5%	+44,000	–4,000	–40,000
Tax exemption young children	+19,000	–20,500	+1,500
Child allowance workers +70%	+18,000	–19,500	+1,500
Child care costs –25%	+9,000	-10,000	+1,000
Child care costs/hour	+29,000	-32,000	+3,000
Social assistance earnings test –25%	–6,000	0	+6,000
Social assistance more strict rules	+29,000	–30,000	+1,000
Economic climate 2002	–262,000	+71,000	+191,000

Changes in the economic climate affect employment. This effect runs via three ways: (1) the reservation wage of the employer is affected by the change in the economic climate; (2) the market wage rate is influenced by the unemployment rate and (3) labor supply is sensitive to changes in the economic climate. If the economic climate of mid 2002 would have been at work in 2000, this would have resulted in a loss of

243,000 full-time jobs and 262,000 persons would have lost their job.[9] This in particular refers to young single persons. The decreased participation is the consequence of both the poverty trap (discouraged worker effects) and the productivity trap. The latter dominates: 70% of the decrease in participation has been related to the productivity trap. As a consequence, policy measures that combat the productivity trap have a larger impact during a recession. For example, whereas the SPAK results in an increase of 17,000 full-time jobs in 2000, its effect would be much larger under the economic climate of 2002. Now its impact amounts to almost 62,000 persons, that share 38,000 full-time jobs. In stead of K€ 53, the costs of an extra job due to the SPAK now amount to less than € 24,000.

The EITC and tax allowance also result in a higher employment gain in economic bad times, but the impact is smaller than found for the SPAK: the impact is 4,000 and 2,000 jobs respectively higher as compared to 21,000 extra jobs for the SPAK. A lower social assistance is somewhat less effective during a recession and due to that the impact of a combination of both a lower benefit and a lower minimum wage is rather limited. The policy measures that refer to the presence of young children are also less effective during a recession. Discouraged worker effects do play a role here. On the contrary, less strict rules with respect to the earnings test result in a somewhat smaller loss of jobs when the economic climate is rather bad. The reduction of the social assistance benefit for persons with a high probability that their productivity exceeds the minimum wage costs has a smaller impact when the economic climate deteriorates. This is caused by the higher requirements put forward by employers under these circumstances. This actually increases the poverty trap.

5.3. Comparison with other studies

With respect to the SPAK we find an impact of 17,000 full-time jobs in 2000. Using results from a questionnaire among employers, Polanen Petel et al. (1999) found a positive net effect of 44,000 to 76,000 jobs. In contrast, Mühlau en Salverda (2000) report no positive effect applying a cross-sectional analysis at the meso level. Our result corresponds to the findings of the CPB Netherlands Bureau for Economic Policy Analysis. Werkgroep Toekomst van het Arbeidsmarktbeleid (2001) reports an extra employment of 20,000 jobs.

Van Soest, Euwals and Donkers (1996) and Van Soest and Kalwij (1996) simulated the impact of a wage costs subsidy for the year 1988. Here, the subsidy amounts to € 2700 for employees with a gross wage rate below 110% of the minimum wage (WML), to € 1800 if the gross wage rate is in between 110 and 120% WML and € 900 if the gross wage rate is in between 120 and 130% WML. Both find an employment increase of about 0.6 percentage points, which is considerably higher than found by us.

CPB Netherlands Bureau for Economic Policy Analysis reports a proportionally large impact with respect to the EITC. An employment gain of 30,000 jobs is to be expected, using the same total amount (€ 0.9 billion); see Werkgroep Toekomst van het Arbeidsmarktbeleid (2001, appendix 5). Applying a tax allowance for workers, the employment gain is about 10,000 jobs, which corresponds well with our findings. This implies that according to Werkgroep Toekomst van het Arbeidsmarktbeleid

[9] If the economic climate of 1990 or 1995 had been at work in 2000, employment would have been lowered by 35,000 full-time equivalent jobs, whereas the economic situation in 1998 would result in 55,000 fewer jobs.

(2001) the EITC results in a larger employment gain in comparison with the SPAK. This is among other things related to the way in which we take into account the impact of the replacement rate on wage formation. In our model the impact is only indirectly. Changes in the replacement rate influence labor supply, that in turn affects the labor market indicator *MR* in the productivity equation. In the CPB model there also exists a direct relationship. On the other hand, the CPB uses a much larger labor supply elasticity for married women.

Earlier research with respect to the effects of childcare subsidies on labour supply is inconclusive. Graafland (2000) reports a reduced form elasticity between the average childcare costs and the labor supply of partners with children of –0.15. This results from the assumption that changes in the childcare costs have the same impact as equivalent changes in the net wage. As a result, the impact of lowering childcare costs results in an effect that is three times as high as our simulation results.[10] Graafland points at the possibility that his results might overestimate the labor supply effect as he does not take account of endogenous changes of childcare subsidies. Other studies for the Netherlands, like Groot and Maassen van den Brink (1992), and more recently, Dobbelsteen et al. (2000), do not find a significant effect of child care costs on participation.

The foregoing shows that our results with respect of the EITC and childcare subsidy deviate from the resuls reported by CPB Netherlands Bureau for Economic Policy Analysis. This is partly related to the circumstance that our model focuses on the labour market, whereas CPB applies a general equilibrium model. Therefore, we are not able to take into account the impact that runs through markets, whereas CPB does. For example, higher employment may result in higher domestic consumption volumes, that in turn leads to an additional (small) increase in employment. Another difference, as said, refers to the way the replacement ratio affects wage setting. Differences also exist with respect to the wage elasticities, in particular the elasticities that refer to partners. CPB assumes an elasticity of 1.0. This elasticity has been based on estimation results and literature overviews that refer to the mid 1980s. Our estimates are in the range of 0.3 to 0.4. These latter estimates are more in line with findings for other countries applying more recent data (see section 4.4).

6. Conclusions

In this contribution we have looked at the impact of various policy measures on employment in the Netherlands. To that end we applied a static structural microeconomic model of the Dutch labor market. This model contains a productivity equation that describes the demand side of the labor market, a wage function, a labor supply function and an equation that describes minimum wage costs. The model also takes into account the impact of the business cycle. The model allows us to look at the impact of very specific policy measures.

An important finding is that we do not find evidence for a positive impact of higher minimum wages on employment. In contrary, we find a negative influence. Model simulations also show that it is less simple to combat the poverty trap (voluntary unemployment) as compared to the productivity trap (involuntary unemployment). However, efficiency gains can be achieved if more tailored policy measures are taken.

[10] This corresponds with the difference in the wage elasticity for partners.

Table 5.2, for example, shows that the SPAK is in particular effective to young, low-educated singles. We also find that generic policy with respect to the costs of child care is less effective as compared to a policy that connects benefits to the number of hours worked. It further appears that the economic climate largely affects the impact of some policies. Policy measures like labor costs reduction appear to be more effective in economic bad times, whereas other ones (like EITC) have a more stable impact. This might plea for a more specific application of various labour market instruments.

A disadvantage of the model presented is that the model has a partial nature. Therefore, we are not able to take into account the impact that runs through markets. On the other hand, this impact is mostly moderated in comparison with the initial effect. Another point is that the model is a static one. This among other things affects for example the way in which the wage equation has been specified. The replacement ratio and tax rates now only affect the wage setting process in an indirect way via the labor supply equation. This problem can be solved in a dynamic model. Another point that deserves attention is to what extent e.g. labor costs reductions are shifted forward to employees and thereby result into higher wages.

Further improvements are possible in order to derive the impact of even more specific measures. As said, one can think of a dynamic setting. In that case it is recommendable to include disability and pension decisions. Then, we will also be able to look at the impact of various policy measures that run via social insurance schemes. Secondly, it is possible to desaggregate the labor market further by region and / or industrial sector. This offers the possibility of the development of even more tailor-made policy measures.

Literature

Abowd, J.M., F. Kramarz, D.N. Margolis and T. Philippon (2000) *The Tail of Two Countries: Minimum Wages and Employment in France and the United States*. IZA DP No. 203, Bonn: IZA.

Blundell, R., A. Duncan and C. Meghir (1998) Estimating labor supply responses using tax reforms. *Econometrica*, 66, 827-861.

Blundell, R. and T. MaCurdy (1999), Labor supply: A review of alternative approaches, in: O. Ashenfelter and D. Card (eds.), *Handbook of Labor Economics, Vol. 3A*, Amsterdam: North-Holland, 1559-1695.

Bonin, H, W. Kempe and H. Schneider (2002) *Household Labor Supply Effects of Low-Wage Subsidies in Germany*. IZA Discussion paper No. 637, Bonn: IZA.

Brown, C. (1999) Minimum Wages, Employment and the Distribution of Income. In: O. Ashenfelter and D. Card (eds.) *Handbook of Labor Economics*, vol. 3B. Amsterdam: North-Holland, 1201-1263.

Burkhauser, R.V., K.A. Couch and D.C. Wittenburg (2000) A Reassessment of the New Economics of the Minimum Wage Literature with Monthly Data from the Current Population Survey. *Journal of Labor Economics*, 18, 653-680.

Card, D. and A.B. Krueger (1994) Minimum Wages and Employment: A Case Study of the Fast-Food Industry in New Jersey and Pennsylvania. *American Economic Review*, 84, 772-793.

Card, D. and A.B. Krueger (1995) *Myth and Measurement: The New Economics of the Minimum Wage*. Princeton, NJ: Princeton University Press.

Currie, J. and B.C. Fallick (1996) The Minium Wage and the Employment of Youth: Evidence from the NLSY. *Journal of Human Resources*, 31, 404-428.

Dickens, R., S. Machin and A. Manning (1999) The Effects of Minimum Wages on Employment: Theory and Evidence from Britain. *Journal of Labor Economics*, 17, 1-22.

Dobbelsteen, S.H.A.M., S.S. Gustafsson and C.M.M. P. Wetzels (2000) *Child care in the Netherlands between government, firms and parents*. Mimeo, University of Amsterdam.

Euwals, R. and A. van Soest (1999) Desired and actual labour supply of unmarried men and women in the Netherlands. *Labour Economics*, 6, 95-118.

Graafland, J.J. (2000) Childcare subsidies, labour supply and public finance: an AGE approach. *Economic Modelling*, 17, 209-246.

Groot, W. and H. Maassen van den Brink (1992) *Labor supply and non-parental child care demand*. RM 920, Amsterdam: UvA.

Keane, M. and R. Moffitt (1998) A structural model of multiple welfare program participation and labor supply. *International Economic Review*, 39, 553-589.

Kramarz, F. and T. Philippon (2001) The impact of differential payroll tax subsidies on minimum wage employment. *Journal of Public Economics*, 82, 115-146.

Machin, S. and A. Manning (1994) The Effects of Minimum Wages on Wage Dispersion and Employment: Evidence from the U.K. Wages Councils. *Industrial Labor Relations Review*, 47, 319-329.

Moffitt, R.A. (1999) Welfare Programs and Labor Supply. In: A.J. Auerbach and M.D. Intriligator (eds.) *Handbook of Public Economics*, vol. 4. Amsterdam: North-Holland, 2393-2430.

Mühlau, P. and W. Salverda (2000) Employment effects of low-wage subsidies: The case of 'SPAK' in the Netherlands. In: W. Salverda, C. Lucifora en B. Nolan (eds.) *Policy measures for low-wage employment in Europe*. Cheltenham: Edward Elgar.

Scutella, R. (2000) *Labour Supply Estimates for Married Women in Australia*. Melbourne Institute Working Paper 25/99. Melbourne.

Van den Berg, G.J. and G. Ridder (1997) Het effect van minimumloon en uitkeringshoogte op werkloosheid en lonen. *Tijdschrift voor Politieke Ekonomie*, 20, 150-163.