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Do medical doctors respond to economic incentives? [1]

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Abstract

A longitudinal analysis of married physicians labor supply is carried out on Norwegian data from 1997 to 1999. The model utilized for estimation implies that physicians can choose among 10 different job packages which are a combination of part time/full time, hospital/primary care, private/public sector, and not working. Their current choice is influenced by past available options due to a taste or habit persistence parameter in the utility function. In the estimation we take into account the budget constraint, including all features of the tax system. Our results imply that an overall wage increase or less progressive taxation moves married physicians towards full time job packages, in particular to full time jobs in the private sector. But the overall and aggregate labor supply elasticities in the population of employed doctors are rather low compared to previous estimates.

JEL classifications: J22, I10, C35
Keywords: Physicians' labor supply, multi-sector, panel data.

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1. Introduction

In this paper we study what determines the supplied working hours of employed medical doctors. In particular, we investigate the choice between working in public and private institutions, and between full time and part time contracts. As economists, we tend to think that wages and taxes are among the most relevant determinants of (physicians') labour supply. But many other relevant features are also important. Some have to do with contracts characteristics, with sectors, with hours. Some have to do with job satisfaction and motivation. In this paper, we model physicians' labour supply choices taking into account also non-pecuniary characteristics of different job types. Based on this type of model we investigate how changes in wages and taxation affect both the overall labour supply and the choice of job-type.

We estimate a structural labour supply model that allows for choices between types of jobs. The physicians are assumed to maximize utility given their budget constraints and given the availability of different types of jobs. The jobs differ with respect to the working loads. At each point in time physicians can choose between 10 different states which are a combination of working full time or part time, working in hospitals or primary care, working in the public or private sector and not working. Our model extends the basic multinomial logit model applied to panel data[6] and it is based on an econometric model developed by Dagsvik (2002). In our model, the current choice depends on all the utility functions associated with each alternative in the past, not only the optimal ones. Thus, we allow for the random parts of the utility functions to be correlated across time and types of jobs, which implies that taste or habit persistence is included in an otherwise multinomial logit model estimated on panel data. This behavioural assumption implies that individuals' past options (and not only past optimal choices, which would have introduced state dependence in the model) matter for current choices. The model is estimated on transitions between jobs based on a panel of 6,564 married employed Norwegian physicians from 1997 to 1999. In our data we do not observe self-employed physicians[7].

Our paper differs from earlier literature on physicians' labour supply because it is the first time that a labour supply model is estimated taking into account choices among job types and

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[6] See for instance Train (2003) or Cameron (2005).

[7] In the period we are analyzing around 14 percent of physicians were self-employed (General Practitioners)

habit persistence over time. Baltagi et al. (2005) estimates a labour supply of 1303 male physicians employed only in Norwegian hospitals who worked for the whole period 1993-1997 and they obtain labour supply elasticities around 0.3. Our paper differs from theirs in many respects. The most relevant difference is that we assume that doctors can choose between different job types with predetermined number of hours, offered by the management in hospital and primary care. There are thus institutional constraints on hours worked that we have to consider when calculating the responses to economic incentives.

Saether (2005, physicians) and Di Tommaso et al (2009, Nurses) utilize a model that is similar to ours but it is a static model estimated on data from one year. He finds that a wage increase causes a modest response in total hours and a reallocation of hours in favor of the sector with increased wages. Midtunn (2007) analyzes the Norwegian physicians' choice to work only in the private sector. Gjerberg (2001) studies physicians' choice of specialty among female and male Norwegian physicians. Godager et al. 2009) concentrate their analysis on choices of working hours of 435 Norwegian General Practitioners after the reform of 2001 where GP's became self-employed. Also Grytten et al. (2008) study a particular aspect of the wage structure of Norwegian GP's: the effect of General Practitioners fees' changes on their income.

Labour supply of medical doctors has been studied also in other countries but none of the previous studies is similar to ours: Rizzo (1994) analyzes only self-employed physicians. Showalter and Thurston (1997) find elasticities for self-employed US physicians equal to 0.33 while the effect is small and insignificant for employed physicians. Their paper utilizes a labour supply model that is similar to the one of Baltagi et al (2005). Ikenwilo (2007) estimates a labour supply model where they include job satisfaction. They use data from a Scottish survey of physicians. The uncompensated earnings elasticities vary between 0.09 (without job's quality controls) and 0.12 when they control for job's quality. Elasticities are lower for physicians working full time and they find the usual gender difference in the elasticities.

Our results imply that overall wage increases and tax reductions give the medical doctors an incentive to move to full time jobs, in particular in the private sector, at the expense of working in other jobs in the health care sector of economy. Because we allow other attributes than observed economic incentives to matter in explaining behaviour, captured by random parts in the preference structure, and because availability of jobs and restrictions on hours work vary across jobs, the overall impact of changes in economic incentives on labour supply among employed Norwegian medical doctors is rather modest. Our estimates of labour supply elasticities are in line with the results for *employed* doctors reported in Showalter and Thurston (1997) and Ikenwilo (2007). It should be noted that the impact of a wage increase on labour supply is in part absorbed by taxation. Because all details of a step-wise linear progressive tax system is accounted for in our model, this absorption is explicitly accounted for.

The paper is organised as follows. In Section 2 the model is presented. Section 3 describes the data. Estimates are given in Section 4. Elasticities and the impact of changes in taxation are presented in Section 5. Section 6 concludes.

2. The model

2.1 The random utility labour supply model

We will assume that physicians make a choice of where to work according to what maximizes his or her utility. In what follows, we will estimate this behavior on panel data and we thus need a model that accounts for transition between states. The model we employ allows for habit persistence and therefore correlation in utilities across time. Our econometric model builds on the econometric framework developed in Dagsvik (2002). Let $U_{jn}(t)$ be the utility of physician n when working in job type j at time t. The utility function is assumed to be random because there are job attributes that affect preferences that we do not observe. Let $v_{jn}(t)$ be the systematic part of the utility function and let $\varepsilon_{jn}(t)$ be the random taste shifter, assumed to be independent and identical extreme value distributed. Following Dagsvik (2002), we assume that

$$U_{jn}(t) = max_j \left[U_{jn}(t-1) - \rho, v_{jn}(t) + \varepsilon_{jn}(t) \right] \quad (1)$$

The coefficient ρ is a preference discount factor. If $\rho = 0$ there is a complete strong taste or habit persistence, and if $\rho = \infty$ there is no taste persistence at all and $U_{jn}(t) = v_{jn}(t) + \varepsilon_{jn}(t)$. The inclusion of taste or habit persistence is a behavioural assumption and it implies that individuals' past options (and not only past optimal choices) matter for current choices. This implies that the current choice depends on all the utility functions associated with each alternative in the past, not only the optimal one.

Equation (1) means that the utility of choosing alternative j at time t is the highest of the two in the bracket. The first entry is the optimal utility lagged one year and where ρ captures habit persistence. Obviously, if ρ is infinitely large then $U_{jn}(t)=max_j\left[v_{jn}(t)+\varepsilon_{jn}(t)\right]$. In this case choices at each point in time will be related to a current random utility function and the model that can be estimated on panel data will be a standard multinomial logit model, see Train (2003). If ρ is not very large, habit persistence plays an role in explaining behavior.

As demonstrated by Resnick and Roy (1990), see also Dagsvik (2002), we get a particular autocorrelation function of the utility process in (1):

$$(2)\quad corr\left\{exp\left[-U_{jn}(s)\right],exp\left[-U_{jn}(t)\right]\right\}=e^{\left(v_j(s)-v_j(t)-(t-s)\rho\right)}\ ;\ for\ s\leq t$$

We observe that if covariates are constant over time the autocorrelation from t to t-1 is approximately equal to $e^{-\rho}$. If $\rho=\infty$, there is no correlation and the model degenerates to a standard multinomial logit model that can be estimated on panel data, see Train (2003). If $\rho=0$, then utilities are perfectly correlated across time. The motivation for applying this particular utility process is that we believe that habit persistence may play an important role in the behaviour of individuals, also in the labour market.

As shown in Dagsvik (2002) the model can be employed to yield transition probabilities, which here will be estimated on panel data. We will assume that doctor *n* will choose the state that maximizes utility, given his or her choice set. Physicians can choose between 10 states, which vary with respect to type of institution (hospitals versus primary care), sector (public versus private) and hours offered by the institutions in the health care sector (part time versus full time). Part time is defined as a number of hours of work less than 30. We will assume that the choice set is the same for all physicians. The choice set is related to availability of jobs, characterized by offered hours. Thus, in our model the physicians are not free to choose any hours they like to work. We will assume that

$$(3)\quad g_{jnt}(h_{jnt}) = exp(d_j z_{jnt});\ z_{jnt} = 1\, if\ h_{jnt} \geq 30; = 0\ otherwise$$

Note that the *g(.)* function captures the rationing of full time jobs and d_j are parameters to be estimated for each sector *j*. The *g(.)* function capture the availability of full time hours in the different jobs.[8] In the estimation, the sum of d_j has an upper bound which ensures that that $0 \leq d_j < 1$ for all *j*.

Let Q_{ijnt} denotes the probability that doctor n moves from state i in period t-1 to state $_j$ in period t, and Q_{iint} denotes the probability that doctor n stays in state i also in period t.

With the assumed probability distribution for ε_{jnt}, we get (Dagsvik (2002):

$$(4)\quad \begin{aligned} Q_{ijnt} &= \frac{V_{jnt}}{\sum_{r=t_0}^{t}\left\{\left[exp(-(t-r)\rho)\right]\sum_{k=0}^{9} V_{knr}\right\}};\ \forall\ i,j = 0,1,2,...,9 \\ Q_{iint} &= 1 - \sum_{\substack{j=0 \\ j\neq i}}^{9} Q_{ijnt};\forall\ i,j = 0,1,2,...,9 \end{aligned}$$

where $V_{jnt}=exp(v_{jnt})g_{jnt}$

The different job types that the employed doctor can choose between are:

0 = not working

1 = working part time in a hospital in the private sector;

2 = working full time in a hospital in the private sector;

3 = working part time in primary care in the private sector;

4 = working full time in primary care in the private sector;

5 = working part time in a hospital in the public sector;

6 = working full time in a hospital in the public sector;

7 = working part time in primary care in the public sector;

8 = working full time in primary care in the public sector;

9= working in other sectors.

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[8] See Dagsvik and Strøm (2006) for further details about rationing of jobs in labor supply models.

The states, 1-9, give all possible type of jobs that employed physicians can choose between, and hence should be part of a labor supply model that attempts at studying labor supply among the stock of employed physicians.

2.2 The deterministic part of the utility function

We will assume that the systematic or deterministic part of the utility function is given by:

$$(5)\quad log\, v_{jnt} = (A + \sum_{s=1}^{5} a_s X_{snt})\frac{(C_{jnt}10^{-5})^{\lambda} - 1}{\lambda} + (B + \sum_{s=6}^{8} b_s X_{snt})\frac{(L_{jnt} - L_0)^{\gamma} - 1}{\gamma}$$

Here C_{jnt} is disposable annual income, and it is given by

$$(6)\qquad C_{jnt}=f_t(w_{jnt}h_{jnt}+SI_{nt})+I_{nt},$$

w_{jnt} is the hourly wage rate, h_{jnt} denotes annual hours of work, SI_{nt} is the wage income from secondary jobs and I_{nt} is non-labor income, including the after-tax income of a spouse, child benefits and other benefits. The functional form of $f_t(.)$ depends on the characteristics of the tax function, $T_t(.)$, which is a step-wise linear tax function at time t, see tables B.1-B.4 in Appendix B. Thus, in our model the economic incentives agents are facing when choosing among states in the labour market is accounted for in great detail.

Annual leisure is denoted L_{jnt}. We assume 12 hours a day for rest and sleep and 48 weeks of work a year. Therefore, leisure in this definition is equal to the total number of hours in a year (8760) minus sleeping time in a year minus hours of work. Leisure includes therefore hours in the week-ends and in vacation time:

$$(7)\quad L_{jnt} = \frac{8760 - (12x365) - 48h_{jnt}}{8760}$$

Moreover X_{1nt} is age and X_{2nt} is age squared. We account for the possibility that there is an impact on hours supplied when spouses are working in jobs where which shift work is very common like in the health sector. We have thus included a dummy variable X_{3nt} which equals 1 if the medical doctor is married to a person in the health sector, and equal 0 otherwise. Other observed covariates that are included to account for observed heterogeneity are the dummy variables X_{4nt} that equals 1 if more than one job, and equal to 0 otherwise, X_{5nt} equals 1 if working in *turnus*[9], and equal to 0 otherwise; X_{6nt} equals 1 if number of children ≤6; and X_{7nt} equals 1 if number of children {>6,≤11}and finally X_{8nt} equals 1 if female, and equal to 0 otherwise.

To account for the possibility that habit persistence may increase with age (a lower preference discount parameter) we let the preference discount parameter ρ depend on the age and age squared of the doctor:

$$(8)\quad \rho_n = \rho_0 + \rho_1 X_{1n} + \rho_2 X_{2n}$$

2.3 The wage equations

In order to estimate the model we need estimates of the wage equations. Log wage is assumed to depend on observed covariates (the Z-vector to be defined below) and a random term. The random term consist of two parts; one that is distributed across job types, individuals and time, and one that is distributed only across individuals. The latter random component accounts for correlation in wages across type of jobs at each point in time. The wage equations are the following:

$$(9)\quad \left\langle \begin{array}{l} log\, W_{int} = Z_{nt}\beta_{it} + \eta_{int} \\ \eta_{int} = \tilde{e}_{int} + \kappa_{it}\tau_n \\ \tau_n \sim L(0,1) \\ \tilde{e}_{int} = \sigma_{it} e_{int},\, where\ e_{int} \sim L(0,1) \end{array} \right|$$

L(0,1) is the standard logistic distribution

We then get

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[9] It is mandatory for all physicians to work their final year of studying medicine as an apprentice doctor in a given, often rural, location.

$$(10)\quad log\, W_{int} = Z_{nt}\beta_{it} + \sigma_{it}e_{int} + \kappa_{it}\tau_{n}; \qquad i = 1,2,,,9$$

The correlations in wages across jobs are given by:

$$(11)\quad \left\langle \begin{array}{l} cov(\eta_{int},\eta_{jnt}) = E\left[\eta_{int}\eta_{jnt}\right] = \kappa_{it}\kappa_{jt} \\ corr(\eta_{int},\eta_{jnt}) = \dfrac{\kappa_{it}\kappa_{jt}}{\sqrt{\sigma_{it}^{2}+\kappa_{it}^{2}}\sqrt{\sigma_{jt}^{2}+\kappa_{jt}^{2}}} \end{array} \right|$$

The wage equations are estimated separately, but we account for selection in the following way. We estimate a set of coefficients for every year. Hence we are using 3 (1997-1999) cross-section datasets to estimate the coefficients. In the estimation of the wage equation we use a larger data set. Unmarried doctors are included and the justification is that there are no reasons to expect wages to differ with respect to marital status. The coefficients vary across the 9 job types and over time. The vector of the explanatory variables Z_{nt} is (1, age, gender, centrality index[10], education)

Let φ be the density for the normalized (0,1) logistic density distribution. And let

$$(12)\quad \left\langle \begin{array}{l} L_{t} = \prod_{j=1}^{9}\dfrac{1}{\sigma_{jt}w_{jnt}}\varphi\left(\dfrac{log\, w_{jnt} - Z_{nt}\beta_{jt} - \kappa_{jt}\tau_{n} - \lambda_{jt}\, log\, P_{jnt}}{\sigma_{jt}}\right) \\ and \\ \hat{\varphi}(.) = \dfrac{1}{S}\sum_{1}^{S}\varphi\left(\dfrac{log\, w_{jnt} - Z_{nt}\beta_{jt} - \kappa_{jt}\tau_{n}^{s} - \lambda_{jt}\, log\, P_{jnt}}{\sigma_{jt}}\right) \\ and \\ log\hat{L}_{t} = \sum_{n=1}^{N_{t}}\sum_{j=1}^{9} - log\,\sigma_{jt} - log\, w_{jnt} + log\,\hat{\varphi}(.) \end{array} \right|$$

The latter $log\hat{L}_{t}$ is used to estimate coefficients in the wage equations. Here s is a random draw for each individual from a standard logistic distribution, number of draws are S=20. P_{jnt}

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[10] See table C.2 for descriptive statistics of these variables.

is a standard multinomial logit probability (for doctor n, working in job type j at time t) used to capture selection effects, see Strøm and Wagenhals m (1991) for an outline of selection effects in wage equations with logistic distributed error terms.

$$(13)\quad \left\langle \begin{array}{l} P_{jnt} = \dfrac{v_{jnt}}{\sum_{k=0}^{9} v_{knt}};\, j = 0,1,2,,,9 \\ v_{jnt} = y_{nt}\alpha_{jt} \end{array} \right|$$

Here the vector y_{nt} is (1,age,education, number of children above and below 6 years of age, dummy for married or cohabiting, dummy for married to a person working in the health sector or not, spouse income). Note that the coefficients, both in the wage equations and in the probabilities capturing selection effects, $P_{jnt,}$ vary across alternatives and over time. Not working is among the alternatives in the probabilities. The estimates of the wage equations and the probabilities related to selection effects, as well as summary statistics, are given in Appendix C.

2.4 The estimation procedure

To proceed with the estimation of the utility function we first have to calculate the disposable income function, here called consumption, in each of the 10 states. For all states, irrespective of the fact that we have observed the wage in the job chosen by the agent, we use the wage equation, including all terms, also the error terms. For the working states we have done the following:

$$(14)\quad \left\langle \begin{array}{l} C_{int} = f_t(w_{int}h_{jnt} + I_{nst}) + I_{nt}, \quad i=1,2,,9 \\ f_t(w_{int}h_{int} + I_{nst}) = w_{int}h_{int} + I_{nst} - T(w_{int}h_{int} + I_{nst}) \\ log\, W_{int} = Z_{nt}\beta_{it} + \hat{\sigma}_{it}e_{int} + \hat{\kappa}_i\tau_n; \quad i = 1,2,,,9 \end{array} \right|$$

The consumption that we will use in the estimation of the utility function is:

$$(15)\quad \bar{C}_{int} = \frac{1}{SR}\sum_{s=1}^{S}\sum_{r=1}^{R} f_t\left[exp(Z_{nt}\hat{\beta}_{it} + \hat{\sigma}_{it}e^{s}_{int} + \hat{\kappa}_i\tau^{r}_{n})h_{int} + I_{nst}\right], \quad i=1,2,,9$$

Here the coefficients in the wage equations are estimated from the previous step. s=1,2,,,S and r=1,2,,,R are draws from the standard logistic distribution. We have used S=R=20. Instead of integrating out the error terms in the wage equations in the disposable income function, we could have integrated them out in the final likelihood function. Due to the complexity of the model we have chosen to do the former. Due to the random variables in the wage equations which are present in the transition probabilities, the assumption of IIA is avoided.

The parameters of the utility function, including the habit persistence parameter ρ, are estimated in a maximum likelihood approach where the likelihood depends on the transition probabilities. The initial year, t_0, is 1997, and the years where transitions can take place are 1998 and 1999. Let the vector of coefficients of to be estimated be π.

Suppressing the observed variables and the random variables that are integrated out, the transition probabilities can be written

$$(16)\quad Q_{ijnt} = Q_{ijnt}(\pi)$$

The likelihood for our sample is:

$$(17)\quad L = \prod_{t=1997}^{1999} \prod_{n=1}^{N_t} \prod_{i=1}^{9} \prod_{j=1}^{9} Q_{ijnt}(\pi)^{y_{i(t-1),j(t),n}}$$

$$y_{i(t-1),j(t),n} = 1\, if\ n\ transit\ from\ state\ i\ in\ year\ t-1\ to\ state\ j\ in\ year\ t$$

$$otherwise$$

$$y_{i(t-1),j(t),n} = 0$$

The coefficients π are estimated by maximizing the likelihood function. Notice that for each individual there are only two probabilities present in the likelihood, namely those related to the transitions chosen.

3. **Data**

The data used in this study are the result of merging register data from Statistics Norway with data on physicians collected by The Norwegian Association of Local and Regional Authorities (from the PAI[11] register). The register data from Statistics Norway consists of demographic, educational, income and labor market data. The income data is taken from tax returns, while the labor market data consist of employee data merged with data on employers.

The resulting panel data set covers *all* employed physicians in Norway in the period 1996 – 2000. We consider an individual as a doctor either if the person's educational attainment is as a doctor or if the person works as a doctor. In this way we include persons who might have education abroad (in which cases the registered educational attainment might not be as a doctor). In the year 2000 there were 12,376 employed physicians in Norway. We excluded the years 1996 and 2000 from our estimation because of problems with the capital income variables in 1996 (our income variables are taken from tax returns and therefore are vulnerable to changes in definitions of taxable income) and with the distribution over sectors in 2000.

Observations of individuals with missing values for gender or job affiliation were dropped. To simplify our analysis we chose to estimate the model for those who were physicians throughout the period 1997 – 1999 and who did not change marital status during this period. Individuals who were not a doctor in this period were thereby dropped as were those who became married or divorced. Table A.1 in Appendix 1 gives an overview of the relationship between our original data set and the data set for which we have estimated our model: 6,564 married physicians.

We coded the data so that we ended up with 10 different sectors of work (including not working) divided according to whether a doctor worked in a hospital or in general health care, whether in a public or private institution and whether it was part-time and full time[12]. Our data only included hours worked per year, so weekly hours are calculated by dividing hours

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[11] The PAI register consists of data on workers in public enterprises, including physicians and nurses working in hospitals and health care.

[12] The part-time category includes physicians who work less than 30 hours a week.

worked in a year by 48 (weeks in a year minus vacation). For physicians not working in a hospital or health care, we do not differentiate between part-time and full- time work. Doctors choose between the different sectors under the assumption that in each sector they will receive a wage generated by the wage equations and work the average observed hours in the sector. Table A.2 shows the number of hours worked in the different sectors. Working hours are longer in the private sector compared to in the public sector.

Table A.3 gives the distribution of married physicians by gender and across sectors. Women constitute around 27 per cent of doctors. Most doctors work in public hospitals followed by the sector called other, and then followed by public health care. Table A.4 provides the age distribution of married doctors in the three years considered in the analysis.

Our model is based on the assumption that we can simulate the different levels of consumption and leisure which could be achieved by each individual in each sector if they chose to work there. Our calculations are based on estimated wage equations done independently for the three years 1997, 1998 and 1999. These estimates are commented on in Appendix C. The resulting levels of possible consumption and leisure are reported in Table A. 5. For the states which are observed chosen by an individual we use observed leisure, while for other potential, but not chosen states, we use average leisure among those observed in the state. Consumption is determined by wage income, capital income, transfer income and the income of the spouse. All income variables were deflated by the consumer price index. Leisure is expressed as a percentage of available time. Available time includes time over the week-ends and vacation time but excludes 12 hours per day of sleeping and personal care time. Table A. 5 shows that leisure is slightly increasing over time except for physicians working full time in private and public health care.

Table A. 6 shows the mean of the dummy for observed working full time in a sector or not. The percentage of physicians working full time in the “other” sector has been falling, while it has been increasing in the “private hospital” and “private health care” sectors. Summary statistics for the remaining explanatory variables are given in Table A.7. We use dummy variables for whether the spouse works in the health sector, whether the doctor has a side job in addition to the main job and whether the doctor is working “turnus”.

In Tables A.8.1-4, we report the observed transitions across states. Although "stayers" are dominating there are also a considerable amount of "movers".

4. Estimates.

In Table 1 we give the estimates of the utility function and of the density function for offered hours in full time jobs.

Table 1. Estimates of the utility function and offered hours density.

Variables (1)	Coefficients (2)	Estimates (3)	Std. Err. (4)	
Consumption:				
Constant	A	-2.28	0.8230	***
Age	a_1	0.14	0.0355	***
Age squared	a_2	-0.0016	0.000367	***
Married to a person in the health sector	a_3	0.15	0.0541	***
More than one job	a_4	0.22	0.0526	***
Working during last year of university	a_5	-0.71	0.1933	***
Exponent	λ	0.31	0.0651	***
Leisure:				
Constant	B	5.07	0.3906	***
Number of children ≤6	b_1	0.09	0.0960	
Number of children {>6,≤18}	b_2	0.24	0.0729	***
Female	b_3	0.10	0.1626	
Exponent	γ	0.42	0.1799	**
Taste correlation:				
Constant	ρ_0	13.76	1.4822	***
Age	ρ_1	-0.49	0.0593	***
Age squared	ρ_3	0.0046	0.0006	***
Density, offered hours, full time:				
Public hospitals	d_2	0.25	0.0024	***
Private hospitals	d_4	0.13	0.0078	***
Public prim.care	d_6	0.21	0.0038	***
Private prim.care	d_8	0.17	0.0060	***

No of observations	6564
Log likelihood	-10993
McFaddens rho	0.27

*** statistically significant parameter at 1% confidence level

The estimates of λ and γ imply that the deterministic part of the utility function is strictly concave.

Marginal utility of consumption is estimated to increase with age until till the age of 44. Thus younger physicians are estimated to be willing to work more than the older ones. With a spouse working in the health sector the incentives to go for higher working loads is strengthen. For physicians who are doing their internship ("turnus") the impact is the opposite[13].

Marginal utility of leisure is estimated to increase with the number of older children, which imply lesser incentives to go for high working loads. Young children has no impact and may be due to the fact that day care centers are available at the working place and/or that flexible working hours makes it easier to combine work and having small children. Gender has no impact on the marginal utility of leisure. This result could be related to the fact that our sample contains only highly educated individuals and also to the relatively egalitarian division of unpaid labor within the household in the Norwegian society.

The estimate of the discounting of utilities (the ρ-function) implies that it decreases with age up to the age of 53. The decline with age means that the *younger* the doctor is, the more he or she can be willing to move between jobs. After the age of 53, the estimated discounting indicate that physicians above this age again become more mobile (ρ becomes higher again), which may be due to the fact that older physicians leave the more strenuous full time job in hospitals and move to lower working loads or to jobs outside hospitals.

The estimates of the density of offered hours imply that full time jobs are more available in public hospitals and public primary care relative to in the private sector. However, it should be kept in mind that a full time job in the private sector has more hours than in the public sector (see Table A.2).

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[13] There are few physicians doing their internship in the sample, ranging from 3 to 0 percent in the three years of the panel. In Appendix D we give the estimates of the utility functions without "turnus" doctors. Comparing Table1 and the Table in Appendix D we observe that the estimates are nearly identical. The labour supply elasticities are also nearly identical, with and without "turnus" doctors.

5. Labor supply elasticities and the impact of less progressive taxes on labor supply.

To calculate labour supply elasticites we use the whole model to calculate elasticities, with random preferences, densities of offered hours, random parts in wage equations, correlation of wages across job types and the step-wise linear tax function according to tax rules. These elasticities, denoted *aggregate* elasticities, means that we have to account for the possibility that number of physicians working in some states increases at the expense of a reduction in other states. Thus, we should expect that these aggregate elasticities are lower than the individual, job-specific labor supply elasticities.[14]. We would argue that it is these aggregate elasticities that are of interest for the health authorities. The reason is that they give the impact of wage increases, or changes in taxation, on the total hours supplied by all employed physicians in the population, and where details of the economic incentives, such as wages and tax structures, are embedded in a framework where institutional constraints are accounted for, and where unobserved non-pecuniary factors give rise to probabilities of working hours rather than deterministic predictions of working hours[15].

To find the aggregate labor supply elasticities we have calculated (or rather simulated) the impact of an overall increase in wages in 1997, 1998 and 1999 on total labour supply for employed physicians. Wages are increased in all 10 states.

An important aspect of our model is that an overall wage increase, or job-specific wage increase, may move the physicians between the different job types. Given that he or she works in a hospital, an increase in labour supply may imply a move from part-time jobs to full time jobs. Or he or she can move to jobs with higher working loads outside hospitals. As mentioned above we account for the fact that there are institutional constraints on hours worked that we have to consider when calculating the responses to economic incentives.

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[14] If we use only the deterministic part of the utility function, we find that these individual job-specific labour supply elasticities for physicians working in public and private hospitals, calculated at mean values, in 1999, are around 0.5. These individual job specific elasticities are comparable with the ones reported in Baltagi et al (2005), although ours are somewhat higher (0.5) than theirs (0.3).

[15] See Quandt (1956) for an early discussion of the importance of employing random utility functions in explaining human behavior and how this would modify the impact of economic incentives on behavior.

Table 2 reports the impact of changes in wages and taxes on the mobility of physicians. In column 1, we report how the mobility of physicians between states in 1999 is affected by a 1 per cent increase in wages in 1997, 1998 and 1999.

Table 2. The impact of changes in wages and taxes on the mobility of physicians in 1997-1999. 6564 married physicians. Percentage change in number of physicians and hours.

Job types	(1) 1% wage increase in 1997, 1998 and 1999	(2) 28% flat tax in 1997, 1998 and 1999	(3) 2006 tax schedule used in 1999	(4) 1% wage increase hospital doctors in 1997, 1998 and 1999
Number physicians				
0. Not working	-0.30	-1.53	-4.19	-0.16
1. Public hospitals, part time	0.02	-1.73	0.16	0.15
2. Public hospitals, full time	0.03	0.79	0.09	0.06
3. Private hospitals, part time	0.04	-2.84	2.37	0.22
4. Private hospitals, full time	0.26	11.43	4.74	0.41
5. Public primary care, part time	-0.03	-2.17	-0.54	-0.13
6. Public primary care, full time	0.06	1.98	0.91	-0.08
7. Private primary care, part time	-0.03	-3.49	1.6	-0.18
8. Private primary care, full time	0.14	5.05	2.73	-0.13
9. Other	0.04	-0.54	-0.33	-0.08
Weighted average of total hours	0.04	0.76	0.43	0.03

We find that an overall wage increase move physicians' labour supply away from the public sector to the private sector, in particular to private hospitals working full time. The weighted overall aggregate labour supply elasticity, with total hours in the ten states as weights, is rather modest, 0.04. The overall wage increase also reduces the probability of not working. The elasticity of not working with respect to an overall wage increase is about -0.3.

The overall weighted elasticity of only 0.04 shadows for higher elasticity in specific jobs. An overall one per cent wage increase in the period 1997-1999 increases the number of physicians in full time jobs in private hospitals by 0.26 percent (Table 2 col.1). This elasticity is not directly comparable with the job-specific elasticity reported above (around 0.5). There are two reasons for this. In the first place, the 0.26 elasticity is derived from a model where the random parts of the utility functions and wage equations are accounted for when the elasticity is calculated. These random parts of the utility function capture other attributes than the pure economic incentives related to working in different types of jobs in the health sector. If these random parts of preferences are ignored, after the model is estimated, one puts too much weight on economic incentives in explaining behaviour. Second, it is embedded in a framework where the physicians are allowed to move between different types of jobs. An overall wage increase may move the physicians that work the shortest hours (part time) towards job types with higher working loads (full time). If one fails to take into account that a wage increase shifts physicians around, one risk to overestimate the labour supply elasticities among physicians.

If only wages in the public and private hospitals are increased, the move towards jobs, in particular to private hospitals is increased at the expense of working in jobs outside hospitals and working in primary care (col. 4 in Table 9). The number of physicians working full time and part time in the private sector increases by respectively 0.41 percent and 0.22 percent. The equivalent increases in the public hospitals are more modest, 0.06 and 0.15, respectively. Because there are far more physicians working in the public sector, the weighted average elasticities over the four possible states in private and public hospitals (full time and part time) in 1999 is 0.08, while the weighted aggregate elasticity for the whole stock of physicians is 0.03, which is due to the fact that physicians move from jobs outside hospitals to jobs in hospitals. The job type that has the strongest reduction is part time jobs in private primary care, -0.18 percent. The wage increase also increases the number of employed physicians (not working goes down by -0.16 percent).

When using the whole sample of physicians in the calculation of elasticities heterogeneity in the population affects the result. Of course, it is of importance to account for this heterogeneity. To illustrate this we have also used the whole model to calculate or simulate the elasticity for a female doctor, aged 35, with a spouse not working in the health sector and with no children. The weighted overall aggregate labour supply elasticity, with total hours in the ten states as weights, now becomes 0.12, while for the whole population as reported above it was 0.04. Clearly, heterogeneity matters in the assessment of how wage and tax changes affect labour supply.

We have also calculated the impact on the transition between states of replacing the current progressive tax structure in the relevant years (1997, 1998 and 1999) by a flat tax of 0.28 (see Table 2 col. 2), which is a considerable change in marginal tax rates[16]. This tax change move physicians away from part time jobs towards full time jobs in both public and private sector, but the transition to private hospitals is by far the strongest. The number of physicians working in private hospitals increases by as much as 11.43 percent, mostly at the expense of physicians working part time jobs in hospitals and primary care. The impact on total hours in the population of medical doctors is rather modest; an increase of only 0.76 percent. For the female doctor aged 35 mentioned above the corresponding increase is 1.90 percent. Clearly, heterogeneity matters in the assessment of tax rate changes on labour supply.

In 2006 the Norwegian tax structure was reformed with a rather strong cut in top marginal taxes[17]. When the tax function in 1999 is replaced by the tax function of 2006, we find results similar to the ones we found with a flat tax of 28% (see Table 2 col. 3). The responses, however, are weaker. Medical doctors get an incentive to move to private hospital (an increase of 4.74% in full time jobs). The overall impact on supplied hours among employed physicians is only 0.43%.

In Table 3 we report how consumption changes according to the different simulations reported above. From Table 3 column 1, we observe that a one per cent wage increase implies a change in consumption ranging from 0.3 to 0.5 per cent in 1999.The highest change in consumption occurs for individuals working full time in private hospitals (0.51 percent). The introduction of a 28% flat tax (Table 3 col. 2) raises consumption for physicians' working full time. The reason for reduction in consumption for doctors working part time is that their average tax in the observed tax regimes is less than 28%.

From Table 3 column 3, we observe that the less progressive tax structure of 2006 increases disposable income among medical doctors by 6-8%. Physicians working full time in private hospitals get the highest increase.

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[16] See Appendix B for the complete tax structure in 1997, 1998, and 1999.

[17] The highest marginal rate in 2006 is equal to 44,8%, while in 1999 it is equal to 49,3%. Note that to be taxed at the highest tax rate in 2006 (44.8 %) the income in real terms has to be considerably higher than the income taxed on the margin by 49.8 % in 1999. The reform in 2006 thus implied a considerable swing away from progressive taxation. See Tables A.3 and A.4 in appendix A.

Table 3. Per cent change in consumption when wages increase by 1 % or a 28 % flat tax is introduced and when 1999 tax schedule is replaced by 2006 tax schedule. 6564 married physicians.

	(1) 1% wage increase in 1997, 1998 and 1999			(2) 28% flat tax in 1997, 1998 and 1999			(3) 2006 tax schedule used in 1999
Job types	1997	1998	1999	1997	1998	1999	
0. Not working	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1. Public hospitals, part time	0.35	0.39	0.37	0.41	-0.22	-0.88	6.27
2. Public hospitals, full time	0.40	0.44	0.42	6.28	6.56	5.02	7.25
3. Private hospitals, part time	0.35	0.41	0.38	0.67	1.20	-0.72	6.23
4. Private hospitals, full time	0.46	0.50	0.51	10.45	10.57	11.15	8.26
5. Public primary care, part time	0.30	0.34	0.33	-1.04	-1.45	-1.73	6.46
6. Public primary care, full time	0.39	0.43	0.42	5.52	6.14	5.00	7.25
7. Private primary care, part time	0.28	0.33	0.33	-1.24	-1.55	-1.76	6.47
8. Private primary care, full time	0.39	0.44	0.45	5.35	6.70	7.23	7.71
9. Other	0.36	0.42	0.41	1.53	0.64	0.20	5.94

6. Conclusion

We have estimated a structural labour supply model that allows for choices between types of jobs. At each point in time, physicians can choose between 10 different states which are a combination of working full time or part time, working in hospitals or primary care, working in the public or private sector and not working. In our model, the current choice depends on all the utility functions associated with each alternative in the past, not only the optimal ones. Thus, we allow for the random parts of the utility functions to be correlated across time and types of jobs (taste persistence). This behavioural assumption implies that individuals' past options (and not only past optimal choices) matter for current choices. The model is estimated on a panel of 6,564 married Norwegian physicians from 1997 to 1999.

Our study implies that overall wage increases and tax reductions give the medical doctors an incentive to move to full time jobs, in particular in the private sector, at the expense of working in other jobs in the health sector of the economy. Because we allow other attributes than pure economic incentives to matter in explaining behaviour, captured by random parts in the preference structure, and because availability of jobs and restrictions on hours worked vary across jobs, the overall impact on labour supply among Norwegian medical doctors of changes in economic incentives is rather modest.

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Appendix A. Data

Table A. 1. Sample selection

Norwegians who were physicians in 2000, original data set	12,376
Dropped due to missing sector or missing gender	688
Dropped if not a doctor in 1997, 1998 or 1999	2,172
Dropped if a change of civil status occurred 1997 - 1999	1,175
Dropped if occupation not relevant	18
Total retained	8,323
Married and a doctor throughout 1997 - 1999:	6,564
Unmarried and a doctor throughout 1997 - 1999:	1,759
Sum	8,323

Table A. 2. Average weekly hours across sectors.

	1997	1998	1999
1. Public hospital, part-time	20.0	19.1	18.7
2. “ “ full time	40.0	39.9	39.3
3. Private hospital, part-time	19.1	20.2	18.5
4. “ “ full time	42.2	41.9	42.1
5. Public health care, part-time	16.7	15.7	15.6
6. “ “ full time	40.5	40.6	40.6
7. Private health care, part-time	14.6	13.2	13.9
8. “ “ full time	42.3	42.6	42.8
9.other	29.3	26.7	26.2

Table A.3. Distribution of married physicians by gender and across sectors.

	1997		1998		1999	
	Male	female	male	female	male	Female
Physicians married throughout 1997 - 1999	4,765	1,799	4,765	1,799	4,765	1,799
Per cent working in sector:						
0. Not working	4.6	6.5	5.3	6.9	5.9	6.3
1. Public hospital, part-time	11.5	17.1	10.1	17.2	11.6	17.2
2. “ “ full time	44.2	35.7	45.6	36.4	44.7	36.6
3. Private hospital, part-time	0.4	1.0	0.5	0.6	0.5	0.8
4. “ “ full time	1.2	1.2	1.4	1.2	1.4	1.4
5. Public health care, part-time	11.3	13.7	11.6	15.5	12.9	16.6
6. “ “ full time	6.0	6.4	5.4	5.6	4.6	5.4
7. Private health care, part-time	2.0	1.3	2.2	1.6	2.2	1.6
8. “ “ “ full time	1.6	1.2	1.9	1.1	2.2	0.9
9. Other	17.2	16.0	16.0	14.1	14.1	13.1
Total	100.0	100.0	100.0	100.0	100.0	100.0

Table A.4. Age distribution of married physicians

	Married		
	1997	1998	1999
<20			
20-24			
25-29	221	120	48
30-34	698	620	547
35-39	1,084	1,023	953
40-44	1,340	1,287	1,248
45-49	1,169	1,257	1,280
50-54	973	1,021	1,041
55-59	568	627	732
60-64	378	403	449
65+	133	206	266
Sum	6,564	6,564	6,564

Table A. 5. Mean consumption and leisure for married physicians by sector. Norwegian kroner and per cent.

	Mean consumption (NOK)			Mean leisure (as % of available time)		
	1997	1998	1999	1997	1998	1999
0. Not working	234,008	208,758	230,922	100.0%	100.0%	100.0%
1. Public hospital, part-time	376,104	347,365	366,002	78.1%	79.1%	79.4%
2. “ “ full time	457,517	444,162	467,571	56.2%	56.2%	56.9%
3. Private hospital, part-time	375,572	370,105	370,429	79.1%	77.9%	79.8%
4. “ “ full time	514,895	497,835	556,823	53.7%	54.1%	53.9%
5. Public health care, part-time	334,460	308,563	332,590	81.7%	82.9%	82.9%
6. “ “ “ full time	448,288	439,211	467,161	55.6%	55.5%	55.5%
7. Private health care, part-time	325,550	304,015	330,991	84.0%	85.6%	84.7%
8. “ “ “ full time	446,135	446,595	497,167	53.7%	53.3%	53.1%
9. Other	399,800	368,367	394,853	68.0%	70.7%	71.3%

Table A. 6. Mean of dummy for observed full time, z_{jnt}, by sector.

	Married		
	1997	1998	1999
1. Public hospital, full time	0.419	0.431	0.424
3. Private hospital, full time	0.012	0.013	0.014
5. Public health care, full time	0.061	0.054	0.048
7. Private health care, full time	0.015	0.017	0.018
9. Other	0.094	0.073	0.063
Full time in total	0.601	0.588	0.569

Table A. 7. Mean of the explanatory variables.

	Married		
	1997	1998	1999
Female	0.27	0.27	0.27
Age	45	46	47
Age squared	2108	2199	2292
No. children younger than 7 years	0.68	0.58	0.49
No. children 7 to 18 years of age	1.01	1.03	1.04
Spouse working in health sector	0.43	0.43	0.43
Has a side job	0.10	0.09	0.08
Works "turnus" (internship)	0.03	0.01	0.00
Number observations	6564	6564	6564

Table A. 8. 1.Transitions of physicians from 1997 to 1998. Number of individuals.

1997	1998										
		Hospitals				Primary care					
	Not working	Public		Private		Public		Private		Other	
	0.	part time 1.	full time 2.	part time 3.	full time 4.	part time 5.	full time 6.	part time 7.	full time 8.	9.	Total
0. Not working	**182**	31	16	0	2	37	1	5	3	57	334
1. Publ. hospitals, part time	66	**305**	330	8	9	24	19	9	4	83	857
2. Publ. hospitals, full time	23	329	**2,218**	7	5	21	29	4	10	104	2,750
3. Priv. hospitals, part time	2	6	6	**9**	9	4	0	0	0	3	39
4. Priv. hospitals, full time	1	4	9	5	**57**	0	0	0	0	1	77
5. Publ. primary care, part time	33	37	30	0	1	**572**	41	11	7	53	785
6. Publ. primary care, full time	10	6	13	1	0	99	**239**	6	4	24	402
7. Priv. primary care, part time	7	8	4	0	0	8	1	**68**	16	6	118
8. Priv. primary care, full time	2	4	7	0	0	3	0	20	**57**	3	96
9. Other	51	62	195	4	3	62	25	12	9	**683**	1,106
Total	377	792	2,828	34	86	830	355	135	110	1,017	6,564

Table A.8.2 Transitions of physicians from 1998 to 1999. Number of individuals.

						1999					
		Hospitals				Primary care					
		Public		Private		Public		Private			
1998	Not working 0.	part time 1.	full time 2.	part time 3.	full time 4.	part time 5.	full time 6.	part time 7.	full time 8.	Other 9.	Total
0. Not working	**194**	33	22	2	3	49	3	4	5	62	377
1. Publ. hospitals, part time	47	**261**	319	4	8	46	12	11	4	80	792
2. Publ. hospitals, full time	21	436	**2,252**	5	7	19	18	6	8	56	2,828
3. Priv. hospitals, part time	2	3	4	**8**	10	2	1	1	0	3	34
4. Priv. hospitals, full time	1	4	2	15	**59**	0	2	1	0	2	86
5. Publ. primary care, part time	35	43	19	2	1	**617**	45	9	3	56	830
6. Publ. primary care, full time	16	15	24	1	0	70	**215**	0	0	14	355
7. Priv. primary care, part time	5	6	5	0	1	11	1	**69**	31	6	135
8. Priv. primary care, full time	1	6	4	0	0	3	3	22	**67**	4	110
9. Other	72	55	135	2	3	95	18	8	3	**626**	1,017
Total	394	862	2,786	39	92	912	318	131	121	909	6,564

Table A.8.3. Transition rates for physicians from 1997 to 1998.

	1998										
		Hospitals				Primary care					
	Not	Public		Private		Public		Private		Other	
1997	working	part time	full time	part time	full time	part time	full time	part time	full time		
	0.	1.	2.	3.	4.	5.	6.	7.	8.	9.	Total
0. Not working	**0.55**	0.09	0.05	0.00	0.01	0.11	0.00	0.02	0.01	0.16	1.00
1. Publ. hospitals, part time	0.08	**0.36**	0.39	0.01	0.01	0.03	0.02	0.01	0.01	0.08	1.00
2. Publ. hospitals, full time	0.01	0.12	**0.81**	0.00	0.00	0.01	0.01	0.00	0.00	0.04	1.00
3. Priv. hospitals, part time	0.05	0.15	0.15	**0.23**	0.23	0.10	0.00	0.00	0.00	0.09	1.00
4. Priv. hospitals, full time	0.01	0.05	0.11	0.06	**0.74**	0.00	0.00	0.00	0.00	0.03	1.00
5. Publ. primary care, part time	0.04	0.05	0.04	0.00	0.00	**0.73**	0.05	0.01	0.01	0.07	1.00
6. Publ. primary care, full time	0.02	0.01	0.03	0.00	0.00	0.25	**0.60**	0.02	0.01	0.06	1.00
7. Priv. primary care, part time	0.06	0.07	0.03	0.00	0.00	0.07	0.01	**0.58**	0.14	0.04	1.00
8. Priv. primary care, full time	0.02	0.04	0.07	0.00	0.00	0.03	0.00	0.21	**0.59**	0.04	1.00
9. Other	0.05	0.06	0.18	0.00	0.00	0.06	0.02	0.01	0.01	**0.61**	1.00

Table A.8.4. Transition rates for physicians from 1998 to 1999.

	1999										
		Hospitals				Primary care					
		Public		Private		Public		Private		Other	
1998	Not working 0.	part time 1.	full time 2.	part time 3.	full time 4.	part time 5.	full time 6.	part time 7.	full time 8.	9.	Total
0. Not working	**0.52**	0.09	0.06	0.01	0.01	0.13	0.01	0.01	0.01	0.15	1.00
1. Publ. hospitals, part time	0.06	**0.33**	0.40	0.01	0.01	0.06	0.02	0.01	0.01	0.09	1.00
2. Publ. hospitals, full time	0.01	0.15	**0.80**	0.00	0.00	0.01	0.01	0.00	0.00	0.02	1.00
3. Priv. hospitals, part time	0.06	0.09	0.12	**0.23**	0.29	0.06	0.03	0.03	0.00	0.09	1.00
4. Priv. hospitals, full time	0.01	0.05	0.02	0.17	**0.69**	0.00	0.02	0.01	0.00	0.03	1.00
5. Publ. primary care, part time	0.04	0.05	0.02	0.00	0.00	**0.74**	0.05	0.01	0.01	0.08	830
6. Publ. primary care, full time	0.05	0.04	0.07	0.00	0.00	0.20	**0.61**	0.00	0.00	0.03	1.00
7. Priv. primary care, part time	0.04	0.04	0.04	0.00	0.01	0.08	0.01	**0.51**	0.22	0.05	1.00
8. Priv. primary care, full time	0.01	0.05	0.04	0.00	0.00	0.03	0.03	0.20	**0.61**	0.03	110
9. Other	0.07	0.05	0.13	0.00	0.00	0.09	0.02	0.01	0.00	**0.63**	1.00

Appendix B. Tax functions.

In this appendix, we only show tax functions for married when the spouse has an income. The tax function for married with a spouse without income is slightly different. In the empirical application we utilize all the appropriate tax functions.

Table B.1 Tax function, 1997.

Nominal income (NOK) Y	Tax T (NOK)
0-18 198	0
18 198 - 24 709	0.25Y-4 250
24 709 – 30 125	0.078Y
30 125 – 156 500	0.302Y- 6 748
156 500 – 233 000	0.358Y- 15 512
233 000- 262 500	0.453Y – 37 647
262 500-	0.495Y – 48 672

Table B.2 Tax function, 1998.

Nominal income (NOK) Y	Tax T (NOK)
0-18 198	0
18 198 - 24 709	0.25Y-4 250
24 709 – 31 250	0.078Y
31 250– 163 000	0.302Y- 7 000
163 000 – 248 000	0.358Y- 16 128
248 000- 272 000	0.453Y – 39 688
272 000-	0.495Y – 51 112

Table B.3 Tax function, 1999.

Nominal income (NOK) Y	Tax T (NOK)
0-21 800	0
21 800 - 31 105	0.25Y-5 350
31 105 – 33 291	0.078Y
33 291 – 166 190	0.2992Y- 7 364
166 190– 269 100	0.358Y- 17 136
269 100-	0.493Y – 53 465

Table B.4 Tax function, 2006.

Nominal income (NOK) Y	**Tax T (NOK)**
0-29 600	0
29 600 - 43 023	0.25Y-7 400
43 023– 67 200	0.078Y
67 200 – 93 529	0.358Y- 18 816
93 529– 179 706	0.2628Y- 9 912
179 706- 394 000	0.358Y – 27 020
394 000 – 750 000	0.448Y-62 480
750 000-	0.478Y- 84 980

Appendix C. Wage equations and selection effects.

As mentioned earlier, estimation of our model requires data for consumption in all possible states (nine working states). To be able to compute such counterfactual incomes we estimated wage equations for all individuals for the three years 1997, 1998 and 1999. It is usual in such estimations to take into account sample selection problems (the Heckman procedure is the most common procedure). We take sample selection into account by including the predicted choice probabilities, Pr_1 – Pr_9, as explanatory variables in the wage equations. These probabilities were the predictions resulting from a simple multinomial logit estimation of sector choice. We show the mean of the explanatory variables used for estimating the logit and the wage equations in Tables C.1 and C.2. The estimates are given in Table C.3 and the resulting average predicted probabilities are given in Tables C.4.

Table C.1. Mean of the explanatory variables for the logit estimation.

	1997	1998	1999
Female	0.32	0.32	0.33
Birthyear	1943	1943	1944
Married	0.76	0.71	0.69
No. children younger than 7 years	0.64	0.56	0.48
No. children 7 to 18 years of age	0.80	0.78	0.76
Less than 20 years of education	0.73	0.73	0.71
20 or more years of education	0.08	0.08	0.09
Missing education	0.09	0.09	0.10
Spouse working in health sector	0.33	0.32	0.32
Income of spouse, NOK	151,423	83,766	86,592
Number observations	9,516	10,206	11,114

Table C.2. Mean of the explanatory variables for the wage equations.

	1997	1998	1999
Female	0.31	0.32	0.33
Birthyear	1943	1943	1943
Less than 20 years of education	0.74	0.73	0.71
20 or more years of education	0.08	0.09	0.10
Missing education	0.08	0.08	0.09
Least central municipalities (kommuner)	0.09	0.08	0.08
Less central and central municipalities	0.32	0.32	0.32
Especially central municipalities	0.59	0.60	0.60
Probability of working at job type 1	0.14	0.14	0.16
Probability of working at job type 2	0.39	0.40	0.38
Probability of working at job type 3	0.002	0.004	0.006
Probability of working at job type 4	0.01	0.01	0.01
Probability of working at job type 5	0.09	0.11	0.12
Probability of working at job type 6	0.05	0.05	0.04
Probability of working at job type 7	0.01	0.01	0.01
Probability of working at job type 8	0.01	0.01	0.01
Probability of working at job type 9	0.16	0.15	0.13
Number observations	8,965	9,547	10,349

Table C.3. Part 1. Logit estimates of choice of sector and hours (job type). Physicians 1997 – 1999.

	1997			1998			1999		
	Coeff.		Std. Err.	Coeff.		Std. Err.	Coeff.		Std. Err.
1. Public hospital, part time									
Female	-0.06		0.1166	0.03		0.1027	0.09		0.0953
Age	-0.09	***	0.0063	-0.08	***	0.0057	-0.09	***	0.0050
Married	0.50	***	0.1741	-0.05		0.1371	0.19		0.1249
No. children younger than 7 years	-0.21	***	-3.3500	-0.08	**	-1.2400	-0.22	***	-3.5300
No. children 7 to 18 years of age	-0.22	***	-3.7600	-0.16	***	-3.1000	-0.08	**	-1.5100
20 or more years of education	1.66	***	5.3200	1.24	***	5.2600	1.19	***	5.4200
Missing education	-0.54	***	-3.6200	-0.74	***	-5.3900	-0.67	***	-5.6800
Spouse working in health sector	0.51	***	3.7900	0.43	***	3.6700	0.53	***	4.7800
Income of spouse (1/1,000,000)	-1.49	***	0.5640	-0.31		0.5550	0.25		0.4690
Constant	167.03	***	12.2757	151.11	***	11.1482	173.53	***	9.7735
2. Public hospital, fulltime									
Female	-0.16		0.1079	-0.22	**	0.0945	-0.08		0.0897
Age	-0.03	***	0.0055	-0.02	***	0.0050	-0.03	***	0.0044
Married	0.60	***	0.1578	0.08		0.1234	0.29	***	0.1137
No. children younger than 7 years	-0.24	***	-4.0900	-0.04	**	-0.7400	-0.13	**	-2.2800
No. children 7 to 18 years of age	-0.13	***	-2.6000	-0.02	**	-0.3800	0.07	**	1.6000
20 or more years of education	1.68	***	5.6200	1.17	***	5.3000	1.34	***	6.4800
Missing education	-0.85	***	-6.2300	-0.83	***	-6.7400	-0.96	***	-8.8400
Spouse working in health sector	0.85	***	6.9600	0.62	***	6.0100	0.72	***	7.1400
Income of spouse (1/1,000,000)	-1.58	***	0.5000	-0.44		0.4840	-0.20		0.4180
Constant	55.81	***	10.6583	37.05	***	9.6725	52.79	***	8.6016
3. Private hospital, part time									
Female	0.45		0.3153	-0.03		0.3075	0.43	*	0.2563
Age	-0.07	***	0.0192	-0.08	***	0.0197	-0.06	***	0.0149
Married	0.80		0.5007	0.07		0.4255	0.48		0.3558
No. children younger than 7 years	-0.24	**	-1.4000	-0.17	**	-0.9000	0.01	**	0.0700
No. children 7 to 18 years of age	-0.12	**	-0.7400	0.06	**	0.3800	-0.11	**	-0.7700
20 or more years of education	-12.36	**	-0.0300	0.37	**	0.4900	1.28	***	2.8200
Missing education	-0.51	**	-1.1200	-0.50	**	-1.1000	-0.71	**	-1.8200
Spouse working in health sector	0.62	**	1.7800	0.20	**	0.5900	0.48	**	1.6800
Income of spouse (1/1,000,000)	-0.89		1.5100	2.68	**	1.1500	0.81		1.1500
Constant	131.95	***	37.3303	151.03	***	38.2027	112.53	***	28.8768
4. Private hospital, fulltime									
Female	-0.04		0.2480	0.16		0.2062	0.21		0.2000
Age	-0.03	**	0.0134	-0.03	**	0.0118	-0.03	***	0.0110
Married	0.54		0.3737	0.29		0.2782	0.19		0.2464
No. children younger than 7 years	-0.15	**	-1.1400	0.05	**	0.3800	0.00	**	0.0200
No. children 7 to 18 years of age	-0.19	**	-1.5900	0.04	**	0.3700	0.16	**	1.6900
20 or more years of education	1.34	***	2.9000	0.68	**	1.6600	0.38	**	0.8700
Missing education	-1.21	***	-2.7200	-0.91	***	-2.5900	-1.10	***	-3.3300
Spouse working in health sector	0.48	**	1.8400	0.54		2.5000	0.69	***	3.2500
Income of spouse (1/1,000,000)	-1.15		1.1500	-2.03	*	1.1800	-0.53		0.5490
Constant	60.10	**	25.9985	46.90	**	22.9587	62.32	***	21.4418
5. Public health care, part time									
Female	0.00		0.1235	-0.04		0.1078	0.02		0.1013
Age	-0.05	***	0.0067	-0.03	***	0.0060	-0.04	***	0.0053
Married	1.05	***	0.1852	0.27	*	0.1436	0.51	***	0.1307
No. children younger than 7 years	-0.17	**	-2.4900	0.00	**	-0.0400	-0.10	**	-1.4800
No. children 7 to 18 years of age	0.16	***	2.9400	0.22	***	4.4500	0.25	***	5.2400
20 or more years of education	-1.38	***	-2.7200	-0.93	***	-2.8600	-0.20	**	-0.7600
Missing education	-0.74	***	-4.4200	-0.84	***	-5.5200	-0.97	***	-7.1900
Spouse working in health sector	0.55	***	4.0600	0.34	***	2.9200	0.43	***	3.7800
Income of spouse (1/1,000,000)	-2.33	***	0.5740	-0.82		0.5630	-0.19		0.4530
Constant	101.50	***	13.0719	65.04	***	11.5900	83.52	***	10.2241

Table C.3. Part 2. Logit estimates of choice of sector and hours (job type). Physicians 1997 – 1999.

	1997			1998			1999		
	Coef.		Std. Err.	Coef.		Std. Err..	Coef.		Std. Err.
6. Public health care, fulltime									
Female	0.10		0.1433	0.00		0.1322	0.12		0.1262
Age	-0.02	***	0.0075	0.00		0.0071	-0.02	**	0.0064
Married	1.01	***	0.2114	0.17		0.1757	-0.03		0.1630
No. children younger than 7 years	-0.21	***	-2.6800	0.01	**	0.1700	-0.14	**	-1.6500
No. children 7 to 18 years of age	0.03	**	0.5300	0.02	**	0.3400	0.18	***	2.9400
20 or more years of education	-1.19	**	-2.0500	-0.60	**	-1.6200	0.07	**	0.2400
Missing education	-0.58	***	-3.0200	-0.69	***	-3.6100	-1.01	***	-5.5800
Spouse working in health sector	0.62	***	4.0400	0.39	***	2.8100	0.46	***	3.3000
Income of spouse (1/1,000,000)	-2.94	***	0.6570	0.03		0.6560	0.08		0.5970
Constant	41.04	***	14.6134	7.47		13.7965	31.08	**	12.5408
7. Private health care, part time									
Female	-0.29		0.2443	-0.33		0.2058	-0.37	*	0.2002
Age	-0.04	***	0.0138	-0.03	***	0.0115	-0.04	***	0.0104
Married	1.36	***	0.4068	0.72	**	0.2955	0.55	**	0.2644
No. children younger than 7 years	-0.19	**	-1.4500	-0.26	**	-1.9500	-0.21	**	-1.6400
No. children 7 to 18 years of age	0.19	**	2.1000	0.20	**	2.4400	0.24	***	2.9600
20 or more years of education	-1.26	**	-1.2000	-0.32	**	-0.6300	-0.08	**	-0.1700
Missing education	-0.50	**	-1.4700	-0.62	**	-1.9800	-0.59	**	-2.2300
Spouse working in health sector	1.26	***	5.6700	1.02	***	5.3600	1.18	***	6.3600
Income of spouse (1/1,000,000)	-2.10	**	1.0300	-0.22		0.9020	0.30		0.8130
Constant	82.04	***	26.8294	55.79	**	22.3203	77.97	***	20.2092
8. Private health care, fulltime									
Female	-0.33		0.2472	-0.50	**	0.2235	-0.59	***	0.2293
Age	-0.04	***	0.0134	-0.02	**	0.0117	-0.02	*	0.0110
Married	0.75	*	0.3862	0.29		0.2855	0.54	**	0.2720
No. children younger than 7 years	-0.33	**	-2.4200	-0.13	**	-1.0000	-0.06	**	-0.4600
No. children 7 to 18 years of age	0.03	**	0.3000	0.13	**	1.5000	0.24	***	2.8900
20 or more years of education	0.17	**	0.2800	-0.02	**	-0.0400	0.22	**	0.5200
Missing education	-1.25	***	-2.8200	-0.77	**	-2.2700	-1.35	***	-3.5500
Spouse working in health sector	1.31	***	5.6700	1.13	***	5.6100	1.11	***	5.7300
Income of spouse (1/1,000,000)	-1.58		1.0700	-0.86		1.0100	-0.25		0.6330
Constant	82.63	***	26.0195	44.11	*	22.6927	38.59	*	21.4841
9. Other sectors, both part time and fulltime									
Female	-0.19		0.1168	-0.23	**	0.1049	-0.07		0.1012
Age	-0.02	***	0.0060	-0.02	***	0.0056	-0.04	***	0.0051
Married	0.56	***	0.1705	0.10		0.1370	0.30	**	0.1300
No. children younger than 7 years	-0.21	***	-3.3000	-0.07	**	-1.1100	-0.23	***	-3.4200
No. children 7 to 18 years of age	0.06	**	1.1800	0.12	**	2.5300	0.17	***	3.5500
20 or more years of education	1.37	***	4.4300	1.28	***	5.5900	1.50	***	6.9300
Missing education	-0.54	***	-3.6200	-0.64	***	-4.5400	-0.94	***	-6.9900
Spouse working in health sector	0.10	**	0.7900	0.12	**	1.0100	0.28	*	2.4400
Income of spouse (1/1,000,000)	-0.90	*	0.5340	-0.16		0.5340	0.10		0.4750
Constant	48.13	***	11.6302	47.87	***	10.8567	76.82	***	9.9579
Number observations			9516			10206			11114
Log liklihood			-15800.67			-17092.76			-18748.45
LR chi2(81)			1379.73			1271.35			1545.97
Pseudo R2			0.04			0.04			0.04

*** statistically significant parameter at 1% confidence interval ** statistically significant parameter at 5% confidence interval
* statistically significant parameter at 10% confidence interval
The base outcome is not working. The base category is male, unmarried physicians with a registered education of less than 20 years and no children under 19 years of age (and, since they are unmarried, no spouse working in the health sector).

Table C.4. Average predicted probabilities, $Pr_1 – Pr_9$, of choosing different job types. All physicians in 1997, 1998 and 1999.

	1997			1998			1999		
	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max
Pr_1: Public hospital, part time	0.157	0.023	0.428	0.160	0.016	0.491	0.186	0.006	0.480
Pr_2: Public hospital, fulltime	0.403	0.182	0.780	0.407	0.240	0.699	0.387	0.201	0.700
Pr_3: Private hospital, part time	0.006	0.000	0.020	0.005	0.000	0.078	0.007	0.000	0.039
Pr_4: Private hospital, fulltime	0.011	0.002	0.018	0.013	0.002	0.033	0.013	0.004	0.159
Pr_5: Public health care, part time	0.113	0.003	0.317	0.119	0.010	0.337	0.127	0.022	0.294
Pr_6: Public health care, fulltime	0.057	0.002	0.435	0.050	0.005	0.115	0.047	0.009	0.103
Pr_7: Private health care, part time	0.015	0.000	0.067	0.017	0.001	0.062	0.016	0.002	0.065
Pr_8: Private health care, fulltime	0.014	0.002	0.035	0.015	0.002	0.046	0.014	0.001	0.062
Pr_9: Other sectors, both part time and fulltime	0.166	0.035	0.377	0.152	0.081	0.369	0.134	0.023	0.301
Residual, not working	0.058			0.064			0.069		

Table C.5. gives details on the observations used in the logit estimations and in estimating the wage equations. The logit estimations were done on all physicians in a given year, while the wage equations were estimated on all working physicians with observations of wage income.

Table C.5. Sample selection for logit estimation and estimation of wage eqations.

	1997	1998	1999
Physicians, used in logit estimation	9,516	10,206	11,114
Not working	-550	-656	-763
Missing wage income	-1	-3	-2
Working physicians, used in wage eq.	8,965	9,547	10,349

The estimates of the wage equations are given in Table C.6. The wage equations for all nine work sectors have been estimated simultaneously using maximum likelihood, allowing for correlation between the different wages. The parameters σ_1 to σ_9 are the variance parameters mentioned in the main paper, and the parameters κ_1 to κ_9 are the parameters allowing for correlation between sectors. As can be seen from Table C.6, only κ_4 in 1997 is significant at level of 95% or better, indicating that there is not much residual correlation between the different wages after correcting for the other explanatory variables.

As expected, one finds the most significant results in the largest sector, full time work in a public hospital. In this sector, being a woman reduces wages, while wages increase with age.

Table C.6. Part 1. Estimated coefficients of the wage equations for physicians 1997 – 1999.

	1997			1998			1999		
	Coef.		Std. Err.	Coef.		Std. Err.	Coef.		Std. Err.
1. Public hospital part time									
Female	-0.03		0.0187	0.04	**	0.0169	0.00		0.0114
Age	0.00		0.0030	0.00		0.0024	0.00	***	0.0018
20 or more years of education	0.13	***	0.0416	0.16	***	0.0330	0.06	***	0.0204
Missing education	0.01		0.0295	0.01		0.0248	0.09	***	0.0179
Least central municipalities (kommuner)	-0.08	***	0.0308	-0.08	***	0.0280	-0.05	**	0.0215
Less central and central municipalities	-0.03		0.0194	-0.03	**	0.0164	0.01		0.0114
Pr_1	-0.16	***	0.0518	-0.16	***	0.0413	-0.14	***	0.0336
Constant	-2.68		5.6776	-1.22		4.4944	-4.40		3.5292
σ_1	0.20	***	0.0045	0.18	***	0.0040	0.15	***	0.0029
2. Public hospital fulltime									
Female	-0.03	***	0.0067	-0.02	***	0.0067	0.00		0.0046
Age	0.01	***	0.0004	0.01	***	0.0004	0.00	***	0.0003
20 or more years of education	0.07	***	0.0123	0.02	**	0.0113	-0.03	***	0.0078
Missing education	-0.06	***	0.0110	-0.02	**	0.0102	0.02	***	0.0081
Least central municipalities (kommuner)	-0.05	***	0.0151	-0.07	***	0.0142	-0.01		0.0119
Less central and central municipalities	-0.05	***	0.0059	-0.04	***	0.0054	-0.02	***	0.0041
Pr_2	-0.04	**	0.0208	0.08	***	0.0280	0.21	***	0.0203
Constant	-8.97	***	0.7524	-6.00	***	0.7873	-2.58	***	0.6423
σ_2	0.10	***	0.0014	0.10	***	0.0013	0.07	***	0.0010
3. Private hospital part time									
Female	-0.05		0.1631	0.00		0.0726	0.01		0.0865
Age	-0.01		0.0081	0.00		0.0053	0.01	***	0.0048
20 or more years of education	-		-	0.83	***	0.1658	0.03		0.1209
Missing education	-0.13		0.1136	-0.05		0.1074	-0.18	*	0.0965
Least central municipalities (kommuner)	0.07		0.1633	-0.11		0.0909	-0.08		0.1196
Less central and central municipalities	0.03		0.1011	-0.16	**	0.0795	-0.06		0.0998
Pr_3	-0.07		0.2467	-0.08		0.0897	0.08		0.1172
Constant	14.67		14.8227	6.52		10.0741	-21.05	**	9.0004
σ_3	0.16	***	0.0189	0.11	***	0.0300	0.16	***	0.0170
4. Private hospital fulltime									
Female	-0.09	**	0.0477	-0.13	**	0.0577	-0.05		0.0605
Age	0.00		0.0024	0.00		0.0028	0.01	**	0.0030
20 or more years of education	0.10		0.0777	0.07		0.1040	0.08		0.1641
Missing education	-0.28	***	0.0932	-0.21	**	0.0891	-0.23	**	0.1034
Least central municipalities (kommuner)	0.13	*	0.0761	0.12		0.1193	0.13		0.1714
Less central and central municipalities	0.00		0.0467	-0.03		0.0607	-0.01		0.0717
Pr_4	-0.34	**	0.1422	-0.05		0.1431	-0.04		0.1555
Constant	-2.71		4.8382	3.12		5.5480	-7.82		5.9511
σ_4	0.06	***	0.0165	0.15	***	0.0106	0.15	***	0.0165
5. Public health care part time									
Female	-0.01		0.0145	-0.03	*	0.0156	-0.01		0.0144
Age	0.01	***	0.0008	0.00	***	0.0008	0.00	***	0.0007
20 or more years of education	0.24	**	0.1073	0.14	*	0.0836	0.12	**	0.0551
Missing education	0.02		0.0256	0.05	**	0.0266	0.05	**	0.0253
Least central municipalities (kommuner)	0.04	**	0.0177	0.03		0.0184	0.05	***	0.0179
Less central and central municipalities	-0.01		0.0151	-0.02		0.0160	-0.01		0.0151
Pr_5	0.08	***	0.0228	0.08	***	0.0284	0.08	***	0.0281
Constant	-4.56	***	1.6114	-0.77		1.6033	-2.20		1.4163
σ_5	0.14	***	0.0038	0.15	***	0.0041	0.16	***	0.0038

Table C.6. Part 2. Estimated coefficients of the wage equations for physicians 1997 – 1999.

	1997			1998			1999		
	Coef.		Std. Err.	Coef.		Std. Err.	Coef.		Std. Err.
6. Public health care fulltime									
Female	-0.02		0.0159	-0.03		0.0224	0.00		0.0177
Age	0.00	***	0.0010	0.00		0.0024	0.00	***	0.0012
20 or more years of education	0.20		0.1309	0.31	*	0.1648	0.05		0.0572
Missing education	-0.01		0.0240	-0.02		0.0316	0.00		0.0274
Least central municipalities (kommuner)	-0.04	**	0.0169	-0.05	**	0.0214	-0.02		0.0175
Less central and central municipalities	-0.05	***	0.0173	-0.05	***	0.0212	-0.04	**	0.0179
Pr_6	0.07		0.0439	0.18	*	0.1014	0.05		0.0502
Constant	-0.47		2.1237	0.52		4.9798	-2.78		2.4181
σ_6	0.10	***	0.0041	0.12	***	0.0051	0.11	***	0.0042
7. Private health care part time									
Female	0.02		0.0426	0.05		0.0640	0.10		0.0655
Age	0.00		0.0024	0.01		0.0034	0.00		0.0030
20 or more years of education	-0.20		0.1730	0.29		0.1841	0.00		0.1583
Missing education	0.04		0.0546	0.04		0.0950	-0.05		0.0777
Least central municipalities (kommuner)	0.02		0.0525	0.12		0.0906	0.08		0.0846
Less central and central municipalities	-0.02		0.0324	0.04		0.0531	-0.02		0.0497
Pr_7	-0.05	*	0.0277	0.00		0.0508	-0.01		0.0521
Constant	5.28		4.7202	-5.22		6.6547	-0.31		5.7537
σ_7	0.11	***	0.0082	0.20	***	0.0139	0.19	***	0.0128
8. Private health care fulltime									
Female	0.01		0.0677	0.04		0.0773	-0.15		0.0988
Age	0.01	***	0.0034	0.01	***	0.0034	0.02	***	0.0038
20 or more years of education	0.03		0.1833	0.30	*	0.1558	0.12		0.1671
Missing education	-0.19		0.1344	-0.07		0.1116	-0.09		0.1527
Least central municipalities (kommuner)	-0.03		0.0996	-0.10		0.0956	-0.03		0.1240
Less central and central municipalities	-0.01		0.0602	-0.02		0.0626	-0.03		0.0661
Pr_8	-0.08		0.0680	-0.02		0.0685	-0.08		0.0742
Constant	-16.55	**	6.5453	-16.87	**	6.6242	-25.12	***	7.5477
σ_8	0.18	***	0.0130	0.20	***	0.0141	0.23	***	0.0156
9. Other sectors, both part time and fulltime									
Female	-0.02	*	0.0134	-0.01		0.0132	-0.02	*	0.0122
Age	0.01	***	0.0007	0.01	***	0.0006	0.01	***	0.0006
20 or more years of education	0.08	***	0.0210	-0.01		0.0212	-0.01		0.0206
Missing education	-0.02		0.0194	0.00		0.0199	0.01		0.0203
Least central municipalities (kommuner)	0.03		0.0235	0.05	**	0.0216	0.04	*	0.0209
Less central and central municipalities	0.01		0.0126	0.05	***	0.0123	0.02	**	0.0121
Pr_9	0.05	**	0.0245	0.09	***	0.0316	0.10	***	0.0333
Constant	-8.55	***	1.3370	-6.87	***	1.2055	-8.16	***	1.1021
σ_9	0.14	***	0.0031	0.14	***	0.0031	0.13	***	0.0030
κ_1	0.02		0.0216	-0.01		0.0137	0.00		0.0086
κ_2	0.00		0.0055	0.00		0.0049	0.00		0.0033
κ_3	-0.02		0.0733	0.10		0.0963	-0.04		0.0873
κ_4	-0.23	***	0.0167	0.00		0.0755	-0.11	*	0.0541
κ_5	0.00		0.0091	0.00		0.0091	0.00		0.0093
κ_6	0.00		0.0095	0.00		0.0117	0.00		0.0099
κ_7	0.00		0.0247	-0.01		0.0369	0.00		0.0353
κ_8	0.00		0.0661	-0.01		0.0567	-0.02		0.0667
κ_9	0.00		0.0091	-0.01		0.0084	0.00		0.0077
Number observations			8965			9547			10349
Log likelihood			-46173.26			-49472.67			-51931.58
Wald chi2(81)			244.65			304.37			572.85

*** statistically significant parameter at 1% confidence interval ** statistically significant parameter at 5% confidence interval

* statistically significant parameter at 10% confidence interval

- not possible to estimate either because of multicolinearity or lack of observations with the relevant characteristic

The base category with regard to the dummy variables is male physicians with a registered education of less than 20 years and living in an especially centralized region.

Table C.7 shows the mean and predicted hourly wages for physicians derived from predictions for all physicians using the estimated wage equations. As expected, the predicted wages have less variation than the observed (any type of estimation/prediction will result in a smoothing of the data).

Table C.7. Mean and median predicted hourly wages for physicians. Norwegian kroner.

		1997			**1998**			**1999**	
	Mean	Std. Dev.	Median	Mean	Std. Dev.	Median	Mean	Std. Dev.	Median
1. Public hospital part time									
Observed	203	136.53	166	205	166.60	172	191	145.88	169
Predicted	186	33.23	180	182	30.74	176	174	27.15	168
2. Public hospital fulltime									
Observed	186	48.98	176	190	47.70	181	183	37.44	181
Predicted	180	16.94	179	185	16.44	184	181	14.88	180
3. Private hospital part time									
Observed	201	132.19	173	214	79.50	188	198	81.92	173
Predicted	187	18.69	189	212	59.92	203	191	24.34	187
4. Private hospital fulltime									
Observed	226	65.78	217	228	77.49	206	243	83.62	221
Predicted	223	27.00	223	226	24.76	227	242	30.55	238
5. Public health care part time									
Observed	156	59.00	157	162	71.74	166	160	57.43	166
Predicted	158	11.55	158	166	12.84	166	165	13.34	164
6. Public health care fulltime									
Observed	160	30.63	166	167	37.82	172	169	34.16	172
Predicted	166	10.51	166	174	15.90	173	175	11.89	175
7. Private health care part time									
Observed	168	50.18	160	188	148.40	169	192	120.98	169
Predicted	164	10.35	163	186	20.11	185	183	17.82	182
8. Private health care fulltime									
Observed	155	63.54	147	167	70.56	158	188	89.08	174
Predicted	157	20.71	151	172	27.81	172	191	35.47	184
9. Other sectors, both part time and fulltime									
Observed	168	67.00	166	167	59.88	169	169	62.31	169
Predicted	168	17.62	166	169	16.30	168	171	16.70	170

Appendix D. Estimates without “turnus” candidates.

Number of obs = 6333
Wald chi2(0) = .
Prob > chi2 = .
Log likelihood = -10303,4

		Coef.	Std. Err.	z	P>|z|	[95% Conf	Interval]
RHO							
	const.	15,78	1,61	9,8	0	12,62	18,94
	age	-0,56	0,06	-8,78	0	-0,69	-0,44
	agesq	0,0053	0,0006	8,34	0	0,00	0,01
CONSUMPTION							
	age	0,12	0,04	3,18	0,001	0,05	0,20
	agesq	-0,0014	0,0004	-3,6	0	0,00	0,00
	sp in hlt s	0,19	0,06	3,29	0,001	0,08	0,30
	xtra job	0,20	0,05	3,65	0	0,09	0,30
	const.	-1,65	0,91	-1,81	0,07	-3,43	0,13
	turnus	-	-	-	-	-	-
	lambda	0,29	0,06	4,55	0	0,17	0,42
LEISURE							
	female	0,12	0,18	0,67	0,502	-0,23	0,48
	const.	5,58	0,41	13,5	0	4,77	6,39
	yng childr	0,07	0,11	0,67	0,502	-0,14	0,29
	old childr	0,27	0,08	3,36	0,001	0,11	0,42
	gamma	0,67	0,18	3,82	0	0,33	1,02
ALPHA							
	alpha2	0,25	0,00	101,91	0	0,24	0,25
	alpha4	0,13	0,01	16,12	0	0,11	0,14
	alpha6	0,21	0,00	54,00	0	0,20	0,22
	alpha8	0,17	0,01	28,17	0	0,16	0,18