LABOR SUPPLY MODEL ALONG THE INTENSIVE AND EXTENSIVE MARGIN, REGULAR AND IRREGULAR LABOR MARKETS

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Abstract

The main purpose of the paper is to study the decision of the individual with regard to the participation and the allocation of time in regular and irregular labor markets. The labor supply decision is analyzed along the extensive margin (participation decision in the labor market) and along the intensive margin (hours of work on the job). The basic model I refer to is the one developed by Strøm et al (2004), a labor supply model when tax evasion is an option. My study reveals that at intensive margin the model achieves to capture and predict better the level of irregular hours of work in comparison with the extensive margin. The expected labor supply, predicted by using the estimated model at intensive margin, is closer to the observed values compared to extensive margin model. The expected tax level evaded is predicted at a higher level by the intensive margin model. These results will be compared with those attained by estimating a labor supply model with the assumption of no irregular hours of work. The findings shows the relevance of studies of labor supply both at intensive and at extensive margin compared to a discrete choice model of labor supply where tax evasion falsely is ignored. The results have important policy implication for the reforms in the tax system and social welfare system.

INTRODUCTION

In the literature, there have been several theoretical studies of tax evasion and labour supply Allingham and Sandmo (1972), Andersen (1977), Isachsen and Strøm (1980), Cowell (1985)), see also Isachsen , Klovland and Strøm (1982), Isachsen and Strøm (1985) and Isachsen, Samuelson and Strøm (1985), as well as Lacroix and Fortin (1992) and Lemieux, Fortin and Frechette (1994), Lacroix and Fortin Joubert (2001) and Strøm, Jørgensen, Ognedal (2004). However, this is just a partial story since the only message these studies reveal is that individuals may have an incentive to work and provide irregular hours of work with the scope to minimize their tax liabilities or to continue receiving social welfare benefits.

In addition, the empirical literature on labor supply has emphasized two margins of labor supply responses (see Heckman (1993)). Referring to Heckman (1993), a crucial theoretical distinction with important empirical payoff, is the one between labor supply decision at extensive margin (participation decision) and at intensive margin (hours or weeks of work). The participation margin–the so-called extensive margin–has been recognized as a potential resolution, as the variation in the number of employees is the dominant source of fluctuations in labor supply (e.g., Coleman, 1984; Heckman, 1984).

However, these studies ignore the behavioural response to the respective transfer and tax programs concerning the incomes generated from the participation in irregular labor market. Workers are heterogeneous in the subjective cost they face when operating in the labor market, regular and irregular one. Analytical and numerical investigations suggest that interactions between regular and irregular activities can affect standard results of policy interventions. Policies aiming to increase individuals benefit from participating in the regular sector are more desirable than deterrence policies (Fugazzaa & Jacques, 2002).

Thus the scope of this paper is to combine these two fields of study into a common one by analyzing the labor supply decision at intensive and extensive margin, including also the option not to declare part of the labor income to the tax authorities.
Including the option of evasion to the labor supply studies, at extensive and intensive margin, can make a difference to define and predict the individual behaviour and their responses, participation

and efforts/hours of work in the labor market. The results may have important policy implications for the reforms in the tax system, social welfare benefits and the design of an optimal tax system.

In this study I analyze the decision of the individual in the labor market and estimate the expected labor supply considering these two distinctions as well as including also the option of working in the irregular labor market as an alternative way of earning higher incomes. [1] The structure of the model used to study the labor supply is important since it allows distinguishing between income and substitution effects in case a new tax policy is introduced.

The model I use is based on Strøm et al (2004), a nested multinomial logit model of labor supply when tax evasion is an option. By tax evasion I refer to legal work whose income is not declared to the tax offices.

The data set allows for three different estimation strategies:

1- an investigation at the intensive margin (IM) of labor supply when tax evasion is an option. In this case I use all available information, participation as well as hours of work, in the estimation of the model allowing for participation and hours of work decision to change.

2- An investigation at the extensive margin (EM) of labor supply when tax evasion is an option. The issue of how many hours to work, given a decision to work, is another desirable extension. In this case I use only the participation information, the yes/no information in the estimation of the model. The motivation in the rear of this approach is that estimating a model using only the participation decision has been the most common approach to a variety of problems in microeconometrics. However, due to the structure of the model I am able to recover all the parameters of the utility function. Hence, the model can be used to predict hours of work even though it is estimated on participation decision only. Thus the IM and EM model predictions of labor supply can be confronted and compared respectively with the observed hours.

3- An investigation of labor supply when tax evasion is ignored. In this case I use only the observed hours of work in the regular part of the economy when estimating the model. The reason why, is that almost all the labor supply studies follow this last approach. But in all countries tax evasion is an option. Unlike others I am able to estimate a traditional labor supply model (a discrete choice model, DCM) on traditional data and compare estimates and predictions from this

[1] A study of Webley& Cole & Eidjar (2001) regarding the tax paying behaviour, treats tax evasion as a defective behaviour within a social dilemma, a conflict between the pursuit of collective outcomes and their own individual outcomes. Thus tax system induces individuals to choose between co-operative behaviour and defective behaviour. So it is relevant to define an appropriate tax system where this dual behaviour is emphasised and taken into consideration.

model with a labor supply model when tax-evading activities are accounted for. The result is that IM performs better than EM and DCM.

The Norwegian Income Tax System has continuously been reformed since the late 1980s with the implication of less progressive taxes. Also in Norway, in 1992, a broad tax reform was implemented with the purpose of reducing tax-induced distortions by lowering the tax rates and broadening the tax base. This reform was also a further step toward a more neutral tax system with respect to the type of economic activity as well as the organizational and financial structure of such activity.

Moreover, the economic structure has changed toward a new one where the opportunities to work in the shadow economy have been reduced. There have been changes in the industrial sectors toward more firms with more employees, less self employed, more government employees, lower unemployment rates, higher income and higher wages in the regular economy. Consequently, these changes have reduced the opportunities and the incentives to evade taxes. During recent years the shadow economy in Norway has gone through a decline, Shima (2005).

Still, the shadow economy has not vanished and it could be of importance to account for the option of tax evasion when labor supply models are estimated in general and in a particular economy, like the Norwegian economy.

The process of identifying the phenomenon of tax evasion in the labor market would gain remarkably from these parallel studies. Independently from the difficulties regarding the interpretation of the results, we can draw important lessons about the tax system, the behaviour of individuals and the supply side of the labour market, both the regular and irregular one.

The results obtained are important for policy implications, since understanding better the mechanism of individual behaviour in labor market helps to remove disincentives related to tax evasion and to design an optimal tax system. Transforming the undeclared irregular work into a regular one helps to achieve lower unemployment, improve the quality and productivity at work and strengthen the social cohesion.

DATA DESCRIPTION AND SUMMARY STATISTICS

The data I use have as the main source the survey conducted in 2003 by a private Statistical Institution in Norway called MMI. This survey was also conducted in 1980, 1989 and 2001. The individuals who participated in the survey replied to questions which provide information about their personal characteristics and economic variables basically; gender, age, education, employment, hours of work, marital status, social benefits and other sources of income, hourly wage rates, income and taxes paid.

Table 1. Response rates

	2003	2001
Asked to participate	1742	1690
Agreed to participate	86%	81%
Answer percentage	72%	58%
Response rate, percent of asked	62%	47%

Table 1 gives the response rates for the years 2001 and 2003, respectively, The response rates are fairly high for surveys of this type and they were particularly high in 2003. In addition to the information mentioned above, the participants in the survey were asked about their engagement and attitudes concerning non-reported income activities. They were also asked if during the last 12 months they have ever evaded taxes or if they did not report to the tax authorities some income from regular work. If the answer was yes they were asked about the wage and number of hours undeclared to the tax authorities. Table 2 presents the summary statistics for the whole sample, while Table 3 presents the summary statistics separately for evaders and non-evaders.

Usually people are skeptical to answer questions regarding tax evasion and undeclared hours of work. This problem may bias the responses of those who participated in the survey. As a consequence it may bias the estimation results of the model. In this survey, the response rates have been considerably high, which can sustain the confirmation that the sample selected may give a good representation of population characteristics (see Isachsen, Klovland and Strøm (1982) and Goldstein, Hansen, Ognedal and Strøm (2003).

Table 2. Summary statistics: the whole sample in 2003.

Number of observations	895
Number of non-evaders	797
Number of evaders	98
Percentage females in the sample	51.62%
Percentage who thinks that tax evasion is socially accepted	51.7 %

	Mean	St.D.	Minimum	Maximum
Age	42.97	11.85	18	66
Hourly wage rate, NOK	166.55	72.71	423	510
Gross annual wage income, NOK	391666	189966	50000	700000
Weekly hours worked in the regular economy	37.6	9.69	15	60
Annual tax, NOK	100776	95541	0	618754
Perceived fine if detected, per cent	26.8%	18.3	0%	50 %
Subjective probability of detection	0 .129	0,050	0.0	0.25

1 EURO = 7.8 NOK

Table 3. Summary statistics: non-evaders and evaders in 2003

	Non evaders	Evaders
Age	43	40
Percentage females	54%	33 %
Weekly hours.	37	31.59
Annual hours in irregular market		73.24
Hourly wage rate, NOK	166.01	157.2
Annual gross wage income,	388627.5	356488
Annual gross income evaded		10485
Perceived fine if detected, %	27%	25%
Subjective probability of detection	0.133	0.10
Social acceptance of tax evasion	48%	76%

It is, however, conceivable to belive that a substantial fraction of labor income in the irregular labor market was under-declared in the survey. The most important questions helpful to construct and estimate the model are those regarding:

- Gender
- Age
- Weekly hours of work in the regular economy
- Hourly wage rate in main occupation
- Occupation by industry
- Non- labour income
- Social acceptance related to not reporting income to tax authorities

- How do they perceive the chance of being caught if they do not report parts of their income to tax authorities
- In the case of evasion being detected by tax authorities, how large do they think the penalty tax rate will be
- If, during the last 12 months, they have received compensation for work that has not been reported or will not be reported to the tax authorities
- If yes, how many hours of non-reported income activity have they conducted during the last 12 months.

The questions mentioned above will be used to define the variables appearing in the empirical model. In Table 4 I report the replies of the respondents considering the decision whether to evade taxes, and the perception of probability of being detected.

Table 4: How does people perceive the probability of being detected

	Will definitely not be caught	**Will probably not be caught**	**Might Be caught**	**Will probably Be caught**	**Will definitely be caught**	**Total**
q	0.05	0.1	0.15	0.2	0.25	
Evader	22	51	21	3	1	98
Honest	63	303	284	94	45	789
Total	85	354	305	97	46	888

q- is the subjective probability of detection

The reply of the respondents considering the decision whether to evade and the perception of probability of being detected reveals that:

- Most people declared that they will probably not be caught and the perceived probability that this event will happen is considered low, respectively 52 percent among the evaders and 40 percent for the whole sample.
- The majority of the respondents are honest individuals and the fear of getting caught may influence their decision not to evade.
- Among evaders only one declared the highest probability of being definitely caught and for the entire sample only 5 percent declared that they would definitely be caught in case of evasion.
- Comparing the percentage of those individuals who declared definitely not being caught, with those who declared being definitely caught, the difference is quite large (22 percent against 1 percent). This detail indicates that, between these two polar events, most of the

evaders assume that they will not be caught (giving the highest probability to this event) against the event of being caught (giving the lowest probability). Thus we can conclude that evaders give overweight to the probability of not being caught.

However, rational taxpayers, apart from engaging themselves in tax evasion by underreporting their labor-generated income, may provide some insurance against detection. As shown by Feinstein (1991) only a fraction of the evaders get detected by the tax auditing. Nevertheless it has been difficult to obtain unambiguous results with regard to how tax rates, probability of being caught through tax audits and penalty taxes would affect individual behaviour.

It is important to know the feeling among the tax evaders about the possibility of detection and social acceptance. Table 5 describes that the relationship between the perception of the probability of being caught and the social acceptance of tax evasion is such that the evaders, who give low weights (1 percent) to the probability of being caught, consider the tax evasion an acceptable behavior (57 percent). The majority of the evaders consider tax evasion to be acceptable (75 percent).

Table 5 Social acceptance of tax evasion

Probability of detection	Acceptable	Doubt of acceptance	Not acceptable	Uncertain	Total
0,05	21	1	0	0	22
0,1	43	5	0	3	51
0,15	8	12	1	0	21
0,2	2	1	0	0	3
0,25	1	0	0	0	1
Total	75	19	1	3	98

An important variable, which influences the individual's decision about the undeclared regular hours of work, is the hourly wage rate. Therefore it is important to observe the hourly wage for those individuals who declared to have evaded. In this survey individuals were asked about gross hourly wages in the regular and irregular labor market.

We find that, among the evaders, the majority of the respondents are those with an hourly wage (lower than 162 NOK per hour) below the level of average hourly wage (166 NOK per hour), approximately 57 percent. The percentage of evaders, including also the category of average hourly rate is around 70 percent. This exemplifies that the phenomenon of tax evasion, not declaring part of the regular hours of work, is more widely spread among individuals with gross hourly wages lower than the average.

Also, we find that, among honest individuals, the percentage of respondents increases with the level of hourly wage rate. This indicates that for individuals with high hourly wage rates the incentive not to declare regular hours of work diminishes. An explanation could be that, if the tax authorities catch them, the opportunity cost would be higher, the higher are the incomes not declared. It is also important to observe what the survey demonstrates regarding the relationship between the age and the behavior towards evasion. In table 6 I split the respondents into 4 groups of age: those with an age below 30, those between 30s and 40s,those between 40s and 50s and those above 50. The percentage of individuals in the group of below 30s, who declared to have irregular hours of work in the labor market, is the highest, 15 percent.

Table 6 Age of the evaders

Age of respondents	Evaders	Non evaders	Total in %
Below 30s	19	125	15%
30=<age<40	30	241	12%
40=<age<50	27	248	11%
age>=50	19	269	7%
Total	95	883	11%

The participation of the individuals below 30s in the labor market could be lower since the starting age of entering in the labor market has shifted upward. This happens because individuals invest more in education and instruction and as a consequence they postpone the entry into the labor market. They may however find it profitable to work a few hours of work in the irregular labor market.

In the second age category, those between 30s and 40s, the participation in the regular labor market is higher, but yet still we observe 31 percent as the largest group among the evaders. The explanation could be that individuals at the age, between 30s-40s are in the beginning of their career and the gross hourly wage is not very high. Therefore, they are tempted not to declare part

of their regular hours of work to tax authorities as an opportunity to obtain higher incomes. As the work experience and qualification increases with age, the individuals may have higher hourly wage rates and as consequence higher labor-generated income. We observe from the survey that the individuals get less inclined to evade taxes as their hourly wage increases. Following the same reasoning we can conclude that when the age gets closer to the retirement age the inclination to evade taxes decreases. The choice made regarding the regular and irregular hours of work by gender is demonstrated in the next table.

Table 7 Gender and hours of work in regular sector

A8 and A1	Male	Female	Total	Percent Male	Percent Female
No work	136	169	305	45%	55%
Less than 10 hrs	11	17	28	39%	61%
10-19 hrs	11	39	50	22%	78%
20-29 hrs	14	52	66	21%	79%
30-39 hrs	220	221	441	50%	50%
40-49 hrs	91	33	124	73%	27%
50-59 hrs	19	3	22	86%	14%
60 hrs +	7	1	8	88%	13%
Total	509	535	1044	49%	51%

Table 7 illustrate the distribution of hours of work per week between male and female. It is shown that a majority of males and females declared to have full time jobs and by gender there is almost no difference, demonstrating that males and female generally prefer having a full time job. Also it is shown that, among those who do not participate in the labor market and have declared no hours of work, female have the highest percentage of 32 percent. We can observe that for weekly hours of work below the average of full time job the percentage of females is higher compared to male, 78 percent versus 22 percent. This fact demonstrates a higher preference among female for part-time jobs compared to male. As the weekly hours of work increases and is above the full time job, the situation is reversed. We find that for this category female percentage is quite low compared to male, 14 percent against 86 percent.

Table 8 provides information and statistics about irregular hours of work by gender. As we observe, most of the evaders, male and female declared to have irregular hours of work for the low categories, but considering the difference by gender male have a higher percentage compared to

female. The conclusion drawn is that, male participation and hours/efforts of work in the labor market is higher compared to female, respectively in regular and irregular labor market. What is puzzling is the female response at the category of 600-799 hours per year. On weekly basis this can be considered as a side job. It may exist a low percentage among females who decides to work part time and not declare it at all. This may depend on marital status, level of income, social benefits and other factors, which I examine in the next tables.

Table 8 Gender and hours of work in irregular sector

A33 and A1	Male	Female	Total	Percent Male	Percent Female
Less than 10 hours	17	9	26	65%	35%
10-24 hours	16	12	28	57%	43%
25-49 hours	16	7	23	70%	30%
50-99 hours	10	2	12	83%	17%
100-199 hours	6	5	11	55%	45%
200-399 hours	4	0	4	100%	0%
600-799 hours	0	2	2	0%	100%
800-999 hours	1	0	1	100%	0%
Total	70	37	107	65%	35%

4- DESCRIPTION OF THE MODEL

The basic idea behind the structure of the model is an application of utility maximization. Individuals consider after tax income as a good and hours offered in the labor market as a bad. They face a market-determined wage, which establishes the price they can exchange leisure for additional income. The individual reaches a higher level of utility by an increase of disposal income and leisure. Consequently, to optimize the utility of an individual a trade off between leisure and income is involved.

When we try to construct a model of labor supply we do not observe the utility of an individual. We thus have to specify how preferences are distributed. Usually the observed labor supply is assumed to correspond with the desired labor supply. Actually individuals are restricted in their choices in the regular labor market, so it would be more realistic to include in the labor supply studies the option of evasion and irregular hours of work. This option may be considered as an alternative of compensation for hours of work restrictions. Hence, it is assumed that preferred

hours of work are equal to actual hours of work, consenting to the later to include regular and irregular hours of work.
The basic reference model is the one developed by Strøm et al (2004), a nested multinomial logit model of labor supply when tax evasion is an option. Tax evasion is characterized as the legal work whose income is not declared to the tax authorities.

I study quantitatively, at the intensive margin, the participation and the hours of work supplied in labor market, regular and irregular one. I also study qualitatively, at the extensive margin, the decision of the individual whether to evade during the last 12 months. The model can be used to predict hours of work, even if it is only estimated on participation decisions.

First, individuals may respond along the extensive margin. That is, they can decide whether or not to enter the labor force, regular and as well as irregular one. Second, individuals can respond along the intensive margin by varying their hours of work on the job. Thus, the basic assumption in this model is that the individual decides in two stages:

In the first stage he decides to be honest or to be an evader, choosing the approach with the highest utility. As preferences are not observable we can derive the probabilities that individuals will pursue an evading or honest approach depending on the expected values of maximum utility, Ben-Akiva and Lerman (1985). Also, it is assumed that the probability of choosing an evading approach depends on the individual's perception of how socially acceptable tax evading is and on the opportunity to evade taxes. The opportunity to evade taxes is different across sectors. In the previous empirical studies, it has been revealed that the construction sector is the one, which mostly favours tax evasion. On the contrary, the government sector is the one where tax evading activities are the most difficult to perform.

In the second stage, the individual decides how many hours to supply in the regular and in the irregular labour market. Thus, being a tax evader implies working in both markets, respectively in the regular and the irregular one. The work in the second market consists of undeclared hours of work, and as a consequence undeclared part of labor-generated income to the tax office.

Summarizing, what was put in plain words the individual decide in two stages:

- First the individual decides whether to be honest or an evader

- Given the first decision, in the second stage he decides how many hours to work in the regular and/or irregular labor market

Three different models will be estimated:

- A labor supply model at the intensive margin or effort model that uses all the observations, participation decisions as well as hours of work observed,(IM).
- A labor supply model at the extensive margin or participation choice that uses only the participation decision in the estimation of the model, (EM).
- A discrete choice labor supply model assuming no irregular hours of work, (DCM).

When the individual decides to follow an evading strategy, he has to consider the risk of being caught. This is a decision taken under uncertainty therefore is assumed to follow the V-N-M (Von Neumann-Morgenstern) expected utility model, Von Neumann and Morgenstern (1944), and Gul and Pesendorfer (2004). The structure of the model I estimate is a conditional multinomial logit, since we are dealing with a multiple-choice problem and the decision varies over individuals and choices. This model has the feature that the predictors vary over choices (and possibly individuals too) but the parameters do not.

The result at the intensive margin (IM) and extensive margin (EM) labor supply model, when tax evasion is an option, can be compared with regard to the prediction of expected labor supply following from (DCM) model when tax evasion is ignored.

4.1- INTENSIVE MODEL OF LABOR SUPPLY

Starting with the second stage, to generate the net income, I calculate individual gross earnings assuming invariant gross hourly wage rates and I derive the net income by applying the 2003 Norwegian tax and transfer system. Thus, the after tax wage income of an honest individual is:

$$D_{iH} = R_{iH} + I - T(R_{iH,} I) \qquad (4.1.1)$$

where i = 1,2… n

The utility of this honest individual is:

$$U_{iH} = U(D_{iH}, h_{iH}, X) + \varepsilon_i \qquad (4.1.2)$$

where i = 1,2….n

and:

- R_{iH} is gross annual wage income derived by multiplying h_{iH} (annual hours of work) with W (hourly wage rate in the formal market).[2]
- I is non labor income.[3]
- $T(R_{iH}, I)$ [4] is the step-wise tax function related to R and I. X is a vector of socio-demographic characteristics,
- n is the number of the alternatives of working hours.

$U(D_{iH},h_{iH},X)$ is the deterministic part of the utility function and ε_i is be the random part, assumed to be extreme value IID distributed with zero mean and a constant variance across alternatives and individuals. This means that the cumulative density of ε_i is given by $F(\varepsilon_i)=\exp(-\exp(-\varepsilon_i))$. Assuming that the individual chooses the alternative with the largest utility across all the possible ones we can derive the expected value of the maximum of the utility function, which we denote S_H and it has been demonstrated by Ben-Akiva and Lerman(1985) to be equal to:

$$S_H = E\left[\max_{i=1,2..n} U_{iH}\right] = \mu_2 \ln \sum_{k=1}^{n} \exp(u_{kH} / \mu_2) \qquad (4.1.3)$$

and μ_2 is a constant. The deterministic part of the utility $u_{kH} = U(D_{kH},h_{kH},X)$ is observed and we know the distribution of the remaining portion of the utility. Taking the derivatives of the consumer surplus S_H with respect to (u_{kH}) we get the optimal choice probability $P(h_{iH} / H) = P(U_{iH} = \max_{k=1,n} U_{kH})$ which is a multinomial logit conditional on the honest strategy:

$$P(h_{iH} / H) = \frac{\partial S_H}{\partial u_{iH}} = \frac{\exp(u_{iH} / \mu_2)}{\sum_{k=1}^{n} \exp(u_{kH} / \mu_2)} \qquad (4.1.4)$$

where 1=1,2..n

If the individual is an evader, his decision is taken under uncertainty following a V-N-M (Von Neumann-Morgenstern) expected utility model. I will define a preference relation over the first and second strategy (evading or not) and I will use this preference to construct a utility function (in case of detection or not). Then, I define the expected utility of an evader as the sum of the

[2] Annual hours of work h_{iH} are computed as the product of weekly hours of work with 52 week per year.
[3] Since in Norway personal income tax follows a dual approach, I- non labor income is taxed at a rate of 28 per cent while labor income is taxed at a higher progressive rate, 2003 tax schedule.
[4] The difficulty in estimating the labor supply decision in the presence of a nonlinear tax comes from the fact that individuals have different preferences over leisure and disposable income (which can not be observed directly) and that the budget set can be non-convex.

utilities in case of detection and not detection, as demonstrated below. First I describe the outcome if the individual is an evader. There are two outcomes, one when he is not detected and one when he is detected.

$$D_{ij,E,D} = R_{iH} + R_{jE} + I - T(R_{iH} + R_{jE}, I) - \pi(R_{jE}) \qquad (4.1.5)$$

where i, j = 1,2, n

(if detected)

$$D_{ij,E,ND} = R_{iH} + R_{jE} + I - T(R_{iH,} I) \qquad (4.1.6)$$ where i, j = 1,2,n

(if not detected)

and:

- $D_{ij,E,D}$ is after tax and penalty rate income when the individual is an evader, works h_{ij} annual hours, including hours h_{iH} supplied in the regular market and h_{jE} supplied in the irregular market and detected by the tax authorities.
- $\pi(R_{jE})$ is the fine he has to pay if detected which may depend on the income evaded.
- $D_{ij,E,ND}$ is after tax income when the individual evades, but he is not detected.
- R_{jE} is gross annual wage income derived by multiplying h_{jE} (annual hours of work in the informal market) with W_E (hourly wage rate in the irregular market)

The decision taken under uncertainty concerning an event implies that it may or may not happen. Most likely the probabilities of accruing of these events are not precisely known. However, people can form a priori belief about these probabilities. In the model, the probability of being detected is denoted q and it is based on the respondents' replies to question a29. This question was used to structure variable q, the respondents perception concerning the chance of being caught in case they do not report part of their income to the tax authorities. Therefore, the utility function of an individual with undeclared regular hours of work, U_{ijE} , following an evading approach, has two parts:

-The deterministic part (expected utility related to the lottery of tax evasion).

-The random term, with the same distribution as the random term in(4.1.2)

Following the V-N-M expected utility model the utility of an evader is defined as:

$$U_{ijE} = q * u(D_{ij,E,D}, h_{iH} + h_{jE}, X) + (1-q) * u(D_{ij,E,ND}, h_{iH} + h_{jE}, X) + \varepsilon_{ij} \qquad (4.1.7)$$

where i,j=1,2..n

Continuing further we derive S_E :

$$S_E = E\left[\max_{i,j=1,2.n} U_{ijE}\right] = \mu_2 * \ln \sum_{k=1}^{n} \sum_{r=1}^{n} \exp(u_{ijE} / \mu_2) \qquad (4.1.8)$$

where $u_{ijE} = q*u(D_{ij,E,D}, h_{iH} + h_{jE}, X) + (1-q)*u(D_{ij,E,ND}, h_{iH} + h_{jE}, X)$

The probability of working in the regular economy h_{iH} hours and in the irregular economy h_{iE} hours, conditional on being an evader, can be derived in the same way as was done previously with the honest individual:

$$P(h_{iH}, h_{jE} / E) = \frac{\partial S_E}{\partial u_{ijE}} = \frac{\exp(u_{ijE} / \mu_2)}{\sum_{k=1}^{n} \sum_{r=1}^{n} \exp(u_{rkE} / \mu_2)} \qquad (4.1.9)$$

According to Ben-Akiva and Lerman(1985) the probability of choosing an optimal strategy can be evaluated by the expected consumer surpluses. Thus, the probability of choosing the honest strategy P(H) ,is given by:

$$P(H) = \frac{\exp(S_H / \mu_1)}{\exp(S_H / \mu_1) + \exp(S_E / \mu_1)} \qquad (4.1.10)$$

Note that the probability of being an evader is, P(E)=1-P(H) and μ_1 is a constant. Since rational taxpayers may engage in tax evasion by underreporting their income they may not only evade taxes but also provide some insurance against detection. As shown by Feinstein (1991) only a fraction of the evaders get detected by the tax auditing. It is important to know, what people think concerning social acceptance of this phenomenon. Therefore it is important to include in the model a variable that reflects the perception of how socially acceptable the individuals think tax evasion is.

It has been demonstrated in other studies that the opportunity to evade taxes differs across sectors and jobs. It has been also shown that one of the sectors, where tax evasion is widespread is the construction sector. The opposite is the case for those working in the government sector and police

office.[5]

To integrate in the model these possible distinctions in tax evasion opportunities we include in the model two dummy variables, one for those working in the construction sector and one for those working in the government sector.

The expected utility value of choosing a tax evasion strategy is influenced by other important factors. These factors can capture the effects of social acceptance and opportunity to evade on the choice probability of undertaking tax evading activities. We denote this factor g(Z).

$g(Z)=\exp(g_0+g_1Z_1+g_2Z_2+g_3Z_3)$ (4.1.11)

where:

Z_1=1 if the individual thinks that tax evasion is socially acceptable and 0 otherwise,

Z_2=1 if the individual works in the construction sector and 0 otherwise,

Z_3=1 if the individual is a government employee and 0 otherwise.

The g(Z) function is included in the model so that the value of evasion in the choice probability is weighted by this function. Thus we would have:

$$P(H)=\frac{\exp(S_H/\mu_1)}{\exp(S_H/\mu_1)+g(Z)\exp(S_E/\mu_1)} \quad (4.1.12)$$

4.2 -EXTENSIVE MODEL OF LABOR SUPPLY

The structure of the model based on participation decision at the regular and the irregular labor market is as follows:

The individual's decision whether being an evader or not is captured by a dummy variable[6]. The construction of this dummy variable is based on the responses given to question a32. This question provides information about the fact of not declaring regular hours of work and earned income to the tax authorities during last 12 months. Compared to the previous model we have:

$\Pr(a_{32}=1)=P(E)$ (4.2.1)

[5] See Pestieau & Possen (1991) as well as Kolm&Larsen (2004) about the connection between occupational choice and tax evasion.

[6] [0]The dummy variable will take value 0 if taxes are evaded during the last 12 months and value 1 if he didn't evade taxes during the last 12 months.

and

$Pr(a_{32}=2)=P(H)=1-P(E)$ (4.2.2)

Following the same structure for the utility function and the optimal choice probability of being an evader we have:

The likelihood expression in this case will be:

$$L = \prod_{n=1}^{N} P_n(E)^d P_n(H)^{1-d}$$

$$d = 1 \text{ if } a_{32} = 1, \qquad (4.2.3)$$

$$d = 0 \text{ otherwise}$$

Comparing the intensive and the extensive models of labor supply we observe that, assuming $\mu_1=\mu_2$, the same parameters appear in these models. The difference between these models consists of the fact that in the intensive model the dependent variable is based on alternatives of hours worked in both, the regular and the irregular labor market. In the extensive model the dependent variable is based only on the participation decision in respective labor markets. But it should be noted that all the parameters of the utility function are estimated in this last model. Once estimated, this model can be applied to yield the probability of working certain hours. At the intensive and the extensive models of labor supply I use log transformation for the variables of disposal income and leisure[7].

The deterministic part of the utility function of the honest individual is:

$$u_{kH}(D,h,X)=\alpha_0 * \log(\frac{D_H}{100000})+(\beta_0+\beta_1 * X_1+\beta_2 * X_2)*\log(\frac{8760-h_{kH}}{8760}) \qquad (4.2.4)$$

The deterministic part of the utility function of the evader is:

$$u_{krE}(D,h,X) = q*\{\ \alpha_0 * \log(\frac{D_{ED}}{100000}) + (\beta_0+\beta_1 * X_1+\beta_2 * X_2) * \log(\frac{8760-h_{krH}}{8760})\ \}+$$

$$+(1-q)*\{\ \alpha_0 * \log(\frac{D_{END}}{100000}) + (\beta_0+\beta_1 * X_1+\beta_2 * X_2) * \log(\frac{8760-h_{krH}}{8760})\ \}$$

(4.2.5)

where:

D_H= disposable income when the individual has declared to be honest and works h_{kH} hours per week,

[7] Since different individuals have different hours of work, hourly wages and disposal income, the raw data may have very large values or very small ones. Thus I Use log transformation of the data, which helps to squeeze and stretch the data. This will avoid problems like skewness , outliers and unequal variation. This is also motivated by the fact that in general log transformation works well in many situations and it can help to make the data symmetric.

h_{kH} = weekly hours of work in the regular labor market,

D_{ED}= disposable income if the individual is a detected evader and works h_{krH} hours.

h_{krH} = weekly hours of work in the regular and irregular labor market.

D_{END}= disposable income in case the evader is not detected.

X_1 = is a dummy variable, equals 1 if the individual is a woman and zero otherwise.

X_2 = is the age (in years) of the respondents and we considered only those individuals included in the category of age between 18 and 66 years old.

(q)= the transformed probability of being caught, where q is based on the replies of the respondents.

The respondents were asked about how large they consider the chance (in percent) of being caught, in case of not declaring the labor-generated incomes to the tax authorities. Thus, the probability of detection is based on the individual's perception of detection probabilities, as reported by the respondent.

The disposable income D has been calculated applying the stepwise tax-function of 2003. The fine, if tax evasion is detected, is based on the respondent's perception, as reported in the survey. Thus the probability of being caught and the associated fines are subjective to the belief of individuals. The hourly wage rate used to calculate gross incomes equals the ordinary hourly wage rate reported by the respondent in the questionnaire. The survey encloses information about the hourly wage rates of the irregular hours of work, which is used to generate not declared incomes. If annual hours of work are denoted by h, the hours of leisure will be (8760-h).[8] Hours worked in the regular sector are observed in broad categories and I have used the midpoints (10, 25, 37.5) per week with 50 hours a week as a maximum. Hours worked in the irregular economy are reported as annual hours, and again in broad categories with midpoints (10,25,37,75,150,250) and 700 as a maximum.

Referring to previous studies there exist a relation of substitutability between hours of work in the regular market with those in the irregular market. The marginal disutility of working in both markets is assumed equal. The hours of work entering in the utility function are taken as the sum of irregular and regular hours of work. In other studies it is assumed that the marginal disutility is not equal since other factors like social stigma may increase the disutility of evading and it would be higher in comparison with the case of no evasion (Fortin 2001).In this model stigma effect is

[8] 8760(annual hours) = [(365days*24hours/day) –(annual hours of work)]

captured by the variable Z_1, used to weight the value of tax evasion appearing in the probability function.

4.3. DISCRETE CHOICE MODEL (DCM) OF LABOR SUPPLY WITH NO OPTION OF EVASION

When we try to construct a model of labor supply we do not observe the utility of an individual. We observe some characteristics and try to mach the unobservable with what is observable by specifying a functional relationship.

In the DCM model the after-tax wage income is:

$$D_{iH} = R_{iH} + I - T(R_{iH,} I) \qquad (4.3.1)$$

where i = 1,2…n

The utility of the individual is:

$$U_{iH} = U(D_{iH}, h_{iH}, X) + \varepsilon_i \qquad (4.3.2)$$

where i = 1,2….n

and:

- R_{iH} is gross annual wage income derived by multiplying h_{iH} (annual hours of work) with W_H (hourly wage rate in the regular market)
- I is non labor income
- $T(R_{iH}, I)$ is the step-wise tax function related to R and I.

U_{iH} is the utility function when the individual works h_{iH} hours, X is a vector of socio-demographic characteristics, $U(D_{iH},h_{iH},X)$ will be the deterministic part of the utility function and ε_i will be the random part, assumed to be extreme value IID distributed. Wee can derive the expected value of the maximum of the utility function, which we denote by S_H like in (4.1.3):

Taking the derivatives of the consumer surplus S_H with respect to (u_{kH}) we get the optimal choice probability $P(h_{iH}) = P(U_{iH} = \max_{k=1,n} U_{kH})$.

Thus, the conditional probability of choosing h_{iH} hours is:

$$P(h_{iH}) = \frac{\partial S_H}{\partial u_{iH}} = \frac{\exp(u_{iH} / \mu_2)}{\sum_{k=1}^{n} \exp(u_{kH} / \mu_2)} \qquad (4.3.3)$$

where 1=1,2..n

The dispersion in unobserved heterogeneity of the preferences is represented by the constant μ_2. The deterministic part of the utility function of the individual is:

$$u_{kH}(D,h,X) = \alpha_0 * \log(D_H / 100000) + \quad + (\beta_0 + \beta_1 * X_1 + \beta_2 * X_2) * \log((8760 - h_{kH}) / 8760) \tag{4.3.4}$$

where: D_{Hk}= disposable income when the individual has declared to be honest and works h_{kH} hours. The disposable income D_{Hk} has been calculated applying the stepwise tax-function of 2003. If hours of work are denoted by h, the hours of leisure will be (8760-h) annually. Hours worked in the regular sector are observed in broad categories and we have used the midpoints (10, 25, and 37.5) per week and with 50 hours a week as a maximum. X_1 is a dummy variable, which equals 1 if the individual is female and zero otherwise. X_2 is the age (in years) of the respondents (we consider only those individuals included in the category of age between 20 and 60 years old).

EMPIRICAL RESULTS OF EM, IM COMPARED TO DCM

Table 9 reports the estimation results of the intensive and extensive model compared with the results of DCM. I observe that in the extensive and intensive margin approach the coefficients are all significant. An exception is age and the dummy about working in the government sector at IM model. It is worth noting that at the extensive margin the coefficient related to woman and age is positive which means that the participation, in the regular labor market relative to the irregular one, increases with age and for female participation increases more than for male. In the intensive model we find that the coefficient of age and female are negative implying that if we refer to efforts/hours of work they decrease with age, and for female more than for male. Getting closer to the retirement age they may prefer to work less both in the regular and irregular labor market. In view of what was observed by the survey regarding age and the decision to evade these results seem logical.

The disposable income[9] is significant and has a positive impact on choices. Thus the disposal income and hence taxes are the main determinants of the behaviour towards tax evasion. Concerning leisure, a positive and significant parameter it is found, at extensive and intensive margin implying a positive relationship between this variable and the expected utility.

[9]Non-linear tax schedules and transfer programs may create complicated functional relationships involving wages, non-labour income and labor supply in regular and irregular labor market. So it is useful to distinguish marginal wages from average wages. The former are relevant to marginal substitution decision and the latter are relevant to income effects Heckman (1993).

Also perceived social acceptance of tax evasion has a significant impact, such that the value of tax evasion increases with the perceived social acceptance of tax evasion. Having more social support, in occurrence of evasion and hence, finding a higher prevalence of evasion among colleagues, friends or the group to whom they pertain to, induce individuals to have a more positive attitude toward tax evasion. Thus, it is essential to bear in mind the individual's perception about tax evasion, the willingness to take risks, perception of possibility to evade, perception of detection, perception of acceptance by the society of tax evasion which influence and determine the probability of choosing to evade or not.

The dummy variables of working in the construction sector have a significant impact both at the extensive margin and at the intensive margin model[10]. The interpretation of this result is that the construction sector may have the highest participation in the irregular labor market but exploring at the intensive margin they do not provide the highest level of efforts and incomes in the irregular labor market.

Table 9: Parameter Estimates following IM, EM and DCM approach

Variable	Parameter Values EM	Parameter values of IM	Parameter values of DCIM[11]
Dependent variable:	Participation	Hours of work	Hours of work
D	0.784	0.591	6.728
(disposal income)	(0.187)	(0.233)	(0 .615)
B1	7.703	-6.000	1.887
(dummy woman)	(2.606)	(1.668)	(0.474)
B2	0.121	-0.077	-0.0182
(age)	(0.078)	(0.054)	(0.0099)
B0	6.871	11.267	-2.531
(leisure)	(3.368)	(2.459)	(0.2674)
	-1.449	-3.117	
(constant)	(0.251)	(1.000)	
Z1(dummy accept evasion)	1.242	0.623	
	(0.275)	(0.334)	
Z2(dummy construct)	0.973	0.942	
	(0.323)	(0. 468)	

[10] The variable of the opportunity density of working in the construction sector includes also those working in the manufacturing sector, since from the summery statistics was found also a high percentage of evaders among those working in the manufacturing sector. They had also the highest level of generated income from evasion.
[11] DCIM (Discrete choice at intensive margin)

Z3 (dummy govern)	-0.285	0.968	
	(0.678)	(0.751)	
Log likelihood	-214	-2548	-1158.0428
McFadden ρ^2	0.30	0.14	0.277
Nr obs.	895	895	895

Standard errors in brackets.

On the subject of the dummy about the government sector it is difficult to comment on it. At the extensive margin it has the expected sign but is not significant. At the intensive margin both the sign and the significance do not satisfy the expectations. Thus the interpretations that the government sector is the one, which do not facilitate the process of tax evasion do not hold.

PREDICTED LABOR SUPPLY

Once I attain the estimation results they can be used to calculate and predict the expected labor supply from the conditional probabilities of being an honest or an evader combined with individual characteristics and actual rules of the tax system. Thus, to recover the expected labor supply conditional that the individual is an honest one, I have to calculate the utility, for each possible combination of hours of work in the regular labor market by substituting the estimations for each parameter into the formula 4.1.2. The following is a logit transformation like 4.1.4 formula, which provides the conditional probability of being honest for each of the possible combinations. These probabilities are used to compute the expected labor supply in the regular labor market conditional that the individual decides to be an honest one. This is confirmed by the last formula as follows:

$$E(YL_H / H) = 52 * \left[\sum_{i=2}^{5} P(h_{iH} / H) * h_{iH} \right]$$

where YL is the expected labor supply in a year.

I follow the same procedure to recover the expected regular labor supply conditional that the individual is an evader. The utility of an evader is calculated from the 4.2.4 formula, which is used to compute the conditional probabilities of being an evader like in 4.1.9 formula. This procedure is demonstrated by the formula below:

$$E(YL_H / E) = 52 * \left[\sum_{i=2}^{5} \sum_{j=1}^{8} P(h_{iH}, h_{jE} / E) * h_{iH} \right]$$

The conditional probabilities like in 4.1.9 can also be used to calculate the expected irregular labor supply conditional that the individual is an evader as follows[12]:

$$E(YL_E / E) = \sum_{i=1}^{5} \sum_{j=1}^{8} P(h_{iH}, h_{jE} / E) * h_{jE}$$

Predictions are given in Table 10. $E(YL_H / H)$ denotes the expected hours of work, given that the individual has chosen an honest strategy, $E(YL_H / E)$ is the expected hours of work in the regular economy, given that the individual has chosen a tax evading strategy, $E(YL_E / E)$ is the expected hours of work in the irregular economy, given that the individual has chosen a tax evading strategy, EL_H is the unconditional expectation of hours of work in the total economy, while EL_E is the unconditional expectation of hours of work in the irregular economy.

Table 10 Predictions of labor supply

Variables	P(H)	P(E)	$L_{H/H}$	$L_{H/E}$	$L_{E/E}$	L_H	L_E
Observed values(per year)	0.89	0.11	1572	1715	74	1586	10
Labor supply*, EM(per year)	0.89	0.11	1390	1071	281	1272	31
Labor supply, IM (per year)	0.82	0.18	1451	1435	265	1448	47
Labor supply DCIM(year)			2504				

***Annual hours**

The first block refers to the comparison of the $E(YL_H / H)$, predicted by the extensive model (EM) and intensive model (IM), with the observed values. The prediction of IM is much closer to the observed values. This is also the case by the prediction of $E(YL_H / E)$ in the second block and $E(YL_H)$ in the third one.

In the 4th series is included the labor supply predicted if we would assume that there is no option of evasion and the individual declare all the labor-generated incomes to the tax authorities. Thus, assuming wrongly that the individual does not provide irregular hours of work we completely ignore the labor supply in the irregular labor market and simultaneously the evaded taxes. The

[12] $E(YLH) = E(YL_H / H) * P(H) + E(YL_H / E) * P(E)$
$E(YLE) = E(YL_E / E) * P(E)$

- E(YLH) is the honest expected labor supply and E(YLE) is the evader expected labor supply.

prediction of labor supply, similar to other studies, is biased upward, relatively higher than the observed.

It is demonstrated that the extensive model predicts the highest $L_{E|E}$, but since the probability of being an honest individual following IM is higher than the one predicted following the EM, the overall level of L_E predicted by IM is the highest, as it is shown from the first series. In the EM the probabilities of participation are correctly predicted. This follows directly from the estimation program and cannot be used to evaluate the performance of the intensive model.

In the IM, the estimation program does not imply that the participation probabilities are the same as the observed fractions. I observe that IM predicts 18 percent of the sample taking part in tax evading activities while only 11 percent is observed to take part. On the other hand expected hours of work are fairly better predicted compared to EM. In the EM the economic incentives play a more significant and numerically important role than in the IM, however in the IM marginal utility of leisure is numerically larger than in EM. Additionally, the social acceptance is a key explanatory variable, together with gender in the explanation of the behavior, in the IM.

Referring to DCM estimation results they are significant but in the vein of what the literature sustains, such models, give biased upward results. This is also the case, when in DCM it is assumed that the individual is an honest one, ignoring as outside observer the option of tax evasion.

The expected labor supply, predicted excluding the option of evasion, provide such results, which are higher than the observed ones. In consequence they are biased upward. Comparing the results of IM, when tax evasion is an option, they are closer to the observed ones, moreover, lower. Therefore, counting for the alternative that individuals supply hours of work to irregular labor market helps to obtain a better approximation of expected labor supply and tax levels.

The IM may not replicate the real situation about the tax evasion and irregular hour of work, considering the peculiarity of this issue plus the fail of the model to deal with the unobserved heterogeneity, but it performances much better compared to DCM.

The tax evasion is a risky activity, punished in case of detection. Consequently, those who engage in this dangerous game and do not obey to the rules, hardly accept to fully report it. In the survey, the observed fraction of being an evader is calculated at 11 percent while from the IM model the prediction of the probability of being an evader is estimated at 18 percent. Assuming that in the survey, the full reporting about the actual level of tax evasion was partial, our estimates may bring into light a result, which is closer to the real level of evaded taxes. The model is capable to capture a fraction of it, which was not fully declared in the survey.

These results sustain the phenomenon of a higher level of undeclared regular hours of work, higher undeclared labor-generate incomes to the tax authorities and higher evaded taxes compared to what could be observed from the survey.

In the IM model, which studies quantitatively this phenomenon, the information provided is more substantial. Passing the first barrier, of accepting that taxes have been evaded, the declaration of hour's quantity is easier. As consequence more detailed information is provided. Even though the procedure itself bears some subjectivity, still helps to acquire a more transparent view of the picture.

What is said above implies that the intensive model, which relies on the responses, both at, participation and hours of work decision, has achieved to visualize better the level of irregular hours of work compared to EM and DCM.

Table 11 Prediction of tax levels

Variables	T_H	$T_{H/E}$	T	T_E- $T_{H/E}$
Observed Level of taxes**	102402	87170	94786	4028
Predicted taxes EM	61685	41053	50287	12939
Predicted taxes IM	65396	63565	65067	15391
Honest intensive	139550			

** Annual tax, NOK

T_H denotes expected taxes paid by the honest individuals (first block) and $T_{H|E}$ (second block) denotes the expected taxes paid by the tax evaders. T (third block) is the total expected taxes in the population, which is the mean level of the two former expectations. T_E (forth block) is a hypothetical amount of expected taxes, namely the amount of taxed paid by the tax evaders if all income, regular and supposed irregular one, were reported to the tax authorities. T_E-$T_{H|E}$ is the expected amount of taxes evaded, which also is a hypothetical amount.

It is noticeable that the predicted level of taxation is lower than the observed one. In the case of those individuals, declaring to be honest conditional of being an evader, the payable taxes are lower compared to the observed level. If the evaders had to report all labor-generated income there is no guarantee that his expected labor supply is the sum of regular and irregular hours. Moreover, the difference that exists between the level of evaded and payable taxes, in case of evasion and not detection, is higher at IM compared to EM. The predictions of higher $E(YL_H / H)$ and $E(YL_H / E)$, from IM compared to EM, simultaneously with the prediction of higher $E(YL_E / E)$ level, from

EM compared to IM, provides an overall effect of the expected hypothetical evaded taxes at higher level, by IM against EM.

Accordingly, the expected labor supply is better predicted by IM, and as consequence the expected level of evaded taxes is better predicted following IM. These findings are crucial because they highlight the importance of parallel studies at intensive and extensive margin of the labor supply with the scope to predict the behavioral response toward reforms, social policies, transfer programs of welfare system reforms.
Thus most labor supply studies use a DCM model. Nevertheless tax evasion takes place most likely in all countries. Thus my study demonstrates that DCM models can yield biased results.

6. CONCLUSION

The main purpose of the paper has been to analyze the decision of the individuals regarding their allocation of time in the regular and irregular labor market, based on IM and EM approach. The probability of participating in the respective labor markets was also studied. The basic model I referred to was a labor supply model when tax evasion is an option, developed by Strøm et al (2004). Following this model I studied the decision of the individual with regards to the allocation of time in the regular and irregular labor market qualitatively (if he ever didn't declare participation in the regular employment) by an EM model and quantitatively (if he undeclared regular work participation how many hours were not declared) by an IM model.

I observe that in the extensive and intensive margin approach the coefficients are all significant. An exception is age and the dummy about working in the government sector at IM model. It is worthy to notice that at the extensive margin the coefficient related to woman and age is positive which means that the participation, in the regular labor market with respect to the irregular one, increases with age and for female participation increases more than for male. But in the intensive model we find that the coefficient of age and female are negative implying that if we refer to efforts/hours of work they decrease with age, and for female more than for male. Getting closer to the retirement age they may prefer to work less both in the regular and irregular labor market. In view of what was observed by the survey regarding age and the decision to evade these result seem logical.

The disposable income is significant and has a positive impact on choices. Thus the disposal income and hence taxes are the main determinants of the behaviour towards tax evasion.

Concerning leisure, a positive and significant parameter it is found, at extensive and intensive margin implying a positive correlation between this variable and the expected utility. The dummy variable related to construction is significant both at the extensive margin and at the intensive margin model. It is difficult to comment on the dummy about the government sector. At the extensive margin it has the expected sign but it is not significant. At the intensive margin both the sign and the significance do not satisfy the expectations. Thus the conjectures that the government sector is the one, which do not facilitate the process of tax evasion, do not hold. Perceived social acceptance of tax evasion has a significant impact, such that the value of tax evasion increases with the perceived social acceptance of tax evasion. Having more social support, in case of evasion and hence, finding a higher prevalence of evasion among colleagues, friends or the group to whom they pertain to, induce individuals to have a more positive attitude toward tax evasion.

The IM predicts better the expected labor supply, mean level of taxes and irregular hours of work. While considering the peculiarity of this issue IM implied a higher level of tax evasion compared to EM and DCM. But it should be observed that the EM model performs relatively well compared to DCM. Thus if the available data at the disposal of the researcher are only on participation decision, discarding the possibility to estimate an IM model, the EM model can yield acceptable results. Note also that in the most labor supply studies one does not observe tax evasion activities. Thus most labor supply studies use a DCM model. Nevertheless tax evasion takes place most likely in all countries. Thus my study demonstrates that DCM models can yield biased results. Consequently, the expected labor supply and tax revenues are better predicted by IM. These findings are crucial for the reason that they highlight the importance of parallel studies at intensive and extensive margin to predict the behavioral response toward reforms, social policies, transfer programs of welfare system reforms.

Thus the inclusion of option of evasion to the studies at extensive and intensive margin would make the difference in sketching the optimal tax system.

The results obtained are important for policy implications. Understanding better the mechanism of individual behavior in labor market helps to remove disincentives related to tax evasion as well as design social and economic policies aiming at increasing individuals benefits of participating in the regular sector. Transforming the undeclared irregular work into a regular one may help to achieve lower unemployment, improve the quality and productivity at work and strengthen the social cohesion.

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