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Discussion paper

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## Abstract

In this paper we analyse how fairness considerations, in particular considerations of just income distribution, affect whether or not people find tax evasion justifiable and their willingness to evade taxes. Using data from the Norwegian “Hidden Labour Market Survey” we show that individuals with low hourly wages and long working hours have a higher probability of justifying tax evasion. These are individuals that arguably are treated unfairly in a tax system that taxes an individual’s total income without taking into account how many hours the individual has worked. The same individuals are also more willing and likely to take home income without reporting it to the tax authorities. The results are consistent with a model in which individuals make a trade-off between economic gains and fairness considerations when they make decisions about tax evasion. Taken together our results suggest that considerations of fair income distribution are important for the analysis of tax evasion.

JEL Classification Codes: D63, H26.

Keywords: Tax evasion; redistributive taxation; fair income distribution.

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## **1. Introduction**

Most people feel the need to be able to justify their actions to themselves and to others. This is also the case when they decide whether or not to abide by a particular law. It is easier to violate a law that one believes is unfair than a law that one believes is fair. In this paper we analyse how fairness considerations affect whether or not people believe tax evasion can be justified and their willingness to engage in tax evasion. The idea that tax evasion may be affected by what the taxpayers perceive to be unfair taxation is not new. For example, Bordignon (1993) presents a theoretical framework where taxpayers are more inclined to evade taxes if they have to pay a tax rate that is higher than what they think is a fair price for the public goods they receive. Fairness effects in tax evasion are also demonstrated in several experimental studies, such as Fortin, Lacroix and Villeval (2004) and Spicer and Becker (1980). In the present paper we focus on how considerations of a fair income distribution might affect people's propensity to justify tax evasion and thus how likely they are to evade taxes.

It is natural to meet attempts to justify tax evasion by appealing to fairness considerations with scepticism and ask whether it is just a way to rationalize behaviour determined by other types of considerations, such as the expected net economic gain from tax evasion. One way to investigate whether fairness considerations play an independent role in motivating tax evasion is to identify a group of individuals that is seems reasonable to view as unfairly treated by the tax system and then study whether these individuals are more likely to view tax evasion as justifiable and more willing to evade taxes.

The obvious problem with such an approach is the inherent difficulty in identifying a group of tax payers that it seems reasonable to view as unfairly treated. However, we shall argue that it is possible to identify a particular group of tax payers that most people will agree is treated unfairly by a progressive tax system. This is the group of individuals who have low hourly wages and work long hours. Evidence from both surveys and from economic experiments have documented that most people find inequalities reflecting differences in work effort as fair (see for example Cappelen et al 2010, Schokkart and Devooght 2003). A progressive tax that is levied on the basis of total income reduces inequalities due to differences in work effort and it can therefore be seen as unfairly treating those who work long hours.

In the empirical parts of this paper we show that among individuals with identical monthly wages, an individual with low wages and long working hours is more likely to justify tax evasion than an individual with high wages and shorter working hours. We also show that the individual with low wages and long working hours is more willing to take home income without reporting it to the tax authorities. These results are consistent with our theoretical model. The results also turn out to be robust to the inclusion of measures of human capital, measures of marginal tax and to the inclusion of norms related to tax evasion as well as the expected probability of being caught.

The rest of the paper proceeds as follows. In section 2 we present a model in which individuals make a trade-off between economic gains and fairness considerations when they make decisions about tax evasion. We furthermore argue that individuals with low hourly wages and long working hours are unfairly treated in a tax system that does not take account of hours worked when taxes are calculated. In section 3 we use data from the “Hidden Labour Market Survey” in Norway to analyse empirically the relationship between fairness considerations and working hours. In the final section we conclude.

## **2. Justification and willingness to evade tax**

It is evident from surveys (Gaertner and Schwettmann 2007, Schokkaert and Devooght 2003) and economic experiments (Camerer 2003) that people are willing to sacrifice pecuniary gains in order to avoid large deviations from what they consider to be fair. Such experiments have also shown that people care about whether or not income inequality is a result of factors under or outside individual control (Konow 2000, Cappelen, Hole, Sørensen and Tungodden 2007).

When people decide whether or not they shall evade taxes, it is reasonable to assume that both economic and fairness considerations play a role. Consequently, a person may not be willing to evade taxes even if it would give a net economic gain because he finds it difficult to justify such behaviour. Similarly, a person may be willing to evade although he does not find it justifiable because the economic gain is high. To study the relationship between the ability to justify tax evasion and the willingness to evade taxes, we introduce fairness considerations into a model of economically optimal tax evasion of the types used in the seminal papers by Allingham and Sandmo (1972) and Sandmo (1981).

To focus on the problem of designing a fair tax system, we assume that the only purpose of the tax system is to redistribute income. There is in other words no public good that needs to be financed. We assume that there is a constant tax rate  $t$  and everyone receives a uniform transfer  $B = tY/n$ , where  $Y$  is the total income in the economy and  $n$  is the number of individuals in the economy.

An individual decides how many hours  $l$  he will work for an hourly wage rate  $w$ . His total income  $wl$  is taxed at a rate  $t$ , and he also receives the transfer  $B$ . Let  $u$  be the income he chooses not to report to the tax authorities, i.e. he reports only  $wl - u$ . We use the standard assumption that the probability of being detected is a decreasing, convex function of the reported income, i.e.  $p = p(wl - u)$ , where  $p' < 0$  and  $p'' > 0$ <sup>1</sup>. An alternative is that the probability of detection depends on the evaded amount  $u$  only. However, it seems reasonable that hiding a certain amount is less suspicious the higher the reported income is.<sup>2</sup> The penalty tax  $\tau(u)$  is an increasing and convex function of the unreported income  $u$ , and always exceeds the evaded tax.<sup>3</sup> The expected penalty is then  $p(wl - u)\tau(u) \equiv \varphi(u, wl)$ . It follows from the assumptions about  $p(\cdot)$  and  $\tau(\cdot)$  that  $\varphi_1 > 0$ ,  $\varphi_{11} > 0$ ,  $\varphi_2 > 0$  and  $\varphi_{22} > 0$ . The expected net income of an individual with unreported income  $u$  is

$$y(u, wl) = (1-t)wl + B + tu - \varphi(u; wl) \quad (1)$$

We assume that the decision to evade is made regularly, and that the evasion is relatively small, such that the potential penalty is small relative to the lifetime income. This allows us to analyse the tax evasion decision as if the individual is risk neutral, and therefore only cares about the expected net income, not the degree of uncertainty. In this respect we depart from the Allingham-Sandmo models.

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<sup>1</sup>. We do not analyse the game between evaders and tax authorities, such as Reinganum and Wilde (1985 and 1986) and Erard and Feinstein (1994), but simply assume that the taxpayers expect the probability of detection to be a decreasing function of his reported income.

<sup>2</sup> In the theoretical literature on tax evasion, the assumptions differ about what factors that determines the probability of detection. For example, the probability of detection depends on reported income in Allingham and Sandmo (1972) and in Kleven et al (2012), while it depends on evaded income in Yitzhaki (1987).

<sup>3</sup> The distinction between penalizing evaded income and evaded tax does not matter for our problem as long as we do not discuss changes in the tax rate.

We assume that individuals are motivated by a desire for income and leisure and by a desire to act in accordance with what they consider to be fair. For our purpose, we lose no insight by using a utility function that is additively separable in a “selfish” and a “moral” part, instead of a more general formulation. In this section, the “selfish” part is simply the expected income minus the cost of work effort. An individual chooses  $l$  and  $u$  so as to maximize the following utility function.<sup>4</sup>

$$V(u,l) = y(u, wl) - zc(l) - \beta f(ut - e^*) \quad (2)$$

The first term is the expected income and is given by equation (1). The second term,  $zc(l)$ , is the cost of working  $l$  hours. The parameter  $z$  is a measure of the relative preferences for consumption versus leisure. The term  $\beta f(\cdot)$  is what we will call *the fairness effect* on evasion: It captures the individuals’ disutility or moral cost of deviating from what he considers to be the *justifiable evasion*, i.e. the evasion that would give the individual a fair income. The term  $ut - e^* \equiv d$  is the difference between the actual evasion  $ut$  and the justifiable evasion  $e^*$ . The disutility is assumed to be increasing in  $d$  if the fraction evaded is below the fair fraction, and decreasing in  $d$  if the fraction evaded is above the fair fraction. Hence,  $f'(d) \geq 0$  if  $ut \geq e^*$  and  $f'(d) < 0$  if  $ut < e^*$ . Moreover,  $f''(d) > 0$  is assumed. The weight a person attaches to fairness considerations relative to his narrow self-interest is given by  $\beta$ .

## 2.1. Fair tax evasion

The crucial question is how the justifiable tax evasion,  $e^*$ , is determined. We shall argue that  $e^*$  is increasing in  $l$  for a given income  $wl$  and strictly decreasing in  $w$ . It is evident from the political debate, surveys (Gaertner and Schwettmann 2007, Schokkart and Devooght 2003), economic experiments (Almås et al 2010, Cappelen et al 2007, Cappelen et al 2010, Frohlich and Oppenheimer 2004, and Konow 2000) and contemporary theories of justice (Arneson 1989, Cohen 1989, Dworkin 1981, Fleurbaey 1995, Roemer 1998 and Cappelen and Tungodden 2009) that people view some inequalities as fair and others as unfair. For example, a large majority view inequalities arising from differences in the number of hours worked as fair, while inequalities arising from gender or race are considered as unfair. One

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<sup>4</sup> In this section, we can leave out subscript  $i$  for individual without causing misunderstanding.

view that respects the distinction between fair and unfair inequalities is the view that individuals should be rewarded in proportion to their work effort. Assuming that person's  $i$ 's work effort is captured by  $l_i$ , his fair income  $Y_i^*$  is then given by

$$Y_i^* = \frac{l_i}{\sum l_j} Y = l_i \bar{w} \quad (3)$$

where  $\bar{w}$  is the average hourly wage rate. This principle of income distribution is in line with the core idea of liberal egalitarian theories of distributive justice (Dworkin (1981), Arneson (1989), Cohen (1989), Roemer (1998), Kolm (1996), and Fleurbaey (1995)). A common feature of these theories is that they draw a distinction between responsibility factors and non-responsibility factors. Inequalities arising from non-responsibility factors are considered to be unjust, while inequalities arising from responsibility factors are seen as just. The principle of fair income distribution in equation (3) is also consistent with views expressed by a large majority of respondents in the Norwegian "Hidden Labour Market Survey" from 2003 (Barth et al. 2008). The survey was designed by the Frisch centre for economic research, and undertaken as a representative postal survey by the Markeds og Medieinstituttet A/S. The response rate was 58 percent and 1062 individuals were interviewed. In this survey 87 percent of the respondents agreed with the statement "*Income differences that are a result of factors under individual control, such as choice of education, profession or work time, should be accepted*" and 88 percent of the respondents agreed to the statement "*People deserve equal income for equal labor effort*".

Based on these results, we make the simplifying assumption that people view inequalities due to hours worked as fair, while inequalities due to differences in the wage rate are viewed as unfair.<sup>5</sup> In a model where the pre-tax income is determined by the wage rate and the hours work, this implies that the fair income distribution is to distribute in proportion to hours worked.

In order to get his fair income, an individual  $i$  should pay net taxes equal to:

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<sup>5</sup> How reasonable this assumption is depends on the extent to which hours worked can be freely chosen and the extent to which the wage rate is outside individual control.

$$T_i^* = Y_i - Y_i^* = l_i(w_i - \bar{w}). \quad (4)$$

Individual  $i$ 's actual net tax payment is:

$$T_i = tw_i l_i - B = t(w_i l_i - \bar{w} l_i). \quad (5)$$

The *unfair tax payment*, defined as the difference between the actual tax payment  $T_i$  and the fair tax payment  $T_i^*$ , is  $T_i - T_i^*$ . We assume that what an individual perceives as a *fair tax evasion* is positively related to the unfair tax payment. To simplify, we assume that the fair evasion equals the unfair tax payment, i.e.  $e^* = T - T^*$ . Using (4) and (5), the fair evasion can then be written as:

$$e^* = T_i - T_i^* = [\bar{w} - (1-t)w_i] l_i - B \quad (6)$$

It follows from Equation (6) that the fair tax evasion may be positive (when actual tax payment is higher than the fair tax payment) or negative (when actual tax payment is lower than the fair tax payment) and that it is strictly decreasing in the hourly wage rate  $w$ . More hours worked increases the justifiable evasion if and only if the fair wage rate  $\bar{w}$  exceeds the net hourly wage  $(1-t)w$ . If the fair wage rate is lower than the net hourly wage, the fair evasion is negative and decreasing in the number of work hours. However, the crucial result for our purpose is that the fair evasion is strictly increasing in the number of hours worked for a given total income  $wl$ . Hence, it is useful to write the fair evasion as a function of  $l$  and  $wl$ , i.e.  $e^*(l, wl)$  where  $e^*_1(l, wl) > 0$  and  $e^*_2(l, wl) < 0$ .

The intuition behind this result is important: Any linear tax system that sets the rate between zero and unity has two opposing effects on unfairness. First, it reduces the inequalities between individuals who work the same number of hours, but have different hourly wages. Second, it reduces the inequalities between individuals who have the same hourly wage, but work different number of hours. If wage rates are seen as outside individual control, while hours worked are seen as inside individual control, it might be argued that the first effect contributes to reduced unfairness, whereas the second effect contributes to increased unfairness.



## 2.2. Fairness and the willingness to evade taxes

With the fair tax evasion  $e^*$  specified by (6), the difference between actual and the fair evasion can now be written as  $ut - e^*(l, wl) \equiv d(u, l, wl)$ . Since  $e_1^*(l, wl) > 0$  and  $e_2^*(l, wl) < 0$ , it follows that  $d_1(u, l, wl) = t > 0$ ,  $d_2(u, l, wl) < 0$  and  $d_3(u, l, wl) > 0$ . The absolute value of  $d$ ,  $|ut - e^*(l, wl)|$ , can be called the deviation from fairness. Hence, for a given total income  $wl$  and evasion  $u$ , the deviation from fairness decreases in the number of work hours if  $ut > e^*(l, wl)$  and increases in the number of work hours if  $ut < e^*(l, wl)$ . Consequently, the cost of deviating from fairness,  $f(d)$ , increases with the number of work hours if  $ut > e^*(l, wl)$  and decreases with the number of work hours if  $ut < e^*(l, wl)$ .

Maximizing  $V$  with respect to  $l$  and  $u$  yields the two first order conditions

$$t = \varphi_u(u, wl) + \beta f'(d)t \quad (7)$$

$$(1-t)w = zc'(l) + \beta f'(d)[d_2(u, l, wl) - d_3(u, l, wl)w] \quad (8)$$

Equation (7) says that the marginal gain from one dollar evaded, the saved tax payment  $t$ , should equal the marginal expected penalty  $\varphi_u$  plus the cost or gain from the change in fairness,  $\beta f'(d)d_u(u, l, wl)$ . Whether the fairness effect is positive or negative depends on whether the actual evasion ( $ut$ ) is above or below the fair evasion ( $e^*$ ). The left hand side of Equation (8) is the net gain from working one more hour. The right hand side is the marginal effort cost of one more work hour plus the changed cost of deviating from fairness. As for a change in evasion, the sign of the fairness effect depends on whether the actual evasion is above or below the fair evasion. If an individual evades less than the justifiable amount  $e^*$ , then  $d < 0$  and so  $f'(d) < 0$ . This implies that the fairness effect reduces the marginal cost of evasion, since more evasion brings evasion closer to its justifiable amount. The fairness effect increases the marginal cost of work effort. The reason is that higher work effort increases the justifiable evasion, for a given income  $wl$ .

How do fairness considerations affect peoples' willingness to evade taxes? In order to study this question we compare individuals who have the same total income  $wl$ , but who may differ with respect to both their wage rates and their relative preferences for consumption over leisure. To simplify, we may think of two groups, A and B, where members of group A work fewer hours at a higher wage rate than members of group B, i.e.  $w_A > w_B$  and  $l_A < l_B$  such that  $w_A l_A = w_B l_B$ . The reason why members of group B work more hours at a lower wage is that they have a higher relative preference for consumption than members of group A, measured by a lower value of  $z$ .

When  $\beta = 0$ , i.e. when fairness considerations play no role, equation (7) and (8) become

$$t = \varphi_u(u; wl) \tag{7}'$$

$$(1-t)w = zc'(l) \tag{8}'$$

Since total income  $wl$  is the same for members of both groups, it follows from (7)' that they will evade the same amount  $u$ . Hence, if we compare individuals who have the same total labour income  $wl$ , but differ with respect to their wage rates and their relative preferences for consumption and leisure, we would expect no differences in their tax evasion if fairness considerations play no role.

If fairness considerations play a role, i.e. if  $\beta > 0$ , it follows from (7) and (8) that evasion must differ between the two groups: Individuals from the high-wage group A will evade less than individuals from the low-wage group B. To see this, let us show that the opposite cannot be true, i.e. we cannot have  $u_A \geq u_B$ . Since  $e_1^*(l, wl) < 0$ ,  $w_A l_A = w_B l_B$  and  $l_A < l_B$ , implies that the fair tax evasion is lower for A than for B, i.e.  $e_A^* < e_B^*$ . Since  $d = ut - e^*(l, wl)$ , this implies that  $d_A > d_B$  if  $u_A \geq u_B$ . If  $u_A \geq u_B$  and  $d_A \geq d_B$  the right hand side of equation (7), the marginal cost of evasion, would be higher for A than for B. Hence,  $u_A \geq u_B$  cannot be true when the first order condition (7) holds for both groups. Since members of the B-group have lower wages and a higher relative preference for consumption than members of the A-group,

they are treated more unfairly by the tax system. As a consequence, they are willing to evade more taxes, i.e.  $u_A < u_B$ .

To sum up, if there is a fairness effect ( $\beta > 0$ ), we would expect people who are unfairly treated by the tax system, i.e. those who work long hours for a low wage, to be more willing to evade than those who work less for a lower wage. As shown above we expect no such difference in the willingness to evade if there is no fairness effect ( $\beta = 0$ ) between people who have the same income. Our model predicts that people's willingness to evade taxes does not only depend on their total income, but also on whether this income is earned as a result of many work hours or a high wage rate. For the same total income, an individual who has earned his income as a result of many work hours at a low wage is willing to evade more than an individual who earns the same total income with a higher wage rate and fewer work hours.

Our prediction of how fairness consideration affects the willingness to evade taxes differs from that of other models. While many other types of fairness arguments implies that an individual's income affects his moral cost of evasion, our model is the first to suggest that it matters whether his income is a result of long work hours or a high wage rate. For example, the fairness argument of Bordignon (1993) implies that the income of an individual matters for his moral cost of evasion since it determines whether or not he pays too much taxes compared to his gain from the public expenses. Allingham and Sandmo (1972) discuss moral costs that depend directly on the amount evaded, such as bad conscience or social stigma. Also in this case, we would not expect the willingness to evade to be affected by whether the income is earned as a result of long hours or high wage rates.

### **3. Empirical analysis**

According to our theoretical model, the propensity to *justify tax evasion* is increasing in the number of hours worked, conditional on monthly income. Furthermore, as a result of fairness considerations, an individual's *optimal level of tax evasion*, conditional on monthly pay, is also increasing in hours worked. We use Norwegian survey data to investigate if these patterns show up in the data as well. It should, however, be stressed that the theoretical predictions were based on the assumption that the tax system was purely redistributive, while the Norwegian tax system also finances public goods.

The data is taken from the *Survey on the Hidden Labour Market* (SHLM). For our analysis we use observations of all 532 individuals in the survey who were of the age 18-64 and wage earners, working at least 20 hours in regular employment the week before the survey and had valid answers to the questions we use. The first question we ask is: *Can tax evasion be justified?* The alternatives were yes, no and do not know. Of the valid answers to this question in the full survey, 162 (16%) answered yes, 720 (69%) answered no, while the remaining 160 (15%) answered do not know. In our sample of 532 individuals, the answers were distributed as follows:

*Table 1. Distribution of answers to the justification question. Wage earners.*

Yes	96 (18%)
No	364 (68%)
Don't know	72 (13%)
<hr/>	
N	532

In the questionnaire the individuals were also asked about their *willingness to take unreported income* and if they had *actually performed unreported work* the previous 12 months. Two dummy variables, “Willing” and “Actual”, are given the value 1 if the respondent answered yes to the respective questions. As we show table A1 in the appendix, 41 percent reported that they were willing to take home unreported income, while 11 percent reported having actually done unreported work during the last 12 months.

The survey contains information on the human capital variables gender, age, and educational level. Respondents are also asked about their perceived probability of being detected if they receive unreported income and to what extent they believe that others accept tax evasion. We also have information about their pay in their regular job. Several of the variables are reported in brackets (see table A1), for instance hourly pay. These variables are transformed into continuous variables using the midpoints of each bracket. Working hours is defined as hours in their regular job and reported in categories only. In our sample, the intervals are 20-29, 30-39, 40-49 and 50 hours and more. A continuous variable is constructed, taking the values 25, 35, 45 and 55 accordingly. Monthly earnings are constructed as the product of hourly pay and reported working hours, both measured in terms of their regular job. Summary statistics of the key variables in the sample are given in table A1.

### 3.1. Working hours and tax evasion

Table 2 reports the key indicators of justification and tax evasion for different intervals of working hours. Regular weekly working hours in Norway are 37.5 hours per week. As predicted by our model, we find an increasing tendency to justify tax evasion as the number of hours worked increases. There is also an increasing tendency to be willing to take home income without reporting it to the authorities, as well as an increasing tendency to have actually performed unreported work during the last 12 months as the number of working hours increase. In particular, there appears to be a jump for all three outcomes among those who work more than the regular weekly working hours.

*Table 2. Tax evasion and working hours*

Working hours	Numbers of observations	Justification <i>Can tax evasion be justified?</i>	Willing <i>If you had the possibility to take home income without reporting it to the tax authorities, would you be willing to do so?</i>	Actual <i>Have you performed work during the last 12 months that were not (is not going to be) reported to the tax authorities?</i>
20-29	44	11.4	31.8	6.8
30-39	364	15.1	38.2	9.9
40-49	99	31.3	52.5	17.1
50+	25	20.0	44.0	12.0

Note: Percentage in each working hours category who report that they believe tax evasion can be justified, that they are willing to evade taxes and that they actually have evaded taxes the last 12 months.

Clearly, this pattern may be due to a host of factors other than fairness considerations. To control for these factors, we undertake a series of simple (probit) regression analyses.

In table 3 we report the results of five simple probit models. In the first three models, the dependent variable is the dummy for agreeing that tax evasion can be justified. The main prediction from our theoretical model is that for a given income, an individual who work more hours to earn this income should be more likely to justify tax evasion. Accordingly, we include as our main explanatory variable the log of weekly hours worked. In model 1 we control for individual characteristics: gender, age, and education. It turns out that women are less likely than men to justify tax evasion and that the probability of justifying tax evasion is declining with age. There is also a positive but not significant relationship between hours worked and the probability of justifying tax evasion.

In model 2 we include control for monthly earnings and (perceived) marginal tax. Thus we may compare individuals who work different hours but make the same amount of money. The relationship between working hours and justification is strongly positive and doubled from the first specification. This observation is consistent with the first prediction of our theoretical model. The coefficient is significant at a 1 percent level, but equally important, the effect is also economically very significant: Increasing working hours by 10 percent increases the probability of justifying tax evasion by 2.5 percentage points, for instance from the average level of 18 percent to 20.5 percent. In line with the predictions from our model, we also find that the probability of justifying tax evasion is negatively associated with monthly pay, conditional on working hours (i.e. changes in the wage rate).

*Table 3. Working hours and tax evasion: Probit equations*

	Justify 1 b/se	Justify 2 b/se	Justify 3 b/se	Willing b/se	Actual b/se
ln(working hours)	.1274 (.0955)	.2489** (.1222)	.2489** (.1132)	.2756 (.1771)	.1292 (.0873)
Woman (d)	-.1215*** (.0334)	-.1294*** (.0340)	-.0703** (.0333)	-.1089** (.0509)	-.0698** (.0273)
Age	-.0069*** (.0016)	-.0063*** (.0017)	-.0038** (.0016)	-.0019 (.0025)	-.0006 (.0013)
Secondary education (d)	.0215 (.0521)	.0301 (.0532)	.0487 (.0518)	-.0294 (.0682)	.0365 (.0388)
Tertiary education (d)	.0300 (.0483)	.0607 (.0527)	.0863* (.0505)	-.0892 (.0709)	-.0095 (.0372)
ln(monthly pay)		-.0957* (.0582)	-.0859 (.0544)	-.0643 (.0813)	-.0579 (.0443)
Marginal tax		.1512 (.1829)	.1231 (.1706)	-.2302 (.2655)	-.1273 (.1443)
Generally accepted (d)			.1025*** (.0313)	.2858*** (.0433)	.0393 (.0259)
Prob(revealed)			-.3757*** (.0779)	-.6225*** (.1121)	-.1867*** (.0626)
N	532	532	532	532	532

Note: Marginal effects evaluated at mean values of the r.h.s. variables. . (d) dummy variable. Marginal effects are calculated as the effect of a change from 0 to 1. Levels of significance (\*\*\*) 0.01 \*\* 0.05 \* 0.10).

One potential problem with this result is that there may be a relationship between reported earnings to the tax authorities, and the probability of being audited by the same authorities. People who intend to evade taxes might therefore work more hours in order to reduce the probability of an audit. This relationship may create a spurious correlation between working hours in regular employment and the probability of justifying tax evasion. We therefore add the individual's perceived probability of being caught by the tax authorities, as well as the individual's perception of other's acceptance of tax evasion in model 3. We note that these variables have large coefficients and considerable explanatory power on our dependent variable, but that the association between working hours and justification is more or less unaffected by the inclusion of these variables.

In model 4 we report from a probit analysis of the probability of replying 'yes' to the "willing" question (see the heading of table 2 for the full wording of the question). We find that willingness to evade taxes follows a similar pattern as justification of tax evasion, even though significance levels vary. Willingness declines with age and is lower for women than for men. The perceived probability of being caught and the beliefs about others' acceptance of tax evasion are significantly correlated with the willingness to evade taxes. Conditional on monthly pay, an increase in working hours by 10 percent is associated with a 2.7 percent higher probability of being willing to take home unreported income, however, this correlation is not statistically significant.

In model 5 we report results from a probit model of the question: *Have you performed work during the last 12 months that is not (is not going to be) reported to the tax authorities?*

We find a positive correlation between working hours and the probability of actually having performed unreported work. The relationship is, however, not as strong as the relationship between working hours and justification or willingness, and not statistically significant.

One potential problem with our finding is that justification, willingness and actual performance may be correlated, and that the effect of working time on the propensity to justify tax evasion may be affected by this correlation. We address this problem first by running a multivariate probit model that allows for arbitrary correlation between the three outcomes. The results are reported in table 4. We do indeed find a strong and significantly positive correlation between the three outcomes, even when conditioning on these variables.

We also find that the probability of justifying tax evasion is increasing in working hours, conditional on monthly earnings, even when we allow for a correlation between justification and the willingness and actual performance of tax evasion. Again, the effect of working hours is statistically significant for justification only.

In the second part of table 4, we impose more structure on the model and investigate the role of justification on the probability of being willing to evade income and actually perform tax evasion directly, under the assumption that the direction of causality goes from norms to behaviour, but still allowing the error terms to be correlated across outcomes.

*Table 4. Norms and tax evasion: multivariate probit equations*

	Justify b/se	Willing b/se	Actual b/se	Justify b/se	Willing b/se	Actual b/se
ln(Working hours)	1.0423** (.5297)	.6697 (.4470)	.7942 (.5716)	1.1786** (.5383)	.4341 (.4667)	.5585 (.6021)
Woman	--.3238** (.1619)	--.2633** (.1306)	--.4700** (.1872)	--.3345** (.1615)	--.1816 (.1377)	--.3920** (.1993)
Age	--.0185** (.0075)	--.0064 (.0063)	--.0058 (.0083)	--.0180** (.0076)	--.0017 (.0067)	--.0013 (.0089)
Secondary education	.2226 (.2244)	--.0923 (.1767)	.1237 (.2266)	.2186 (.2258)	--.1214 (.1791)	.1141 (.2318)
Tertiary education	.3860* (.2318)	--.2588 (.1836)	--.1516 (.2403)	.4004* (.2334)	--.3507* (.1875)	--.2509 (.2494)
ln(monthly pay)	--.3436 (.2515)	--.0417 (.2057)	--.2701 (.2817)	--.4070 (.2578)	.0179 (.2070)	--.1935 (.2932)
Marginal tax	.4778 (.7909)	--.7181 (.6656)	--.7898 (.9721)	.5798 (.8032)	--.9439 (.6795)	--.9994 (1.0242)
Prob(revealed)	--1.7292*** (.3841)	--1.5565*** (.2849)	--1.2563*** (.4355)	--1.7706*** (.3854)	--1.2872*** (.3176)	--.9717** (.4855)
Generally accepted	.4709*** (.1540)	.7996*** (.1199)	.2490 (.1749)	.4970*** (.1552)	.7027*** (.1340)	.1230 (.1908)
Justify					.9949*** (.3714)	.8423* (.4592)
Constant	--.9819 (1.7581)	--1.3266 (1.4761)	--.7328 (2.0444)	--.9919 (1.7826)	--1.3095 (1.4986)	--.8693 (2.1149)
Cov JA	.3959*** (.1017)			--.0561 (.2469)		
Cov AW		.8286*** (.1281)			.8255*** (.1544)	
Cov JW			.4796*** (.0911)			--.0063 (.1913)
N	532	532	532	532	532	532



Note: Probit coefficients. Levels of significance (\*\*\*) 0.01 \*\* 0.05 \* 0.10).

We find that under these assumptions, justification has a strong impact on both willingness to evade taxes and actual tax evasion. We also observe that the coefficient of working time on both willingness to evade taxes and actual tax evasion drops once we introduce justification into the equation, suggesting that the impact of working time mostly go through justification. Again, working hours have a statistically significant relationship with justification only. Of course, lack of convincing instruments for each of the outcomes necessitates caution with respect to the interpretation of this result, since feed-back effects from behaviour to justification are indeed possible.

#### **4. Conclusions**

In this paper we have addressed the questions of how fairness considerations affect tax evasion. In section 2 we developed a theoretical model in which we assumed that individuals were motivated by a desire for income and leisure and by a desire to act in accordance with what they consider to be fair. We furthermore assumed that they view it as fair that income is distributed in proportion to hours worked. Based on this model we predicted that for individuals with a given total income the propensity to justify tax evasion should be increasing in the number of hours worked. The empirical analysis conforms with this prediction, since individuals with low wages and long working hours are more likely to justify tax evasion. We have also found a strong positive relationship between the probability of justifying tax evasion and actual performance of unreported work.

These results are consistent with a model in which individuals make a trade-off between economic gains and fairness considerations when they make decisions about tax evasion. Taken together our results suggest that considerations of fair income distribution are important for the analysis of tax evasion.

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*Table A1 Summary statistics*

	Mean	Std.dev.	Min	Max
ln(hours)*	3.60	0.18	3.22	4.17
Woman (d)	0.46	0.50	0.00	1.00
Age	42.39	10.33	20.00	63.00
Tertiary (d)	0.48	0.50	0.00	1.00
ln(earnings=wagexhours*)	8.72	0.44	7.60	10.20
Marginal tax*	0.41	0.09	0.15	0.75
Accepted (d)	0.55	0.50	0.00	1.00
P(caught)*	0.39	0.23	0.00	1.00
Justify (d)	0.18	0.38	0.00	1.00
Willing (d)	0.41	0.49	0.00	1.00
Actual (d)	0.11	0.31	0.00	1.00

N=532, \*) midpoints of brackets, (d) dummy variable.

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