

THE DETERMINANTS OF TELEVISION LICENSE FEE COMPLIANCE

Abstract: Television license fee compliance in Sweden is very high – 87 percent of television-owning households pay the fee. That people choose to behave in accordance with the law does not in itself come as a surprise, but when the law in question is difficult to enforce and the service provided in many ways lends itself to free-riding, traditional microeconomic theory would tend to predict a higher rate of evasion than is presently seen. The purpose of this study is to empirically explore what determinants are influential in the compliance decision. Restricting ourselves to a set of five hypotheses, we create a multi-factor model of license fee compliance and, through a survey, collect quantitative data to analyze the impact of each factor.

We conclude that deterrence measures, in particular risk of detection, are significant but that respondents' tendencies towards pro-social behavior and free-riding as well as their personal consumption of televised public broadcasts also have some impact on compliance levels. That deterrence factors cannot be exclusively relied on to explain license fee compliance may in turn have implications for how compliance levels are best sustained and encouraged by the authorities.

Keywords: *public broadcasting, television license fee, public goods, free-riding, deterrence, pro-sociality, norms*

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There is no kind of dishonesty into which otherwise good people more easily and frequently fall than that of defrauding the government.

Benjamin Franklin (1706-1790)

1. Introduction

People, if they think they can get away with it, will evade taxes. With central assumptions of neoclassical economics in mind, there is nothing particularly remarkable about Franklin's claim – that people resort to dishonesty when it benefits them goes hand in hand with notions of “more is better” and rational decision making. Luckily for society as a whole, the most overt opportunities for evasion are seldom allowed to occur. However, when it comes to the television license fee, compulsory for all television-owning households in Sweden, a considerable opportunity to evade the fee exists. Still, few households seize the occasion. The reasons for this are not self-evident and compel us to look beyond simple deterrence models to explain the level of compliance. What influences the payment decision? What factors distinguish compliers from non-compliers? In a society where public broadcasting is often taken for granted these are questions that are worth more than a passing glance.

1.1 The license fee – context and background

Public television, the way it is broadcasted in Sweden today, is both non-excludable and non-rivalrous – anyone with a television receiver gains access to it and any number of people can watch it at the same time. Limiting the service to subscribers only, the way certain private networks do, is inconsistent with the aims of public service broadcasting and also technologically quite costly. Public broadcasts therefore emerge as a near text book example of pure public goods and general economic theory expects such goods to be underprovided on the open market. The fact that advertisers are excludable does enable market provision of commercial broadcasting but raises questions about the negative externalities associated with advertising and the quality of the programs produced from advertising revenue. (Anderson and Coate 2000) Public broadcasting

remains the advertising-free alternative in Sweden and many other countries and is often intended to cover markets to which the commercial channels do not cater.

Television license fees have, particularly in Europe, emerged as a prevalent solution to the question of how public broadcasting should be financed. A type of fee on the use of radio equipment was introduced in Sweden as early as 1907 and in 1956 the television license was introduced. Since 1978 there has been no separate radio license but public radio is still financed via the television license fee. The government-owned Radiotjänst i Kiruna AB (RIKAB) has since 1988 been in charge of collecting the fee from every Swedish household that owns one or more television sets and as of 2009, the fee is 2 076 SEK per year, divided up quarterly. (RIKAB 2009) All households are subject to the same charge, irrespective of household income or time spent watching public broadcasts. Failure to report television ownership is in breach of *The Act (1989:41) on Financing of Radio and Television in the service of the public* and therefore, in theory, punishable by fines even if done unwittingly.

According to RIKAB's information officer Tina Benson, it is only in exceptional cases that offenders are prosecuted. There are exceptions that have been widely discussed by the media, in particular when RIKAB decided to prosecute a number of ministers that were revealed to have evaded the license fee when the new government was installed in 2006, but RIKAB will not normally file criminal complaints unless the offender refuses to start paying once caught. Generally offenders cannot be found guilty unless they confess. It is likewise rare, although not unheard of, that RIKAB's controllers ask that offenders pay for their television ownership retroactively. The reason that this happens only rarely is that it is difficult to prove how long someone has had a television. (Benson 2009) RIKAB's controllers are not allowed to enter people's homes and while direction-finding instruments do exist, they are used very sparingly (RIKAB 2009).

Eighty-seven percent of television-owning households do pay the license fee, according to RIKAB's estimates (Benson 2009). The remaining 13 percent will be referred to as non-

compliers and can be divided up between those that free-ride, that is consume public broadcasts¹ without paying for it, and those that consistently never consume public broadcasts. Both groups break the law to the same extent but may have differing motives in doing so.

1.2. Statement of purpose

Based on the above, three conjectures can be made that will be of relevance to this study.

- Non-compliance, as long as the person is not caught, results in a significant monetary gain.
- The risk of being caught and punished is low (but may be contingent upon the offender's willingness to lie as the risk of being subject to controls remains quite high).
- The vast majority of television-owning households pay the license fee.

This constitutes the apparent paradox that drew us to the subject.

There are no previously published studies that examine the determining factors behind television license fee compliance. The purpose of this paper is therefore to explore empirically which determinants are influential in the decision of whether to pay the TV-license fee. Earlier research in behavioral economics, particularly literature on tax compliance, will assist us in indentifying these factors and formulating a number of hypotheses. We cannot hope to form a complete model for all conceivable determinants, therefore the hypotheses used will mark the boundaries for this paper. In order to test the hypotheses we will use quantitative data from a survey that we conduct ourselves.

¹ The term public broadcasts will in this paper be used to denote programs aired on any of the Sveriges Television (SVT) channels. Radio broadcasts will not be considered.

2. Theory

2.1 Deterrence

A good is public “if, once produced, no one can be excluded from benefiting from its availability and if the good is nonrival – the marginal cost of an additional consumer is zero.” (Snyder and Nicholson 2008, p. 680) We have already proposed that public broadcasting in Sweden satisfies these criteria and that there consequently exists a distinct possibility for free-riding. RIKAB’s role is to minimize this by enforcing payment of the fee and the organization therefore takes on a function similar to that of the tax authorities.

Whereas we have found no studies that explore or explain compliance with television license fee legislation from a microeconomic standpoint, there is a multitude of literature on tax compliance behavior within this field. There are some obvious parallels between tax evasion and TV-license fee evasion. Both are illegal acts that involve withholding money from the state. The money from both license fees and taxes goes toward the state provision of public goods and services so that those who fail to contribute can, in effect, free-ride on those that do. In neither case is the amount a person pays in taxes or television license fees calculated in proportion to how much he actually makes use of the services that his money finances. In many ways it is also arguable that the television license fee is really a dedicated tax on television ownership. Viewed in this light, tax compliance literature becomes highly relevant in explaining license fee evasion.

There are, however, differences that prevent most behavioral models for tax compliance from being applied straight onto license fee compliance. Income tax is progressive and the total tax paid varies between individuals while the television license fee is the same for everybody but only has to be paid by one person per household. Depending on occupation and knowledge of the taxation system, different people arguably have different opportunity windows with respect to tax evasion. This is not true to the same extent for license fee evasion. The moral decision whether or not to evade taxes has to be reconsidered on at least a yearly basis in connection with the tax declaration. It is also possible to evade in degrees, by underreporting a smaller or larger share of the actual income. The decision whether or not to report television ownership is usually only made once and people either report or they do not – it is impossible to “partly” own a

television. For these reasons we will not be able to replicate any existing models on tax compliance in their entirety, but will select individual factors that we deem to be relevant.

In what has become perhaps the most influential framework for analyzing the rational choice of tax-compliance, Allingham and Sandmo (1972) provide a deterrence model in which the agent measures his potential gains against the risks of detection and punishment. The model is well anchored in the neoclassical framework in that the agent will always maximize his expected utility by taking primarily monetary risks and payoffs into consideration. The main deterrents are the perceived likelihood of being subject to investigation and the loss of income at a penalty rate if caught evading. The main incentive is the money saved from underreporting one's income.

The importance of the deterrents provided by the enforcement environment is further underlined by Klepper and Nagin (1989). Laurin (1986) shows that an individual's opportunities to evade without getting caught along with the likelihood of detection and expected penalties are important factors that distinguish compliers from non-compliers. Slemrod (2007) likewise believes deterrence is a dominant factor in determining evasion decisions: "No government can announce a tax system and then rely on taxpayers' sense of duty to remit what is owed." (2007, p. 25) Stepping away from the more narrow scope of tax evasion, Häckner and Nyberg (1996), while conceding that strong social norms can make people act honestly and that breaking norms that a majority complies with can be stigmatizing, emphasize that if the economic profit from breaking such norms consistently is high, the norm becomes watered down and the stigma reduced. Therefore, systems of rules based on the assumption that people are saints will soon collapse while those based on the assumption that people deceive have a better chance of keeping them honest. High potential gain and low material risk increase the opportunity cost of honest behavior.

Deterrence measures, then, are presumed to be fundamental to economic decision making as rationally behaving agents will always add potential costs into their utility calculations. This leads us up to a first, none too provocative, hypothesis:

*Hypothesis 1: **Deterrence.*** The higher a person's perceived risk of detection and the more severe he expects the consequences of getting caught to be, the more probable it is that he will comply with the TV-license fee.

2.2 Pro-sociality

The Allingham and Sandmo model (1972) has received mixed support over years and a number of studies have indicated that the theoretical deterrence models over-predict non-compliance and underlined that more work needs to be done to disentangle the myriad of psychological factors that influence tax evasion (see e.g. Feld and Frey 2002, Andreoni et al. 1998). Individuals' sense of civic duty is often lifted out as a significant determinant in tax compliance decisions (Scholz and Pinney 1995, Orviska and Hudson 2002) According to Orviska and Hudson, "Civic duty is the concept that people are motivated partially by a concern, by a loyalty if you like, for the wider state or the country." (2002, p. 86)

Ostrom (1997) mentions non-commercial radio broadcasts as an example of a public-good dilemma where the good would be underprovided if everyone followed their individual rational strategy but suggests that people "systematically engage in collective action to provide local public goods or manage common-pool resources without an external authority to offer inducements or impose sanctions." (p. 2) She explains this by that people to varying extents learn the norms of reputation, trust and above all, reciprocity. Meanwhile, Bénabou and Tirole (2006) explain the provision of public goods by that people act pro-socially and shows that pro-social behavior, in turn, is the result of a mix of intrinsic, extrinsic, and reputational motivations. Extrinsic factors such as rewards and punishments may be effective but can also on occasion serve to "crowd out" the intrinsic motivations such as personal norms of generosity. Pro-social behavior is here defined as "activities that are costly to [the agents] themselves and that primarily benefit others" (p. 1652) and can quite simply be applied to TV-license fee compliance.

Leading on from the idea that individuals have differing personal norms for reciprocity, civic duty and other intrinsic motivations, we arrive at our second hypothesis:

*Hypothesis 2: **Pro-sociality.*** The more inclined towards pro-social behavior a person is, the more probable it is that he will comply with the TV-license fee.

2.3 Free-riding

If people have differing inclinations towards pro-social behavior they should, conversely, have varying tendencies towards free-riding. In traditional economic theory, it is generally expected that people free-ride when the opportunity occurs (Perloff 2008). The rationale for free-riding is that people are rational and try to maximize their own utility (Snyder and Nicholson 2008). From such assumptions stem the archetypical representation of *Homo economicus* (see e.g. Persky 1995). This framework has many critics, however. Henrich et al. (2001) found “large, consistent deviations from the predictions of the textbook representation of *Homo economicus*” (p. 73) and Gneezy (2005) found that people will also take other people’s losses into consideration alongside their own gain when they make decisions. Hirshleifer (1985) notes that as faced with identical incentives, some people resort to offences that others will not commit, it is not possible to discard the idea that criminals to an extent have “deviant personalities” (p. 54).

Orviska and Hudson (2002) find a positive impact of the perceived importance of law abidance on tax compliance. Wahlund (1991) finds that an agent’s attitudes toward not only tax evasion but also crime in general affect whether or not he will evade taxes. Laurin’s study (1986) shows a significant impact on tax compliance of the respondents’ attitudes toward criminal behavior that in its nature resembles tax evasion (e.g. benefit fraud). Individuals’ attitudes toward behavior more traditionally regarded as crime, such as theft, embezzlement and drunk driving, have less influence over their decision to evade taxes. A deduction from this is that people’s inclinations toward a certain type of behavior will influence how they act in similar situations. Focusing on small-scale offences of free-riding character, we therefore hypothesize:

*Hypothesis 3: **Free-riding.*** The more inclined towards free-riding a person is, the more probable it is that he will *not* comply with the TV-license fee.

2.4 Social norm

Whereas pro-sociality and free-riding are often regarded as reflecting upon individuals personal norms, such norms are frequently mentioned alongside social norms in studies on behavioral economics.

According to Bénabou and Tirole (2006) people are to a large extent affected by what others do and will seek to avoid breaking norms when valid excuses to not participate are rare and participation is expected or inevitable, as can be argued in the case of the TV-license fee. Beliefs about others' behavior as expressed through sentiments like "It's just not done" or, conversely, "Everyone does it" regularly influence the decisions we make. Slemrod (2007) notes that "the ranks of the dutiful shrink" (p. 25) when they notice that a large number of others are taking advantage of the system and Laurin's (1986) study supports that respondents' perception of fellow-tax payer's behavior affects how they behave. This result is supported in a number of studies that all found that people with more non-compliant behavior perceived tax non-compliance to be more prevalent among people known to them (e.g. Porcano 1988, Wallschützky 1984, Webley et al. 2001). Porcano (1988) states that this effect can have two causes: it is either that non-compliers presume that others do the same or that non-compliers decide not to comply because they presume others refrain from doing so. Wallschützky (1984) find that people are not only influenced to evade if their surroundings do so, they also *learn* evasion in this way.

In the light of previous studies that show a positive correlation between beliefs that others evade taxes and own evasion, we form the following hypothesis:

*Hypothesis 4: **Social norm.*** The more a person believes that others comply, the more probable it is that he will comply with the TV-license fee.

2.5 Public broadcast consumption

Differing attitudes to free-riding have already been discussed, but we also want to consider that non-compliance does not automatically imply free-riding. Individuals cannot be presumed to watch public broadcasts simply because they own a television set. Therefore the amount of public broadcast individuals consume becomes of interest.

Andreoni et al. (1998) suggest that people may be less prepared to pay taxes if they feel they are not getting anything for their tax money. Hanousek and Palda's (2004) survey of four Eastern European countries revealed that tax evasion is lower among those who believe the quality of government services to be good. That people should be reluctant to pay for a service that they do not actually benefit from does not appear as a particularly foreign concept but, Slemrod (2007) remarks, "such survey responses may also reflect after-the-fact rationalization of noncompliant behavior." (p. 40) By asking for actual own consumption rather than beliefs about the qualities of government services we hope to avoid this problem when we hypothesize:

*Hypothesis 5: **Public broadcast consumption.*** The more a person watches public broadcasts, the more probable it is that he will comply with the TV-license fee.

2.6 Socio-economic factors

Socio-economic factors serve better to point out who the tax evaders are than to explain why they choose to evade. Slemrod (2007) points out that tax evasion is remarkably heterogenous in that in almost any demographic group there will be some who do and some who do not engage in it.

Several studies show that women are less likely to evade taxes than men (see e.g. Orviska and Hudson 2002, Scholz and Pinney 1995). Chung and Trivedi 2003 proceed to show that friendly persuasion has a positive impact on the tax compliance behavior of women but not on men. Another common result is that tax evasion declines with age (Orviska and Hudson 2002, Clotfelter 1983). Both these findings are usually explained by that the groups have different perceptions of risk. It is unclear what effect education has on tax evasion (Clotfelter 1983). With regard to the television license fee, RIKAB regards students as a problem group as non-compliers are overrepresented among them (Benson 2009).

When it comes to the effect of income, existing economic research does not appear to reach a consensus. Already from the Alingham and Sandmo model (1972) it was unclear what impact the agent's income would have on his choice. Individuals with higher incomes may have a higher incentive to evade but may also face greater risks of detection. There is a general notion that "the poor evade and the rich avoid" (Slemrod 2007) but there are studies that find no effect at all of

the income variable (e.g. Feinstein 1991). In any case such a scenario is difficult to extend to the case with TV-license fees as these are not progressive and RIKAB's controls are directed at all income brackets equally.

We choose not to formulate any explicit hypotheses regarding the socio-economic factors that in our study serve more as control variables.

2.7 Hypotheses

To summarize, we formulate the following five hypotheses:

1. ***Deterrence measures.*** The higher a person's perceived risk of detection and the more severe he expects the consequences of getting caught to be, the more probable it is that he will comply with the TV-license fee.
2. ***Pro-sociality.*** The more inclined towards pro-sociality a person's behavior is, the more probable it is that he will comply with the TV-license fee.
3. ***Free-riding.*** The more inclined towards free-riding behavior a person is, the more probable it is that he will *not* comply with the TV-license fee.
4. ***Social norm.*** The more a person believes that others comply, the more probable it is that he will comply with the TV-license fee.
5. ***Public broadcast consumption.*** The more a person watches public broadcasts, the more probable it is that he will comply with the TV-license fee.

In addition to these, we will control for a number of socio-economic factors, but without formulating any specific hypotheses.

3. Empirical method

We begin by discussing questionnaire design and sample collection, proceeding afterwards to set up the regression models used in the analysis of the quantitative data.

3.1 The questionnaire

The survey was carried out using a standardized questionnaire² where questions generally were “closed”; the respondents chose from pre-stated alternatives and did not have to produce written answers. This to enhance the likelihood that all respondents answered the questions in the same way and to simplify the analysis of the data since no personal comments had to be categorized and coded before the regressions were run (Trost 2007).

The questions from the survey can be divided into different groups. Firstly there are questions that identified the respondents who were relevant to the study and sorted out the rest (households without televisions etc.). A second group of questions was designed to correspond directly to the hypotheses formulated. Where effects could be measured alternatively through questions about behavior or opinions, behavioral questions were given precedence since respondents in general answer more truthfully regarding actual behavior (Trost 2007). Other questions ask respondents to estimate actual circumstances, such as perceived risk or what share of households they believe comply with the license fee. The questionnaire also includes a few questions aimed at obtaining a more general view on the respondents’ behavior, attitudes, and opinions. A last group of questions was designed to control for socio-economic factors.

The questionnaire was handed out to respondents who read the instructions, answered the questions and then put their questionnaire in a sealed box. The sealed box was used to emphasize to respondents that the survey was anonymous, with the hope of receiving answers that were more honest and reliable (Trost 2007). Anonymity was further underlined in the survey instructions. To make all answers comparable we did not answer any questions from the respondents until they had handed back their questionnaire. The language used aimed to

² An English translation of the questionnaire is found in Appendix 1.

minimize interpretation differences among the respondents. On average the questionnaire took three to five minutes to fill in.

A typical problem with questionnaires is that certain people will always be more inclined to participate in research surveys than others. This effect may have been further reinforced due to the, for some, sensitive nature of the survey topic. This could mean we get a slight bias towards compliance in the samples, but as we do not explicitly aim for representativeness this is not a serious issue.

3.2 The samples

Two subsamples were collected, one consisting of students from the Stockholm School of Economics (SSE) and one more general sample. Four classes at SSE were visited between Monday the 9th of March and Thursday the 12th of March 2009. The students were asked to fill in the questionnaires during classes. Most students were in their first or second year at SSE which resulted in an unexpectedly large share of respondents still living with their parents or being registered in their parents' household. These had to be sorted out. The SSE-students make up a convenient sample but was selected for a special purpose: we knew compliance in the general population to be quite high and we needed more heterogeneity in the regressions. From RIKAB we had a strong indication that students are more likely to evade the fee.

The places used for collecting the general sample were the Central Station in Stockholm and the adjacent City Terminal. We chose these places for two reasons. First of all, it was among the places where we felt we were most likely to obtain responses from a true mix of social groups and ages. Secondly, it was convenient in the sense that travelers sit down and wait for their departures and can take the time to answer the questionnaire more carefully. This also allowed us to hand out the questionnaire to several people at the same time and to leave respondents to fill in their answers in privacy. Respondents who had to leave for a train or bus were instructed to just leave the finished questionnaire on their seat. This would not have been possible with respondents on the street. The general sample was collected at different times of day on Wednesday the 25th of March 2009 and the following Saturday, taking into consideration that different groups of people travel at different times. While this sample was selected to be more

representative of the general population than the student sample, we are well aware that we cannot assume that this sample reflects the Swedish population as a whole. Students that filled in the questionnaire at the Central Station or the City Terminal were grouped together with the SSE-students into the student sample.

3.2.1 Socio-economic distribution of the sample

After sorting for those respondents not obliged to pay the license fee, our sample consists of 178 respondents, out of which 76 are students and 102 non-students. Table 2 below shows the socio-economic distribution of the non-student sample and the student sample. The student sample is considerably more homogenous than the non-student or total sample.

Table. 2: Socio-economic distribution of the total, non-student and student samples

Variable	Total sample	Non-student sample	Student sample
Gender	(%)	(%)	(%)
Men	51	49	53
Women	49	51	47
Age (years)	(%)	(%)	(%)
19-25	38	4	85
26-35	21	25	13
36-45	8	14	2
46-55	10	17	-
56-65	13	23	-
66+	10	17	-
Adults per household	(%)	(%)	(%)
1	51	42	62
2	42	48	33
3+	7	10	5
Household income (SEK/month) before taxes	(%)	(%)	(%)
0-10000	25	6	51
10001-25000	29	25	35
25001-40000	23	32	9
40001-60000	12	21	1
60000+	11	16	4
Education (highest level reached)	(%)	(%)	(%)
Elementary/middle school	5	9	-
High school	19	33	-
University	76	58	100

The age distribution is biased downwards in the total sample and the student samples, while it is more evenly distributed in the non-student sample, however with a slight dip for the middle ages (36-45 and 46-55). For household income we see more of a bell curve shaped distribution for the non-student sample. The distribution between genders is very even and corresponds well with the Swedish population in general (SCBb 2009). Regarding the sample as a whole, we did not expect

it to be representative of the general population, nor was it something we strived for since it was crucial to obtain a sizeable share of non-compliers. Due to our large proportion of students (43%), our sample as a whole is younger and the monthly household incomes on average lower than in the population at large (SCBa 2009).

3.3 Variables

We call our dependent variable *complier*. In the survey, respondents are asked to state whether or not they pay the license fee. Note that non-payment is not the same as non-compliance as we have to take into consideration whether the person has an actual obligation to pay in order to state whether or not they comply with existing laws. We test this through questions about television ownership and household circumstances. Respondents who do not own a television or who, for instance, are registered as living with their parents have not been included. All respondents under 18 years have been sorted out.

The regression models were designed with the five hypotheses in mind. Socio-economic controls are included as a sixth variable category.

3.3.1 Deterrence

To answer the hypothesis we need a measure on risk of detection and a measure on expected consequences. Detection by RIKAB happens when a television is discovered in a household where ownership has not been registered. Punishment in relation to the TV-license fee is such a rare occurrence that we settle for a measure on whether respondents think RIKAB will choose to report offenders to the police by filing a criminal complaint. This opens the door to more severe consequences. Without a criminal complaint, no formal penalties can happen. We therefore test for:

- Respondent's perceived risk of detection (*risk_detection*).

The question asked was: “*How big do you perceive the risk of detection to be for TV-license evasion?*”

- Whether the respondent thinks a criminal complaint will be filed by RIKAB upon detection (*criminal complaint*).

The question asked was: “*What do you think Radiotjänst’s policy is when they detect TV-license fee evasion?*”

3.3.2 Pro-sociality

Pro-social behavior can take a variety of shapes. We limit ourselves to three measures of pro-sociality that differ in character:

- Annual donation to charity (*charity*).

The question asked was: “*How much have you donated to charity over the past year?*”

- Volunteer work (*volunteer*).

The question asked was: “*Do you volunteer for any organization, club or association?*”

As examples of volunteer work, we provide work for sports associations, charities, tenants associations and religious or political societies.

- Blood donation (*blooddonor*).

Respondents are asked if they are registered blood donors.

3.3.3 Free-riding

We limit ourselves to two measures of free-riding behavior that in their nature resemble license fee evasion, being fairly low-risk criminal offences that involve a public goods dilemma:

- Illegal file sharing and downloading (*fileshare*). Multimedia files are non-rival and exclusion impossible once the files are in circulation.

The question asked was: “*Over the past year, how often have you shared or downloaded files illegally on the Internet?*”

- Fare evasion on public transport (*fare_evasion*). Public transport is, to an extent, non-rival and while excludable in theory, eliminating all free-riding is generally too costly to be desirable.

The question asked was: “*Over the past year, how often have you evaded fares on public transport?*”

3.3.4 Social norm

People can be presumed to be affected both by the norm in society at large and by what the norm is in their group of friends and acquaintances. These sorts of questions generally involve the risk of a false consensus effect – people projecting their own behavior onto others (Ross et al. 1977). This effect is assumed to be weaker with regard to the behavior in the population at large. Our chosen measure is therefore:

- Respondent's estimated percentage of television owning households in Sweden that pay the license fee (*share_households*).

The question asked was: “*How big a share of Swedish households do you believe pay the TV-license fee?*”

3.3.5 Public broadcast consumption

We limit ourselves to television broadcasts as radio ownership no longer requires registration:

- Respondent's consumption of public television broadcasts (*public_broadcast_consum*).

The question asked was: “*How frequently do you watch public broadcasts on SVT?*”

3.3.6 Socio-economic factors

A fairly typical selection of measures are controlled for. We notably do not control for gender in the regression as the fee often is jointly paid by couples living together.

- *Student*. The respondent answers whether or not he is currently studying at university.
- *Age*.
- *Income*. We ask for the monthly average income of the respondent's household before tax.
- *Education*. Respondent states the highest level of education attained.
- *Adults*. The number of adults (over 18 years) living in the household. We use this measure instead of marital status as, particularly among the student population, flat sharing arrangements are quite common.

The result is a multi-factor model, coded and interpreted as follows:

Table 1: Dependent and explanatory variables

	Coded	Interpretation
Dependent variable:		
<i>Complier</i>	0, 1	0: non-complier, 1: complier
Explanatory variables:		
<i>Deterrence</i>		
<i>Risk_detection</i>	-2 – 2	Perceived risk of non-compliance detected by RIKAB: very low-very high
<i>Criminal_complaint</i>	0, 1	0 : RIKAB will not file complaint, 1: RIKAB will file complaint.
<i>Pro-sociality</i>		
<i>Charity</i>	0-1500+	Annual donation to charity in SEK.
<i>Volunteer</i>	0-3	Frequency of volunteer work, 0: never, 3: often
<i>Blooddonor</i>	0,1	0: not registered blood donor, 1: registered blood donor
<i>Free-riding</i>		
<i>Fileshare</i>	0-4	Frequency: 0: never 4: daily
<i>Fare evasion</i>	0-4	Frequency: 0: never 4: daily
<i>Social norm</i>		
<i>Share_households</i>	1-5	Estimated share of TV-owning households that comply, 1: 0-20%, 5: 80-100%
<i>Public broadcast consumption</i>		
<i>Public_broadcast_consum</i>	-2 – 2	Frequency: very rarely-very often
<i>Socio-economic factors</i>		
<i>Student</i>	0,1	0: non-student, 1: student
<i>Age</i>	0-7	0: 0-18 years, 7: 66+ years
<i>Income</i>	0-60000+	Monthly household income in SEK.
<i>Education</i>	1-3	Highest level attained. 1: Elementary/middle school 2: High school 3: University
<i>Adults</i>	0-3	Number of adults (+18 years) in household

3.4 Method of analysis

Three linear³ regressions are run: one for the entire sample, one for the non-student sample and one for the student sample. All use Ordinary Least Square (OLS), with heteroskedasticity-robust standard errors. For this we use the statistical software *Intercooled Stata 9.2*. Each of the three regressions are run using regular OLS regressions but since we had a relatively large number of variables in relation to the number of respondents, we also used the function stepwise to “screen” the regressions until only variables statistically significant (at a ten percent level) were left. When using stepwise, Stata starts by estimating the full regression and removes the variable with the highest p-value, i.e. the least significant variable. This is then repeated for the remaining variables until all that are left are statistically significant.

³ With a dependent variable that is a dummy variable, a logit or probit regression may be appropriate to use. However, they are not as intuitive and easy to interpret as OLS regressions. We have estimated all regressions using logit as well, but since the results do not markedly differ, we report only the OLS regressions in this paper.

If explanatory variables are too highly correlated with each other the statistical problem of multicollinearity may arise. A regression that suffers from multicollinearity is possible to estimate, but one or more of the correlated variables may be estimated imprecisely (Stock and Watson 2007). This has no impact on the significance or goodness-of-fit of the regression as a whole but can alter what variables turn out significant. In our sample, the problem of multicollinearity mainly affects the variables *age*, *income*, *education*, and *student*.⁴ This is not surprising considering the fact that all students in our sample have the same level of education and that students are normally young and earn a low income. One recommended way to deal with multicollinearity is to exclude some of the correlated variables from the regression (Wooldridge 2008). We solve this by adjusting the regression models slightly depending on which sample is used.

3.5 Regression models

For the total sample we construct the following regression model:

$$\begin{aligned} \textbf{Regression 1: } Y_i = & \beta_0 + \beta_1 \cdot \textit{risk_detection}_i + \beta_2 \cdot \textit{criminal_complaint}_i + \beta_3 \cdot \textit{charity}_i + \\ & \beta_4 \cdot \textit{volunteer}_i + \beta_5 \cdot \textit{bloodonor}_i + \beta_6 \cdot \textit{fileshare}_i + \beta_7 \cdot \textit{fare_evasion}_i + \beta_8 \cdot \textit{share_households}_i + \\ & \beta_9 \cdot \textit{public_broadcast_consum}_i + \beta_{10} \cdot \textit{student}_i + \beta_{14} \cdot \textit{adults}_i + \epsilon_i \end{aligned}$$

For the non-student sample we leave out the variable *student* since all respondents in the subsample per definition answer the same – *student* has no explanatory function for the non-student sample. When *student* is omitted *age*, *income* and *education* can be more reliably estimated and are therefore included. The regression has the following formula:

$$\begin{aligned} \textbf{Regression2: } Y_i = & \beta_0 + \beta_1 \cdot \textit{risk_detection}_i + \dots + \beta_9 \cdot \textit{public_broadcast_consum}_i + \\ & \beta_{11} \cdot \textit{age}_i + \beta_{12} \cdot \textit{income}_i + \beta_{13} \cdot \textit{education}_i + \beta_{14} \cdot \textit{adults}_i + \epsilon_i \end{aligned}$$

⁴ See Appendix 2 for a correlation table.

Student or *education* cannot, for the same reason as above, be included in the student sample. *Age* is included while *income* is left out because students' incomes are so homogenous and highly correlated with *age*. We construct the following regression model:

$$\textbf{Regression 3: } Y_i = \beta_0 + \beta_1 \cdot \textit{risk_detection}_i + \dots + \beta_9 \cdot \textit{public_broadcast_consum}_i + \beta_{11} \cdot \textit{age}_i + \beta_{14} \cdot \textit{adults}_i + \varepsilon_i$$

The results are reported in section 4.

4. Results

Descriptive data for the total sample and the two subsamples is presented below. We then proceed to report the results of the separate regressions. The results are briefly commented upon in this section but will be further discussed in section 5. For statistical significance, we will accept p-values of at most ten percent.

4.1 Descriptive data

In total we have 121 compliers and 57 non-compliers. The non-student sample consists of 102 respondents out of which 90 comply. The student sample includes 76 respondents out of which 31 comply. Descriptive data of the variables is presented below.

Table 3: Descriptive data over the total, student and non-student sample

	Total sample			Non-student sample		Student sample	
	Obs.	Mean	St Dev.	Mean	St Dev.	Mean	St Dev.
Dependent variable							
<i>Complier</i>	178	0.68	0.47	0.88	0.32	0.41	0.49
Explanatory variables							
<i>Deterrence</i>							
<i>Risk_detection</i>	176	-0.88	0.96	-0.77	0.96	-1.01	0.94
<i>Criminal_complaint</i>	173	0.17	0.37	0.18	0.39	0.15	0.36
<i>Pro-sociality</i>							
<i>Charity</i>	177	1.24	1.30	1.42	1.33	1.00	1.22
<i>Volunteer</i>	175	1.34	1.26	1.38	1.26	1.28	1.26
<i>Blooddonor</i>	178	0.14	0.35	0.13	0.34	0.16	0.37
<i>Free-riding</i>							
<i>Fileshare</i>	174	1.00	1.26	0.56	1.07	1.59	1.27
<i>Fare_evasion</i>	176	0.31	0.76	0.10	0.30	0.61	1.06
<i>Social norm</i>							
<i>Share_households</i>	175	3.72	0.76	3.80	0.74	3.61	0.77
<i>Public broadcast consumption</i>							
<i>Public_broadcast_consum</i>	169	0.30	1.38	0.71	1.21	-0.22	1.42
<i>Socio-economic factors</i>							
<i>Student</i>	178	0.43	0.50	0.00	0.00	1.00	0.00
<i>Age</i>	177	3.69	1.80	4.81	1.56	2.16	0.49
<i>Income</i>	177	26921	19405	35760	17975	14900	14157
<i>Education</i>	176	2.73	0.62	2.53	0.76	3.00	0.00
<i>Adults</i>	178	1.58	0.63	1.68	0.65	1.43	0.60

A first thing to notice is of course that the non-students, as expected, comply to a much greater extent than the students (88% compared to 41%). *Public_broadcast_consum*, *age* and *income* are also considerably higher in the non-student sample. The means for *fileshare* and *fare_evasion*, however, are more than twice as high in the student sample than in the non-student sample.

4.2 Regressions on the total sample

Table 4: Regressions on the total sample using regular OLS and stepwise OLS

	Regular OLS			Stepwise OLS			
Variable	Coef.	Std. Error	P> t	Coef.	Std. Error	P> t	P-value when eliminated
Deterrence							
<i>Risk_detection</i>	.0845559	.0309893	0.007	.084292	.0278536	0.003	
<i>Criminal_complaint</i>	.0694836	.0845754	0.413	-	-	-	0.358
Pro-sociality							
<i>Charity</i>	-.0000309	.0000588	0.600	-	-	-	0.585
<i>Volunteer</i>	.057659	.0245412	0.020	.0559452	.0237473	0.020	
<i>Blooddonor</i>	.0891369	.0876232	0.311	-	-	-	0.303
Free-riding							
<i>Fileshare</i>	-.0380493	.0304907	0.214	-	-	-	0.199
<i>Fare_evasion</i>	-.0335619	.0408851	0.413	-	-	-	0.417
Social norm							
<i>Share_households</i>	-.0114724	.0460224	0.803	-	-	-	0.8035
Public broadcast consumption							
<i>Public_broadcast_consum</i>	.0669748	.0261962	0.012	.0752937	.0256499	0.004	
Socio-economic factors							
<i>Student</i>	-.2912452	.0789415	0.000	-.3413066	.0688553	0.000	
<i>Adults</i>	.129272	.0493316	0.010	.1324819	.0463221	0.005	
<i>Constant</i>	.6553689	.186338	0.001	.5889043	.0987189	0.000	
Dependent: Complier							
Number of observation	163			163			
F-value	12.32			23.33			
Prob > F	0.0000			0.0000			
R²	0.4027			0.3946			
Adjusted R²	0.3592			0.3753			

4.2.1 Deterrence

Risk_detection is significant in both of the regressions and has a positive coefficient, just like predicted in the hypothesis. The higher a person's perceived risk of detection, the higher is the probability of compliance. The coefficient for *criminal_complaint* behaves in the predicted way;

it is positive, meaning people who believe a criminal complaint will be filed upon detection are more likely to comply with the fee. It is not, however, significant in either of the regressions.

4.2.2 Pro-sociality

Volunteer is the only significant variable in this group whether the regular or stepwise OLS regression is used. The positive coefficient means that the more pro-social a person's behavior is (in this case the more time he spends doing volunteer work), the higher is the probability for compliance. This is in line with the hypothesis regarding pro-sociality. *Blooddonor* is also positive, as expected, but it is not significant. *Charity* is not close to being significant in either regression but the fact that it has a, even if just slightly, negative coefficient is surprising. A negative value of *charity* means that the more a person donates to charity, the higher the probability is that he will *not* comply. As the variable is highly insignificant we choose to overlook this result.

4.2.3 Free-riding

Neither *fileshare* nor *fare_evasion* is significant in either of the regressions, but both of them have the predicted (negative) value. The interpretation is that the more a person free-rides on public transport or by sharing and downloading multimedia files from the Internet, the more likely it is that he will free-ride when it comes to the TV-license fee. This is what our hypothesis stated.

4.2.4 Social norm

Share_households is negative but is also the least significant variable in both regressions, with a p-value of above 0.80. The negative coefficient would suggest that respondents who believe a large share of other households comply with the fee are less likely to comply themselves. This goes against our hypothesized effect. Again, as it is so highly insignificant, this result will be largely disregarded.

4.2.5 Public broadcast consumption

The coefficient of *public_broadcast_consum* is positive and significant in both regressions. The interpretation is that the more a person watches public broadcasts, the more likely it is that he will comply, just as the hypothesis stated.

4.2.6 Socio-economic factors

Student is negative and significant in both of the regressions. This is not surprising considering students were included to add diversity to the sample. *Adults* is significantly positive in both the regular and stepwise OLS regressions, meaning that the more adults that live together, the higher is the probability that they will comply.

4.3 Regressions on the non-student sample

Table 5: Regressions on the non-student sample using regular OLS and stepwise OLS

Variable	Regular OLS			Stepwise OLS			
	Coef.	Std. Err.	P> t	Coef.	Std. Err.	P> t	p-value when eliminated
Deterrence							
<i>Risk_detection</i>	.0460792	.0413023	0.268	.0594051	.0341152	0.085	
<i>Criminal_complaint</i>	.0620112	.0875843	0.481	-	-	-	0.400
Pro-sociality							
<i>Charity</i>	.0000156	.0000665	0.815	-	-	-	0.8150
<i>Volunteer</i>	.0386606	.0225303	0.090	.0488845	.0250207	0.054	
<i>Blooddonor</i>	.0302258	.1042814	0.773	-	-	-	0.774
Free-riding							
<i>Fileshare</i>	-.0493835	.0412412	0.235	-.0634298	.0376693	0.096	
<i>Fare_evasion</i>	.2560358	.0994489	0.012	.2308895	.0938843	0.016	
Social norm							
<i>Share_households</i>	.0631591	.0498745	0.209	-	-	-	0.140
Public broadcast consumption							
<i>Public_broadcast_consum</i>	.0533983	.0332121	0.112	.0581719	.0315303	0.068	
Socio-economic factors							
<i>Age</i>	.0246564	.0299398	0.413	-	-	-	0.417
<i>Income</i>	-1.13e-06	1.75e-06	0.520				0.576
<i>Education</i>	.0525314	.0564028	0.355				0.459
<i>Adults</i>	.1278397	.0629438	0.046	.1182996	.0489111	0.018	
<i>Constant</i>	.1417221	.2797725	0.614	.6305382	.1232664	0.000	
Dependent: Complier							
Number of observation	92			92			
F-value	1.91			3.22			
Prob > F	0.0410			0.0066			
R²	0.3316			0.2924			
Adjusted R²	0.2202			0.2425			

The non-student sample has higher demographic variability but less compliance variability than the student sample.

4.3.1 Deterrence

Risk_detection is significant in the stepwise OLS regression only. *Criminal_complaint* behaves as in the regression on the total sample, displaying a positive coefficient without being significant in either of the regressions.

4.3.2 Pro-sociality

Volunteer is, just as in the regression of the total sample, significant using both the regular and stepwise OLS regressions. *Bloodonor* is positive but not significant. This time *charity* is positive but close to zero and the least significant variable in the model.

4.3.3 Free-riding

Fileshare is significantly negative in the stepwise regression, in line with our previously stated hypothesis. *Fare_evasion* is positive in both of the non-student regressions. The positive impact of *fare_evasion* is unexpected and goes against our hypothesis about free-riding behavior since it states that the more a person evades fares, the more likely it is that he will comply with the TV-license fee. This might simply be explained by the fact that fare evasion is too infrequent an occurrence in the non-student sample to have any implications. Only ten non-students confess to fare evasion and only at the most infrequent basis. Of these ten, all comply with the license fee. We open for other interpretations in section 5.3.

4.3.4 Social norm

Share_households is positive in the regular OLS but has a p-value of 0.209 and is therefore not significant. In the stepwise regression it is closer to being significant with a p-value of 0.140.

4.3.5 Public broadcast consumption

Public_broadcast_consum is significant (positive) in the stepwise regression and close to being so in the regular OLS regression with a p-value of 0.112.

4.3.6 Socio-economic factors

Adults is the only significant socio-economic factor and it is positive using both regression methods. *Age* and *education* have positive coefficients, suggesting that the older or more

educated a person is, the more likely it is that he will comply. However, neither of them are significant. Income has a negative coefficient (the higher the income, the lower the compliance), but it is close to zero and not significant.

4.4 Regressions on the student sample

Table 6: Regressions on the student sample using regular OLS and stepwise OLS

Variable	Regular OLS			Stepwise OLS			
	Coef.	Std. Err.	P> t	Coef.	Std. Err.	P> t	p-value when eliminated
<i>Deterrence</i>							
<i>Risk_detection</i>	.1201785	.0565757	0.038	.1063607	.0500278	0.037	
<i>Criminal_complaint</i>	.0414134	.1721937	0.811	-	-	-	0.811
<i>Pro-sociality</i>							
<i>Charity</i>	-.0001564	.0001312	0.238	-	-	-	0.141
<i>Volunteer</i>	.0734286	.0543612	0.182	-	-	-	0.174
<i>Blooddonor</i>	.1671569	.1656874	0.317	-	-	-	0.367
<i>Free-riding</i>							
<i>Fileshare</i>	-.042198	.0513292	0.414	-	-	-	0.428
<i>Fare_evasion</i>	-.0656543	.0461816	0.160	-	-	-	0.174
<i>Social norm</i>							
<i>Share_household</i>	-.084996	.0776204	0.278	-	-	-	0.306
<i>Public broadcast consumption</i>							
<i>Public_broadcast_consum</i>	.0722588	.0413988	0.086	.0797091	.0400354	0.051	
<i>Socio-economic factors</i>							
<i>Age</i>	.0512997	.1181033	0.666	-	-	-	0.6030
<i>Adults</i>	.1103441	.1122423	0.330	.1615367	.0958747	0.097	
<i>Constant</i>	.621752	.3460089	0.078	.297271	.1648298	0.076	
Dependent: Complier							
Number of observation	70			70			
F-value	3.68			7.31			
Prob > F	0.0005			0.0003			
R²	0.2595			0.1648			
Adjusted R²	0.1191			0.1268			

Forty-one percent of the students comply, indicating that this subsample has a higher variability in the dependent variable than the non-students sample.

4.4.1 Deterrence

In this sample, *risk_detection* is again significant in both regressions. *Criminal_complaint* also acts as before, i.e. it is positive but not significant in either regression.

4.4.2 Pro-sociality

Neither of the pro-sociality variables are significant in this sample. *Volunteer* and *blooddonor* are positive, while *charity* once more is negative.

4.4.3 Free-riding

Both *fileshare* and *fare_evasion* have negative coefficients but are not significant in either regression. *Fare_evasion* is the closest to being significant of the two.

4.4.4 Social norm

Share_households is negative but not significant in either regression.

4.4.5 Public broadcast consumption

Public_broadcast_consum is positive and significant in both regressions.

4.4.6 Socio-economic factors

The coefficient for *age* is positive but not significant either of the regressions. *Adults* is positive and significant only when the stepwise regression is applied.

5. Discussion

We begin by discussing the results obtained in relation to the individual hypotheses before going into a more general discussion of the study's implications and limitations.

5.1 Deterrence

Even though, as conjectured, respondents on average perceive a low risk of detection from TV-license fee evasion, *risk_detection* remains one of few variables that consistently show up as significant in the regressions. Low perceived risk of getting caught results in lower levels of compliance and vice versa. This is consistent with a lot of the pioneering work on tax evasion and goes well with neoclassical economic assumptions in that people, being rational decision makers, weigh expected costs into their utility calculations. As much as personal and social norms and a sense of civic duty may impact, a very low risk of detection undermines these norms by increasing the opportunity cost of honest behavior. High risk of detection, in turn, constitutes a significant deterrent, as predicted by Allingham and Sandmo (1972) and subsequent extensions of their deterrence model of tax evasion. That the impact of the *risk_detection* variable is significant and positive in the two subsamples as well as the total sample indicates that the relative homogeneity of the subsamples does not divert the results. The variable can be supposed to be quite inherent to the compliance decision. The literature suggesting that stricter enforcement might negatively impact compliance through an over-justification effect thus gets no support in our study.

The other risk variable, *criminal_complaint*, obtains very weak support throughout the regressions. Few respondents (approx. 17%) believe that a criminal complaint is likely to follow upon detection and it has no significant impact on the payment decision for either of the subsamples. Since offenders cannot be prosecuted and penalized unless a criminal complaint has been filed, this could be an indicator that risk of detection is a more influential determinant than the expected penalties in this case. The same conclusion has been reached before in connection with tax evasion (see e.g. Kinsey 1992). However, as a measure, *criminal_complaint* is quite ambiguous as it provides no concrete suggestions as to what the criminal complaint might eventually lead to. A more significant result might well have been obtained had a more solid

scale of possible consequences been constructed. In reality though, penalties are so rare in connection with the television license fee that the question seems largely irrelevant.

5.2 Pro-sociality

Of our three measures of pro-social behavior, only *volunteer* shows up as significant in the regressions. There are no obvious reasons for why this should be the strongest measure and we want to refrain from labeling any one of the measures as more or less pro-social than the others. This said, volunteer work is time-wise probably the most costly of the three. It might be argued that the coding intervals used for the question on donation to charity were too narrow (approx. 500 SEK) to get any significant effect. We did not, however, want to get intervals that were too high as very large annual donations probably say more about the respondent's income than their inclination towards pro-sociality. Another explanation might be that volunteer work and donations to charity can be shown to be rather highly correlated.⁵ This could mean that *volunteer* captures some of the effect of *charity* in the regressions.

Blooddonor is not highly correlated to the same extent with the other two. It is consistently positive, which agrees well with our hypothesis, but never significant at any conventional level. As blood donors are relatively rare and the sample very limited, a larger sample might have yielded a more significant result.

Volunteer is positive and significant in the regressions regarding the whole sample and the non-student sample. The more frequently an individual engages in volunteer work (i.e. unpaid work for an organization or society) the more likely he is to comply. The reason this effect is not as strong in the student sample might be simply that the student sample has too few observations or that students are too homogenous with respect to volunteer work. Volunteer work can also be considered an ambiguous measure in the sense that it is difficult to draw a line where "helping out" ends and volunteering begins.

Overall we get some support for the pro-sociality hypothesis and no evidence that directly conflicts with it. Different measures of pro-sociality may have yielded different results.

⁵ See Appendix 2.

5.3 Free-riding

The interpretation of the free-riding measures is not too clear. *Fileshare* is only significant in the non-student sample when the stepwise regression is applied: it gains strength in the regression when the number of variables is reduced. The coefficient is negative as would be expected: the less a person file shares, the more probable it is that he will comply.

Fare_evasion is, in the non-student sample, significant in a way that conflicts with our hypothesis. While the coefficient is insignificantly negative for the sample as a whole and for the student sample, it is here positive – people who evade fares comply more. Because fare evasion and license fee evasion are both rare among the non-students it is not too remarkable that they do not co-occur. The results can therefore be purely coincidental, but we cannot discard the possibility of a real trend. There could for instance be ideological reasons behind the result: there are conceivably left-wing formations that demand free public transport and that for political reasons oppose commercial television and therefore approve of the license fee. This is speculative only, a larger sample would again be needed to draw any real conclusions around this. The fact that no similar effect is seen in any of the other regressions would suggest that it is more of a sample-selection flaw than a true relationship.

Both free-riding measures are strongly correlated with age which might explain why they show up as significant in the non-student sample but not in the student sample where the age distribution is very narrow. The young are far more inclined to free-ride, which under certain circumstances makes it difficult to tell whether it is age or free riding tendencies that most impact on license fee compliance.

Overall we get mixed and rather weak support for the free-riding hypothesis.

5.4 Social norm

The only hypothesis that we get no significant support for from any of our regressions is the one that suggests agents will act according to the perceived social norm. The *share_households* variable is never significant at any conventional level, coming the closest in the stepwise regression of the non-student sample where it is lifted out of the model last, at a 14 percent

significance level. On average, respondents think around 60-80 percent of Swedish households comply – just below the actual figure but still a good majority. While it is not significant, an interesting result is that the coefficient is negative among students but positive among non-students – a not entirely surprising result as it is often more socially accepted for student groups to be deviant. It is likely that more significant results would have been obtained had we asked people to estimate the share of their friends and acquaintances complying with the fee instead, as the correlation between this and their own compliance is likely to be higher than with the population in general. We must not forget, however, that there is a very real risk of a false consensus effect in such cases – people tend to project their own behavior onto their friends (Ross et al. 1977).

Interesting to note in this context is that a few weeks after the survey was carried out, RIKAB launched an offensive campaign to increase compliance. The key words of this campaign were “9 out of 10” – explicitly underlining that the vast majority complies. RIKAB, by setting out to increase awareness of the high level of compliance, are signalling that they believe it will compel more people to report TV-ownership. Our findings would suggest that this should have quite limited effect. As the campaign is ongoing we have not been able to obtain any evaluation of it. Again, more observations would have allowed us to draw more confident conclusions.

5.5 Public broadcast consumption

We get substantial support for the hypothesis that people who watch more public broadcasts are more likely to pay the license fee. The *public_broadcast_consum* variable is significant in the regular OLS regressions both for the whole sample and the student sample, and becomes significant in the non-student sample when the stepwise regression is applied. This is a concept that standard neoclassical economics finds difficult to explain. By law, all households with televisions have exactly the same obligation to pay irrespective of how much and which channels they watch. It can therefore seem irrational that agents’ levels of compliance depend on their levels of consumption – watching more does not generally increase the risk of being detected.

There are studies on tax evasion that show tax compliance to be dependent on people’s happiness with the public services provided (e.g Hanousek and Palda 2004) and this case in

analogous. It indicates that people are more prone to evade if they can justify it by that they are not free-riding, just failing to pay for a service they do not appreciate or use. It can be a case of personal norms or ideological principles.

5.6 Socio-economic factors

Student is very highly significant (and negative) in the total sample, which is in line with the information we were given by RIKAB. *Student* correlates very strongly with *age* and *income* which means we cannot draw any direct conclusion regarding what it is about the student life style that most encourages non-compliance: low age, low income or other factors such as that it is more accepted among students to evade.

Adults is significant and positive in all regressions except the regular OLS regression on the student sample, which indicates that more adults living together in a household improves compliance. However, *adults* captures two effects. First of all, there might be a signalling effect; a person might not want to tell his partner or flatmate that he does not want to comply. This would be in line with Bénabou and Tirole's (2006) study that shows signalling to be an important reputational incentive for pro-social behavior. Secondly, more adults in the household lower the amount each has to pay for the fee – the cost is split.

Neither *income* nor *education* is significant in the only sample we test for them, the non-student sample. There can be multicollinearity effects here that cause different socio-economic effects to cancel each other out but we can overall conclude that there are some socio-economic differences between compliers and non-compliers. The most important characteristics are *student* and *adults*.

5.7 General discussion

Descriptive statistics confirm that the population on average perceive a low risk of non-compliance and still, to a great extent, comply. This is particularly true for the non-student sample, presumed to be more representative of the general population and revealed in our study to have approximately the same level of compliance as is estimated by RIKAB (87%).

Four of our five hypotheses get partial support although, particularly for the free riding hypothesis, this support is sometimes weak and met by some conflicting results. Perceived risk of detection and public broadcast consumption are most consistently significant. The regressions generate few surprises although the positive significant impact on compliance of fare evasion in the non-student sample is difficult to explain. The full sample of students and non-students combined generate the most significant factors and the best fit of the model to the data. This was expected, both because of the higher number of observations and because of the greater variation in the dependent variable. The distinguishing factor between the two subsamples, whether the respondent is a student, is highly significant in the total sample which further affirms that students, more than the population at large, slip under RIKAB's radar. The non-student sample has a higher adjusted R^2 -value than the student sample which also indicates that our model is better suited to explain the behavior of the general population. The number of explanatory variables is greater for the non-student sample as we test for income and education, neither of which is expected to have any impact in the student sample. Instead, there may be other factors connected with the student life style and ideology that the model does not capture. The fact that the student sample primarily consists of business and economics students makes it all the more homogenous and we must also consider that the sample is rather small.

Generally the study has its limitations and it would certainly be desirable to estimate the regressions using larger samples and with more randomly selected respondents. As it is, we test for a large number of factors using a very limited set of observations. It is likely that a larger sample would turn out more significant variables since small anomalies and statistical deviations would have less influence. By using a sample with a better selection of respondents, more unambiguous conclusions could be reached concerning the population as a whole and the study's usefulness would therefore improve. However, it should be noted that representativeness was not something we explicitly strived for, as we needed more variation in compliance than a truly representative sample would give us.

Our hypotheses also set the limitations for our study and we cannot discard the possibility that a range of other, largely uncorrelated factors, may impact on the compliance decision. This is an unfortunate but necessary short-coming of almost any regression model that sets out to explain

real-world behavior – people are never as simple as *Homo economicus*. Since no previous study of this nature had been conducted on license fee compliance, it was also far from clear where we should look towards in order to formulate our hypotheses. Tax compliance studies can only to an extent be regarded as analogous.

The determinants of license fee compliance may have implications for how compliance levels are best maintained and encouraged. The fact that compliance levels are already quite high is helpful in that it narrows down the group of non-compliers, making it easier to control. Our survey results would support that people are affected by perceived risk of detection which means that increased use of direction finding instruments and more persistent controls could well have effect. It is, however, an expensive solution and deterrent measures cannot be exclusively relied on to explain compliance. As people's consumption of public broadcasts is another highly significant determinant, working from the opposite direction to continuously improve the quality and variety of public service may be equally effective. Appealing to people's consciences and stressing the strong norm of compliance are tactics that RIKAB seems to be currently trying and while our pro-sociality and social norm hypotheses get only limited support in our study we can conclude that an open approach that takes several determining factors into consideration is a sound way to face the problem of non-compliance. This in turn means that public service may benefit from further, more extensive work to clarify the behavioral aspects behind television license fee compliance and evasion.

6. Concluding remarks

Of the five hypotheses tested for their impact on TV-license fee compliance, four receive some support, even if it is weak in some cases and occasionally met by contradictory evidence. The individuals' perceived risk of detection and consumption of public broadcasts emerge as the two most influential determinants of license fee compliance. Inclinations toward pro-sociality have some impact, just as inclinations toward free-riding, even though we obtain mixed results for the latter. We get no significant support for that individuals' perception of the social norm is influential. We can also conclude that there are differences in socio-economic factors between compliers and non-compliers. While deterrence factors have long been the focus of tax evasion literature, we conclude that no single determinant can be exclusively relied on to explain license fee compliance and in order to form a clear image of the typical complier and non-complier many factors need to be taken into consideration. Our main interest has been in the determinant aspects of license fee compliance and how these can be fitted into an economic framework, but we feel that our research has often brought to mind questions and inferences about the financing of public service and its sustainment. With limited time and resources we could but dip our toes into this extensive subject.

6.1 Further research

A similar study with a larger and more representative sample for the Swedish population is suggested for future research. As our study was limited to the evaluation of a number of hypotheses this new study should ideally examine other possible determinants or use additional, or different, variables as measures of these determinants. Such a study could serve a complementary or confirmatory purpose and would allow for the possibility to draw clearer and more definite conclusions. It would also be interesting to conduct a study on the determinants of TV-license fee compliance in a country outside of Sweden to see similarities and differences between the countries. Finally a study that more critically evaluates the function and effectiveness of the television license fee, taking the determinants of compliance into consideration, could be of interest in order to place the subject matter in a broader context.

References

- Allingham, Michael G. and Agnar Sandmo (1972), "Income Tax Evasion: A Theoretical Analysis", *Journal of Public Economics*, vol. 1, p. 323-338.
- Anderson, Simon P. and Stephen Coate (2000), "Market Provision of Public Goods: The Case of Broadcasting". Working paper, National Bureau of Economic Research.
- Andreoni, James, Brian Erard, and Jonathan Feinstein (1998), "Tax Compliance", *Journal of Economic Literature*, vol. 36(2), p. 818-860.
- Bénabou, Roland and Jean Tirole (2006), "Incentives and Prosocial Behavior", *The American Economic Review*, vol 96(5), p. 1652-1678.
- Benson, Tina. Information officer at Radiotjänst i Kiruna AB. Telephone interview the 5th of February 2009.
- Chung, Janne and Viswanath Umashanker Trivedi (2003), "The Effect of Friendly Persuasion and Gender on Tax Compliance Behavior", *Journal of Business Ethics*, vol. 47(2), p. 133-145.
- Clotfelter, Charles T. (1983), "Tax Evasion and Tax Rates: An Analysis of Individual Returns", *Review of Economics and Statistics*, vol. 65(3), p. 363-373.
- Feinstein, Jonathan S. (1991), "An Econometric Analysis of Income Tax Evasion and Its Detection", *The RAND Journal of Economics*, vol. 22(1), p. 14-35.
- Feld, Lars P. and Bruno S. Frey (2002), "Trust Breeds Trust: How Taxpayers Are Treated", *Economics of Governance*, vol. 3(2), p. 87-99.
- Gneezy, Uri, (2005), "Deception: The Role of Consequences", *The American Economic Review*, vol. 95(1), p. 384-394.
- Hanousek, Jan and Filip Palda (2004), "Quality of Government Services and the Civic Duty to Pay Taxes in the Czech and Slovak Republics, and other Transition Countries", *Kyklos*, vol. 57(2), p. 237-252.
- Henrich, Joseph, Robert Boyd, Samuel Bowles, Colin Camerer, Ernst Fehr, Herbert Gintis, and Richard McElreath (2001), "In Search of Homo Econoicus: Behavioral Experiments in 15 Small-Scale Societies", *The American Economic Review*, vol. 91(2), p. 73-78.
- Hirshleifer, Jack (1985), "The Expanding Domain of Economics", *The American Economic Review*, vol. 75(6), p. 53-68.
- Häckner, Jonas and Sten Nyberg (1996), "Marknaden och Moralen", *Ekonomisk Debatt*, vol. 24(2).

Kinsey, Karyl A. (1992), "Deterrence and Alienation Effects of IRS Enforcement: An Analysis of Survey Data", *Why People Pay Taxes: Tax Compliance and Enforcement*, Editor: Joel Slemrod (Ann Arbor: University of Michigan Press).

Klepper, Steven and Daniel Nagin (1989), "The Anatomy of Tax Evasion", *Journal of Law, Economics, & Organization*, vol. 5(1), p. 1-24.

Laurin, Urban (1986), *På heder och samvete. Skattefuskets orsaker och utbredning* (Stockholm: Norstedts Förlag AB).

Orviska, Marta and John Hudson (2002), "Tax evasion, civic duty and the law abiding citizen", *European Journal of Political Economy*, vol. 19, p. 83-102.

Ostrom, Elinor (1997), "A Behavioral Approach to the Rational Choice Theory of Collective Action.", *American Political Science Association*, vol. 92(1), p. 1-22.

Perloff, Jeffrey M. (2008), *Microeconomics* (Boston: Pearson Education, Inc, 5th edition).

Persky, Joseph (1995), "Retrospectives: The Ethology of Homo Economicus", *The Journal of Economic Perspectives*, vol. 9(2), p. 221-231.

Porcano, Thomas M. (1988). "Correlates of Tax Evasion", *Journal of Economic Psychology*, vol. 9(1), p. 47-67.

Radiotjänst i Kiruna AB [RIKAB] (2009). Available [online]: <http://www.radiotjanst.se/sv/> [Visited 23rd of April 2009]

SCBa (2009), *Sammanräknad förvärvsinkomst 2007*. Stockholm: Statistiska centralbyrån. Available [online]: http://www.scb.se/Pages/TableAndChart____159835.aspx [Downloaded 11th of May 2009]

SCBb (2009), *Sveriges befolkning efter kön och ålder 31/12/2008*. Stockholm: Statistiska centralbyrån. Available [online]: http://www.scb.se/Pages/TableAndChart____262459.aspx [Downloaded 5th of May 2009]

Scholz, John T. and Neil Pinney (1995), "Duty, Fear, and Tax Compliance: The Heuristic Basis of Citizenship Behavior", *American Journal of Political Science*, vol. 39(2), p. 490-512.

Slemrod, Joel (2007), "Cheating Ourselves: The Economics of Tax Evasion", *Journal of Economic Perspectives*, vol. 21(1), p. 25-48.

Snyder, Christopher and Walter Nicholson (2008), *Microeconomic Theory. Basic Principles and Extensions* (Mason: Thomson South-Western, 10th edition).

Stock, James H. and Mark W. Watson (2007), *Introduction to Econometrics* (Boston: Pearson Education, Inc, 2nd edition).

Trost, Jan (2007) *Enkätboken* (Lund: Studentlitteratur, 3rd edition)

Wahlund, Richard (1991), *Skatter och ekonomiska beteenden : en studie i ekonomisk psykologi om främst skattefusk och sparande utifrån 1982 års skatteomläggning* (Stockholm: Ekonomiska forskningsinstitutet vid Handelshögskolan i Stockholm, EFI).

Wallschutzky, I.G. (1984), “Possible causes of tax evasion”, *Journal of Economic Psychology*, vol. 5, p. 371–384.

Webley, Paul, Michaela Cole, and Ole-Petter Eidjar (2001), “The prediction of self-reported and hypothetical tax-evasion: Evidence from England, France and Norway”, *Journal of Economic Psychology*, vol. 22, p. 141–155.

Wooldridge, Jeffrey M. (2008), *Introductory Econometric: A Modern Approach* (Mason: South-Western Cengage Learning, 4th edition)

Laws

The Act (1989:41) on Financing of Radio and Television in the service of the public [Lag (1989:41) om finansiering av radio och TV i allmänhetens tjänst]. Available [online]: <http://www.riksdagen.se/webbnav/index.aspx?nid=3911&bet=1989:41> [Downloaded 11th of May 2009]

Appendix 1: The questionnaire

Thank you for taking the time to fill in this questionnaire. Please observe that all answers are strictly anonymous and that the survey is conducted without any connection to Radiotjänst i Kiruna AB. We ask you to fold your questionnaire before you hand it back to us.

The survey is conducted at the Stockholm School of Economics and the results will be presented in partial fulfillment of a Bachelor's degree in economics. Our field of interest is behavioral economics and it is important that you answer the questions as truthfully as possible.

If you have any questions we will be happy to answer them *after* you have handed back the questionnaire. Thank you for your participation!

1. Including yourself, how many people live in your household?

Number of adults (over 18): ☐ 1 ☐ 2 ☐ 3 or more

Number of children (under 18): ☐ 0 ☐ 1 ☐ 2 ☐ 3 or more

2. Does your household have a television?

☐ Yes ☐ Yes, but put aside and not in use ☐ No

3. Does your household pay the television license fee?

☐ Yes ☐ No ☐ Do not know

4. Who in the household has the primary responsibility for television license fee payments?

☐ Me ☐ My partner ☐ Parents ☐ Other

5. Radiotjänst i Kiruna AB is in charge of television license fee collection. Have you ever been contacted by them?

☐ No, never ☐ Yes, once ☐ Yes, several times

6. If you have been contacted, how did you respond?

☐ I had no television and said so ☐ I had a television and answered truthfully

☐ I had a television but said I did not

7. Radiotjänst's controls consist of individual phone calls and house calls. What do you think of these methods?

	Fully disagree	Partly disagree	Neither agree nor disagree	Partly agree	Fully agree
A. Unpleasant	☐	☐	☐	☐	☐
B. Necessary	☐	☐	☐	☐	☐
C. Intrusive	☐	☐	☐	☐	☐
D. Annoying	☐	☐	☐	☐	☐

8. The television license fee is paid four times a year. What do you think it costs per quarter?

It costs _____ SEK.

9. The television license is used to finance Sveriges Television (SVT), Sveriges Radio (SR) och Utbildningsradion (UR). What function do you think these institutions have?
☐ No function at all ☐ Unimportant function ☐ Neither important nor important function.
☐ Important function ☐ Very important function
10. How frequently do you watch public broadcasts on SVT? *
☐ Very rarely ☐ Rarely ☐ Neither often nor rarely ☐ Often ☐ Very often
11. How big a share of your friends and close acquaintances do you believe pay the TV-license fee?
☐ 0-20% ☐ 21-40% ☐ 41-60% ☐ 61-80% ☐ 81-100%
12. How big a share of Swedish households do you believe pay the TV-license fee? *
☐ 0-20% ☐ 21-40% ☐ 41-60% ☐ 61-80% ☐ 81-100%
13. Radiotjänst has the power to report offenders to the police by filing a criminal complaint. Invoicing commences from the date a person is registered as a TV-owner. What do you think Radiotjänst's policy is when they detect TV-license fee evasion? *
☐ No measures taken, offenders asked to report TV-ownership on their own.
☐ Offender is registered as a TV-owner from the date of detection.
☐ Offender is registered as a TV-owner from the date of detection and a criminal complaint is filed.
☐ Offender is registered as a TV-owner retroactively (from when payments should have started).
☐ Offender is registered as a TV-owner retroactively and a criminal complaint is filed.
14. To what extent do you agree with the following statements:
- | | Fully disagree | Partly disagree | Neither agree nor disagree | Partly agree | Fully agree |
|---|--------------------------|--------------------------|----------------------------|--------------------------|--------------------------|
| A. "I find the idea of being subject to controls uncomfortable." | ☐ | ☐ | ☐ | ☐ | ☐ |
| B. "I think it is important to always obey the law." | ☐ | ☐ | ☐ | ☐ | ☐ |
| C. "I think the cost of the license fee is unjustifiably high." | ☐ | ☐ | ☐ | ☐ | ☐ |
| D. "I think public broadcasts should be financed through the general income tax." | ☐ | ☐ | ☐ | ☐ | ☐ |
15. I would describe my attitude towards the TV-license fee as:
☐ Very negative ☐ Negative ☐ Neutral ☐ Positive ☐ Very positive
16. Over the past year, how often have you shared or downloaded files illegally on the Internet? *
☐ Never ☐ Very occasionally ☐ 1-2 times a month ☐ 1-2 times a week ☐ Daily
17. What is your view on illegal file sharing/downloading?
☐ Very harmless offence ☐ Quite harmless offence ☐ Neither harmless nor serious
☐ Quite serious offence ☐ Very serious offence

18. Over the past year, how often have you evaded fares on public transport? *

☐ Never ☐ Very occasionally ☐ 1-2 times a month ☐ 1-2 times a week ☐ Daily

19. What is your view on fare evasion in public transport?

☐ Very harmless offence ☐ Quite harmless offence ☐ Neither harmless nor serious
☐ Quite serious offence ☐ Very serious offence

20. How big do you perceive the risk of detection to be for:

	Very small	Small	Neither big nor small	Big	Very big
A.TV-license evasion *	☐	☐	☐	☐	☐
B.Filesharing/illegal downloading	☐	☐	☐	☐	☐
C.Fare evasion	☐	☐	☐	☐	☐

21. How much have you donated to charity over the past year? *

☐ 0-100 SEK ☐ 101-500 SEK ☐ 501-1000 SEK ☐ 1001-1500 SEK ☐ 1500+ SEK

22. Do you volunteer for any organization, club or association? *

E.g sports associations, charities, tenants associations, religious or political societies

☐ No ☐ Yes, but rarely ☐ Yes, often ☐ Yes, very often

23. Are you a registered blood donor? *

☐ Yes ☐ No

24. Gender: * ☐ Male ☐ Female

25. Age: * ☐ 0-18 ☐ 19-25 ☐ 26-35 ☐ 36-45 ☐ 46-55 ☐ 56-65 ☐ 66+

26. Highest level of education reached: *

☐ Elementary/middle school ☐ High school ☐ University

27. Tick here if you are currently a student: * ☐

28. Who would you vote for if there was an election today?

☐ The right-center alliance (m, c, fp, kd) ☐ The red-green opposition (s, v, mp) ☐ Other

29. What is the monthly average income of your household before tax? *

☐ 0-10 000 SEK ☐ 10 001-25 000 SEK ☐ 25 001-40 000 SEK ☐ 40 001-60 000 SEK
☐ Over 60 000 SEK

* = Questions that were explicitly used in the construction of the factor model.

Appendix 2: Correlation table

The upper number in each cell shows the correlation and the lower shows the significance of the correlation (p-value).

	Complier	Risk_detection	Criminal_complaint	Charity	Volunteer	Blooddonor	Fileshare	Fare_evasion	Share_household	Public_broadcast_consumm	Student	Age	Income	Education	Adults
Complier	1.0000 0.0000														
Risk_detection	0.2553 0.0006	1.0000 0.0000													
Criminal_complaint	0.0459 0.5489	0.0474 0.5385	1.0000 0.0000												
Charity	0.0810 0.2837	-0.0479 0.5279	-0.1099 0.1513	1.0000 0.0000											
Volunteer	0.1772 0.0190	0.0054 0.9440	-0.0802 0.2984	0.1847 0.0144	1.0000 0.0000										
Blooddonor	0.0379 0.6145	-0.1382 0.0675	-0.1404 0.0654	-0.0545 0.4709	0.0856 0.2601	1.0000 0.0000									
Fileshare	-0.4005 0.0000	-0.2064 0.0066	0.0205 0.7899	-0.1561 0.0403	-0.0607 0.4306	-0.0000 1.0000	1.0000 0.0000								
Fare_evasion	-0.1844 0.0143	0.0027 0.9720	-0.0269 0.7271	-0.0300 0.6927	0.0961 0.2073	-0.0602 0.4275	0.2247 0.0030	1.0000 0.0000							
Share_household	0.1140 0.1332	0.1557 0.0408	0.0044 0.9545	0.1050 0.1678	0.1193 0.1189	-0.0434 0.5688	-0.2115 0.0051	-0.0341 0.6559	1.0000 0.0000						
Public_broadcast_consumm	0.4013 0.0000	0.1808 0.0194	-0.0138 0.8592	0.0376 0.6282	0.0421 0.5893	-0.0551 0.4770	-0.3485 0.0000	-0.1416 0.0671	0.1281 0.0970	1.0000 0.0000					
Student	-0.5146 0.0000	-0.1233 0.1032	-0.0439 0.5660	-0.1629 0.0303	-0.0395 0.6040	0.0433 0.5657	0.4061 0.0000	0.3310 0.0000	-0.1226 0.1059	-0.3324 0.0000	1.0000 0.0000				
Age	0.4880 0.0000	0.2770 0.0002	-0.0438 0.5684	0.1891 0.0117	0.1752 0.0204	-0.1832 0.0146	-0.5028 0.0000	-0.2895 0.0001	0.2627 0.0005	0.3805 0.0000	-0.7321 0.0000	1.0000 0.0000			
Income	0.3949 0.0000	0.0333 0.6613	-0.0745 0.3314	0.3236 0.0000	0.1706 0.0240	0.0184 0.8077	-0.3349 0.0000	-0.1517 0.0445	0.1932 0.0106	0.2588 0.0007	-0.5327 0.0000	0.4272 0.0000	1.0000 0.0000		
Education	-0.1625 0.0312	-0.1625 0.0316	-0.1233 0.1082	0.0307 0.6858	0.0253 0.7406	0.0444 0.5585	0.1560 0.0410	0.1311 0.0838	-0.0252 0.7417	-0.1676 0.0304	0.3745 0.0000	-0.3300 0.0000	-0.0557 0.4632	1.0000 0.0000	
Adults	0.3088 0.0000	-0.0225 0.7673	-0.1131 0.1383	0.1240 0.1001	0.1143 0.1319	0.0411 0.5849	-0.2181 0.0038	0.0404 0.5943	0.0484 0.5249	0.1866 0.0151	-0.1890 0.0115	0.1956 0.0091	0.5775 0.0000	-0.0150 0.8437	1.0000 0.0000