THE PATTERNS OF TAX EVASION
IN RUSSIA: THE EVIDENCE FROM
RUSSIAN LONGITUDINAL
MONITORING SURVEY OF
HOUSEHOLDS

by

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Abstract

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This study develops a methodology that uses microeconomic data from RLMS of households to explore tax evasion patterns in Russia and their changes due to the possible impact of PIT reform launched in the beginning of 2001. The relationships between the measure of tax evasion and characteristics of the household representative such as age, gender, size of the household, total household income reported by the household representative and its structure are investigated and compared to the earlier theoretical and empirical studies. The validity of the wide spread claim that there is a negative relationship between tax rates and tax incompliance is also a research question for this study.

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C h a p t e r   1

INTRODUCTION

The increasing concern on the extent of tax evasion has induced a lot of studies in different countries on the amount of unreported incomes and factors accounting for this phenomenon. Although a number of motives may impel to non compliance behavior, the prevalent judgment is that agents take into account the existing level of tax rates, while deciding on how much to evade. Keeping all other things being equal, higher marginal tax rates drive more economy into the shadow.[1] As Clotfelter (1983) mentioned "this view has provided an additional argument for *flat-rate taxes* and some other proposals aimed at reducing marginal tax rates". How powerful this view was can be judged from profound reforms in the taxation of personal income carried out by countries with developed market economy over two recent decades. The common features of all these reforms were reduced marginal tax rates and a broadened tax base.

Similar to developed economies in their 1980s, transitional economies in the middle 1990s seem to give a new born to the analogous reformations, while introducing a flat tax rate in taxation of personal incomes. As far as the flat tax rate is concerned, a new, however already distinctive trend might be observed that transition economies are shifting from graduated tax rates towards flat taxes, while cutting their personal income tax rates. At present, Estonia (1994), Latvia (1995), Russia (2001) and Ukraine (2004) have already substituted a progressive income tax system (taxpayers face higher marginal tax rates as they earn more money) by a flat personal income tax.

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[1] For instance, Allingham and Sandmo (1972) in their pioneering work presented the solution for utility maximizing problem for risk-averse individual that supported the claim that the size of unreported income is positively related to the marginal tax rate.

In Ukraine and Russia the 13% tax rate has become applicable to all citizens regardless of their incomes since January 1, 2004 and January 1, 2001, respectively. Both of the countries had similar progressive personal income tax systems with identical set of marginal tax rates for PIT taxpayers and were at the comparable stages of their transition progress before the flat tax was introduced. However in contrast to Russia, in Ukraine it is too early to evaluate the impact of tax rate cut on the tax evasion, because records for after-reform period are not yet available. The latter is probably the very reason which explains why Ukrainian researchers are so sluggish in studying the impact of the 13% flat tax on the amount of tax evasion. The existing studies of Ukrainian authors' aims to demonstrate that the tax rate cut in Ukraine will eventually lead to nothing else but budget deficit and to less equal distribution of incomes in the Ukrainian society. For example, Skrypnyk and Belyayev (2003) used the forecast of PIT budget proceeds for 2004 in Ukraine and applied new flat tax rate (13%) to calculate PIT budget proceeds in the year 2004. This static analysis revealed that even assuming that PIT budget proceeds growth trend would constitute about 20% the 13% flat tax rate will result in 30% loss of budget proceeds, taking PIT budget proceeds in the year 2003, as the base of comparison. This outcome was attributed to the fact that the effective tax rate for 2003 (15.9%) was almost 3% higher than the 13% flat tax rate. In addition, another Ukrainian economist, Butsyura (2003), after presenting some not sophisticated calculations has demonstrated that 13% flat tax will be beneficial for all taxpayers except for taxpayers whose income was below 206,43 UAH in 2003. Therefore, according to the researcher 13% flat tax is not desirable because it shifts the burden of the PIT tax to the shoulders of the least well-off stratum of the society. As can be seen, Ukrainian researchers are not

optimistic about tax evasion decline which might follow due to the flat tax adoption and completely disregard this effect in their studies.

Taking these facts as a given, we suggest that Ukraine is in a suitable position to learn from the Russian experience of influencing tax evasion by means of tax rate cutting and should not disregard this exclusive opportunity for its own benefit. Unfortunately, in fact we don't see that Ukraine exploits its natural privilege efficiently.

For instance, the Ukrainian government has predicted that after the new law takes effect, budget revenues from personal income taxes will proliferate as chronic tax-dodgers will log out from the 'shadow'. The only argument that Ukrainian policy-makers put forward to support their expectations is the successful experience of Russia with the flat tax, which was purposely introduced to increase government revenues by reducing tax evasion and avoidance. Indeed, in 2001, the first year under the flat tax, personal income tax (budget) revenues were 19% higher than in 2000, after adjusting for inflation, and rose another 20.7% in 2002 compared with 2001. (Rabushka, 2003). Although very fruitful these efforts to increase budget revenues may look in Russia, the relationship between tax rates and the scale of tax evasion is far more complicated than one may expect. Economics, for instance suggests that there are other factors, besides a tax rate, that a taxpayer takes into account making his decision on how much to evade. They are a severity of punishment for a tax a crime, the probability of being caught in evasion, level of income, opportunities to avoid taxation, etc. Therefore, it is quite possible that, although PIT reform in Russia was accompanied under the banner of tax rate cut, the final outcome was determined by changes in some other factors. These changes, expectedly, could have created, magnified or downplayed the impact of the alleged tax rate cut effect on tax evasion.

In spite of this, Russian economists (Sinelnikov-Murylev et al., 2003) claim that an observed upswing in PIT revenues is mainly attributed to the impact of tax rate cut on taxpayers' decisions concerning the amount of optimal tax evasion. The latter, according to the researchers, has fallen due to the smaller margin between marginal benefits and marginal costs induced by the new PIT law enforcement.

Although this line of arguments seems rather persuasive this finding has to be taken with more than a grain of salt.

First of all, there are no reliable statistics on tax evasion as this activity is veiled by its nature. What economists usually do in this situation is that they try to find some proxy for tax evasion in their empirical studies. In the case of Russia, the researchers for this purpose used a difference in PIT revenues before and after tax cut. It was suggested that as far as the negative relationship between this proxy and tax rate is established, one may conclude that lower tax rate accounts for less evasion. However, this is not necessarily the case since some other factors such as the increase of labor supply resulted from tax rate decline may have also produced an analogous effect on PIT revenues.

Secondly, other key elements of the reform should not be ignored. For instance, the impact of tax base expansion and the abolishment of some tax concessions as the key elements of PIT reform in Russia should have also been controlled for - to guarantee that there was no bias due to omitting a relevant variable.

Finally, the empirical evidence from Russia seems to conflict with the results received from public opinion polls. For instance, Krasilnikiva (2001), making use of (VCIOM) surveys of the second half of 2000 and January 2001, concludes that process of legalization of "shadow" incomes is not well grounded if not illusory at all, as most of the respondents had a negative

attitude to the government and did not believe in its capability of effective protection of individuals' interests. Moreover, people widely believed that the only purpose of lowering the rate was to persuade the naïve citizens to report officially their shadow incomes and then return back to the previous tax schedule.

Taking these 3 remarks into account, our paper aims to verify the patterns of tax evasion in Russia and revise the impact of Russian PIT reform with respect to non-compliance behavior in more details than it was done in the earlier study by Sinelnikov-Murylev et al (2003). **Specifically, we examine evasion in Russia, by comparing gaps between estimated expenditures and reported incomes, for different periods of time, i.e. pre-reform period and after-reform period, using Russian Longitudinal Monitoring Survey of Households.** Unlike the analysis conducted by Sinelnikov-Murylev et al (2003), which is the only empirical study devoted to the assessment of the results of PIT reform in Russia, our analysis is based on the data set with lower level of aggregation (household data) as opposed to highly aggregated data used in the previous research.

Furthermore, in looking for the effects of changes in tax rates between 2000 and 2001 on changes in evasion, we use a new proxy (expenditure-income gap) that have never been used in the other related studies[2]. Although this proxy by no means is faultless (we will discuss its advantages and disadvantages in details), our data allows controlling for many important factors such as the size of household, its income, source of income, demographic characteristics of the respondent etc.

We would like also stress from the outset that the impact of the Russian PIT reform is not associated with tax cut only. Already mentioned tax base expansion and abolishment of many tax concessions - are another pillars of

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[2] This approach was kindly recommended by Larisa Leschenko, an expert from World Bank, Ukraine

the reform, so we are aware that we cannot attribute changes in household tax evasion decisions purely to tax rate cut. Thereby, to avoid any misinterpretations of our results we would like to underline that PIT reform, ideally, should be perceived in a broader sense than the mere tax rate cut. Unfortunately, it is not possible to account for many details of the PIT reform especially while performing the empirical part. That is why while discussing the impact of tax rate cut on tax evasion we will not lose the chance to explain a certain outcome by considering potential impact of the other relevant (to tax evasion) variables.

Taking into account that Ukraine and Russia are very similar economies and that Ukrainian PIT forthcoming reform mimics in many details the Russian one; we believe that our findings can be useful in terms of fiscal policy implications for both countries.

The rest of the paper is organized as follows: in Chapter 2 we make a short review of theoretical and empirical studies and discuss their results. This is an essential part of our study since it demonstrates that tax evasion is a too complicated phenomenon to be explained by mere theory of tax evasion in its current state, so empirical studies is of great demand nowadays. After we complete Chapter 2 with analysis and discussion of the theoretical model of tax evasion, we perform the empirical analysis of tax evasion in Russia in Chapter 3, which contains methodology issues, data description and estimations for different specification models. The results provide some insights into how tax rates and income size are related to tax evasion, or more generally, whether tax evasion problem in Russia has been reduced after PIT reform was launched in the beginning of 2001.

LITERATURE REVIEW

Tax incompliance behavior, among other reflections of the desire to avoid government regulations and restrictions, is possibly the oldest feature characterizing relations between the government and the rest of economic agents that interact within the common economic field. A number of arguments supportive for this claim could be found in economic and non-economic literature, especially in philosophy and political science. In this research we stick mainly to the economic aspect of the problem, therefore the overview of only economic literature will be presented in this section.

Every tax influences economic agents' behavior as it makes agents to consume less or adjust their working hours (at the expense of leisure) leaving them with reduced consumption whatever is the case. That is why with few exceptions economists agree that individuals generally perceive taxes as "bad" that takes away their welfare. Noncompliance behavior, in this respect, is usually seen by economists as a rational response of an agent who maximizes his/her utility or income.

At the same time, scholars' opinions diverge profoundly when effects on evasion resulted from application of different fiscal instruments are discussed. In this context debates on the effect that tax rates produce on the magnitude of evasions seems to be the ardent ones. This can be seen directly from a clash between the pioneering works on tax evasion performed by Allingham and Sandmo (1972) and Yitzhaki (1974). More specifically, Allingham and Sandmo (1972) posed the tax evasion problem in the

framework of the decision making under uncertainty. Having choice either to report a full income or just a part of it, a risk-averse individual *with decreasing risk aversion*, will tend to increase or decrease the amount of unreported income as marginal tax rate increases. This indeterminate effect is the result of the interaction between the substitution and income effects. *Substitution effect* tells that it is more attractive to evade taxes on the margin when tax rate increases, while *income effect* implies less evasion, because increased tax rate makes individual less wealthy, and, under decreasing absolute risk aversion assumption, one tends to reduce evasion.

The crucial assumption underlying this result is that penalty due to the exposed deception definitely links to the *income understatement*. Formally, it means that penalty (fine) is calculated as {G*(Y-X)}, where (Y-X) stands for the gap between true income (Y) and the reported income (X), and (G) is the penalty rate. Alternatively, as this was first noticed by Yitzhaki (1974), it is more likely that not an *income understatement*, but rather *tax understatement* defines the size of the penalty in practice, which implies that penalty (fine) is calculated according to the following rule {t*G*(Y-X)}, where *t* stands for the tax rate. Introduction of this slight change into agent's target function alters the conclusion obtained from the Allingham and Sandmo framework, implying that the taxpayer increases his reported income and reduces the amount of tax evasion, as the tax rate increases. Economic explanation proposed by Sandmo is that if the penalty or fine is defined like, G*t*(Y-X), the overall sum of fine increases proportionally with *t*. Hence, substitution effect disappears and we are left only with the income effect. It is worth of being noted here that in Ukraine as well as in Russia penalty is calculated as the function of unpaid taxes, in contrast to the function of unreported incomes. (Vyshnevskiy and Vetkin, 2004). This observation, at least from the theoretical point of view presented by Yitzhaki (1974), suggests that the

level of tax rate and tax evasion might have negative relationship, which highly contradicts to the general belief that the high tax rates stimulate tax evasion

The failure of the early theoretical analysis to explain the association between the amounts of evasion and the size of tax rate imposed did not, however, discourage economists from subsequent theoretical analysis. "Concealment technology" (Cremer and Gahvavi, 1994) and the notion that the probability of detection is the growing function of taxpayer's expenditures (for example, Usher, 1986, Kaplow, 1990 and Cowel, 1990) are just selective examples taken from a non exhaustive list of various amendments that failed, however, to solve the ambiguity inherent to theoretical analysis.

Summing up the contribution of numerous theoretical models aiming to predict the linkage between tax rates and incentives for evasion, Adreoni et al. (1998) conclude "Theoretical models generate no clear predictions on the effects of tax rates on compliance. The presence of both income and substitution effects complicates the analysis, and special assumptions about the form of penalties, distribution of income, and shape of preferences are often required to identify any comparative static".

Within the view that theoretical studies did produce contradicting inferences regarding the effect of tax rates on the amount of tax evasion, in 1980's many economists shifted their scientific efforts towards the empirical analysis of the subject.

According to Slemrod (1985) the first trace of this 'healthy infusion' of empirical studies was usually associated with the name of Clotfelter (1983), who originally applied micro-unit data from *Internal Revenue Service's Taxpayer Compliance Measurement Program (TCMP)* and suggested that in

the United States estimates of the elasticity of unreported income with respect to marginal tax rates were positive with point estimates in the range from 0.5 to over 3.0.

It should also be noted that the relationship between marginal tax rates and tax evasion is not always found to be positive. Geeroms and Williamson (1985) using Belgian data find precisely the converse conclusion, i.e. tax increases lead to less evasion (Cullis and Jones, 1998 p. 200)

However, not only changes in tax rates explain variation of unreported incomes. The source of income is another possible circumstance that should be kept in mind while studying evasions. For instance, tips and wages presumably have different propensities to underreporting as probability of being exposed to fraud is much more higher in the case of wages (Groves, 1958 and Hinrics, 1964) Furthermore, original model by Allingham and Sandmo (1972) and its version amended by Yitzhaki (1974); both suggest that individuals will naturally evade less the more risk-averse they are and the higher is perceived probability of being disclosed. The less obvious conclusion coming from the Scrinivasan's model (1973) is that evasion, as a fraction of income, has a negative relation with measure of relative risk-averseness and the positive one with income.

Furthermore, some surveys found that there is a positive relation between incomes and evasions as well as that aged people are more reluctant to conceal taxable incomes than younger people (see Vogel, 1974). The first fact could be partially attributed to relatively higher opportunities to avoid taxation rules available to relatively well-off agents of the society. Another possible explanation is that as income grows the attitude to the risk may change so that the same agent becomes less risk-averse (concave utility function). This, in turn, can also imply that wealthy people have lower

subjective estimates of the probability of being caught than poor do, which means that latter evade less vis-à-vis well-to-do agents. The second finding reflects the hypothesis that older people tend to have relatively high degree of risk-averseness if compared with young.

Nevertheless, there is no clear consensus on the association between income and tax evasion since Spicer and Lundstedt (1976) as well as Song and Yarbrough (1978) found a negative relation between income and propensity to underreport. Besides, Song and Yarbrough (1978) suggested that association between age and evasion is more sophisticated, i.e. individuals with age spread 40-65 are least likely to twist with taxes, while older and younger people are more likely to evade.

Another paper that is worth mentioning is empirical test for tax evasion conducted by Slemrod (1985). Using data from Internal Revenue Service, he found that married couples are more inclined to resort to fraud. At the same time the tendency to evade taxes with higher marginal tax rates was reported and age effect was similar to previous studies. Nevertheless, as additional explaining variable, AGI, entered the regression the association between marginal tax rate and evasion altered in sign.[3] This outcome is consistent with presence of significant correlation between marginal tax rate and income, implying that independent effect of income or tax rate can not be identified (Slemrod, 1985). Therefore, an important conclusion follows from this paper: one should be aware of the problem of multicollinearity between income and marginal tax. This problem is particularly important for the analysis undertaken for economies with progressive tax system where there is a positive relation between marginal tax rates and income by definition.

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[3] AGI (Adjusted Gross Income) is a taxable income net of prescribed exemptions and deductions

Consequently, previous economic studies suggest that in general - income, wage share in the income structure, marital status, tax rate and age - comprise a set of appropriate variables for empirical studies. Other variables such as field of employment, region, and complexity of taxation might also add to the whole picture (Slemrod, 1985 and Clotfelter, 1983)

So far, our overview included only empirical studies related to countries with developed market economies. This fact by no means signifies that tax underreporting is not the important issue for the less developed economies such as transition economies are. As far as transition economies are concerned, the shortage of related studies is the matter of relevant data. Reasons accounting for the difficulty or impossibility of obtaining data on the subject for these countries may be diverse. The most trivial one, perhaps, is that data sets analogous to the one obtained for the US (TCMP-survey held by Inland Revenue Service (IRS)) simply do not exist. Nevertheless, there are still some ways to perform evasion studies for transition economies.

Perhaps, the most straightforward way to analyze tax evasion without having official data from tax authorities is to create them. It can be done using the laboratory experiment technique. According to Gerxhani and Schram (2002) all experimental studies on tax evasion are very similar: they study individuals' behavior when they are faced with changes in tax rates, penalties for cheating and audit probabilities. The stylized evidence on tax incompliance from experimental studies can be summarized as follows: (1) tax evasion increases with the tax rate and income; (2) decreases with the level of fines and audit probability; (4) tax evasion is less when proceeds are used to provide public good; (5) a large subset of people never cheat, because they believe that cheating is wrong; (6) women evade taxes less than men do (Gerxhani and Schram, 2002). Laboratory experiment has the advantage of controlling the environment, in which the experiment is

conducted. As to disadvantages the experiments requires additional funding. Besides, laboratory settings of the experiment rarely correspondent well with the real world settings (for example, individuals in the real life evade without knowing the probability of the audit or the amount of fine (punishment) levied, if being revealed in illegal activity).

In addition to or instead of experiments, the analysis of macro-economic statistics can also be useful. In Russian Federation that consists of more than 100 regions, some aggregated regional macroeconomic data were utilized to assess the results of Personal Income Tax Reform of 2001, which implied introduction of 13 % flat tax (Sinelnikov-Murylev et al, 2003)[4]. Roughly, the change in budget revenue from PIT for the period of 2000-2001 was chosen as a dependent variable. As explaining variables the change in regional expenditures (dE) and change in tax rates (dt) for the same period were taken. Markedly, in contrast to Slemrod (1985), Russian researchers used expenditures instead of income (AGI). This trick allowed them to tackle the problem of multicollinearity, which was briefly mentioned above.[5] Applying difference-in-difference technique the authors demonstrated that lowered tax rates induced PIT budget revenues to go up as individuals had fewer incentives to underreport their incomes. Obviously, two factors made this kind of tax evasion study feasible and relevant in Russia: the first, is the assumption that change in the budget PIT revenues is mainly attributed to decline in the scale of tax evasion; second, the reform has already been implemented hence a natural experiment was created. (In Ukraine that in

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[4] 13% income tax flat rate correspondent to the minimal marginal tax rate in 2000

[5] For each region change in the tax rate was computed as an effective tax rate per region (in 2000) minus 13%. Expenditures, but not income falls into analysis in order to escape the plague of multicollinearity. Note that computed expenditures are not balanced with official incomes in Russia. This fact allows usage of dE instead of d(Income) due to: (1) the correlation between dE and dt is significantly lower than the correlation between d(Income) and dt.; (2) correlation between d(Income) and dE is high.

many respects is similar to Russia, such a study would not be feasible to date, since records for after-reform period are not available).

Another solution potentially applicable to transition economies, having problems with official data, is using of questionnaires administered by professional survey departments ('survey method'). This approach was successfully carried out for Albania (Gerxhani, 2003), Slovakia and Czech Republic (Hanousek and Palda, 2002)

In the former paper the author made use of survey method to test Feige's conjecture, i.e. non-compliance behavior proliferate when formal and informal institutions clash.[6] Specifically, in post communist countries formal institutions have changed radically, but informal institutions lag far behind. As a result, man-maid constraints (in the form of formal institutions) do not determine incentives for human interactions and people do not behave according to the 'rules of the game' set by the formal institutions. This, according to Feige, leads to "noncompliant behaviors involving protective and predatory activities" such as tax evasion (Gerxhani, 2003). Using a self-administered questionnaire, Gerxhani created a proxy for tax evasion, which just counted the number of times that a respondent fulfilled the criteria of tax evasion she defined in her paper, and used attitudes towards formal and informal institutions as predictors (in addition to other explanatory variables) to explain evasion. Her finding is that formal and informal institutions seems more compatible for females, highly educated people, income earners for large families and urban inhabitants, implying that holders of this group of characteristics are less inclined to evade.

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[6] Formal institutions include laws, tax regimes, and rules, while informal institutions comprise norms of behavior and established conventions. (Gerxhani, 2003)

On the other hand, Hanousek and Palda (2002) selected the survey method "as it is rich in demographic information". Collecting subjective data from respondents who were proposed to answer "what they believe is the probability of being caught evading", "what penalties they believe they face", "whether they believe evasion to be moral" etc., authors found that taxes might be of minor importance in determining a degree of evasion, while morality of evaders and opportunities for evasion seems to be more important in the decisions on how much to underreport. The major question with the 'survey method', however, is how sincere respondents are. The obvious problem when asking people about the degree of their involvement into shadow economy is that they will be reluctant to confess their participation (Hanousek and Palda, 2002).

Although it looks as if tax audit data is the most desirable approach for studying tax evasion, it is not always the case. For instance, while comparing with the 'survey method' tax audit surveys seems to contain much less demographic and social characteristics that would be appropriate as explanatory variable. Finally, the usage of tax audit data for studying tax incompliance in the transition is jeopardized by the fact that tax auditors in transition are typically not paid for many months at a time, hence they are encouraged to use their position to extract bribes from taxpayers and the actual amount of tax evasion, as a result, can be significantly biased downwards (Anderson and Carasciuc, 1999). This fact coupled with earlier mentioned difficulty to obtain relevant data from state tax authorities in transition countries, explains why our study on tax evasion in Russia is performed using a 'survey method', an alternative and less direct source of information if compared with tax audit surveys (see data and methodology sections).

EMPIRICAL PART

3.1 THE DATA

[This section draws heavily on the description of RLMS data on households]

The data used in this research were collected as a phase II of Russian Longitudinal Monitoring Survey (RLMS). The RLMS is a household-based survey designed to measure the effects of Russian reforms on the economic well-being of households and individuals. Its survey instruments were designed by an interdisciplinary group of Russian and American social science and biomedical researchers with extensive experience in survey research.

Particular care was taken to collect data that would allow one to answer policy-relevant questions concerning the design and impact of programs and policies affecting a wide range of social sector outcomes. Taking this into account, we expect that it can also be used successfully to study the impact of PIT reform in Russia (2001) on the amount of unreported incomes.

The data set we use is predominantly a raw data for households' incomes and expenditures for the years 1998, 2000, 2001 and 2002. Besides, RLMS on households contains other valuable information on households', including living conditions and household property that we might need in order to find a set of sensible explanatory variables for Gap, proxy for tax evasion, defined as total household's expenditures net of total household's incomes.

Table 3.1 RLMS PROFILE

Year	Observations	Roster Variables	Housing Variables	Land Use Variables	Expenditure Variables	Income Variables
1998	3,831	287	74	199	328	87
2000	4,006	294	76	200	303	104
2001	4,528	317	74	201	312	109
2002	4,635	317	75	201	312	109

As can be seen from the table reported, sample size per each year on average contains about 4,000 interviews. For the household interview, a single member of the household was asked questions that pertained to the entire family. The respondent was usually the oldest living woman in the home since she was available to be interviewed during the daytime. This explains why the number of women answering the questionnaire is higher than the number of men. Any attempt to identify one person as the "household head" is as problematic in Russia as it is in the United States. Thus, the interviewer was instructed to speak with "the person who knows the most about this family's shopping and health."

"Household" was defined as a group of people who live together in a given domicile, and who share common income and expenditures. Households were also defined to include unmarried children, eighteen years of age or younger, who were temporarily residing outside the domicile at the time of the survey. Note, however, that single-member households are excluded from the comparison. Although, the target sample size was set at 4,000, the number of households drawn into the sample was inflated to 4,718 to allow for a non-response rate of approximately 15%. So, the true response rate is always higher than 80%. Finally, in order to analyze panel data, we excluded from the sample all those households that did not participate in the RLMS at least once. As a result the actual sample has shortened to about 10,000 and is less than one can observe using data in Table 3.1 .

3.2 METHODOLOGY

There are several approaches to studying tax evasion that we mentioned in the literature review (tax audit survey approach, macro-economic statistics approach, experiments and a 'survey method'). Considering advantages and disadvantages of these approaches we find it worthwhile to limit our choice to a survey method. Aside from our failure to obtain official data on tax evasion, the rationales behind our decision to employ a 'survey method' are the following ones:

(1) one of the goals we pursue in this study is the exploration of different characteristics accompanying and perhaps influencing the tax evasion practices; in other words, we want to test a wide range of characteristics shown to be significant in explaining the variance of tax evasion in the previous studies discussed in the literature review section;

(2) the survey we use, allows us to generate a proxy for tax evasion that is similar to the proxy that one may encounter in the studies based on tax audit surveys. Our proxy is intuitively appealing, as it is measured in monetary units, and save us from the efforts of working out a sophisticated index of tax evasion, the practice that one may frequently observe in many other studies which resort to a 'survey method'.

The latter highly contributes to the possibility of making a direct comparison of our results with the findings, stemming from tax audit data that allows evaluating the relevancy of our analysis and data used. In addition, as it is shown below, there are grounds to expect that the data we use in this study are trustworthy, applicable and to some extent are more informative than a tax audit survey data could be.

Apparently, the most convenient way to explain the methodology that we employ in our study is to outline in some details the technique applied by

Clotfelter (1983), whose concept serves as a starting point for our empirical analysis. The data set used by Clotfelter is the tax audit survey by Internal Revenue Service, called Taxpayer Compliance Measurement Program (TCMP) for 1969. The data on reported income (X) and the amount of income that IRS auditors determined (Y) per individual are available in TCMP. According to Clotfelter the difference between true (Y) and reported income (X) is the sum of deliberate evasion (V) and "honest" error (U): Y-X=V+U. While comparing the reported sum with the sum determined by an auditor, Clotfelter found that the tendency to underreport far exceeded the tendency to overreport. In addition, the average of understatements in every class of taxpayers was larger than the average for overstatements. So, Clotfelter's main assumption was to use an underreported income as a proxy for the tax evasion, although it contains both an error term and deliberate evasion component.

Following Clotfelter (1983), we adopt his idea to generate proxy for tax evasion. However, instead of taking data from a tax audit survey, we exercise a fragment of an abundant and valuable stock of information from Russian Longitudinal Monitoring Survey (RLMS) that contains panel data on conditions of life, property, estimated expenditures and incomes as well as their structures for households in Russia. Specifically, we generate a series of unreported income (Gap) defined as total household estimated expenditures (TE) net of household total incomes (TI). **The TI can be obtained for each household and according to the questionnaire this is the total income encompassing all possible sources of income for a household (wages, stipend, subsidies, pension, alimony repayment of loans, received gratuitous money, etc). On the other hand, TE is the total expenditures estimated for a household by the specialists from RLMS (who can be treated as audits to some extent), using the information on what has been bought, in what volume as well as how much money was paid by a**

household for some product during a certain period of time etc. Specifically, by TE we imply all financial decisions of the household, so irrespective of whether the household buys some product, lend outside, return its debt or set aside a fraction of current income in order to increase consumption in the future, we treat these financial decisions as separate expense items of TE

Note, however, that the usage of RLMS data for studying tax evasion relies heavily on the assumption that the value of the household reported income would be the same no matter who collects data from the household representative: an RLMS interviewer; or a tax officer.

Assumption 1. Reported income from RLMS is the same as the one that would be available for a tax officer.

This assumption looks as a very restrictive on the face of it, and many would reasonably perceive that a tax officer is in a better position to elicit information from a taxpayer than an RLMS interviewer does, because the tax officer is legitimately entitled to exercise procedures outlined in the Criminal Codex (for example fines, deprivation of liberty etc.) in the case of detected tax fraud, while RLMS interviewer has no power to punish his deceitful respondent. Fortunately, this is just a starting point of a mental exercise that one would need to accomplish before inferring that the *Assumption 1* is not more restrictive than the assumption that economic agents are rational, which is a very fundamental assumption in economics. To demonstrate this we will use a game theoretic approach.

Imagine a taxpayer who is asked to fill in information on his/her incomes to a tax officer. A tax payer, who in his turn is assumed to be rational, has only three options.

Option 1. To report a true income
Option 2. To underreport his true income

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To over-report his true income.

Note that the same set of options our taxpayer has while reporting his income to a RLMS interviewer. Furthermore, in order to make conditions of our game more realistic, we will add one more reasonable assumption.

Assumption 2. A RLMS interviewer guarantees confidentiality of data received from a taxpayer, but a taxpayer does not fully trust this guarantee and presumes some probability of data leakage from an RLMS to a tax officer. Tax officer, while comparing his data with the 'leaked out data' will impose a fine, if the reported income available from the income statement file turns out to be smaller than the reported income from the 'leaked out data' file. If otherwise or equality takes place for data received from different sources, i.e. tax office or RLMS, than a fine will not be imposed.

Figure 3.1 HOW SINCERE A TAXPAYER IS WHILE REPORTING HIS/HER INCOME TO THE RLMS INTERVIEWER
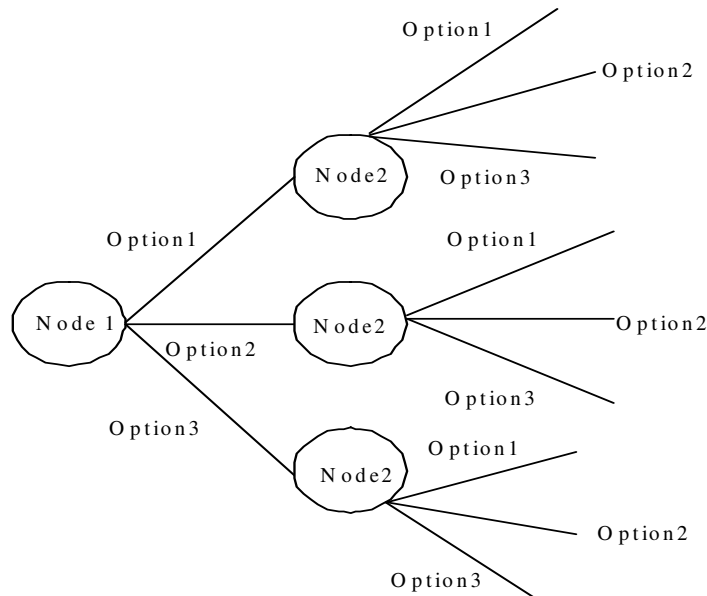
Now, let us begin our logical tree from the starting decision node, where a taxpayer is delivering an income statement addressed to a tax office (decision node 1 in the Figure 3.1). Now, in order to answer which option would be

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appropriate for a taxpayer, we need to analyze the costs and accruing benefits stemming from each out of the three options.

Choosing *Option 3* is not rational since our taxpayer has natural incentive to maximize his after tax income (utility). Suppose that a taxpayer have chosen *Option1* in the decision node 1 (decision on income statement addressed to a tax officer). Then moving into the subsequent decision node (node 2) of the logical tree, he has to decide which option he will chose, when filling in RLMS questionnaire. *Option 1* and *Option 2* in the node 2 (conditional upon that Option 1 in the decision node 1) are not associated with additional costs in a form of fine according to the Assumption 2. The situation is completely different as far as *Option 3* is concerned. Hence, conditional upon that *Option 1* is taken at node1, our taxpayer ends up with *Option 1* or *Option2* at the decision node 2.

Let us now assume that the *Option 2* was chosen by a taxpayer at the decision node1. Option 2 at the decision node 1 implies that the agent decided to twist with his tax liability while reporting income to the tax office. Then *Option 1* and *Option 3* will be associated with probability to pay a fine, according to the Assumption 2 and therefore will be rejected. Obviously, if Option 2 was chosen in the decision node1, taxpayer will be better of if he/she will opt for Option 2 again when making his decision at node 2. Such a strategy, Option 2 in the node 1 and Option 2 in the node 2, means that a taxpayer understate his/her true income to a tax officer and interviewer by the same amount.

Assuming that at the decision node 1, 50% of taxpayers chose O*ption 1* and 50% opt for *Option 2*, and that 50% chose to underreport (Option2) at the decision node 2, we may calculate a conditional probability that Assumption 1 holds, P("Assumption1_holds")=0.5*0.5+0.5*1=0.75=75%. Note that probabilities that were set to obtain 75% were arbitrary. Nonetheless, probability that 50% will underreport at the decision node 1 (Option 2) is

quite compatible with the estimations evidencing that FSU official economies has 1 to 1 relationship with its informal (unaccounted, shadow) counterparts. Another probability at the decision node 2, is also 50% percent, however this time - this is just the expectation at the probability interval ranging from zero to one.

Now that we have demonstrated that our data on the reported incomes can be treated as the relevant ones, we may discuss some disadvantages of GAP, our measure of tax evasion. Of course, Gap, or (TE-TI), is a very rough approximation for the real sum of unreported income. **The problem associated with (TE-TI) as a proxy for tax evasion is that (TE-TI) can be negative for some households.**

Clotfelter (1983) has solved this question by converting that negative values into zeroes by using Tobit estimation technique in his analysis. Such a transformation, although is very appealing and instructive, solves only a part of the problem, as it implies that households having (TE-TI)<0 are treated in a similar way as households that are thought of not to resort to underreporting (households with (TE-TI)=0). This assumption, leads us to another inconvenience, namely censoring at zero, excludes the possibility to underreport expenditures versus incomes. For instance, a household representative could underreport his/her household total income at some rate and downplay his/her household total expenditure even at a higher rate. As a result, some bias will be built in Tobit estimates.

In order to handle the disadvantage associated with a Tobit estimates, there are at least two options at our disposal. First of them, implies filtering of our data, so that all observations containing negative Gap will be dropped out of the sample. Obviously, this practice will lead to the loss of efficiency as a lot of information from the original sample will be disregarded. So, we cannot

commit ourselves with the assertion that truncation is preferable to censoring with Tobit and will make use of both of them.

Alternatively, we may try to relax the problem inherent to the Tobit methodology by converting our negative gaps into positive. This trick will enable us to measure evasion in absolute terms, allowing for both income, as well as expenditure understatement, where the letter is another possible technique of evasion we did not mentioned before.

Let's now shift our attention to the possible advantage of our proxy. Despite the disadvantages that Gap-measure entails, this proxy might include some income that is unobservable for taxpayers audit surveys (moonlighting, income from cash only business, some kind of expenditures etc.). Consequently, other things being equal, there is no a priori evidence that audit survey would yield a better proxy than the Gap which we constructed using RLMS.

Now that we explained how the dependent variable can be created, we may describe econometric specification that we use to test our main hypothesis that PIT reform in Russia, launched at the beginning of 2001, has discouraged tax evasion.

The simple and probably rather crude way to complete this task is to estimate the following regression:

$$Gap = \beta_0 + \beta_1 X_t + ... + \beta_k X_k + \delta_0 Year\_2000 + \delta_1 Year\_2001 + \delta_2 Year\_2002 + u \quad (1)$$

Equation (1) is a pooled regression across the years 1998, 2000, 2001 and 2002, where Gap is the difference between TE and TI; Xs are explanatory variables (the number of household members, wealth (assets) and estimated expenditures (as a proxy for the true income), propensity to save etc). The variables Year_2000, Year_2001 and Year_2002 are year dummies. Dummy equals one if the observation comes from 2000, 2001 or 2002, respectively, and zero if otherwise. The intercept for 1998 is β_0, while $\beta_0 + \delta_0$ is the

intercept for year 2000 and $\beta_0 + \delta_1$ for the year 2001 etc. Under plausible, however, conventional assumption we may think that the effect of the PIT reform is fully captured by δ_1 and δ_2, meaning that other exogenous effects are of minor importance, and therefore they do not affect δ_1 and δ_2 significantly, we would conclude that the PIT reform (2001) induced less of unofficial economic activity, if $\delta_i < 0$, and otherwise if $\delta_i > 0$, *i=1,2*. Furthermore, the comparison of δ_i and δ_0 is also of interest, since it allows some judgments on the power of such an anti tax fraud preventive measure as the PIT reform in Russia (2001) in fact is. If it turns out that δ_i s are significant and statistically different from δ_0, than we have the evidence that the reform accounts for changes in the amount of tax evasion. The direction of this change will show whether tax evasion has increased or decreased in Russia, following the reform.

To obtain more information from our data, for example one may be interested whether high earners get more incentives not to evade taxation (not to understate their true incomes/expenditures) due to the reform, we may want to interact those independent variables of interest with a year dummies.

Due to already mentioned disadvantages connected with the choice of Gap, as a proxy for tax evasion, our **research strategy in the empirical part** is as follows:

(1) Because of the large proportion of households that have negative Gap, our specifications will be estimated using Tobit maximum likelihood procedure. The observations that have Gap<0 will be converted to zeroes when using Tobit.

(2) Afterwards, instead of Tobit we will use OLS, Random Effects and Fixed Effects to estimate regressions for Gap>0.

(3) Finally, and in addition to the first two approaches, we will estimate regressions with the absolute value of Gap.

As far as explanatory variables are concerned the majority of them are mainly suggested by theory and other empirical studies. The list of potential explanatory variables and their expected signs can be found in Table 3.2

Table 3.2 TAX EVASION EXPLANATORY VARIABLES AND THEIR EXPECTED SIGNS[7]

NOTATION	DESCRIPTION	EXPECTED SIGN
household size	Number of household members	Positive/Negative
sex	Sex of the respondent (1-male, 2-female)	Negative
age	Age of the respondent (in years)	Negative
real_incm	Total household expenditure as a proxy for the real income of the household	Positive
luxury_ratio	Proportion of expenditure on luxuries in the Real_incm (for ex. 23 (means 23%))	Positive
rent_dum	Dummy(whether household has an income in the form of rent)	Negative
bond_dum	Dummy for holding bonds	Positive/Negative
gov_incm_ratio	Percentage of income received from government sector	Negative
savings_ratio	Total household savings as a percentage of total household expenditures	Negative
d98	Year dummy	Positive
d2001	Year dummy	Negative
d2002	Year dummy	Negative
gap_r	Gap, difference between total expenditures and total income, calculated in 1992 rubles	Dependent variable
abs_gap_r	The absolute value of Gap, calculated in 1992 rubles	Dependent variable

Let's comment the content of the Table 3.2. At the bottom of the table different measures of Gap are presented. The only difference between them is that abs_gap_r = |gap_r|. We will use both of the measures for the reasons explained earlier.

The list of the explanatory variables begins with the **household size** (number of household members). The appropriateness of this variable is dictated by our

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[7] Descriptive statistics for the variables from Table 3.2 is reported in the Appendix (see Table A.2).

intention to control for unintentional error when reporting household income or household expenditures to the interviewer (Remember that Gap is the mixture of deliberate underreporting and unintentional mistake). As one may notice the expected sign is ambiguous, according to the table. The intuition behind positive expected sign is that a representative of the big household is more likely to misreport a household income (or expenditures) unintentionally than a representative of a small household would do, but on the other hand, we expect that a representative of the big household is likely to be more risk-averse than a representative of a small household, other things being equal. The latter interpretation can be found in Gerxhani, 2002. Therefore, priory we cannot predict which effect will be of dominant importance.

The meanings of **sex** and **age** as explanatory variables are straightforward and their influence on the tax evasion is predetermined by the results obtained in the previous researches, namely women evade less and so older people do. Note, however, that in the literature review we quoted the study that found a non-linear relationship between tax evasion and age. Taking this into account, we will use both **age** as well as **age^2** in our specification to control for the effects of age on our dependent variable.

In order to control for the source of income while studying tax evasion, we propose to use the following variables: **rent_dum, bond_dum, gov_incm_ratio.** The first variable tells us whether a household receives income in the form of apartment rental. If it does, one would expect that this household is in the better position to evade more, since apartment rent is usually paid in cash and therefore has lower probability for being detected by tax auditors. On the other hand, if the apartment rent is so suitable for underreporting and households share this view, we should expect that only a little fraction of households will report on this income item to an RLMS interviewer. The logic is as follows: a rational household representative will

inform the interviewer on the apartment rental income if and only if it already pays tax on this income. If the rental income is kept in secret from the tax office, a rational household representative would prefer not to share this information with the interviewer due to some probability of data leakage to a tax officer. Taking this view into account it is likely that the observed coefficient near the **rent_dum** will be negative, signaling that the respondents with **rent_dum**=1 were more sincere during the interview, hence a smaller gap should be expected. The same logic should be applied to a **bond_dum**, however in the case of bonds we may encounter the effect with the opposite direction, because being a bondholder seemingly demonstrates more of risk-loving behavior than otherwise. Hence the expected sign near a bondholder dummy cannot be determined at this stage.

In studying how the source of income affects the patterns of evasion, we also distinguish a share of income received from the government Preliminary we predict that households whose major sources of income come from the government (**gov_incm_ratio**) should have fewer incentives to evade than households that receive their incomes from other sources, because government practices personal income taxation at the source, which means that taxation procedure is fulfilled automatically before a household member receives his net income (income net of sum paid in taxes). Therefore, keeping the rest of arguments unchanged, it is reasonable to expect that having larger share of incomes from the government institutions should automatically translate into the smaller gap.

As for the rest of the variables, we use amount of total expenditures, **real_incm,** as a proxy for real (virtual) income to control for the incentives that real income create for tax evasion. On the similar grounds, percentage of expenditures spent on luxuries, **luxury_ratio,** is also presented. The expected

sign is negative, due to decreasing absolute risk-aversion, an attractive assumption supported by everyday life[8].

Note that some of the explained variables will be interacted (year_dummy*variable) using d98, d2001 and d2002. This will allow us to observe how the effects of the chosen variables have changed over time, namely before and after personal income tax rate cut in Russia (January 1, 2001).

3.3 ESTIMATIONS

Now that we explained and specified which variables are essential for tax evasion analysis, we will follow our research strategy as we defined it earlier: Note that the structure of our data allows conducting a panel data analysis. For this reason, in addition to the OLS and Tobit estimates (both of which rely on pooled data) we report fixed effects and random effects estimates in our output table, Table 3.3. Note that results reported in Table 3.3 are valid only for observation with positive gaps[9]. The estimates based on the absolute value of gap will be reported in the separate table, which you may find in the Appendix, see Table A.1.

Let's comment the information presented in the Table 3.3. Estimated coefficients near the *size of the household* proved to be significant and negative for all estimation techniques we applied. This observation is in line with our expectation that representatives of big households tend to exhibit more risk-aversion than individuals from the small households. Moreover, the effect stemming from the relationship between size of the household and risk-

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[8] The assumption of decreasing absolute risk aversion means that the willingness of an individual to engage in a bet increases as his income increase (Gandi p.142).

[9] Only Tobit estimates are based on the whole sample available, because all negative gaps are automatically mapped into zeroes.

aversion seems to be superior in absolute terms than the effect connected with the relationship 'degree of unintentional mistake and household size'

Table 3.3 ESTIMATES BASED ON THE POSITIVE VALUES OF GAP[10]

```
------------------------------------------------------------------------------
   Variable        ols            re             fe            tobit¹¹
---------------+--------------------------------------------------------------
household size | -245.69425***   -262.30417***   -188.05616**    -227.2061***
          sex |  119.79082       133.40846        182.76377       175.9047*
          age | -96.934355***   -87.785505***     35.168767      -73.43424***
        age_2 |  1.0738845***    .98523523***    -.38156564       .7761661***
d98_real_incm | -.03160518*      -.0204393         .01696122      -.00675
d2001_real_incm | -.13456574***   -.12971996***    -.11560818***   -.0597587***
d2002_ real_incm| -.20825119***   -.19204394***    -.15218341***   -.0870108***
savings_ratio | -45.381757***   -44.597114***    -38.534968***   -27.00444***
     rent_dum |  -860.34034      -1036.5935*      -1511.4261*     -799.51***
     bond_dum |  -151.6898       -146.05836       -732.45089     -1417.956***
    real_incm |  .81548165***    .81943869***     .86822731***    .4439307***
 gov_incm_r~o | -16.595279***   -17.469483***    -25.279321***   -18.40598***
 luxury_ratio |  54.886462***    54.062544***     45.555814***    28.44123***
          d98 |  552.69078***    518.99911***     424.50111**     218.952*
        d2001 |  740.28144***    686.60042***     485.55217**     159.3721
        d2002 |  1179.6726***    1035.8946***     635.52595***    213.2705*
        _cons |  182.51118       -44.85444       -2948.9997**
------------------------------------------------------------------------------
                                legend: * p<0.05; ** p<0.01; *** p<0.001
```

As to demographic characteristics (sex and age in our case), estimates near **sex** of the respondent tend to be positive, but insignificant in all cases, except for the Tobit. The significant and positive coefficient near **sex** for the Tobit regression evidences that women are likely to evade more than men do.

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[10] The H0 for F-test that all fixed effects are simultaneously are equal to zero is rejected with p<0.001. The Hausman test reveals that using random effects method instead of fixed effects is inefficient but consistent.

[11] The column labelled 'tobit' reports marginal effects at mean values of non-dummy explanatory variables. As far as dummies are concerned, the reported coefficients should be treated as the marginal effects of a discrete change of a dummy variable from 0 to 1

This result is unexpected and contradicts the findings of the previous studies, which possibly can be attributed to the different attitudes towards the risk among men and women in Russia.

The effect of the age on tax evasion (proxied by gap_r) seems to be non-linear according to Tobit, OLS and Random Effect estimates. The positive coefficient near **age^2** and the negative one near the **age,** strongly support the conclusion of Song and Yarbrough (1978), suggesting that individuals in their middle age are likely to twist with their tax liabilities less, than old and young people usually do.

Recall that we decided to use **real_incm** (total household expenditures in rubles 1992, which is used as a proxy for real incomes) and **luxury_ratio** (the percentage of expenditures spent on luxuries) to study the relationship between income and tax evasion. The estimated coefficients near both of them are stable positive and statistically significant irrespective of whether OLS, Fixed Effects (FE) or Random Effects (RE) was applied. Note, however, that Tobit estimates are also statistically significant, but approximately two times smaller if compared to the coefficients estimated by OLS, RE and FE.

The similar patterns, in terms of the stability of the coefficients, can be observed for the estimated coefficients near interaction terms **d2001_real_incm** and **d2002_real_incm.**[12] Note, however, that coefficients near **d98_real_incm** are either negative but close to zero or not significantly differ from zero, which means that the relationship between the total expenditures and tax evasion (**gap_r**) was pretty much the same at the end of the years 1998 and 2000, i.e. additional ruble spent was translated into approximately 0.44 through 0.86 rubles of gap, depending on the

---

[12] Coefficient near interaction term, for example the coefficient near **d2002_real_incm**, reflects how the effect of variable (**real_incm** in our case) changed in the year 2002 relative to the baseline year, which is 2000 for Table 3.3. Consequently, the coefficient near **real_incm** shows the marginal effect of the additional rubble spent on tax evasion only for the year 2000.

computational technique we applied. Nonetheless, the relationship between **gap** and **real_incm** changed due to tax rate cut at the beginning of 2001, so that at the end of 2001 and 2002, the marginal effects of real incomes on the measure of gap fell into the range (0.38, 0.76) for 2001 and (0.32, 0.72) for 2002. **Altogether this implies that income and tax evasion are positively related in Russia, although the degree of this association becomes weaker due to Personal Income Tax Reform in Russia, initiated at the beginning of 2001.**

In order to ascertain how the source of income affects propensity to pay taxes in Russia, one should draw some attention to the estimated coefficients near **rent_dum, bond_dum, gov_incm_ratio.** As far as the first variable is concerned, one may notice that coefficients near dummy for receiving income in the form of rent (**rent_dum**) are negative and significant for all methods applied, except for the OLS. This observation fits our prediction well and reinforces our conclusion that the data we use are of a good quality in the sense that RLMS interviewers seemingly obtained the data on household income, which wouldn't differ much should tax officers have collected them instead of RLMS interviewers.

The coefficients near the dummy for the household being a bondholder, **bond_dum**, proved to be not significantly different from zero in the majority of cases, except for the Tobit. The latter predicts that the bond-holding households evade less that contradicts to our prior expectation that a bond-holding household will generally demonstrate more evasion because of higher level of risk susceptibility of its owners.

Finally, negative and significant coefficient at **gov_incm_ratio** is compatible with our prediction that the household with high share of true income

received from the government should have fewer incentives to underreport their true incomes.

Let's now comment the coefficients near year dummies. In the methodology section we stressed the role of the coefficients near year dummies in studying the effectiveness of the PIT reform on tax evasion. Although year dummies for 2001 and 2002 have positive and statistically significant coefficients it doesn't necessarily mean that the amount of evasion has increased after the end of the year 2000, which is a baseline year in the setting of our regression and the last year when the progressive PIT system was operating in Russia. The reason that motivates us not to base the analysis of the reform using year dummies coefficients only, is that some interaction terms in the set of explanatory variables, i.e. **d2001_real_incm** and **d2002_real_incm**, proved to be essential for the model and coefficients near these terms can also tell us something about the results of PIT reform in Russia. Specifically, we can observe from the Table 3.3 that the positive slope relating tax evasion and the amount of true income (proxied by total household expenditures) became more flat in 2001 than in the year 2000 and even more flat in the 2002. At the same time it can be seen from the intercept and coefficients at year dummies that the positive intercept in year 2000 was lower than the intercepts for subsequent years. This implies that keeping rest of the factors unchanged, tax rate cut and other measures undertaken in compliance with the PIT reform have led to the situation, when households with a total amount of true income below a certain amount of threshold level (X), began to underreport more than they had done before the reform; while the household with total income above the threshold level (X), found it worth-while to underreport in fewer amounts (see Figure 3.2).

FIGURE 3.2. THE IMPACT OF PIT REFORM ON THE HOUSEHOLDS DECISIONS ON HOW MUCH TO UNDERREPORT IN RUSSIA
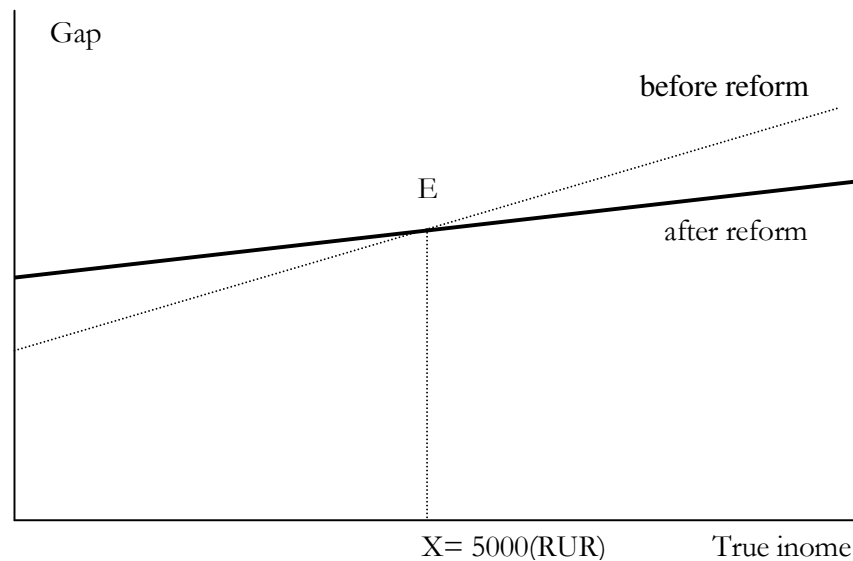
From our point of view this situation can be interpreted as follows: The households with the true income below X, could have decided to evade more in the after reform period because of two reasons. The first reason, is that although 13% level of flat tax corresponds to the minimal PIT rate in the pre-reform period, the PIT in Russia after the reform is levied from the broader base of taxation. The second reason is that, assuming that the major target of the reform was to make a relatively better off stratum to start paying PIT adequately, tax collecting bodies could have shifted their efforts from the households with the true incomes below X to the more well off households (this conclusion draws heavily on the assumption that tax authority's capacity of disclosing tax crimes remained unchanged after the reform was implemented). So, relatively better off households has encountered not only

reduced PIT rates, but faced a higher probability of being accused in underreporting. As a result, the probability of being detected has decreased for households with incomes below X that led naturally to increased level of underreporting for them. Here, it is worth of being mentioned that the analyses of the PIT budget collections before the reform shows that the majority of taxes were paid by the people whose marginal tax rate were low, or in the other words, by people with low incomes. Combining this fact with our finding, we may conclude that flat PIT rate system in fact turned out to be more equity tuned and more progressive than a nominally progressive PIT system had been before 2001.

The coefficients near explanatory variables for the absolute value of gap, as a dependent variable, can be found in the Appendix, Table A.1. The patterns reflected in Table A.1 are in compliance with observations produced for Table 3.3.

CONCLUSIONS

Tax evasion by its nature is a veiled activity, which is difficult to observe. This study develops a methodology for using data from Russian Longitudinal Monitoring Survey of Households to explore the patterns of tax evasion in Russia and their changes due to PIT reform (2001) which is often associated with the personal income tax rate cuts and 13 % flat tax imposition.

Having created a proxy for tax evasion and using explanatory variables suggested mainly by the relevant theoretical and empirical studies, we performed a standard regression analysis which allowed us to observe the following facts concerning tax evasion in Russia.

First of all, while comparing the total reported incomes with the total household expenditures (including savings), we found out that more than 60% of households from our sample spend more than they earn. This observation may suggest that tax evasion, or income understatement, is a very wide-spread practice in the country.

Next, there are demographic features of tax incompliance. Specifically, there is some evidence, according to our data, that women underreport household incomes more than men do and middle aged individuals evade less than younger and older people do.

Furthermore, a structure and the size of the household true incomes do matter as well. It was estimated that households receiving high share of their incomes from the government institutions tend to evade less.

 As far as the relationship between incomes and tax evasion is concerned, our analysis reveals that in Russia, households tend to evaded more as their true income increases. This observation is in line with the theoretical conclusion postulating that the risk aversion is a decreasing function in income.

After the general patterns of tax evasion have been verified, we performed an attempt to evaluate the impact of PIT reform on the income understatement in Russia. We did it by a straightforward comparison of the slopes and intercepts that were estimated for the *pre-* and *after-* reform periods. As a result, we found an empirical confirmation that there was a twofold impact of the reform on tax evasion. On the one hand, the households with real incomes above some threshold level (5000 RUR per month) started on the average to evade less after reform, but on the other hand, households with the total incomes below this level began to evade more than they had done before the reform. The latter observation calls into question a wide spread believe that lower tax rates stimulates less evasion, but it does not contradict to the conclusion stemming from the theoretical model of Allingham and Sandmo (1972). Framing our empirical evidence into this model, we put forward the following interpretations of the patterns observed. It is quite possible that income effect of tax rate cut appeared to be more powerful than the substitution effect for the households with true incomes below the threshold and otherwise for the households with incomes above the threshold. Another possible explanation is that relatively better off households faced a higher probability of being detected due to PIT reform, whilst the probability of being detected has decreased for the households with incomes below the specified threshold. The second explanation, however, implies that tax authority's capacity of disclosing tax crimes did not increase after the reform had been implemented.

Finally, taking all above into account we conclude that mere tax rate reduction is not a guarantee against the mass tax incompliance. In order to diminish the scale of tax evasion we would recommend increasing the probability of tax crime revelation, although the combination of these two

measures might lead to even more devastating effect on tax evasion incentives.

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Table A.1. ESTIMATES BASED ON THE ABSOLUTE VALUE OF GAP

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--------------------------------------------------------------
   Variable          ols            re             fe
--------------------------------------------------------------
household size | -121.75136**   -123.87277**    -114.36368
          sex  | -285.45457     -274.60726      -57.658065
          age  | -26.356691     -25.560306       16.884732
        age_2  |  .39552847      .3878602       -.10130557
  d98_real_incm| -.06600126***  -.06235824***   -.02600406
d2001_real_incm| -.12990942***  -.12789615***  -.10846558***
d2002_real_incm| -.19194145***  -.18658459***  -.13556096***
 savings_ratio | -50.193512***  -50.419674***  -52.814244***
      rent_dum |  388.00153      393.28554       600.93349
      bond_dum |  2575.3968      2546.4131       2184.5214
     real_incm |  .75943642***   .75913916***    .77180373***
gov_incm_ratio | -10.299095***  -10.384515***  -13.244208***
  luxury_ratio |  81.575994***   79.385262***    52.956423***
           d98 |  410.93892*     386.27289*      165.45556
         d2001 |  707.96737***   693.53255***    540.77904**
         d2002 |  1134.4528***   1093.8351***    683.36424***
         _cons | -136.53379     -160.46899      -1291.7884
--------------------------------------------------------------
             legend: * p<0.05; ** p<0.01; *** p<0.001
```

Table A.2 . DESCRIPTIVE STATISTICS

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--------------------------------------------------------------
Variable          Mean       Std. Dev.      Min         Max
--------------------------------------------------------------
        gap_r  | 1243.923    8701.121    -210781.5    169200.1
household size | 2.983464    1.499665           1          13
          sex  | 1.889846    .3130976           0           1
          age  | 51.93448    14.94632          21          79
  d98_real_incm| 1422.427    4434.606           0    150803.1
d2001_real_incm| 1952.852    5667.861           0    133957.2
d2002_real_incm| 1977.268    5475.206           0    130414.5
 savings_ratio | 2.477359    8.991039           0    94.36511
      rent_dum | .0073238    .0852697           0           1
      bond_dum | .0008907    .0298334           0           1
     real_incm | 7117.096    8795.864       10.39    174079.8
gov_incm_ratio | 42.47091    32.27885           0         100
  luxury_ratio | 1.518816    8.093376           0    96.72311
           d98 | .2408947    .4276477           0           1
         d2001 | .2537609    .4351839           0           1
         d2002 | .2536619    .4351279           0           1
--------------------------------------------------------------
```