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Cheating the Government: Does Taxpayer Perception Matter?

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Cheating the Government: Does Taxpayer Perception Matter?+

by

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July 2019

Abstract

Do people cheat because they can get away with it or because they feel that the rules are unfair? I examine this question in the context of tax evasion. Specifically, I incorporate taxpayer perception into a widely used consumption-based method for estimating income tax evasion. Compared to the standard method which distinguishes taxpayers only by their occupational or income type as a way of measuring their “ability” to misreport income, the refined method introduces taxpayers who may be “able but unwilling” to cheat because they feel fairly treated with respect to public services and compared to other taxpayers. Applied to a longitudinal data for Korea (2007-2015), the standard method yields a uniform tax evasion rate of 13 per cent, but the refined method provides a range of 7 to 25 per cent based on taxpayer perception. This implies that strategies for improving tax compliance must be tailored to different motivations for tax evasion.

JEL classification numbers: H26.

Keywords: Tax evasion, tax compliance, tax morale, taxpayer perception, third-party reporting, Engel curve.

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I. Introduction

Tax evasion is as old as taxes themselves. It is a way of cheating the government (Cowell, 1990), with adverse effects on social welfare.¹ However, assessing the extent and determinants of tax evasion remains a challenge given its hidden nature.

In the economic literature, the benchmark model posits that people cheat if the probability of being caught and punished is low compared to potential monetary savings (Becker, 1968; Allingham and Sandmo, 1972). A popular comparison is between wage earners who are “unable” to cheat because their incomes are subject to withholding or third-party reporting, versus the self-employed who are “able” to cheat because their incomes are harder to detect for tax authorities (Slemrod, 2007; Kleven and others, 2011).

However, while tax authorities are certainly concerned about enforcement, they also emphasize “tax morale,” by which they generally mean increasing voluntary compliance with tax laws and creating a social norm of compliance (Luttmer and Singhal, 2014). Behavioural models in economics also suggest that tax decisions are influenced by perceptions of fairness and other factors that fall outside the standard, expected utility framework (Bordignon, 1993; Feld and Frey, 2002; Torgler 2003, among other studies). Not accounting for such factors could result in over-attributing evasion to the lack of heavy enforcement.

To contribute to this debate on whether taxpayers are “unable” or “unwilling” to cheat, I examine the following hypothesis: *Ability to cheat matters only if one is willing to cheat*. If this were true, taxpayers with identical occupational or income characteristics may exhibit very different compliance behaviours.

To empirically test this hypothesis in the absence of reliable data on tax evasion, I extend the consumption-based method for estimating income tax evasion, which was pioneered by Pissarides and Weber (1989) and has been widely applied (Lyssiotou and others, 2004; Johansson, 2005; Hurst and others, 2014; Kim and others, 2017; Kukk and Staehr, 2017; Engstrom and Hagen, 2017, among other studies). This method is based on measuring “excess” consumption among the self-employed as evidence of undeclared income, compared to wage earners who serve as the benchmark.

My contribution is to introduce another layer of heterogeneity among taxpayers based on their perception of fairness with respect to public services and compared to other taxpayers. Applying the refined method to a longitudinal household survey data for Korea, I estimate a higher rate of tax evasion for the self-employed who feel unfairly treated, but a lower rate for those who feel fairly treated, compared to what the standard method predicts. While Korea is used as an illustration given its high degree of self-employment relative to income level, the refined method is replicable in other countries.

The paper is organized as follows. Section II lays out the conceptual framework. Section III explains the consumption-based method for estimating income tax evasion. Section IV discusses the data. Section V reports the estimation results and provides some robustness checks. Section VI concludes.

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¹ If widespread, tax evasion could constrain the provision of necessary public services. And if higher tax rates are applied to a narrow tax base to make up for the revenue shortfall due to evasion, there could be adverse welfare effects. Moreover, if concentrated among certain segments of society, tax evasion could undermine trust and social cohesion.

II. Conceptual framework

This section examines the conditions for tax evasion, as shown in the benchmark model in the literature and a simple extension which I propose to incorporate taxpayer perception. I then present a problem tree approach to determining which taxpayers are both “able” and “willing” to cheat.

A. Conditions for tax evasion

The standard framework for considering a taxpayer’s choice of whether and how much to misreport income is a deterrence model first formulated by Allingham and Sandmo (1972), who adapted Becker’s (1968) model of the economics of crime. In this model, people cheat if the probability of being caught and punished is low compared to potential tax savings. The expected utility function is given as:

$$[1] \quad E(U) = (1 - p)U(W - \theta X) + pU(W - \theta X - \pi(W - X)),$$

where W and X are the actual income and the reported income respectively. Tax is levied at a constant rate θ on X . Importantly, the two states are separated by p , the probability of detection; and π is the penalty rate. Letting Y and Z stand for the net income without and with detection respectively, the first-order condition for an interior solution gives $\frac{U'(Z)}{U'(Y)} = \frac{(1-p)\theta}{p(\pi-\theta)}$, which implies that a higher probability of detection discourages tax evasion. Taking the derivative of the expected utility when $W = X$, the condition for evasion is $p\pi < \theta$, i.e. the ability to escape detection matters.

To this model, I add a parameter which applies regardless of detection, to account for factors other than the threat of punishment which may influence taxpayer behaviour. Specifically, taxpayers may be less inclined to cheat if they view the tax system as fair and are satisfied with the public services they receive. In contrast, if they feel that they are unfairly treated, they could perceive some tax evasion to be justified (Bordignon, 1993; Barth, Cappelen and Ognedal, 2013). The expected utility function becomes:

$$[2] \quad E(U) = (1 - p)U(Y) + pU(Z) - C(E - E^*),$$

where the additional parameter is a function of evaded income, $E = W - X$, and what the taxpayer perceives to be “justified” evasion, $E^* \geq 0$. In equation [2], the condition for tax evasion not only depends on the probability of detection but also on taxpayer perception, such that optimal evasion is lower than what is predicted under equation [1] if $E > E^*$, but higher if $E < E^*$.

B. Problem tree approach

As tax evasion decision has become more complex, I propose a problem tree approach to determine tax evasion outcomes based on key parameters contained in equation [2]. The steps are shown in figure 1.

Figure 1. Grouping taxpayers by income and perception

Once the sample is restricted to households with a taxable income, I distinguish taxpayers by whether their income is subject to withholding or third-party reporting (W_T) or simply self-reported (W_S). The probability of detection would be close to 1 if the taxpayer declares an amount below W_T as such discrepancies are easy to detect, whereas reporting below W_S may go undetected.² As taxpayers typically draw on various types of income, I apply a certain threshold on the ratio $\frac{W_S}{W_S + W_T}$ to separate those who are “able” versus “unable” to cheat.

In practice, employees who rely mostly on labour income fall under the former, while the self-employed who rely on business income under the latter. Whether capital income from interest, dividend and rent qualifies as W_T or W_S depends on the extent to which the country’s financial sector is subject to third-party reporting, including at the international level, without which offshore accounts could facilitate tax evasion.

Once the sample is restricted to taxpayers that are “able” to cheat, I distinguish them base on their perception of fairness which is related to the “justified” tax evasion parameter E^* in equation [2]. However, accurately measuring taxpayer perception is challenging. For instance, in the World Values Surveys, respondents are asked whether tax evasion is “never, sometimes, or always justified”, but it is difficult to confirm whether they would act in such a manner.³ In other cases, respondents are asked whether they would fully declare their income if misreporting would go undetected. But it is questionable why anyone would reveal such information if there is even a small chance that it might be used against them.

² Today many countries make extensive use of withholding and third-party reporting, under which the audit rate alone is a poor proxy for the probability of detection. For instance, firms remit the majority of tax revenues to the government, including through withholding taxes owed by employees. The financial sector, including banks, insurers and pension funds, also reports taxable income earned by individuals to the government. Such information could be compared to what is declared by the taxpayer. See also Kleven and others (2011).

³ World Values Surveys have been used in empirical studies on tax morale, such as Torgler (2003).

An alternative approach is to construct a latent variable based on taxpayer responses to questions such as: How does one's tax burden compare to others' earning similar income levels? Are the wealthy paying enough taxes? Is the quality of public services commensurate with your tax payment? Given that "fairness" is likely to reflect multiple dimensions such as horizontal and vertical equity as well as reciprocity, I use structural equation modeling (SEM) to pull these dimensions into a latent variable and then apply a certain threshold to distinguish those that are "unwilling" versus "willing" to cheat.⁴ Such grouping of taxpayers by perception as well as income serves as a basis for incorporating taxpayer perception into the estimation of tax evasion, as discussed in the following section.

III. Consumption-based method

This section explains the consumption-based method for estimating income tax evasion, which has been widely applied in the literature (Pissarides and Weber, 1989; Lyssiotou and others, 2004; Johansson, 2005; Hurst and others, 2014; Kim and others, 2017; Kukk and Staehr, 2017; Engstrom and Hagen, 2017, among other studies). Compared to other methods such as the currency demand approach, this method is based on household income and expenditure surveys which are widely available in most countries and lend themselves to incorporating micro-level information such as taxpayer perception. It is also more replicable compared to special audit programmes or experiments with actual taxpayers which have been deployed in few countries (see, for instance, IRS, 2016 and Kleven and others, 2011) but could be costly and raise issues of legality in other countries.

A. Basic approach and assumptions

Figure 2 illustrates the consumption-based method. It shows two log-linear Engel curves, one for wage earners (benchmark group) and another for the self-employed (comparison group). Letting c stand for log food expenditures and y log disposable income, β denotes the elasticity of consumption with respect to income. The intercept difference γ between the two curves measures the "excess consumption" of the self-employed, which is used to estimate the undeclared fraction of income: $1 - \exp(-\gamma/\beta)$.

Figure 2. Engel curve showing consumption-income relationship

⁴ SEM has emerged as a useful tool in other social sciences, including education and psychology. In the economic literature, Schneider and Enste (2000) applied SEM to estimate the extent of the shadow economy based on country-level variables.

This method relies on three central assumptions. First, the elasticity of consumption with respect to income, β , is equal for the two groups, as illustrated by the curves having the same slope. Second, neither group systemically misreports spending on certain items such as food or non-durables. Food is widely used in the literature, as it is mundane enough for individuals not to be afraid of reporting truthfully, and purchased regularly and thus less subject to unintended misreporting. An exception is Lyssiotou and others (2004) who use nondurable expenditures to account for demand heterogeneity. Third, whereas wage earners are assumed to report their true incomes, the self-employed systematically underreport their income by a constant factor.⁵ One additional assumption is that people misreport their income in surveys in the same way they do to the tax authorities (Hurst and others, 2014).

B. Accounting for transitory income

Given that household consumption is influenced not by current income but by a more permanent measure of income, estimating the Engel curve using the current income would result in a measurement error. Specifically, transitory income fluctuations would attenuate the estimate of the income elasticity (Wooldridge, 2009), which in turn would result in over-estimation of income misreporting among the self-employed. For household i , let c_i stand for food expenditure, y_i^P the permanent income, and X_i a vector of variables affecting consumption. D_{it} is a dummy taking the value 1 for the self-employed. A log-linear Engel curve is given as:

$$[3] \quad \ln c_i = \gamma D_{it} + \beta \ln y_i^P + \theta X_i + \varepsilon_i$$

Let g_i stand for a random variable showing the degree of transitory income variation such that $y_i = g_i y_i^P$. The mean of g_i is assumed to be the same for both groups, but the variance may differ. Substitution gives an Engel curve in terms of the current income, with the transitory element pushed to the error term:

$$[4] \quad \ln c_i = \gamma D_{it} + \beta \ln y_i + \theta X_i + (\varepsilon_i - \beta \ln g)$$

Pissarides and Weber (1989) and other early studies addressed this through instrumental variable (IV) techniques, but more recent studies (Hurst and others, 2014; Kim and others, 2017; Engstrom and Hagen, 2017) have exploited panel data and constructed multi-year average income measures. In this paper, I follow the latter approach. With average incomes, positive and negative variations of transitory income cancel each other over time, especially for the self-employed who typically have higher income variation from year to year. This also implies that the covariance between the degree of underreporting and the degree of transitory income variation disappears over time. The Engel curve is now written as:

$$[5] \quad \ln c_{it} = \alpha + \gamma D_{it} + \beta \overline{\ln y_{it}} + \theta X_{it} + \mu_t + \varepsilon_{it},$$

where subscript t denotes year, $\overline{\ln y_{it}}$ is the mean value of reported incomes over time for the same household i , μ_t is the time effect, and ε_{it} the cumulative effects of unobserved determinants over time.

C. Incorporating taxpayer perception

⁵ If wage earners also underreport their income, the method will only provide a lower bound estimate of tax evasion.

All previous studies have estimated income tax evasion based on a single comparison group, that is, the self-employed. However, as discussed in Section 2, such an approach could overlook factors other than tax savings from misreporting which may influence taxpayer behaviour. To test the hypothesis that *ability matters only if one is willing to cheat*, one could take the interaction term approach. Let D_{Ait} and D_{Wit} denote dummy variables taking the value 1 for the

“able” and the “willing” to cheat respectively, and $D_{Wit} * D_{Ait}$ be the interaction term. The log-

linear Engel curve for estimation becomes:

$$[6] \quad \ln c_{it} = \alpha + \gamma D_{Ait} + \delta D_{Wit} + \omega D_{Wit} * D_{Ait} + \beta \overline{\ln y_{it}} + \theta X_{it} + \mu_t + \varepsilon_{it}$$

, where the parameter of interest is ω . With the interaction term, the partial effect of ability to cheat on consumption would be $\gamma + \omega D_{Wit}$.

However, one question is whether the benchmark group should be the “unable and unwilling” to cheat as in equation [6] or simply the “unable” to cheat. In the former case, we would be allowing the “unable” to also cheat in a way which is inconsistent with the main assumptions discussed earlier. Therefore, in the present case I explicitly introduce two comparison groups “able but unwilling” and “able and willing” to cheat, as shown by D_{AUWit} and D_{AWit} respectively:

$$[7] \quad \ln c_{it} = \alpha + \gamma D_{AWit} + \delta D_{AUWit} + \beta \overline{\ln y_{it}} + \theta X_{it} + \mu_t + \varepsilon_{it}$$

If the concerned hypothesis were true, δ would be insignificant, i.e. the “able but unwilling” to cheat would exhibit a similar behaviour to the benchmark group, those that are unable to cheat.

IV. Data and sample restriction

Compared to other OECD members, Korea has a relatively high degree of self-employment and therefore presents a relevant case for testing this method. The Korean panel data, drawn from the National Survey on Tax and Benefit, contains information on about 5,000 households across nine years (2007-2015), including their occupation, incomes, assets, expenditures, taxes and social security, as well as gender, age and educational attainment of family members. Importantly, the most recent round of the survey for 2015 contains questions on how the respondents perceive the tax system and the factors which affect their taxpaying decision.

Following the steps outlined in figure 2, I drop households with income levels below the exemption threshold. I also drop households with zero annual expenditures. To maintain some degree of homogeneity, I only keep households whose primary income earner is between the ages of 20 and 70.

The next step is to distinguish taxpayers by their occupational or income type. Following previous studies, I define the “able” to cheat as households which derive at least 25 per cent of

their total income from business income, and the “unable” to cheat as households with less than 1 per cent of their total income from business income.

I then construct a latent variable “willing to cheat” based on responses to the questions regarding vertical and horizontal equity and satisfaction with public services, discussed in Section 2. All responses are scaled from 1 to 5 and I reverse the scale where necessary for consistency. These variables are standardized and combined into a latent variable using structural equation modelling. As shown in figure 3, the latent variable “willing” to cheat is most closely associated horizontal equity and public services. I define the top and bottom quartile according to this measure as the “unwilling” and “willing” to cheat respectively, and drop the two middle quartiles from the sample.

Figure 3. Constructing a latent variable based on taxpayer perception

Note: The circle denotes the unobserved latent variable, and the squares the observed variables which are based on response to questions regarding horizontal and vertical equity and satisfaction with public goods and services. The latent variable is constructed based on maximum likelihood estimation.

Following previous studies, I consider the following control variables:

- (i) *Family size*: more mouths to feed or clothe, thus likely to have a positive sign.
- (ii) *Capital city dummy*: price levels are higher, thus likely to have a positive sign.
- (iii) *Home ownership*: without the need for rental fees, general spending may be higher, thus likely to have a positive sign.
- (iv) *Age of primary income earner*: likely to spend more with age but at a diminishing rate, thus likely to have a positive sign but its quadratic would have a negative sign.
- (v) *Education of primary income earner*: higher educational attainment, through higher income, may result in more spending, thus a positive sign.
- (vi) *Hours worked*: working more hours may increase income and spending, but long working hours may also indicate low wages; thus, the expected sign is unclear.

Table 1 presents the descriptive statistics for the benchmark group “unable” to cheat (17,125 observations), and the two comparison groups “able but unwilling” (4,474 observations) and “able and willing” to cheat (2,142 observations). About a fourth of the sample is self-employed, based on a definition of business income share of 25 per cent or above, and the rest are wage

earners, based on a definition of business income share of 1 per cent or below. Based on summary statistics, there are no marked differences across the three groups, but the “able and willing” to cheat are located in the capital city and work longer hours, perhaps to meet the higher cost of living.

Table 1. Descriptive statistics

	Unable (wage earner)	Able but unwilling (self-employed)	Able and willing (self-employed)
log of income	8.5582 (0.4357)	8.4850 (0.4160)	8.5793 (0.4733)
log of food expenditures	6.7493 (0.4911)	6.6891 (0.5162)	6.8673 (0.5584)
family size	3.8102 (1.0054)	3.8355 (1.1314)	3.7005 (0.9031)
capital city	0.2071 (0.4053)	0.2047 (0.4035)	0.3086 (0.4620)
age	47.0318 (9.1368)	47.7295 (9.0039)	47.1328 (8.9109)
education	2.4918 (0.6469)	2.3596 (0.6932)	2.5125 (0.6220)
hours worked	42.1849 (8.9804)	46.3978 (15.5131)	49.1839 (13.0722)
Observations	17 125	4 475	2 142

Note: Income is the 3-year average income. Capital city dummy denotes 1 if the household is based in Seoul, Korea and 0 otherwise. Age and education refer to that of the household head, or the primary income earner. Educational attainment is on a scale of 1 to 3, where 1 is lower-secondary or below, 2 is upper-secondary and 3 is tertiary. Working hour is the average per week.

V. Estimation results

This section reports the main estimation results and provides some robustness checks. Full results are shown in the annex.

A. Main results – Taxpayer perception in the food Engel curve

I regress log food consumption on log disposable income and a set of control variables as in equations [5] and [7]. Table 2 reports the estimates of key parameters, $\hat{\beta}$, $\hat{\gamma}$ and $\hat{\delta}$, and the corresponding estimated amount of income underreporting, denoted as $1 - \hat{k}$. There are 23,946 observations. The estimated elasticity of consumption with respect to income, $\hat{\beta}$, is stable across different specifications, with a 1 per cent increase in income resulting in just under 0.4 per cent increase in food expenditures based on the OLS estimator.

Compared to the “unable” to cheat, the “able” to cheat consume about 6 per cent more, as shown in column (2). The estimated tax evasion rate is 13 per cent, assuming that people will cheat if they can. However, given that some taxpayers may be “able but unwilling” to cheat, I incorporate taxpayer perception in column (3) based on the latent variable approach. While $\hat{\gamma}$ is positive and statistically significant, it is relatively small compared to $\hat{\delta}$ for the “able and

willing” to cheat who consumes 11 per cent more than the benchmark group, which translates into a tax evasion rate of 25 per cent, or double that of the “average” evasion rate for the “able” to cheat.

Columns (4) and (5) show the IV results. Following Hurst and others (2014), I use education as instrument for income, i.e. it would affect food consumption only through the income effect. While it passes the endogeneity tests⁶, $\hat{\beta}$ is implausibly large. This is similar to the findings of Engstrom and Hagen (2017), who compare the performance of several instruments including education, housing and capital income and conclude that the use of IV approach is inferior to a simple OLS based on multi-year average income. Given the large $\hat{\beta}$, the estimated tax evasion rates are lower than when using the OLS. Nevertheless, (4) and (5) exhibit the same trend as (2) and (3).

Full estimation results in the Annex show that all control variables have the expected sign, but whereas family size, capital city dummy, age and education are statistically significant, home ownership dummy and hours worked are not. The year dummies are included with 2008 as based year; the first and last years in the sample, 2007 and 2015 respectively, do not appear because of the use of 3-year average income.

Table 2. Estimation results: log of food expenditures as dependent variable

	(1) OLS	(2) OLS	(3) OLS	(4) IV	(5) IV
able		0.0554*** (0.00582)		0.0922*** (0.00698)	
able but unwilling $\hat{\gamma}$			0.0261*** (0.00680)		0.0819*** (0.00865)
able and willing $\hat{\delta}$			0.113*** (0.00851)		0.111*** (0.00928)
log(income) $\hat{\beta}$	0.387*** (0.007)	0.393*** (0.00734)	0.387*** (0.00737)	0.866*** (0.0295)	0.858*** (0.0305)
Observations	23 946	23 946	23 946	23 946	23 946
R-squared	0.282	0.284	0.287	0.144	0.149

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, p<0.1.

	$\hat{k}$	$1 - \hat{k}$
OLS		
able	0.869	0.131
able but unwilling	0.935	0.065
able and willing	0.747	0.253
IV		
able	0.899	0.101
able but unwilling	0.909	0.091
able and willing	0.879	0.121

Note: $\hat{k}$ is the general term for the fraction of the true income which is declared.

To see whether taxpayer perception emerges as a significant factor under other specifications as well, I conduct two robustness checks.

⁶ The null hypothesis of the Durbin and Wu-Hausman tests is that the variable under consideration can be treated as exogenous. If the test statistics are highly significant, we can reject the null and treat as endogenous.

B. Taxpayer perception under demand heterogeneity

Following Lyssiotou and others (2004), to account for demand heterogeneity among households, Table 3 shows estimation results with log of nondurable expenditures as dependent variable. $\hat{\beta}$ is stable across different specifications, with a 1 per cent increase in income resulting in about 0.3 per cent increase in nondurable expenditures based on the OLS estimator. Compared to the “unable” to cheat, the “able” to cheat consume about 7 per cent more, as shown in column (2). This gives an “average” tax evasion rate of 19 per cent.

With taxpayer perception in column (3), essentially the same trend is established as in the case of the food Engel curve. Compared to the “unable” to cheat, the “able but unwilling” consume about 4 per cent more. On the other end of the spectrum, the “able and willing” consume about 13 per cent more compared to the same benchmark group. This gives an estimated tax evasion rate of 33 per cent, three times than that of the “able but unwilling.”

Columns (4) and (5) show the IV results. Again, $\hat{\beta}$ is relatively large but within a more reasonable range. It may be that education is a better instrument for income in the case of nondurable expenditures, compared to food expenditures. Households with more educated parents are likely to spend more on children’s education, for instance, although they may not necessarily spend more on food. The estimated tax evasion rate is slightly lower than in the case of OLS, at 14 per cent on average and with a range of 11 per cent to 20 per cent depending on taxpayer perception.

Table 3. Estimation results: log of nondurable expenditures as dependent variable

	(1) OLS	(2) OLS	(3) OLS	(4) IV	(5) IV
able		0.0693*** (0.00475)		0.0909*** (0.00543)	
able but unwilling $\hat{\gamma}$			0.0381*** (0.00552)		0.0700*** (0.00671)
able and willing $\hat{\delta}$			0.131*** (0.00697)		0.130*** (0.00722)
log(income) $\hat{\beta}$	0.321*** (0.006)	0.329*** (0.00588)	0.323*** (0.00588)	0.608*** (0.0231)	0.593*** (0.0239)
Observations	23 913	23 913	23 913	23 913	23 913
R-squared	0.318	0.324	0.328	0.254	0.263

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, p<0.1.

	$\hat{k}$	$1 - \hat{k}$
OLS		
able	0.810	0.190
able but unwilling	0.889	0.111
able and willing	0.667	0.333
IV		
able	0.861	0.139
able but unwilling	0.889	0.111
able and willing	0.803	0.197

Note: $\hat{k}$ is the general term for the fraction of the true income which is declared.

C. Taxpayer perception based on an alternative measure

As noted in Section II, there are different ways to measure taxpayer perception. Compared to the main result which is based on the latent variable approach, I use here an alternative measure which is based on the following hypothetical situation: “If you have a rent income which the tax authorities cannot observe, would you declare the full amount?” Those who indicate “Yes, all of the income” are defined as “unwilling” to cheat, while those who indicate “There is no need to declare if the amount is small” or “Declare none in any case” as the “willing” to cheat. The sample size is almost twice as in earlier specifications, as no observations are dropped to define willingness.

Table 4 shows the estimation results for food Engel curve. β , is stable across different specifications, with a 1 per cent increase in income resulting in just below 0.4 per cent increase in food expenditures based on the OLS estimator. With taxpayer perception in column (3), essentially the same trend is established as in the latent variable approach, although the willingness to cheat now explains a much smaller portion of the overall variation. The difference between the “unable” and the “able” to cheat is much more significant compared to perception differences within the “able” to cheat. This seems to confirm the suspicion why anyone would reveal information which might be used against them.

Table 4. Estimation results: alternative measure of willingness to cheat

	(1) OLS	(2) OLS	(3) OLS	(4) IV	(5) IV
able		0.0462*** (0.00408)		0.0866*** (0.00492)	
able but unwilling $\hat{\gamma}$			0.0390*** (0.00539)		0.0745*** (0.00613)
able and willing δ			0.0518*** (0.00524)		0.0938*** (0.00609)
log(income) β	0.372*** (0.005)	0.377*** (0.00509)	0.377*** (0.00509)	0.839*** (0.0211)	0.840*** (0.0211)
Observations	49 300	49 300	49 300	49 300	49 300
R-squared	0.284	0.286	0.286	0.150	0.150

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, p<0.1.

	k	1-k
OLS		
able	0.885	0.115
able but unwilling	0.902	0.098
able and willing	0.872	0.128
IV		
able	0.902	0.098
able but unwilling	0.915	0.085
able and willing	0.894	0.106

Note: $\hat{k}$ is the general term for the fraction of the true income which is declared.

VI. Conclusion

This paper examined the question of why people cheat in the context of income tax evasion. The standard, expected utility model of tax evasion posits that people cheat if the chances of getting caught and punished is quite low. Given that this information asymmetry between taxpayer and the tax authority plays a key role, many countries have introduced third-party reporting schemes to complement traditional audit in increasing the probability of detection. Such efforts did improve tax compliance in many cases but only up to a certain extent. The remaining “residual” may be harder to explain and requires a deeper under-standing of the human behaviour.

This paper explored one possibility in which people are “able” and yet “unwilling” to cheat the government. Because they feel fairly treated with respect to public services and compared to other taxpayers, they do not find tax evasion to be “justified.” While a plausible argument, empirically testing it is not so straightforward. Using the consumption-based method for estimating income tax evasion, this paper provided a way to tackle the issue. And based on an illustrative case of Korea, it turns out that taxpayer perception matters and that in some cases, monetary returns may play a relatively minor role in deter-mining tax evasion, unlike in the case of the standard, expected utility model.

The policy implication is that, for curbing tax evasion, voluntary compliance measures and appropriate changes to the tax law may be just as necessary as third-party reporting and other enforcement measures. An optimal strategy for improving compliance may be to target both the extensive and the intensive margins: foster social and cultural norms for compliance while making cheating more difficult for those who are persistently inclined to cheat.

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Annex 1. Full estimation results

Table A.1. Estimation results: log of food expenditures as dependent variable

	(1) OLS	(2) OLS	(3) OLS	(4) IV	(5) IV
able		0.0554*** (0.00582)		0.0922*** (0.00698)	
able but unwilling			0.0261*** (0.00680)		0.0819*** (0.00865)
able and willing			0.113*** (0.00851)		0.111*** (0.00928)
log(income)	0.387*** (0.007)	0.393*** (0.00734)	0.387*** (0.00737)	0.866*** (0.0295)	0.858*** (0.0305)
family size	0.076*** (0.004)	0.0761*** (0.00357)	0.0766*** (0.00355)	0.0543*** (0.00383)	0.0547*** (0.00384)
capital city	0.215*** (0.007)	0.210*** (0.00690)	0.206*** (0.00688)	0.179*** (0.00818)	0.178*** (0.00809)
home ownership	0.010* (0.006)	0.0104* (0.00591)	0.0101* (0.00590)	-0.0372*** (0.00704)	-0.0368*** (0.00705)
age	0.034*** (0.003)	0.0327*** (0.00312)	0.0332*** (0.00314)	0.00620 (0.00378)	0.00669* (0.00382)
age squared	-0.000*** (0.000)	-0.000335*** (3.34e-05)	-0.000338*** (3.35e-05)	0.000105*** (3.94e-05)	-0.000108*** (3.96e-05)
education	0.081*** (0.005)	0.0855*** (0.00512)	0.0825*** (0.00513)		
hours worked	-0.001*** (0.000)	-0.00160*** (0.000274)	-0.00174*** (0.000274)	-0.00107*** (0.000301)	-0.00112*** (0.000304)
2009.year	0.000 (0.011)	-2.97e-05 (0.0110)	-0.000688 (0.0110)	-0.0128 (0.0120)	-0.0129 (0.0120)
2010.year	0.069*** (0.011)	0.0686*** (0.0108)	0.0686*** (0.0108)	0.0486*** (0.0120)	0.0489*** (0.0120)
2011.year	0.066*** (0.011)	0.0661*** (0.0108)	0.0659*** (0.0108)	0.0162 (0.0123)	0.0168 (0.0123)
2012.year	0.168*** (0.011)	0.169*** (0.0108)	0.169*** (0.0108)	0.120*** (0.0123)	0.121*** (0.0123)
2013.year	0.160*** (0.011)	0.163*** (0.0108)	0.162*** (0.0108)	0.106*** (0.0125)	0.107*** (0.0125)
2014.year	0.197*** (0.011)	0.199*** (0.0109)	0.199*** (0.0109)	0.134*** (0.0127)	0.135*** (0.0127)
Constant	2.060*** (0.084)	2.028*** (0.0835)	2.074*** (0.0836)	-0.965*** (0.212)	-0.913*** (0.219)
Observations	23 946	23 946	23 946	23 946	23 946
R-squared	0.282	0.284	0.287	0.144	0.149

Table A.2. Estimation results: log of nondurable expenditures as dependent variable

	(1) OLS	(2) OLS	(3) OLS	(4) IV	(5) IV
able		0.0693*** (0.00475)		0.0909*** (0.00543)	
able but unwilling			0.0381*** (0.00552)		0.0700*** (0.00671)
able and willing			0.131*** (0.00697)		0.130*** (0.00722)
log(income)	0.321*** (0.006)	0.329*** (0.00588)	0.323*** (0.00588)	0.608*** (0.0231)	0.593*** (0.0239)
family size	0.092*** (0.003)	0.0914*** (0.00281)	0.0919*** (0.00279)	0.0785*** (0.00298)	0.0794*** (0.00298)
capital city	0.183*** (0.006)	0.178*** (0.00565)	0.173*** (0.00561)	0.159*** (0.00633)	0.157*** (0.00624)
home ownership	-0.010** (0.005)	-0.00960* (0.00491)	-0.00998** (0.00489)	-0.0377*** (0.00559)	-0.0368*** (0.00558)
Age	0.048*** (0.003)	0.0471*** (0.00262)	0.0477*** (0.00263)	0.0315*** (0.00300)	0.0325*** (0.00303)
age squared	-0.000*** (0.000)	-0.000466*** (2.80e-05)	-0.000469*** (2.81e-05)	-0.000329*** (3.14e-05)	-0.000337*** (3.15e-05)
education	0.045*** (0.004)	0.0505*** (0.00415)	0.0472*** (0.00415)		
Hours worked	-0.000 (0.000)	-0.000763*** (0.000231)	-0.000907*** (0.000230)	-0.000453* (0.000245)	-0.000558** (0.000245)
2009.year	0.006 (0.009)	0.00564 (0.00885)	0.00487 (0.00883)	-0.00172 (0.00938)	-0.00191 (0.00932)
2010.year	0.055*** (0.009)	0.0548*** (0.00874)	0.0547*** (0.00873)	0.0432*** (0.00937)	0.0436*** (0.00931)
2011.year	0.074*** (0.009)	0.0741*** (0.00875)	0.0738*** (0.00874)	0.0449*** (0.00958)	0.0459*** (0.00954)
2012.year	0.133*** (0.009)	0.134*** (0.00874)	0.134*** (0.00872)	0.105*** (0.00962)	0.106*** (0.00957)
2013.year	0.130*** (0.009)	0.133*** (0.00873)	0.133*** (0.00872)	0.0998*** (0.00974)	0.101*** (0.00971)
2014.year	0.151*** (0.009)	0.154*** (0.00885)	0.154*** (0.00884)	0.116*** (0.00997)	0.117*** (0.00995)
Constant	2.701*** (0.071)	2.661*** (0.0704)	2.710*** (0.0702)	0.895*** (0.168)	1.000*** (0.172)
Observations	23 913	23 913	23 913	23 913	23 913
R-squared	0.318	0.324	0.328	0.254	0.263

Table A.3. Estimation results: alternative measure of willingness to cheat

	(1) OLS	(2) OLS	(3) OLS	(4) IV	(5) IV
able		0.0462*** (0.00408)		0.0866*** (0.00492)	
able but unwilling			0.0390*** (0.00539)		0.0745*** (0.00613)
able and willing			0.0518*** (0.00524)		0.0938*** (0.00609)
log(income)	0.372*** (0.005)	0.377*** (0.00509)	0.377*** (0.00509)	0.839*** (0.0211)	0.840*** (0.0211)
family size	0.079*** (0.002)	0.0792*** (0.00229)	0.0790*** (0.00229)	0.0522*** (0.00258)	0.0519*** (0.00259)
capital city	0.187*** (0.005)	0.186*** (0.00475)	0.187*** (0.00475)	0.143*** (0.00588)	0.143*** (0.00588)
home ownership	0.007 (0.004)	0.00685* (0.00410)	0.00686* (0.00411)	-0.0366*** (0.00487)	-0.0368*** (0.00487)
age	0.041*** (0.002)	0.0392*** (0.00219)	0.0395*** (0.00218)	0.0172*** (0.00262)	0.0177*** (0.00260)
age squared	-0.000*** (0.000)	-0.000415*** (2.33e-05)	-0.000417*** (2.32e-05)	-0.000224*** (2.73e-05)	-0.000227*** (2.72e-05)
education	0.078*** (0.004)	0.0810*** (0.00356)	0.0812*** (0.00356)		
Hours worked	-0.000 (0.000)	-0.000526*** (0.000181)	-0.000520*** (0.000181)	0.000459** (0.000207)	0.000486** (0.000208)
2009.year	0.013* (0.007)	0.0124* (0.00748)	0.0124* (0.00748)	0.000763 (0.00815)	0.000746 (0.00815)
2010.year	0.068*** (0.007)	0.0678*** (0.00748)	0.0676*** (0.00748)	0.0442*** (0.00828)	0.0437*** (0.00829)
2011.year	0.070*** (0.007)	0.0707*** (0.00741)	0.0705*** (0.00741)	0.0170** (0.00856)	0.0164* (0.00857)
2012.year	0.171*** (0.007)	0.172*** (0.00743)	0.171*** (0.00743)	0.112*** (0.00867)	0.111*** (0.00868)
2013.year	0.163*** (0.007)	0.165*** (0.00741)	0.164*** (0.00741)	0.0961*** (0.00889)	0.0950*** (0.00890)
2014.year	0.201*** (0.007)	0.203*** (0.00741)	0.203*** (0.00742)	0.124*** (0.00911)	0.123*** (0.00912)
Constant	1.999*** (0.059)	1.986*** (0.0591)	1.982*** (0.0591)	-1.042*** (0.154)	-1.057*** (0.154)
Observations	49 300	49 300	49 300	49 300	49 300
R-squared	0.284	0.286	0.286	0.150	0.150

Annex 2. Engel curve estimation in Pissarides and Weber (1989)

For household i , let C_i stand for the expenditure share of food and Y_i^P the permanent income which influences consumption decisions. Z_i is a vector of household characteristics.

$$\ln C_i = Z_i \alpha + \beta \ln Y_i^P + \varepsilon_i$$

The true income Y_i is a function of the reported income Y_i' and the permanent income

$$Y_i = k_i Y_i' \quad Y_i = p_i Y_i^P,$$

where $k_i \geq 1$ and p_i are random variables showing the degree of underreporting and the degree of transitory income variation, respectively. Note that $k_i = 1$ for employees. The distinction between permanent and transitory income may seem redundant but could be important as it is likely that the covariance of underreporting and transitory income is not zero; if an individual had an exceptionally good year in self-employment income, he may be less inclined to declare the full income as it would only arouse the curiosity of the tax authority. The mean of p_i is assumed to be the same for both groups, although the variance may differ. k_i and p_i are assumed to be log normal,

$$\ln k_i = \mu_k + v_i \quad \ln p_i = \mu_p + u_i,$$

with errors that have zero mean and constant variances σ_v^2 and σ_u^2 . Substitution gives

$$\begin{aligned} \ln C_i &= Z_i \alpha + \beta \ln Y_i' - \beta \ln p_i + \beta \ln k_i + \varepsilon_i \\ \ln C_i &= Z_i \alpha + \beta \ln Y_i' + \beta (\mu_k - \mu_p) + \beta (v_i - u_i) + \varepsilon_i \end{aligned}$$

Let SE_i be a dummy taking the value 1 if the household is self-employed and 0 if not, and SE and EE stand for the two groups. Then,

$$\begin{aligned} \ln C_{ij} &= Z_i \alpha_j + \beta_j \ln Y_i' - \gamma_j SE_i + \eta_i \\ \text{where } \gamma &= \beta [(\mu_{kSE} - \mu_{kEE}) - (\mu_{pSE} - \mu_{pEE})] = \beta [\mu_{kSE} + \frac{1}{2}(\sigma_{uSE}^2 - \sigma_{uEE}^2)] \end{aligned}$$

This gives us a rough estimate of underreporting, as $\ln k = \gamma / \beta$. The mean of the underreporting component can be derived as

$$\ln \bar{k} = \mu_{kSE} + \frac{1}{2} [\sigma_{vSE}^2 - (\sigma_{uSE}^2 - \sigma_{uEE}^2)]$$

P-W introduce a reduce form equation out of concern for endogeneity but also to gain an independent estimate of the variances of underreporting and transitory income.

$$\ln Y_i' = Z_i \delta_1 + X_i \delta_2 + \tau_i,$$

where X_i is a set of identifying instruments. Here the error term consists of deviations of actual from permanent income and actual from reported income as well as the unexplained variation in permanent income. The residual variances for the two groups are related by

$$\sigma_{\tau SE}^2 - \sigma_{\tau EE}^2 = \sigma_{v SE}^2 + (\sigma_{u SE}^2 - \sigma_{u EE}^2) - 2cov(uv)_{SE}$$

The lower ($\sigma_{v SE}^2 = 0$) and upper ($\sigma_{u SE}^2 = \sigma_{u EE}^2$) bounds give an interval

$$\ln \bar{k} \in \left[\frac{\gamma}{\beta} - \frac{1}{2}(\sigma_{\tau SE}^2 - \sigma_{\tau EE}^2) + cov(uv)_{SE}, \frac{\gamma}{\beta} + \frac{1}{2}(\sigma_{\tau SE}^2 - \sigma_{\tau EE}^2) + cov(uv)_{SE} \right]$$

P-W uses the mid-point of the interval. Kim et al (2008) uses panel data, which enables them to make an exact estimate rather than intervals. Moreover, they employ ‘between estimation’ to use the household-specific mean (mean value of reported incomes over time for the same household) in the regression and thus control for transitory income variations.

$$\overline{\ln y'_{it}} = \overline{\ln y_{it}} - \overline{\ln k_{it}} = \ln y_i^P + \overline{\ln p_{it}} - \overline{\ln k_{it}}$$

This can allow the positive and negative variations of transitory income over time to cancel each other out over time. This implies that the covariance between the degree of underreporting and the degree of transitory income variation also disappears over time. The estimated function is

$$\ln \bar{k} = \mu_{k SE} + \frac{1}{2} \sigma_{v SE}^2 = \gamma_j / \beta_j + \frac{1}{2} (\sigma_{\tau SE}^2 - \sigma_{\tau EE}^2)$$

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