Tax avoidance and the endogenous formation of social norms*

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Abstract

We analyse a model of income tax avoidance with heterogeneous agents who face monetary as well as psychic costs in order to successfully hide their income from the fisc. We argue that, in general, the stigmatization of tax dodging is motivated by the desire to make redistribution more effective. In this context, we demonstrate two results. First, we study the policy preferences of the agents, identify a median-agent political equilibrium, and show that the presence of a psychic cost of tax dodging favours a high degree of progressivity of the income tax. Second, we model the endogenous formation of the stigma attached to the act of avoidance as a "conformism game", and argue that a higher level of stigma is favoured by the low-income members of the society, implying that social norms condemning tax dodging will be stronger in effectively democratic societies where the poor carry more social weight.

JEL Code: D72, H26, H31, Z13
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I Introduction

A problem that economists have traditionally encountered when studying imperfect tax compliance is that, while the phenomenon is quantitatively relevant in all countries, it is not nearly

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as large as it should be: according to Schneider and Enste (2000) the average size of the shadow economy in the 90's was in the range of 12%, 23% and 39% of GDP for, respectively, developed, transition and developing economies. If *homo oeconomicus* were an accurate portrait of the real-world economic agent, then nobody should ever fully comply with the tax rules, as there are immediate and obvious gains to be reaped against a small probability of being caught. In reality, while it is presumably true that, given the chance, almost everybody will commit the occasional act of tax dodging, only a minority takes this up as a systematic activity.¹

There have been various attempts at solving this conundrum. An interesting insight is offered by works like those by Friedman et al. (2000) and Johnson et al. (1997, 1998), arguing that tax dodging is closely related to tax implementation, regulation and corruption, and thus that changes along these dimensions explain most of the variation in non-compliance. We will return later to these findings, but for now we follow another branch of the literature, focusing on the existence of social norms against tax dodging; see e.g. Gordon (1989), Myles and Naylor (1996) and Orviska and Hudson (2002). If an individual believes that cheating the government is an intrinsically bad act, that is if she has interiorised a social norm against such behaviour, she will abstain from it even if it is clearly lucrative. Possibly, this line of enquiry goes, in some sense, *deeper* than the preceding one. It is in fact likely that the presence in the society of a negative attitude towards tax dodging will affect both the way the tax system is administered and the way individual citizens relate themselves to it. Where avoiding or evading taxes carries a social stigma there is less scope for corruption among tax officers and the tax-payers are more prone to comply with the rules.

One thing which is usually overlooked in the literature on social customs and tax dodging is the question of how the norm is established. Why should rational, utility-maximising agents endeavour to *establish* a norm? There is a missing link in the analysis; one studies how the norm affect individual behaviour, but does not ask how individual behaviour contributes to create the norm. This missing link will be addressed in the present paper.² In order to do this, we

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¹Slemrod (2003) has remarked that employed individuals, whose income is reported to the tax authorities by the employer, have basically a 100% chance to be audited if they do not report their income correctly on their own tax return. Thus, this particular instance of compliance does not count as evidence against *homo oeconomicus*. As Chorvat (2006) notices, employed individuals could nevertheless dodge their taxes, e.g. by overstating their deductions or moonlighting, but the evidence does not suggest that these practices are as common as they should be according to the *homo oeconomicus* view.

²For related attempts, see Feld and Frey (2002), where tax compliance is interpreted as the outcome of a
can rely on two important lines of research, since both economists and social psychologists have investigated the spontaneous formation of social norms. In economics, we have the pioneering work of Akerlof (1980) and more recent examples, like Lindbeck et al. (1999), in which social norms, whose importance reflects (among other things) the number of agents that comply with them, are assumed to arise endogenously. In social psychology, there are fundamental works showing that indeed groups tend to create internal rules for behaviour using informal procedures, and that conformity to the views of the majority is a powerful factor in determining adherence to the norm (the classical references are Sherif 1936 and Asch 1955).

The model we employ to investigate the questions posed above has the following timing: 1) agents establish social norms; 2) agents vote on policy; 3) agents make avoidance decisions.

In line with the standard backward solution procedure we proceed first to illustrate the third stage (Section 2). Our agents have fixed incomes and must only decide whether to dodge the income tax and if so, to what extent. In fact, adding a variable labour supply would not be difficult in principle, although it would make the analysis more involved. The only relevant, but by no means dissonant, modification would be that of extending the scope of the custom, which should include a work ethic, thus stigmatising in general anti-social attitudes like cheating on one’s taxes or being absent from work (for a recent take on this latter issue, see Lindbeck and Persson 2006). It is however expedient to keep the model simple at this stage, to avoid difficulties at later stages.

In Section 3, we move back to the second step, i.e. we study the agents’ policy preferences and the ensuing political equilibrium in a standard majority voting setting. The winning policy turns out to be the one preferred by the median voter; there will be a progressive income tax in place at the political equilibrium, and some tax dodging will occur. We find that the progressivity of the tax system is directly related to the strength of the social norm. This is plausible, as the presence of the stigma increases compliance, and therefore lowers the social cost of redistributive taxation. It is also consistent with casual observation. For example, the marginal income tax rates were reduced in Italy for 2005. The arguments in favour of such a move were often casts in terms that clearly signalled the lack of stigma for non-compliance: the then Prime Minister (who was also a businessman) endorsed avoidance as "good" behaviour, declaring that "[i]f reasonable taxes are demanded, no one thinks about avoiding paying them.

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psychological contract; and Cullis and Lewis (1997), who propose a view of tax compliance as adherence to a social convention.
But if you ask 50% or more ... *I consider myself morally justified to do everything I can to avoid paying them*"\(^3\) In 2006, the government changed, a tougher stance on tax dodging was taken, and the tax rates pertaining to the higher income brackets were increased from 2007 onwards (in 2008 the government changed again, but at the time of writing, i.e. August 2008, no changes have been made or announced regarding the income tax schedule).

Finally, in Section 4, we examine the preferences of the agents concerning the force of the social norm (first stage). The perspective we take here is that social norms do not exist in a vacuum, they must perform some useful social task in order to first arise and then survive. This is for example the basis of the well-know argument by Coleman (1990) that the presence of externalities creates a demand for a social norm such that the externalities are regulated; social interactions in dense networks make then the actual establishment of the norm feasible (see also Dufwenberg and Lundholm 2001). We have already mentioned that a social norm against tax dodging serves the purpose of making redistribution less costly and more effective by reducing the distortion associated with redistributive taxation.\(^4\) We suggest that low-income agents, those who benefit from redistribution, will be the major advocates of a norm condemning tax dodging, and explore a mechanism (the "conformism game") that leads to the formation of such a norm.

Section 5 offers a brief summary and some concluding remarks.

**II A model of tax avoidance with social stigma**

In order to keep the tax dodging model manageable, we will introduce several simplifications, such as a quasi-linear utility function, or a reduced-form approach to norm adherence based on the notion of psychic cost of violation. None of them is however really crucial for the results we are pursuing; they only reflect our modelling strategy, namely to keep the framework in which the agents make their basic choices and take their political decisions as straightforward as possible, so as to be able to build a comparatively more elaborate model of social interaction.

\(^3\)Reported by *Time*, March 1, 2004, p. 17, emphasis added.

\(^4\)It might be argued that the stigmatisation of tax dodging should favour not only redistribution, but also social competition, in that it ensures that all "play by the rules". We analyse this extension of the model in a background paper (Balestrino 2007).
The main ingredients

Consider an economy inhabited by agents differing for their gross incomes \( y \). Gross income is fixed, and distributed continuously along an interval \((y^-, y^+)\); the total number of agents is normalised to unity, \( \int y f(y) dy = 1 \). The government levies a linear income tax on the agents’ incomes, with a marginal tax rate \( t \geq 0 \) and a uniform grant \( T \geq 0 \). The agents have the option to hide a share of their income from the fisc by exploiting loopholes in the tax code; let \( a \in [0, 1) \) be the percentage of hidden income, such that \( r = (1 - a) y \) is the income actually reported, and \( h = ay \) is hidden income. In order to avoid taxes\(^5\), the agent incurs in some monetary costs (e.g. by paying a lawyer fee to learn how to circumvent the rules) and in some psychic costs associated with breaking the social norm condemning tax avoidance (provided such norm exists). The m-cost function is written \( K(h, y) \),\(^6\) and the p-cost function is written \( \theta C(h, y) \), where \( \theta \in [0, 1] \) measures the strength of the social norm (for \( \theta = 0 \) the norm is in fact absent). We assume that \( K(\cdot) \) and \( C(\cdot) \) are both strictly convex in \( h \) as well as homogeneous of degree one in \( h \) and \( y \), and that

\[
K(0, y) = K_h(0, Y) = C(0, y) = C_h(0, Y) = 0. \tag{1}
\]

Then, we can write per-unit-of-true-income cost functions as

\[
k(a) \equiv K(ay, y) / y = K(a, 1); \quad c(a) \equiv C(ay, y) / y = C(a, 1) ; \tag{2}
\]

we will have that both \( k(\cdot) \) and \( c(\cdot) \) are strictly convex and that

\[
k(0) = k'(0) = c(0) = c'(0) = 0. \tag{3}
\]

\(^5\)We model tax dodging as tax avoidance, i.e. a riskless but costly activity, as opposed to tax evasion, which is instead risky because of the possibility of pecuniary sanctions if discovered (see e.g. Cowell 1990b for a discussion). In fact, the two approaches can be connected using the concept of "cost of evasion", i.e. "the monetary amount that [a] person would just be prepared to pay in order to be guaranteed that he will get away with tax evasion" (Cowell 1990a p. 232), and reinterpreting the cost-of-avoidance function as a reduced form of the cost-of-evasion function. While this does not mean that the two approaches are completely equivalent, it does normally imply that the main insights survive as we shift across them (Balestrino and Galmarini 2003 discuss the point at some length and provide an example).

\(^6\)We assume that there is no enforcement of the tax code, and therefore that the monetary cost of avoidance is unaffected by policy. In our background paper (Balestrino 2007), we show in an Appendix that, even if we endogenise tax enforcement, the main findings do not change.
The functions defined in (2) are independent of true income, which makes the model much simpler to analyse and interpret — similar assumptions are used e.g. in Boadway et al. (1994) and Balestrino and Galmarini (2003).

From the above, we can write the agent’s net income or consumption as

$$ X = (1 - t + ta - k(a)) y + T. \quad (4) $$

The agent’s utility depends on consumption, and on the psychological cost of avoidance; for the sake of simplicity, we take it to be quasi-linear:

$$ u = X - y\theta c(a). \quad (5) $$

**The agent’s problem**

Substituting the agent’s budget into the utility function and rearranging gives:

$$ u = (1 - t + ta - k(a) - \theta c(a)) y + T. \quad (6) $$

Maximising w.r.t. $a$, we get

$$ t = k' + \theta c', \quad (7) $$

which is necessary and sufficient for a maximum thanks to the strict convexity of the cost functions. The first order condition (FOC) has the obvious interpretation that, at the optimum, the percentage of hidden income $a$ equates the marginal benefit (avoided taxation) with the marginal cost (monetary plus psychic). Note that for $t = 0$ the FOC is satisfied at $a = 0$, as it becomes $0 = 0$ by (3).

We denote the solution as $a = a(t, \theta)$. Given quasi-linearity, and first-degree homogeneity of the cost functions, gross income does not affect the solution.\(^7\) Straightforward comparative statics yields:

$$ a_t > 0; \quad a_\theta < 0, \quad (8) $$

that is, the avoidance activity increases when the tax rate rises and decreases when the norm bites more (see the Appendix for details of derivation). We also make the following assumption on the behaviour of second derivatives:

**Assumption 1** a) $a_{tt} \geq 0$; b) $a_{t\theta} \leq 0$.

\(^7\)Quasi-linearity also implies that the poll-tax has no impact on the avoidance decision.
This assumption is satisfied by e.g. a quadratic cost function for both monetary and psychic costs; in general it requires a restriction on the sign of the third derivatives of the cost functions. It has a plausible interpretation: part a says that the fraction of hidden income increases with the tax rate at a non-decreasing pace, whereas part b says that whenever the social norm becomes more stringent, the fraction of hidden income becomes less (or at least not more) reactive to increases in the tax rate.

As for reported income, \( r(\cdot) = y(1 - a(\cdot)) \), it is easy to see using (8) that \( r \) decreases as \( t \) increases, and increases with \( \theta \), since \( r_z = -ya_z, z = t, \theta \). Moreover, we have \( r_y = (1 - a) > 0 \), that is, reported income rises with true income. However, hidden income \( h = ay \) also rises with income \( (h_y = a > 0) \). This is consistent with the observation that tax avoidance is normally an activity at which high-income agents are more successful (see e.g. Slemrod 2001).^8

Finally, consider net income or consumption. Define

\[
\pi(t, \theta) \equiv 1 - t(1 - a(t, \theta)) - k(a(t, \theta)) > 0
\]

as the complement to unity of the effective tax rate, the percentage of income which is actually lost due to taxation, including the benefits and costs of avoidance.^9 We can then write \( X(\cdot) = \pi(\cdot) y + T \). First, note that

\[
\pi_\theta = (t - k') a_\theta < 0; \quad (10)
\]

\[
\pi_t = - (1 - a) + (t - k') a_t, \quad (11)
\]

where the sign of the first derivative follows from (7) and (8). The effect w.r.t. \( t \) is ambiguous since when the marginal tax rate is positive and rises, the effective tax rate rises too because taxation is more stringent but at the same time falls because the percentage of hidden income increases. Hence, we have

\[
X_y = \pi > 0; \quad X_T = 1; \quad X_\theta = y\pi_\theta < 0; \quad X_t = y\pi_t. \quad (12)
\]

^8This is not necessarily true for all forms of imperfect compliance. Black markets activities appear to be mostly carried out by low-income agents; see e.g. Anderberg et al. (2003) and the references therein.

^9It is possible to show that (7) implies \( 1 > t(1 - a) + k + \theta c \geq t(1 - a) + k \), so that \( \pi \) is indeed positive. To see this consider the \( -(k' + \theta c') \equiv -\gamma \) curve, which is decreasing in the \([0,1]\) interval. The optimal \( a \) is given by the intersection between that curve and a straight line representing the value of \( t \). Then \( t(1 - a) + k + \theta c \equiv \int_0^1 t \gamma(z) dz < t \equiv \int_0^1 \gamma(z) dz \), since \( -\gamma(z) < t \) for \( z \in (a, 1) \) by (7). Clearly, if \( t(1 - a) + k + \theta c \quad \text{< t then}\quad t(1 - a) + k + \theta c < 1 \quad \text{for} \quad t \leq 1. \) The proof is taken, with adaptations, from Balestrino and Galmarini (2003).
That is, consumption rises with income and with the poll-subsidy, but falls when the norm becomes stronger; changes in the tax rate have an ambiguous effect.

An important consequence of \( a(\cdot) \) being independent from income is that the agent’s positions on the gross true income distribution carry over to both the reported and net income distributions; most notably the agents with, respectively, mean and median gross true income also have mean and median reported and net income. We shall use frequently this fact in what follows, as it facilitates the interpretation of the policy results.

### III Voting behaviour

We are now ready to start with the policy analysis. We assume a simple Downsian model of political competition where the candidates are solely office-motivated and commit to policies before the election. The outcome of the elections is decided by majority voting.

#### Policy preferences

To begin with, let us investigate the agents’ policy preferences. Indirect utility will be written:

\[
V(t, T; \theta, y) = (1 - t + ta - k(a) - \theta c(a)) y + T.
\]

The marginal rate of substitution between policy tools is

\[
\frac{V_t}{V_T} = -\frac{(a - 1)y}{1},
\]

where we used (11) and the fact that \( t - k = \theta c \) by (7). The MRS is monotonic in type, since

\[
\frac{\partial (-V_t/V_T)}{\partial y} = \frac{1 - a}{1} > 0.
\]

This observation is important because monotonicity of the MRS guarantees that the indifference curves in the policy space satisfy a so-called "single-crossing" condition, which in turn ensures that a median-voter equilibrium exists under majority voting (see Gans and Smart 1996 for details). In fact, the single-crossing condition implies that, for any two tax rates \( t' \) and \( t'' \) such that \( t' > t'' \) and any two agents \( y' \) and \( y'' \) such that \( y'' > y' \), if \( y' \) prefers \( t'' \) to \( t' \), then also \( y'' \) prefers \( t'' \) to \( t' \); in words, agents "on the same side" of the income distribution have consistent policy preferences.

The government’s budget constraint, written in per capita terms, is simply

\[
\mathcal{F}(t, \theta) = T,
\]
where we used the fact that the total size of the population is normalised to unity. Note that, since all agents hide the same fraction $a$ of their income, we have that

$$
\overline{r}(t, \theta) = (1 - a(t, \theta)) \overline{y}.
$$

(17)

We can interpret the budget equation as expressing $T$ as a function of $t$ (and $\theta$) and check whether the revenue curve in the $(t, T)$-space (holding $\theta$ fixed) is strictly concave, i.e. if $T_t > 0$ and $T_{tt} < 0$.\footnote{Incidentally, notice that $T_\theta = tr_\theta > 0$, i.e. if the social norm becomes more stringent, revenue will go up.} We note that $T_t = \overline{r} + t r_t$, where $r_t = -\overline{y} a_t < 0$ by (8); this is positive as long as

$$
\left| \frac{t}{\overline{r}} r_t \right| < 1
$$

(18)

i.e. if the elasticity of reported income w.r.t. the tax rate is less then unity (which is empirically plausible, see e.g. Kopczuk 2005). The second derivative is $T_{tt} = 2 r_t + t r_t$, and is negative since $r_{tt} = -\overline{y} a_{tt} \leq 0$ by Assumption 1. Strict concavity of the revenue curve is thus generally guaranteed.

Consider now the ideal tax rate. It can be identified by solving $V_t = 0$ for $t$ after substituting $T$ with the revenue constraint $T(t, \theta)$:

$$
V_t = (a - 1) (y) + (1 - a) \overline{y} t \overline{y} a_t = 0.
$$

(19)

We have then:

$$
t(\theta, y) = \frac{(1 - a)}{a_t} \left( 1 - \frac{y}{\overline{y}} \right).
$$

(20)

Since $a_t > 0$ by (8), it follows that agents with higher than average income would prefer income subsidisation; as we ruled out that possibility, they will settle for a corner solution, $t = 0$. The agent with exactly average income would prefer no policy. This is the most efficient solution, since it eliminates the social waste of resources associated with avoidance. However, if an agent desires to achieve some redistribution in her favour, she will willingly trade off some efficiency against the desired amount of redistribution; all agents with less than average income prefer a positive rate of income tax, no matter whether this generates tax dodging (an efficiency loss).

Close inspection of (20) will readily reveal that the ideal tax rate is monotonically decreasing in income for $y < \overline{y}$ (see the Appendix for details). This is actually a straightforward variant of a well-known result from the literature on the political economy of income taxation (see e.g. Meltzer and Richards 1981), although we replaced the usual distortion due to a variable labour supply with the waste of resources devoted to tax dodging.
The political equilibrium

Given our assumptions on the political competition, recalling that the median-voter theorem applies, and adding the usual assumption that the median income is below the mean income (which is true for virtually all real-world income distributions), we can conclude that at the political equilibrium there will be a positive tax rate, and that a certain amount of tax avoidance activity will thus be carried out. Letting \( y_m \) denote median income, we can in fact write the winning policy as

\[
t(\theta, y_m) = \left(1 - \frac{1 - a}{a_t}\right)
\]

(21)

The budget-balancing value of the universal grant will be established via the relationship \( T(t(\theta, y_m), \theta) \).

We now investigate the impact of changes in \( \theta \) on the equilibrium tax rate. Intuitively, we expect that, the stronger is the social norm against tax avoidance, the higher will be the tax rate at the political equilibrium. The straightforward reason is that when tax dodging carries social stigma, redistribution can be pushed farther because it entails a lower efficiency loss (it generates less avoidance activity). The analysis (see the Appendix) supports the intuitive arguments. The ideal policy problem is well-behaved, in the sense that \( V_{tt} < 0 \) for all agents with income below the mean (including in particular the median income agent); this allows us to perform a meaningful comparative statics analysis. We find that, under Assumption 1, the following is true:

**Proposition 1** The equilibrium tax rate is increasing in the strength of the social norm:

\[
t(\theta, y_m) > 0.
\]

(22)

IV  Endogenous formation of the social norm

In the analysis so far, we have treated \( \theta \) as exogenous: we now turn to the analysis of the origin of the social norm. The modelling strategy that we adopt follows closely the political economy approach we have used to identify the chosen policy rule – a social norm is informal rather than backed by the law, but it works pretty much in the same way as a formally established norm.\(^\text{11}\)

Agents have preferences over policies, and then the policy preferences are aggregated through

\(^{11}\)Including the enforcement procedures, an issue which is however not central to our present approach due its reduced form structure (the use of a cost-of-avoidance function).
a formal mechanism (i.e. voting) yielding the policy choice. In a similar way, agents have preferences over the customs and there is an informal mechanism aggregating these preferences into a society-wide norm. The informal mechanism relies on what we called a tendency to conformism. A possible explanation of this tendency has been supplied by Festinger (1950), who suggested that it might appear when the members of a group perceive a clearly defined common aim, to be reached by coordinating each agent’s effort with that of the others. Obeying to a social norm, whose importance for the stability and flourishing of the group can well be grasped by its members, is a type of behaviour that can be explained along these lines, consistently with the arguments by Coleman (1990) referred to earlier.

In order to keep the model manageable, we take the conformity mechanism as given. This is common in the literature: Akerlof (1980) assumes for example that deviations for a custom entail a loss of reputation. We posit here, more generically, that disobeying a social norm produces a cost in utility term. Although there have been attempts at deriving conformist attitudes endogenously starting from basic assumptions on preferences, we may regard our modelling strategy as relatively innocuous, at least judging from the wealth of evidence in the social sciences in favour of the idea that conformism to the majority or otherwise authoritative groups is a tract shared by all main contemporary cultures. For example, we might want to consider the large social psychology literature on the subject, mostly based on an experiment, originally devised by Asch (1955), and known as "line judgement task". The experiment can be briefly described as follows. An experimenter asks the subject to guess the length of a line traced on a wall in front of an audience that the subject believes to be made of other subjects but actually includes several other experimenters. The hidden experimenters suggest inaccurate guesses as a counterproposal to the subject’s guess. Even when counterproposals are evidently wrong, if the hidden experimenters form a majority in their support, the subject normally agrees with them. In fact, in all 100-plus versions of this classical experiment reviewed by Bond and Smith (1996), significant fractions of participants end up accepting the opinion of the majority also when they know, as ascertained by personal interviews after the experiment, that such an

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12 For a brief summary of other explanations of conformism in social psychology, and a few references, see Balestrino (2008).

13 Most notably, Bernheim (1994) who considers a signaling model where agents care about their own consumptions as well as status, and concludes that when the preference for status is sufficiently large for enough agents, then a social custom is established. Notice that, as the author himself remarks, this result is obtained within a standard self-interested optimisation framework but depends on a non-standard formulation of preferences.
opinion is factually wrong.

Preferences over the social norm

We begin by identifying the preferences over the strength of the social custom. Let us move a further step backward and consider how indirect utility is affected by changes in the parameter \( \theta \) (expressing the force of the social norm) when the equilibrium policy is in place. Let us then write

\[
W (y, \theta) \equiv V (t^m (\theta y^m), y, \theta) =
(1 - t^m + t^m a (t^m) - k (a (t^m)) - \theta c (a (t^m))) y + T (t^m, \theta)
\]

(23)

where \( V (\cdot) \) is defined in (13), the budget equation (16) has been used to replace \( T, t^m = t (y^m, \theta) \) is the equilibrium tax rate, and \( a \) is chosen optimally given \( t = t^m (\cdot) \). We can now ask what the preferred \( \theta \) would be for each agent. If we maximise \( W (\cdot) \) w.r.t. \( \theta \), under the constraint that \( \theta \geq 0 \), we have that

\[
W_{\theta} \equiv V_{t^m t^m_{\theta}} + V_\theta = V_{t^m t^m_{\theta}} - yc \leq 0; \ \theta \geq 0; \ \theta W_{\theta} = 0.
\]

(24)

In order to have an interior solution, \( \theta (y) > 0 \), it must be the case that

\[
V_{t^m t^m_{\theta}} = yc,
\]

(25)

which can be interpreted as marginal benefit \( V_{t^m t^m_{\theta}} \) equating marginal cost \( yc \). Now, the marginal cost of \( \theta \) is simply the disutility of violating the norm, and it is necessarily positive.

The sign of the marginal benefit depends instead on the impact on the equilibrium tax rate; an interior solution requires that the marginal benefit is also positive, i.e. that it is actually a benefit and not a cost. To check when this is the case, we may reason as follows. An increase in \( \theta \) induces a higher equilibrium tax rate, since \( t^m_\theta > 0 \) by (22); hence, a marginally higher \( \theta \) will represent a gain for all agents will income below the median, who would prefer a higher tax rate than the equilibrium one (for them \( V_{t^m} > 0 \), but it will represent a loss for all agents with income above the median (\( V_{t^m} < 0 \), while agents with median income will be unaffected (\( V_{t^m} = 0 \)). Therefore, the above condition for an interior solution only applies to agent with

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14 We assume that the constraint \( \theta \leq 1 \) is always satisfied, and also that the problem is well-behaved, i.e. that the second order condition is \( V_{t^m_{\theta}} (t^m_{\theta})^2 + V_{t^m t^m_{\theta}} + V_{\theta \theta} < 0 \).
Table 1: The pattern of preferred strength of the social norm

<table>
<thead>
<tr>
<th>level of $y$</th>
<th>marg. benefit</th>
<th>marg. cost</th>
<th>value of $\theta$</th>
</tr>
</thead>
<tbody>
<tr>
<td>$y &lt; y^m$</td>
<td>$V_{t \cdot t^m_{\theta}} = yc$</td>
<td>$\theta (y) &gt; 0$</td>
<td></td>
</tr>
<tr>
<td>$y = y^m$</td>
<td>$0 &gt; yc$</td>
<td>$\theta (y) = 0$</td>
<td></td>
</tr>
<tr>
<td>$y \geq y^m$</td>
<td>$0 &gt; yc - V_{t \cdot t^m_{\theta}}$</td>
<td>$\theta (y) = 0$</td>
<td></td>
</tr>
</tbody>
</table>

income below the median. For all those with income equal or above the median, we have a corner solution: for them $V_{t \cdot m} \leq 0$, so that $W_t = V_{t \cdot m} \cdot t^m_{\theta} - yc < 0$, and therefore $\theta (y) = 0$; indeed, for these agents the social norm does not generate any benefit, only costs.

Condition (25) takes thus different forms depending on the level of the agent’s income; Table 1 illustrates. We summarise the above analysis as follows:

**Proposition 2** Only agents with income below the median have a positive ideal level of the norm, i.e. favour an active condemnation of tax dodging.

This is an important step in the direction we are pursuing, since we argued that the supporters of the norm will prevalently be among the low-income agents (see our Introduction), i.e. those who have more to gain from redistribution. We may however make the result more precise; in particular, we may ask how the individually preferred strength of the social norm varies as income varies. Intuitively, the lower is an agent’s income, the larger is the redistributive gain to be reaped from an increase in tax compliance following a tightening of the norm, so we expect that the ideal norm decreases with income. The comparative statics does not yield totally unambiguous results, but the intuitive argument is substantially confirmed (see again the Appendix for details). Assuming that the ideal norm problem is well-behaved, and that first-order effects prevail over second-order ones, we find that:

**Proposition 3** The preferred value of the norm is decreasing in income:

$$\theta_y (\cdot) < 0.$$  \hspace{1cm} (26)

The basic ingredients of the conformism game

We now model the aggregation mechanism, that is the informal procedure that establishes a society-wide level of the norm. We call it the "conformism game"; it is intended to capture the
idea that we interact with other members of our society in a myriad of circumstances: at home, on the workplace, on the commuter train, when we dine with friends, when we attend a meeting at our children’s school, and so on and so forth. In the course of these interactions we shape our ideas (and contribute to shape those of others) on the common values of a society, including the particular object we are focusing on in this paper, namely the attitude towards tax dodging. The emphasis on conformism is meant to underline an idea that, as a first approximation, could be expressed as follows: the more influential agents in these interactions will be the ones belonging to large communities sharing a common idea, because the implicit or explicit support of a numerous group makes a person more capable to impose her own view or anyway to maintain it against the arguments of others who are in disagreement with her.

In our context, the members of a group are identified by the fact that they have the same income, and thus share the same view on what the appropriate level of $\theta$ should be. The conformism game consists of a potentially infinite sequence of rounds of simultaneous two-players, one-shot bargaining games, each of them pairing agents with possibly differing views on what is the "correct" strength of the norm (i.e. with possibly differing incomes). The game ends only if an overall agreement is reached, i.e. if it so happens that at some round everybody shares the same view on $\theta$.

There are two elements that have to be characterised in order to give content to the general game. First, we have to specify a mechanism whereby players are matched two at the time to play against each other in each round. We employ an admittedly oversimplified characterisation, assuming that the agents facing each other meet by pure chance, and that anybody is just as likely to meet anybody else. More accurate formulations turn out to change nothing of substance. $^{15}$ Second, we describe the typical two-player game. The players may agree on a norm, and both follow it; or, if no agreement has been reached, they may each continue to follow the same norm as before entering the game. We distinguish two types of games:

- the trivial games are those in which the two agents share the same view on $\theta$ to begin with; the straightforward outcome is that they continue to agree.

$^{15}$For example, it might be argued that we interact mostly with those who are more similar to us, who share our interests, our long-term aims, our quality of life, etc. Within the boundaries of the present model, this means that, at any given round, there should be a large proportions of interacting pairs made of agents with similar income levels, as income is the only element by which agents differ. The probability that two agents encounter each other in a bargaining game should therefore be a decreasing function of the difference in their incomes. This does not affect neither the solution procedure nor the outcome of the game, as it will become clear below.
• the **non-trivial games** are those in which the agents have different views prior to their interaction; the outcome depends crucially on the costs associated with the two possible courses of action at their disposal – agree or disagree.

In the non-trivial two-player games, there is an utility loss to face when adopting the other’s view, i.e. when agreeing; there is however also a cost for disagreeing (perhaps a loss of reputation – see above), and whenever this cost exceeds the cost of switching sides, the agent will adopt the norm supported by her opponent in the game. The exact way in which the costs of disagreement are formulated is important for the final outcome. We postulate that the costs for disagreeing are not symmetric in the precise sense that they are heavier for agents in the minority group. This is how we capture the tendency towards conformism: the cost of disagreeing depends on the difference between the size of the groups to which the agents belong, in the sense that, the larger an agent’s group size is, the more secure she is in her positions and the lower is for her the cost of disagreeing. We define the cost of disagreeing for a $y^j$-agent facing a $y^i$-agent as

$$g^i = g \left( f \left( y^j \right) - f \left( y^i \right) \right),$$  

(27)

with $g' (\cdot) > 0$, $g^i = 0$ for $f \left( y^j \right) \leq f \left( y^i \right)$ and $g^i > 0$ for for $f \left( y^j \right) > f \left( y^i \right)$.\(^{16}\) Thus, supposing e.g. that $f \left( y^j \right) > f \left( y^i \right)$, and that the $j$-agent makes his proposal first, the payoffs of a non-trivial typical game are described by the following matrix:

<table>
<thead>
<tr>
<th>$i$’s choice</th>
<th>$i$</th>
<th>$j$</th>
</tr>
</thead>
<tbody>
<tr>
<td>agree</td>
<td>$W \left( \theta \left( y^j \right), y^i \right)$</td>
<td>$W \left( \theta \left( y^j \right), y^j \right)$</td>
</tr>
<tr>
<td>disagree</td>
<td>$W \left( \theta \left( y^i \right), y^i \right) - g^i$</td>
<td>$W \left( \theta \left( y^i \right), y^j \right)$</td>
</tr>
</tbody>
</table>

Notice that the asymmetry in the cost function implies that there are only two possible outcomes of the non-trivial game: either the majority-backed agent imposes her view, or the two agents continue to disagree. Whenever

$$W \left( \theta \left( y^i \right), y^i \right) - W \left( \theta \left( y^j \right), y^i \right) \leq g^i,$$  

(28)

the $i$-agent will take the view of $j$-agent as her own – she will conform to that view and act accordingly. Even if the agent from the minority moves first, the outcome does not change, as the member of the majority rejects the other’s idea at no cost, and starts with his counterproposal.\(^{16}\)

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\(^{16}\)We take the extreme view that majority members face no cost for disagreeing; this simplifies the analysis, but it is not essential (what counts is that costs are asymmetric for agents in groups of different sizes).
The description of the two-player games allows now to characterise the conclusion of the general game. Suppose that, somewhere along the sequence of rounds, there is a round in which all players enter the bargaining games with the same view on \( \theta \); in other words, all the two-player games become trivial, no matter who is paired with whom. Note that if the game were repeated for one more time the same outcome would be replicated, and so on round after round (supposing, of course, that the environment remains unchanged): we therefore assume that the game ends. Now consider the following:

**Definition 1** Suppose that, in one of the rounds, all the simultaneous two-player games end with the agents agreeing on a level of \( \theta \), and that this level is the same across games; we call this common outcome a "social norm".

According to this definition, the conclusion of the conformism game identifies a "social norm".

**A benchmark result**

With the above building blocks, we can establish a benchmark result in order to illustrate the general procedure by which we can "solve" the conformism game.

In the first round each player will be randomly matched with another player, and the simultaneous one-shot bargaining games take place. We are particularly interested in the non-trivial games in which one of the players belongs to the relatively more influential group, i.e. the one with the largest relative size. Since groups are defined solely on the basis of their income, the relative majority will be formed by the agents with modal income, \( y^m \). By construction, the agents belonging to the relative majority do not change their mind when they play, as their cost of disagreeing is zero no matter whom they are paired with; however, each of them can convince the opponent to change her mind, the more so, the smaller is the group to which the opponent belongs. Suppose now that the cost of disagreeing is sufficiently large for (28) to hold in at least some of the non-trivial games in which a member of the modal income group is engaged; then, after the first round is completed, the number of those who support the view that \( \theta (y^m) \) is the adequate strength of the norm will be larger. To be precise, if we let \( \delta^r_i \geq 0 \) denote the fraction of agents who, at round \( r = 1, 2, \ldots \), change their mind and agree on \( \theta (y^i) \) as the "right" strength of the norm, the group of supporters of \( \theta (y^m) \) will be given by \( f (y^m) + \delta^r_m \). However, in the meantime, also the members of other income groups will have played their games, and
some of them will have changed opinion. As a consequence, it is in principle possible that, at
the end of the first round, the group backing \( \theta(y^m) \) does not constitute a relative majority
anymore, if another group has been distinctly more successful in acquiring new "followers". In
order to rule this out, we assume that \( \delta^1_m \geq \delta^1_j, \forall j \neq m \).17

In the second round, new pairs of players are again formed randomly, and, after the bar-
gaining games are played, the relative majority will be even larger, provided that \( \delta^2_m \geq \delta^2_j > 0 \).
And so on for the subsequent rounds: indeed, with \( \delta^r \) always non-negative, strictly positive for
at least some rounds, and at least as large as any other \( \delta^r_j \), we will necessarily end up with
all agents in the society sharing the view that \( \theta(y^m) \) is the "correct" strength of the norm
concerning the condemnation of tax dodging. More precisely, unanimity will be achieved at a
round \( R \) for which
\[
f(y^m) + \sum_{r=1}^{R} \delta^r = 1.
\]
Having reached this stage \( R \), the conformism game ends, and, according to Definition 1, \( \theta = \theta(y^m) \) constitutes the social norm. This is a situation from which no one has any incentive to
move, and is in this sense an equilibrium.

To summarise:

**Proposition 4** If \( \delta^r_m \geq \delta^r_j \) \( \forall r \) and \( \forall j \neq m \), and if \( \delta^r_m > 0 \) for some \( r \), the conformism game
reaches, at a round \( R \) such that (29) is satisfied, a conclusion; the level of \( \theta(y) \) preferred by
agents with modal income is established as the social norm and, if the median of the exceeds
(falls short of) the mode, such a norm prescribes \( \theta > 0 (\theta = 0) \).

In order to interpret this result, it is useful to recall that the ideal level of the norm decreases
with income; that is, the lower is the mode relative to the median, the stronger will be the social
norm. This suggests that in a society in which redistribution matters because a sizable share of
the population is poor, a norm against tax dodging will be particularly felt. This is a sensible
prediction, and is in principle testable, as it links the strength of the norm to the extent of
poverty.

The result, however, presupposes that the opinions of all agents count the same when it
comes to the formation of the norm – if two groups with different income level have the same

17The condition is only sufficient, not necessary. Furthermore, even if a new majority is formed, it will be
grouped around an income level not too far from the modal one (provided the income distribution is unimodal);
hence, the eventual outcome of the game would not be very different.
size, they carry the same weight. In fact, one might argue that this is not necessarily true. For example, in the "line judgment task" experiments mentioned above, it has been found that the authoritativeness (as expressed by demeanour, clothing, etc.) of the members of the group opposing the subject did have an impact on the extent to which the latter conformed to the view of the former, acting as a substitute for size; other features might play similar roles (see e.g. Baron et al. 1996). In the following sub-section, we consider a variant of the model in which the influence exercised by each group does not depend exclusively on size.

**Refining the result**

The simplest way to account for the circumstance that size alone is not enough to gauge the social influence of a group is to define a social weight-adjusted size of the income groups. As we know, income is the only feature distinguishing agents in the present setting. Suppose then that an income \( y \) commands a social weight \( p(y) \); the relative social weight attached to income \( y \) will be \( p(y) / \int p(y) f(y)dy \), and the adjusted size of the income group could be defined as

\[
\phi(y) = \frac{p(y)}{\int p(y) f(y)dy} f(y). \tag{30}
\]

It is easy to see that \( \phi(y) \) behaves exactly like a distribution function. Then, we define a new cost function with the same properties as (27) using \( \phi(\cdot) \) rather than \( f(\cdot) \) in the argument. The interpretation of the cost function is as above, with weight-adjusted size replacing sheer size.

Typically, the weights will vary with income. They might be *increasing* in income, \( p'(y) > 0 \), meaning that high-income agents have a strong social influence, perhaps because they are more vocal in propagating their views, have more access to the means of information, etc. Or, somewhat less plausibly, they might be *decreasing* in income, \( p'(y) < 0 \); then, low-income agents would wield a strong sociopolitical influence, perhaps because they are well represented by pressure groups such as unions, left-wing parties, etc. One way or the other, the implication of having income-related weights is that whenever an agent faces another in a bargaining game, he will take into account not only the number of agents that are backing his opponent’s view, but also whether the latter comes from a group with a large social influence. So, for example, a middle-earner who faces a poor opponent might regard the latter’s opinion as scarcely relevant even if the poor are numerous, if little weight is placed on the low-income groups.

For our purposes, it is useful to have a way of comparing adjusted distributions obtained using different weighting structures. To this end, we employ the following definition:
Definition 2 An adjusted distribution in which the mode is to the right (left) of another is said to be “more positively (negatively) biased” than the other.

The original distribution can be thought of as an extreme case of the adjusted distribution in which all income groups have the same weight, \( p'(y) = 0 \); it is therefore in this sense "unbiased". Relative to the original distribution, negative (positive) bias only obtains if \( p'(y) < (>) 0 \). However, given any two distributions derived by the original one applying two different sets of weights, both satisfying \( p'(y) > 0 \) or both satisfying \( p'(y) < 0 \), it is always possible to order them according to the above Definition.

Once the income distribution has been redefined to account for the weights, the same procedure as above can be used to solve the conformism game – of course, condition (29) will have to be modified as

\[
\phi(y^m) + \sum_{r=1}^{R} \delta^r = 1, \tag{31}
\]

where \( y^m \) is the modal income in the adjusted redistribution. We will then conclude that:

Proposition 5 If \( \delta^r_m \geq \delta^r_j \ \forall r \text{ and } \forall j \neq m \), and if \( \delta^r_m > 0 \) for some \( r \), the conformism game reaches, at a round \( R \) such that (31) is satisfied, a conclusion; the level of \( \theta(y) \) preferred by agents with modal income in the adjusted distribution is established as the social norm and, if the median of the original distribution exceeds (falls short of) the mode of the adjusted distribution, such a norm prescribes \( \theta > 0 (\theta = 0) \).

Furthermore, using Proposition 3 as well as Definition 2, we can state:

Proposition 6 The more negatively biased is an adjusted distribution, the larger will be the equilibrium value of the norm.

Exploiting the fact that the strength of the ideal norm is decreasing in income, the above Propositions capture the simple and quite plausible idea that in a society in which low-income agents have a relatively strong social influence (that is, the weights attached to the agents belonging to low-income groups are relatively large), tax dodging will be more stigmatised that in others.

We might perhaps expect that social influence is always at least slightly positively biased: the well-off segments of the population always carry a little more weight than their number might
seem to warrant.\textsuperscript{18} However, this will be more or less true in different societies, depending basically on the extent to which a country can be said to be democratic.

Discussion

To sum up, we can identify two different outcomes of the conformism game:

1. a social norm against tax dodging will be in place if the modal income of the adjusted distribution \textit{is less than} the median income of the original distribution;

2. no social norm against tax dodging will be in place if the modal income of the adjusted distribution \textit{is larger than} the median income of the original distribution.

This corresponds roughly to the idea that the degree of stigmatisation will be stronger the more negatively biased is social influence. Basically, we expect the social influence of the less well-off to be relatively stronger in truly democratic societies, where they have some voice in shaping the social attitudes, and consequently the policies.

Autocratic regimes only attend to the demands of the ruling elites. Democratic governments, at least in principle, listen to everybody. Importantly, however, democracy is not an all or nothing condition: different countries can be said to be democratic to different extents, depending on such things as the balance of power between the executive, legislative and judiciary branches of the administration, the independence of the press and other media, the accessibility of civil and political rights, the effectiveness of the unions and other pressure groups representing the less well-off, etc. There will be societies in which democracy is more deeply rooted than in others: in those society, an active participation to the political life for the low-income fractions of the population will be relatively easier. An important component of the climate that permits such a participation is a respect for the social rules: if the game is not played fairly enough, the poor will never have a chance to make themselves heard over the noise, there will be no social competition, no upward mobility, etc. In this climate, the opinions of the poor will be more respected than in other societies, where there is a "rat race" situation, and cheating is an accepted part of the game: in those societies, democracy is more a matter of form (elections are held periodically) than of substance. Indeed, it is a well-known stylised fact in the social sciences

\textsuperscript{18}Ermish (2006) develops theoretically, and then tests empirically, a model in which social customs are first introduced by high-income, well-educated agents, and then spread to the rest of the community (in his case, the focus is on the social acceptance of the practice of having children outside marriage).
(see for example Triandis, 1989) that in certain societies, such as those of the Anglo-Saxon or Nordic countries, social norms guide individual behaviour more than in others, such as Italy or Japan, where the demands of personal ties overrule obligations towards the society at large.

We can then interpret the model as predicting that countries with more robustly democratic regimes should exhibit a more severe attitude against tax dodging. Long-established and well-working democracies like the US, the UK or the Scandinavian countries tendentially belong to the type of society where social norms matter; they would be represented by the first possible outcome of the conformism game. Instead, the status of institutionally more fragile nations like, say, Greece, Portugal and Italy would be captured by the second possible outcome.

V Concluding remarks

We have modelled the behaviour of taxpayers trying to decide the amount of income they can hide from the fiscal authorities, assuming that their choices are affected by the presence of a social norm stigmatizing tax dodging. After identifying the agents’ equilibrium, we have evaluated their ideal tax policies, and found that the political equilibrium is of the median voter variety. Then, we discussed the impacts of the social custom on the policy prevailing at the political equilibrium, and argued that a stronger custom induces a higher equilibrium tax rate.

We then moved to the core of the paper, namely we investigated the source of the social norm, introducing an informal mechanism for aggregating the individuals’ preferences on the norm which we dubbed the conformism game. We found that the strength of the social custom depends on its useful social role as a factor that makes redistribution more effective. As such, it is valued mostly by the low-income individuals, who have much to benefit from redistribution. As is made clear in the version of the model that accounts for the social weight of the groups, a norm condemning tax dodging will be particularly felt in societies with stable democratic institutions in which even the poor can make their voice heard by the general public. This is consistent with the observation that in mature democracies there is much more stigma associated with anti-social acts like tax dodging than in less stable democracies. This is because much of the strength of the norm will depend on whether the public opinion is entirely dominated by the high-income classes or whether the middle-to-low-income people carry some weight in shaping the views of the society.

It is worth mentioning how our conclusion, linking the degree of social stigmatization of tax dodging to the extent to which a government can be said to be democratic, sits well with
the findings of at least two important branches of the literature on tax compliance. First, we mention the literature on tax morale, which emphasizes that direct democracy boosts tax compliance, because the citizens perceive that taxes are spent according to their preferences and are thus more inclined to pay them - i.e. have a higher tax morale (Torgler 2005); indeed, in a direct democracy, there is bound to be political participation from all economic classes. It comes then as no surprise that Switzerland, the only large-scale direct democracy of our contemporary world has one of the smallest shadow economies (8-10% of GDP in the 90’s according to Schneider and Enste 2000). Second, we recall the already cited works by Friedman et al. (2000) and Johnson et al. (1997, 1998) that have now made clear how political and administrative corruption, signalling at the very least a malfunctioning democracy (or worse), goes hand in hand with low tax compliance. Indeed, Southern European countries like Greece, Italy, Spain and Portugal, routinely classified among the most corrupt in Europe by Transparency International (www.trasparency.org) have larger shadow economies than less corrupt countries like Great Britain or the Nordic countries (again according to Schneider and Enste 2000, the former are in the 24-30% range, the latter in the 13-23% range).

Appendix

As mentioned above, this appendix illustrates the details of the comparative statics, for the agent’s equilibrium, for the political equilibrium, and for the ideal norm problem.

**Comparative statics of the agent’s equilibrium.** In the basic model, we know that at an interior solution:

\[ u_a = t - k'y - \theta c' = 0; \quad u_{aa} = -k'' - \theta c'' < 0. \]  

(A1)

It is then immediate to compute \( u_{a\theta} = -c' < 0 \) and \( u_{at} = 1 \), so that

\[ a_\theta = -\frac{u_{a\theta}}{u_{aa}} < 0; \quad a_t = -\frac{u_{at}}{u_{aa}} > 0. \]  

(A2)

as reported in (8).

**Comparative statics of the political equilibrium.** We claimed in the main text that the policy problem is well-behaved for all agents below the average income (including therefore the median voter). Indeed, we have

\[ V_{tt} = a_t (y - \overline{y}) - t \overline{y} a_{tt} < 0; \]  

(A3)

22
the sign follows because \( a_t > 0 \) by (8), \( y < \overline{y} \), \( a_{tt} \geq 0 \) by Assumption 1. We can now compute

\[
V_{ty} = a - 1 < 0; \quad (A4)
\]

\[
V_{t\theta} = a_\theta (y - \overline{y}) - \overline{y} a_{t\theta t} > 0 \quad (A5)
\]

where the sign of (A4) is obvious and that of (A5) follows because \( a_\theta < 0 \) by (8) and \( a_{t\theta} \leq 0 \) by Assumption 1. Hence, we have

\[
t_y = -\frac{V_{ty}}{V_{tt}} < 0, \quad (A6)
\]

that is, the ideal tax rate is decreasing in income, as explained informally in the main text. Concerning specifically the median voter, we can state that

\[
t_\theta = -\frac{V_{t\theta}}{V_{tt}} > 0, \quad (A7)
\]

confirming Proposition 1.

**Comparative statics of the ideal norm problem.** We are interested in the conditions under which

\[
\theta_y (\cdot) = -\frac{W_{\theta y}}{W_{\theta\theta}} < 0; \quad (A8)
\]

As mentioned in fn. 14, we assume that the ideal norm problem is well-behaved, \( W_{\theta\theta} < 0 \). Then we should ask whether it is true that \( W_{\theta y} < 0 \). We compute

\[
W_{\theta y} = V_{tmy} t_\theta^m + V_{t^m t^m_{\theta y}} + V_{\theta y}; \quad (A9)
\]

and note that the first-order effect has the desired signs: \( V_{\theta y} = -c < 0 \). If it dominates the second-order effects,\(^{19}\) then (A8) is verified and Proposition 3 is confirmed. This result applies of course also to the social equilibrium level of the norm.

**References**


\(^{19}\) The second-order effects can be signed only in part. We know that \( t_\theta^m > 0 \) by (22) and \( V_{t^m y} < 0 \) by (A4): hence, \( V_{t^m t^m_{\theta y}} < 0 \), again as required. Instead, \( V_{t^m t^m_{\theta y}} \) cannot be signed at this level of generality, as we do not know the sign of \( t_\theta^m \).


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