



## Tertium Datur: Pricing, Regulating and Intrinsic Motivation

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Standard economic theory overlooks the effect that the policy instruments of pricing and regulating under specific conditions have on people's intrinsic motivation and, therewith, on their behaviour. This may be called the 'crowding-out' effect. The application of these instruments may, under identifiable conditions, either enhance or damage the internal motivation people have to behave in a desired way. When prices or regulations undermine individuals' intrinsic motivation, the goal set by using these instruments is achieved to a lesser degree, and the outcome may even be less desirable than if there had not been any policy intervention. In this case, economic instruments have an unintended or perverse effect. Consequently, more care should be taken when the use of prices and regulations are suggested for economic policy and, in particular, the possible damaging effects of interventions on motivation should be taken into consideration.

This paper suggests that a third incentive for behaviour exists beyond pricing and regulating - intrinsic motivation: *tertium datur*. Section I discusses external and internal incentives of human behaviour and their relationship. In Section II the impact of pricing and regulating on human behaviour, i.e. the crowding-out effect, is analysed, taking into account the supporting or damaging consequences on intrinsic motivation. The following section shows that the results are of substantial relevance by providing applications to environmental, crime

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prevention, social, manpower, tax and organizational design policies. Section IV offers concluding remarks.

The approach pursued stays within the rational choice framework on which economic theory is based, but psychological effects, disregarded in standard economics, are taken into consideration<sup>1</sup>.

#### I. EXTERNAL POLICY INSTRUMENTS AND INTRINSIC MOTIVATION

Economic theory focuses on changes in the opportunity set to explain changes in individuals' behaviour. Systematic reactions to rising or falling relative prices are at the centre of microeconomic analysis. Relative prices are not only the explicit ones charged for goods and services but also implicit ones. Changes in opportunity cost, including variations in the cost of time [BECKER, 1965], lead to changes in the full income constraint, the slope of which is taken to determine human behaviour. A second type of change in individuals' opportunity set is due to regulations combined with a threat of punishment if they are violated.

When prices and regulations are applied for policy purposes, the same motivational mechanism is relied on; the incentives to behave in a particular way come from *outside* the person(s) concerned. In economic analysis as championed by STIGLER and BECKER [1977] such external controls are the only ones considered, the argument being that it is possible to identify the corresponding changes in the opportunity set, but not those in preferences.

Another, quite different, kind of motivation for human behaviour lies at the core of the other social sciences, in particular sociology and psychology; people are taken to change their behaviour for internal or intrinsic reasons, or, in economic language, because preferences have changed. According to cognitive social psychology (DECI [1971, p. 105], see also DECHARMS [1968], STAW [1976]) 'one is said to be intrinsically motivated to perform an activity when one receives no apparent reward except the activity itself'. In this case, behaviour is based on the moral and ethical considerations which form part of people's preferences.

Standard economics does not reject the notion that individuals possess internalized values but chooses to neglect them, because they are taken as

1. This has, of course, been undertaken before, most prominently by AKERLOF [1984, 1989], with DICKENS [1982], with YELLEN [1990], or FRANK [1985, 1988], or earlier by VEBLEN [1899], SIMON [1957, 1990], KATONA [1975] and SCITOVSKY [1976].

exogenously given and remain unaffected when prices or regulations change. This methodology has been successfully applied to illuminate and explain many aspects of social life (BECKER [1976], and for surveys STIGLER [1984], HIRSCHLEIFER [1985], FREY [1992]).

Some economics scholars, among them BOULDING [1968], HIRSCHMAN [1965], ARROW [1970, 1974] or SEN [1977]<sup>2</sup>, as well as adherents of the rational choice approach in sociology [COLEMAN, 1990], are, however, concerned with the relationship between external and internal human motivation. Indeed, there exists good *prima-facie* evidence that the use of pricing has a systematic and quantitatively important effect on people's intrinsic motivation. HIRSCHMAN [1982] gives a fascinating account of how some writers assume that the price system destroys morals while others believe, on the contrary, that the price system improves human morality. The negative view has been dominant in history, and is nowadays brought forth by such heterodox writers as TITMUS [1970] or HIRSCH [1976] who describe the damaging consequences with terms such as the 'commercialization effect' or 'demoralization cost' [MICHELMAN, 1967]. In comparison to the alleged morally undermining consequences of pricing, it has often been overlooked that conditions exist where direct interventions via regulations also worsen moral values. An extreme case is in planned communist economics, where people are forced to show public support for a system which they privately abhor, making them completely cynical [KOLAKOWSKI, 1978]. As a result, individuals' internal incentives and norms are undermined.

Whether an analysis assumes that preferences are constant, or whether one allows for changes in constraints via prices and regulations affecting preferences, should depend on what approach provides superior insights and yields better empirical predictions. Making preferences endogenous is to be rejected if it boils down to accounting *ex post* for changes in behaviour which are otherwise inexplicable. On the other hand, if it can be shown that changes in constraints systematically affect preferences, and thus add to the direct relative price effect considered in standard microeconomics, it is advisable to integrate endogenous preference changes into the body of theory. It is argued here that such a systematic relationship does exist in the form of an empirically identifiable effect of prices and regulations on intrinsic motivation.

Both experiments and real-life observations undertaken in cognitive social psychology (see, in particular, LEPPER, GREENE and NISBETT [1973], DECI

2. See also the more formal analyses of endogenous preference changes by, e.g., POLLAK [1970], VON WEIZSÄCKER [1971], and more recently SPINNEWYN [1981] and BOYER [1983].

[1975], and DECI and RYAN [1980, 1985], as well as the survey by PITTMAN and HELLER [1987]) provide convincing empirical evidence that, under specific conditions, external interventions systematically affect intrinsic motivation. The 'hidden costs of reward' (see LEPPER and GREENE [1978]) has received the greatest amount of attention; it states that the introduction of a reward into a situation where people already have a high interest in an activity or a task, results in a decrease of their intrinsic motivation as compared to a not-rewarded control group.

## II. HUMAN BEHAVIOUR: EFFECTS OF PRICING AND REGULATING

In a simple rational choice model, individual behaviour ( $B$ ) is determined by external instruments ( $E$ ) (the application of prices and of regulation, respectively) and by intrinsic motivation ( $M$ )<sup>3</sup>

$$B = B(E, M) \quad (1)$$

Consider a principal-agent relationship in which behaviour is defined so that an increase in  $B$  of the agent is deemed desirable by the principal. An increase in externally imposed instruments  $E$  thus raises  $B$  ( $\delta B / \delta E \equiv B_E \geq 0$ ), with decreasing marginal effect ( $\delta^2 B / \delta E^2 \equiv B_{EE} < 0$ ). Again, from the principal's point of view, an increase in the agent's intrinsic motivation also raises performance  $B$  ( $B_M \geq 0$ ,  $B_{MM} < 0$ ). The principal maximizes the agent's performance by choosing the appropriate intensity of external instruments, yielding

$$\frac{dB}{dE} = B_E + B_M \frac{dM}{dE} = 0. \quad (2)$$

$B_E$  captures the standard neoclassical relative cost or generalized relative price effect. Based on overwhelming empirical evidence collected within economics, it is taken that  $B_E > 0$ , i.e., that the policy instruments work effectively. The second term of (2) shows the effect of the external intervention on intrinsic

3. The (initial) level of intrinsic motivation can be taken as exogenously given or as the result of an evolutionary process in which individuals achieve higher utility in the long run by adopting rules to abstain from temptations to pursue short-term gains (see AXELROD [1984], SCHOLZ [1984]).

motivation, with  $dM/dE \geq 0$ . How the use of prices or regulations influences human behaviour thus depends on two distinct effects which — in case of a detrimental effect on intrinsic motivation — are countervailing.

The agents increase their utility by applying their intrinsic motivation but there are also costs involved as possibilities for opportunistic behaviour are not exploited. Marginal utility is assumed to be decreasing, and marginal cost increasing, in  $M$ . Agents choose (in the 'as if' sense) that level of intrinsic motivation where the marginal benefits and costs balance, or where their net benefit ( $U$ ) is maximized

$$\frac{dU}{dM} = U_M = 0; \quad (3)$$

When the principal varies the intensity of the instrument  $E$ , the agents adjust their optimal choice of intrinsic motivation according to

$$U_{ME} + U_{MM} \frac{dM}{dE} = 0, \text{ or}$$

$$\frac{dM}{dE} = \frac{U_{ME}}{-U_{MM}}. \quad (4)$$

$U_{MM}$  always being negative, the sign of  $dM/dE$  is determined by the sign of  $U_{ME}$ , or by the effect of the instruments on the marginal utility of indulging in intrinsic motivation. A rational principal takes the agent's motivational adjustment into consideration when the intensity of instrument use  $E$  is chosen. Inserting (4) into (2) gives

$$\frac{dB}{dE} = B_E + B_M \left( \frac{U_{ME}}{-U_{MM}} \right) = 0 \quad (5)$$

When individuals' (agents') intrinsic motivation is immune to the policy intervention ( $U_{ME} = 0$ ), a performance-maximizing principal selects the instrument solely on the basis of the direct (relative price) effect. If the use of the instrument raises the marginal utility of exerting intrinsic motivation, 'crowding-in' effect, with  $U_{ME} > 0$ , the principal rationally applies the instrument more extensively than according to the direct relative price effect. If the use of the

instrument damages the marginal utility of intrinsic motivation, 'crowding-out' effect, with  $U_{ME} < 0$ , it is applied less extensively than according to standard economic theory. If the damaging effect on intrinsic motivation is stronger than the relative price effect ( $B_M[U_{ME}' - U_{MM}] > BE$ ) it is not rational to apply the instruments at all ( $E = 0$ ). Intrinsic motivation is then better able to achieve the goals desired than either the use of pricing or of regulating. In that case the third option, reliance on what the individuals do without (external) reward or punishment, is the only motivating force used by a rational decision-maker. Which effect prevails is an empirical matter.

Psychologists (see in particular DECI and RYAN [1985]) have identified two conditions which determine whether external intervention supports ( $U_{ME} > 0$ ) or damages ( $U_{ME} < 0$ ) intrinsic motivation: (a) Individuals' marginal utility of their intrinsic motivation is reduced when they perceive the external intervention to diminish their *self-determination*, i.e. when they consider themselves to be externally controlled. In that case, they substitute intrinsic for extrinsic control. The individuals subjected to external influence feel 'overjustified' (a term introduced by LEPPER et al. [1973]) if they maintain their intrinsic motivation when they feel forced to behave in a specific way by outside intervention. They are then rational to reduce the motivational factor under *their* control, i.e. intrinsic motivation. In principle, the application of policy instruments may also convey the feeling that *self-determination is therewith increased*, but this is likely to be a rare case. What matters is the relative effect of different external interventions on the individuals' subjectively perceived self-determination, a subject which will be extensively analysed below. (b) The agents' marginal utility of exerting intrinsic motivation is raised if the external intervention serves to inform the agents that the principal acknowledges their intrinsic motivation. This raises their *self-evaluation*. If, on the other hand, the principal makes clear by his or her intervention that he or she does not recognize that the agents exercise their intrinsic motivation in the task, it is worth less to the agents. Thus, a prize given for good performance supports intrinsic motivation, while a monetary reward is usually understood as a sign that the principal does not acknowledge the efforts arising from intrinsic interest.

Standard economic theory mainly analyses economic policy instruments with respect to their efficiency characteristics, but other criteria such as the distributional consequences, the time delay, the effect on the government budget and political and administrative aspects are also considered (see, e.g., BAUMOL and OATES [1979] for environmental policy). Once intrinsic motivation is taken to depend on the application of the instruments, an additional consideration becomes relevant: does a particular policy instrument support or damage intrinsic motivation? This question is to be answered on the basis of

the two criteria just listed, (a) the effect on *self-determination*, and (b) the effect on *self-evaluation*.

The two criteria may well be relevant simultaneously. A prize given in recognition of one's performance which is connected with a substantial sum of money (such as the Nobel prize) raises the marginal utility of the recipient's intrinsic motivation through the enlargement of self-determination as well as through the accompanying acknowledgment. Conversely, a person having been imprisoned despite having performed well according to the principal's wishes, has a lower marginal utility of exerting his or her intrinsic motivation both because of the loss in self-determination and the implied refusal to acknowledge the intrinsic interest applied.

The effect of policy instruments on intrinsic motivation depends on how exactly an external intervention is implemented. Consider for instance the principal-agent relationship in which a secretary is intrinsically motivated to do additional work which is beyond what is required by the employment contract. If the boss gives her (assuming she is female) a bunch of flowers, a box of chocolates or theatre tickets, this is perceived as a sign of recognition for the interest in the work supporting intrinsic motivation. If, on the other hand, she receives money as a compensation for the additional work, 'hidden costs of reward' tend to be created and intrinsic motivation to be damaged; the secretary then performs additional work only if she receives additional pay.

However, under slightly varying conditions, the same type of gift as just mentioned is likely to lower instead of raise intrinsic motivation. This will be the case when (i) the boss knows that the secretary regularly buys chocolate or regularly goes to the theatre, in which case the gift is perceived as a direct substitution for monetary payments, tending to reduce intrinsic motivation; (ii) gifts in terms of flowers, chocolates etc. are regularly given whenever additional work is performed, in which case it will be taken for granted and intrinsic motivation will not (or at least no longer) be raised; (iii) the gift is given for work which the recipient considers to be within the terms of the contract, in which case no positive effect on intrinsic motivation results (it may even be damaged); and (iv) the gift is interpreted as an effort to externally control self-determination and intrinsic motivation. Clearly, the way a gift is perceived and interpreted by the recipient differs between cultures (including 'corporate cultures').

While the precise way in which the instruments are applied is of considerable importance, based on the notions of self-determination and self-evaluation, it is nevertheless possible to advance a few conjectures about their general effects on intrinsic motivation. Three propositions can be advanced.

*Proposition 1.* Direct quantitative regulations (coupled with punishment if violated) tend to reduce self-determination of the agents to whom they are applied more than price incentive instruments and are therefore more damaging to intrinsic motivation.

When pricing instruments are applied (for instance when an undesired activity is taxed), the addressees have a 'free choice' in the sense that they are not forced to reduce or forgo an activity. They can decide for themselves on the extent to which they wish to change their behaviour, taking the cost of substituting into account. This point has always been recognized by economists but has not been related to motivation. Because individuals can (up to a point) determine the extent of adjustment to the externally imposed policy instruments themselves, their self-determination is less restricted than it is in the case of regulating. As a consequence, pricing destroys intrinsic motivation less than regulating<sup>4</sup>. The marginal utility of intrinsic motivation is less reduced ( $U_{ME}$  is less negative). This is an additional, so far neglected, reason for why pricing is more effective than regulating in economic policy.

However, it should not be overlooked that individuals often feel subjectively 'forced' by a change in prices, i.e. they do not necessarily share the economists' notion that they are still free to choose within their (changed) opportunity set<sup>5</sup>. Thus, when the wage rate falls, and the workers affected find it utility maximizing (or loss minimizing) to move to a location with better job opportunities, most of them feel that they are being *forced* to relocate, and accordingly experience a major reduction in their self-determination and intrinsic motivation to work. The incentive to actually relocate to locations with more jobs may, under these conditions, be looked at as if the workers were forced to do so by direct government intervention.

*Proposition 2.* The use of price instruments reduces self-evaluation and hence damages intrinsic motivation when it is argued and made clear (as economists tend to do) that once the price is paid to undertake an activity, there is no reason not to engage in it.

Provided a Pareto-optimal price is imposed on an activity with negative external effects, following standard economic reasoning there is nothing to

4. If violating a regulation is punished by a fine the difference to pricing becomes less clear-cut.

5. This is one conclusion one may draw from the empirical studies on the fairness of pricing compared to regulating. See KAJINEMAN, KNETSCH and THALER [1986] and FREY and POMMERERINE [1992]. The acceptability of the use of prices also varies across cultures, e.g. American workers find it to be more legitimate than Japanese workers, see, e.g., AOKI [1990]. Similar differences were found in professional economists' attitudes towards pricing compared to regulating between Americans and Europeans, see FREY, POMMERERINE, SCHNEIDER and GILBERT [1984].

morally disapprove of: '... if the charges were to be paid, few economists would express any criticism of a person undertaking the behaviour' (KELMAN [1983, p. 313], also COOTER [1984, p. 1523]). By implication, somebody refraining from the activity for intrinsic reasons, or not acting opportunistically, experiences that his or her feelings are being ridiculed. However, such statements and implications going with the use of pricing means that those persons exercising intrinsic motivation are not acknowledged; on the contrary, they feel that their intrinsically driven restraint is rejected, inducing them to reduce it. Such damaging effects on intrinsic motivation are of particular importance in the context of environmental policy, which may explain why tradable effluent permits are generally considered to be a 'license to pollute' by non-economists. This charge is vehemently rejected by standard economics which only looks at the *ex ante* incentives induced by the change in relative prices, while non-economists focus on the detrimental effect on intrinsic motivation, once the price has been paid. Applications to environmental policy are discussed more fully in Section III.

*Proposition 3.* Direct regulations which morally condemn an activity therewith enhance the self-evaluation of a person who refrains from it and bolster the respective intrinsic motivation.

Regulations conveying the notion that not exploiting them to the full is morally acknowledged support the corresponding intrinsic motivation, which makes them (*cet. par.*) a more attractive policy instrument. In many cases, the regulations clearly imply (but do not explicitly state) that staying below the intensity allowed is morally commendable. (Driving less than 30 km/h in built-up areas where children can play is obviously a good thing.) However, not all regulations imply that when a person engages less in the regulated activity than is allowed, this is positively acknowledged by the principal. (One example would be restricted parking where it is not morally acknowledged if one leaves the parking site before time has run out.) In a free society, at least, all that is not explicitly forbidden may be undertaken with a clear conscience. The situation may be quite different in an authoritarian society, where the legal rules are deliberately phrased in such a way that it remains unclear to the man-in-the-street whether or not a certain behaviour is morally admissible. Clearly, the way the public authorities present the introduction, and administer the use of a particular policy instrument influences its perception by the persons affected. If the government adopts a cynical view on people's motive for behaviour, intrinsic motivation is likely to be negatively affected.

III. APPLICATIONS

In order to demonstrate that the crowding effect of pricing and regulating on intrinsic motivation is of substantial relevance for economic policy, and under some circumstances leads to an optimal use of the instruments clearly deviating from standard theory, the analysis is applied to five policy areas. Attention will especially be paid to the environment, not only because it is topical but because some of the implications are apparent in this area. Other fields, discussed at shorter length, are crime prevention, social, manpower, tax and organizational policies.

*1. Environmental Policy*

Individuals' intrinsic motivation to preserve the environment may be called 'environmental ethics'<sup>6</sup>. The question is how the various instruments used to fight pollution affect environmental ethics. The following propositions are offered:

*Regulation (Emission Standards).* When individuals are forced by commands (backed by threats of punishment) not to damage the natural environment, following 'overjustification theory' the locus of control is shifted from internal to external forces. People behave in an environmentally responsible manner because they are forced to by the regulations, and there is little incentive to so behave due to one's environmental ethic. While the direct effect of regulating the environment is likely to improve its quality (though at high cost, see, e.g., TIETENBERG [1985], HAHN [1989]), there is a countervailing effect because the general environmental ethic is thereby undermined. This consequence is particularly serious in those areas of the environment where regulation is either ineffective or inapplicable due to high transaction cost, because in those areas behaviour is (by assumption) guided solely by intrinsic motivation. An example would be littering.

*Effluent Charges.* The induced change in relative prices (pollution is made more costly) makes people damage the environment less but also causes a substitution of extrinsic for intrinsic motivation; whether the environment improves can only be determined empirically. The damaging effect on en-

6. See, e.g., DRYSEK [1987], ROLSTON [1988], HARGROVE [1989], the readers by BLACKSTONE [1974] and SCHIERER and ATTIG [1983], or articles in the *Journal of Environmental Ethics*.

vironmental ethics is, however, smaller than in the case of regulation because individuals' self-determination is less impaired.

*Tradable permits.* The direct substitution effect caused is of similar size as that for effluent charges; with an optimal use of this instrument relative prices change to the same extent. The major difference is that tradable permits are perceived as a 'license to pollute' by individuals *once* the permit has been acquired. The owner of the permit is not morally condemned if he or she pollutes; it may even be perceived to imply that those who, for reasons of environmental ethics, do not pollute as much as the permits allow, are irrational. As a result, the use of tradable permits tends to strongly damage the intrinsic motivation to preserve the environment; the marginal utility of acting in a way conforming to environmental ethics ( $UME$ ) is expected to be strongly negative.

*Subsidies.* When individuals receive monetary support from the government to behave in an environmentally friendly manner, their self-determination is fully maintained, but more importantly, a clear sign of acknowledgment of their ethical behaviour towards nature is given. The marginal utility of acting intrinsically in favour of the environment is supported (i.e.  $UME$  is positive).

On the basis of these considerations, the following empirically testable hypotheses on the ranking of the effect of environmental policy instruments on environmental ethics can be established: A supporting effect by subsidies; a mildly damaging effect by effluent charges; a more pronounced undermining by direct regulations; and a strongly pronounced undermining by tradable permits. This ranking must be seen in the context of optimizing equation (5). It only provides a ranking with respect to the factor  $UME$ . This ranking is ineffective if environmental ethics are irrelevant for behaviour ( $BM = 0$ ). The optimal policy choice depends on, of course, also, the ranking of the environmental instruments with respect to the direct relative price effect ( $BE$ ). The result derived here of the ranking of instruments for combating pollution suggests that subsidies are a better instrument for improving the environment, and tradable permits a worse one, compared to what is suggested by standard economic environmental analysis (which only looks at instruments' effectiveness with respect to the direct effect  $BE$ ). This result is consistent with the empirical analyses of environmental policy [OECD, 1989; HAIN, 1989] revealing that subsidies are often, and tradable permits and effluent charges are little, used. Perhaps policy makers are more rational than assumed by some economists (see, e.g., BLINDER [1987, p. 147]), who attributes their behaviour to 'ignorance of the argument or elementary errors in logic'. Neither need policy makers' instrument choice be attributed to the pressure of interest groups (as implied by BUCHANAN and TULLOCK [1975]). It *may* indeed be the case, as suggested here, that policy makers and the public sense the damaging effect of

tradable permits and effluent charges on environmental ethics which makes them hesitant to use them.

While the existence of environmental ethics is well established for individuals, at least in industrial countries (see the literature quoted in footnote 6), firms under intensive competition cannot indulge in environmental ethics, or only to the extent that such behaviour is honoured by consumers and owners. Under these circumstances, the policy instruments only have a direct relative price effect ( $BE > 0$ ), and effluent charges and tradable permits are particularly effective. However, many firms have some discretionary room to engage in environmentally conscientious behaviour so that the effects of policy instruments on environmental ethics need to be taken into account.

## 2. Crime Prevention

The economics of crime [BECKER, 1968; TULLOCK, 1974] rests on the (direct) relative price or deterrence effect: when the cost of committing a crime is increased relative to legal activities, the extent of crime is reduced ( $BE > 0$ ). On the other hand, there is a great deal of evidence that intrinsic motivation is of crucial importance for people's behaviour in this area. Indeed, most sociologists, psychologists and criminologists concentrate exclusively on internal values with respect to crime, thus (implicitly) assuming that intrinsic factors have a systematic and strong effect on criminal behaviour (i.e.  $BM > 0$ ). GRASMICK and BURSICK [1990] found that when intrinsic motivation is introduced as a determinant of crime in addition to deterrence within a standard subjective expected utility maximizing model, behaviour is better explained. For the three crime areas studied there is strong evidence that the shame of violating one's intrinsic beliefs prevents criminal activities, highlighting 'the importance of internal control in producing conformity to the law' [p. 840].

When individuals' behaviour is more tightly monitored in order to raise the probability of apprehension, and if punishment is increased, actors observe the laws more strictly because of the higher expected cost of crime, and not because they are intrinsically motivated to behave morally. Due to this 'overjustification' effect, it is to be expected that the individuals, who, on average, then have a lower intrinsic motivation to obey the law, would exploit the possibilities allowed by the law more fully. For example, when maximum speed limits are starkly reduced, individuals observe them to the extent they find optimal in view of the expected punishment, but at the same time they tend to go to the limit wherever it suits them, because they are morally less inhibited (e.g. curves are taken at the maximum speed, which previously were not). If the damaging

effect on the intrinsic motivation to drive carefully is sufficiently strong, a reduction in the speed limit may lead to an unintended, perverse result, i.e. more, and not less accidents happen. There is an analogy to PELTZMAN's [1975] perverse effect of introducing safety belts<sup>7</sup>. In this case, the increase in accidents is due to the fact that the drivers compensate the induced reduction in risk by driving more recklessly. This is a special case of our more general substitution effect.

A perverse effect of increasing punishment has also been identified by AKERLOF and DICKENS [1982], and DICKENS [1986]. Their argument is based on a specific psychological theory - cognitive dissonance. They argue that when punishment is low, individuals build up a motivation to obey the law. With high punishment, on the other hand, no such build-up is needed, so that there is no restraint once the punishment is removed. Hence, higher sanctions may increase crime, a proposition for which some empirical evidence is adduced. AKERLOF and DICKENS' model may be considered a special case of the more general model used here. The major difference is that cognitive dissonance only comes into effect when punishment is removed. Our approach allows for positive and negative impacts on intrinsic motivation, depending on how an individual's perceived self-determination is affected, and on whether or not the external intervention is conceived by the individual to acknowledge or reject the exercise of intrinsic motivation. While the overjustification effect triggered by a rise in expected punishment damages intrinsic motivation, and therewith tends to reduce the effectiveness of increased punishment, there are circumstances in which intrinsic motivation, and therewith the effectiveness of punishment, is supported. A relevant case is when increased monitoring does not only serve to catch delinquents but also serves to acknowledge the moral behaviour of those not violating the law.

### *3. Social Policy*

An individual employer or the managers of a firm who care for the health and welfare of their employees for intrinsic reasons, and who introduce accident precaution measures beyond what is required by law and beyond what is demanded by the employees (given their wage rate and other conditions of

7. The evidence has been disputed, e.g. CRANDALL and GRAHAM [1984] find a modest beneficial effect. However, it has been observed far beyond driving that regulations are little, or not at all, effective. See, for instance, for consumer protection, occupational safety, health and pharmaceutical prescriptions, MAGAT and VISCUSI [1990], VISCUSI [1984].

work) will, to an extent, reduce their internal motivation when such measures are externally imposed by law. Such behaviour has indeed been empirically observed for regulations in the area of occupational health and safety in the United States, administered by OSHA: '... when they felt they acted responsibly, some business managers respond by taking the position that they will act no more responsibly than the agency's rules require' (BARDACH and KAGAN [1982, p. 107]; see also VELJANOVSKI [1984]). The overall change induced by imposing the social regulations are smaller than would be predicted on the basis of the direct regulatory effect (*BE*) only because the employers who are ahead of requirements reduce the amount undertaken for intrinsic reasons. The outcome can be different if the managers, who do more than required from a legal and profit-maximizing point of view, receive due acknowledgment when the new policies are introduced. However, continually indulging in intrinsic motivation is only possible if the product, takeover, and managerial markets are not fully competitive — conditions which seem to apply more in Japan and Europe than in the United States (see AOKI [1990]). With no dramatic change in competitive conditions, it is moreover to be expected that the intrinsically motivated part of social policy gets smaller, as the intrinsic social motivation is increasingly crowded out by government regulation of the area. Individual employers and firms in state welfare countries, such as in Scandinavia, are not likely to go beyond the government regulations because the employer's intrinsically motivated 'demand' for social policy has been taken over by the government. This proposition is consistent with empirical observations. Voluntary social work must be expected to decrease, an effect which has indeed been found in econometric analyses of the supply of volunteer labour [MENCHIK and WEISBROD, 1987, p. 135]. This explains why, in Sweden, the official policy is to pay for the donation of blood, in contrast to most other industrial countries (including not only European nations but also Japan and the United States where today more than 95 percent of all blood is obtained from unpaid voluntary donors (see HANSMANN [1989, p. 60]; HOUGH [1978]); in Sweden, despite its 'humanitarian' social ideology, intrinsic motivation leading to voluntary giving has been crowded out by government regulating [DRAKE et al., 1982, p. 118; ECKERT, 1985, p. 13]. A study group has quite generally found that 'voluntary work has traditionally been viewed in a negative light in Sweden' and that the activities of voluntary care organizations' are of modest proportions by the standards of many other countries [LÄGERGREN et al., 1984, pp. 210, 212]. In the Swedish setting this study group puts no faith in intrinsic motivations but they 'believe that a compulsory social service will be needed to provide [...] the care and welfare services needed' [p. 211]. On the other hand, in countries where the state interferes less with the social aspect of

the economy (see, e.g., DIXON and SCHEURELL [1989]), one would expect to see a larger extent of intrinsically motivated social action, which is again supported by both circumstantial evidence (in such countries voluntary social organizations are thriving) as well as by scientific research (see WEISBROD [1988] with extensive references).

#### 4. *Manpower Policy*

Property rights [ALCHIAN and DEMSETZ, 1972; FURUBOTN and PEJOVICH, 1974] and transaction costs [WILLIAMSON, 1985] economists find that due to human beings' opportunism a pervasive tendency for shirking exists. One of the main tasks of organizations is to introduce rules and regulations to reduce shirking. Employees with a high intrinsic motivation to do a good job thereby experience a reduction in their self-determination and react by curtailing their intrinsic work motivation. The introduction of external controls gives them a clear indication that the superior does not acknowledge their devotion to work, they feel that their high work morale is rejected. As a reaction, intrinsic motivation is undermined by the externally imposed regulations and work morale falls.

This size of the overjustification effect ( $B_M - U_{ME}/U_{MM}$ ) compared to the size of the direct regulatory effect ( $B_E$ ) varies systematically between occupations and skill levels. Increased regulations in simple jobs can well be tailored to result in higher performance, as any reduction in work morale can be counteracted by more intensive monitoring. The situation is quite different in professional, managerial, artistic and scientific occupations where monitoring is less, or not at all, effective, and where the performance depends essentially on intrinsic motivation. Accordingly, rational employers regulate jobs requiring a high work morale less than other jobs, a proposition consistent with empirical observations (see the extensive research on optimal work supervision, e.g. DONALDSON [1980] or REBER and VAN GILDER [1982]).

#### 5. *Tax Policy*

The neoclassical theory of taxation and tax evasion [ALLINGHAM and SANDMO, 1972] posits that an increased probability of being detected and punished decreases tax evasion because rational individuals react to the higher cost of cheating by evading less. This clear result is *not* supported by empirical research. An extensive survey of the available work in the area finds that 'most

studies have failed to demonstrate that higher penalty rates encourage compliance' [ROTH et al., 1989, p. 6]. It has even been concluded that 'most theoretical work to date is not particularly useful either for policy analysis or empirical study' [GRAETZ and WILDE, 1985, p. 357].

Our approach which includes a crowding-out effect of intrinsic motivation possibly explains the shortcoming of standard economic theory: tighter monitoring and heavier punishment of taxpayers negatively affect their tax morale (a particular kind of intrinsic motivation). The relative price effect of higher expected punishment is counterbalanced by reduced tax morale so that the net effect of a stricter tax policy is uncertain, or nil. The empirical literature emphasizes the importance of tax morale. This has been long established in Europe by STRÜMPPEL [1969] and SCHMÖLDERS [1970], and later also in the United States (e.g. WITTE and WOODBURY [1985], GRAETZ, REINGANUM and WILDE [1986]). Tighter monitoring and heavier fines for tax evasion implicitly, and often explicitly, imply that the tax authorities put no faith in the individuals' and firms' tax morale. As their intrinsic motivation is not recognized, the actors feel that they may as well be purely opportunistic, thereby reducing their 'overjustification'. Tax morale is not expected to be crowded out, however, if the tighter policy is perceived by the honest taxpayers to be mainly or exclusively directed against dishonest taxpayers.

A cooperative atmosphere and basic trust between taxpayers and the tax officials strengthens tax morale. Such a 'beneficial game' is the more likely to come about, the more extensively individuals can directly participate in political decision making (see the empirical evidence in POMMEREHNE and WECK-HANNEMANN [1991]). The citizens feel that the government is treating them fairly and providing useful public services with their tax money.

### *6. Organizational Policy*

The approach pursued here also throws light on the choice between forms of organization, in particular between a voluntary (paid) and a conscripted military service. The large body of economic literature on the issue<sup>8</sup> does not discuss the incentives to fight under the two institutional arrangements. While the different quality (education) of a volunteer as opposed to a conscripted army

8. See ANDERSON's [1976] bibliography, and the collection of articles by Tax [1967] and ANDERSON [1982] which, among others, include the well-known articles by AMACHER, MILLER, PAULY and WILLET. A more recent contribution is ROSS [1988].

are considered, the fighting morale or intrinsic motivation and therewith the productivity are (implicitly) taken as given. Yet the experience of the last two (major) wars the United States has been engaged in suggests that the choice between coercion and voluntarism strongly affects the efficiency of an army. Discipline and fighting morale in the conscripted American army which lost the Vietnam war was low, while it was high in the paid, voluntary army which successfully fought the war in the Gulf<sup>9</sup>. This impression is shared by scholars. The British military strategist and historian LIDDELL HART [1982, p. 35-36] flatly states: 'Twenty-five years spent in the study of war [...] brought me to see that the compulsory principle was fundamentally inefficient', and he attributes it to intrinsic motivation: 'Efficiency springs from enthusiasm [...] enthusiasm is incompatible with compulsion.' The most important and successful sections of the German military forces in WW II — the air force and tank force — were recruited on a semi-voluntary basis. The conscripted, ordinary German army did not have 'anything like the same enthusiasm [...] which constituted a basic weakness in Germany's apparent strength' (LIDDELL HART [1982, pp. 36-7], see, in general, KELLET [1982], RICHARDSON [1978]).

These empirical observations are consistent with our analysis. The more coercive military enlistment is, the more strongly is self-determination reduced undermining the intrinsic motivation to fight. A voluntary army, on the other hand, permits choice, does not affect self-determination and therefore does not damage the fighting spirit. Taking into account the effect of organizational form on intrinsic motivation also allows us to explain observations relating to different variants of the draft. A general conscription where all able men serve (as, e.g., in Switzerland) is less damaging than a lottery (as was, for instance, applied in the United States) because 'The man drafted on the basis of a lottery is a loser' [JANOWITZ, 1967, p. 74] and 'Under a lottery system ... the military system is considered a form of punishment [and] morale [is] more difficult to maintain' [HAYES, 1967, p. 18]. The draft lottery thus gives the individuals a clear signal that the government does not care for a citizen's intrinsic motivation to serve the country, inducing him or her to reduce morale.

Our analysis also suggests that to allow conscripts to buy their way out for a fee, or to provide a replacement as a 'means to increase the efficiency in a conscription system' [ROSS, 1988, p. 15] is ill conceived because it is bound to undermine the intrinsic motivation of those remaining in the army. During the

9. Lieut. General JOHN H. YEOSACK, commander of the army units in the Gulf said 'I have fewer disciplinary problems commanding a third of a million troops now than I did in 1973 commanding 1,000 men' [*Time*, March 18, 1991, p. 25]. See also GARY BECKER's column on the volunteer army [*Business Week*, March 25, 1991, p. 14] espousing the same view.

American Civil War, both the Union and the Confederation allowed this form of evasion, with such dire consequences to both sides that the experiment was given up [BILLINGS, 1968; ROSS, 1988].

#### IV. CONCLUDING REMARKS

In order to better understand human behaviour and the effect of economic policy instruments it is crucial to look beyond externally imposed interventions of pricing and regulating, and to consider how they affect intrinsic motivation. Empirical research within cognitive social psychology shows that individuals lower their intrinsic motivation when external controls reduce their perceived self-determination and self-evaluation ('crowding-out effect'). By the same token, more leeway for action and acknowledgment by principals tends to enhance intrinsic motivation ('crowding-in effect').

These relationships are of immediate relevance for economics. The analysis suggests that (i) regulations are more damaging to intrinsic motivation than are instruments based on pricing; (ii) pricing undermines intrinsic motivation when it implies that non-opportunistic or moral behaviour is ridiculous; (iii) direct regulations condemning an activity morally support the intrinsic motivation to refrain from it. In addition, a cynical view by the government on people's motives for behaviour is likely to negatively affect their intrinsic motivation.

The application to various policy areas indicates that, under identifiable conditions in which intrinsic motivation is systematically and strongly affected by pricing and regulating, the optimal use of the policy instruments changes significantly. For the case of environmental policy it is shown that subsidies (which tend to bolster environmental ethic) are to be preferred, and tradable permits (which, once acquired, are perceived as a 'license to pollute' and therefore damage environmental ethic) are less preferable than suggested by standard economic theory which considers only the direct effect. In the case of crime prevention, the conditions are identified in which increased expected punishment increases crime and thus produces a perverse outcome. In social policy, government intervention crowds out the intrinsic motivation to undertake social measures on one's own. This explains the smaller extent of voluntary social work in state welfare countries compared to countries with less public welfare intervention. For manpower policy, the theory predicts that professional, managerial, artistic and scientific activities, for which work morale is crucial, are less strongly regulated by employers than occupations where performance can more easily be monitored. Tighter monitoring and heavier punishment for tax evaders tends, under many circumstances, to crowd out tax

morale which reduces tax revenues. With respect to organizational design the theory predicts that volunteer soldiers have a higher fighting morale and therefore (ceteris paribus) a higher productivity than drafted soldiers. A general conscription is less damaging to intrinsic military motivation than a lottery system, and the possibility for conscripts to buy their way out undermines it, and is therefore not undertaken by a rational decision maker over an extended period of time. These, as well as other propositions derived from the theory, are consistent with empirical observations.

The approach constitutes an attempt to introduce a systematic and empirically founded psychological effect into economics without giving up the rational choice framework. Preferences are endogenous, but in a way that allows us to derive empirically testable propositions relevant for economic policy making.

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SUMMARY

Beyond prices and regulations a third motivation influences human behaviour: intrinsic motivation. Under identifiable conditions, rational individuals reduce their intrinsic motivation when prices and regulations are imposed from the outside ('crowding-out effect'). Conversely, policy instruments which acknowledge intrinsic motivation and extend actors' self-determination 'crowd-in' intrinsic motivation. Empirical studies support these psychological effects. Regulations damage intrinsic motivation more than pricing; and subsidies are more, and tradable permits less, attractive than suggested by standard environmental economics. In the areas of crime prevention, social, manpower, tax and organizational policy, empirical observations can be better explained than by standard economic theory.

ZUSAMMENFASSUNG

Menschliches Verhalten wird nicht nur durch Preise und staatliche Eingriffe (Regulierungen) beeinflusst, sondern es gibt einen dritten Motivationsfaktor: Die intrinsische Motivation. Unter identifizierbaren Bedingungen reduzieren rationale Individuen ihre intrinsische Motivation, wenn ihnen Preise und Regulierungen von aussen auferlegt werden («Verdrängungseffekt»). Die intrinsische Motivation wird geschädigt, weil mit den Politikinstrumenten eine Geringschätzung der intrinsischen Motivation und eine Einschränkung der Selbstbestimmung der betroffenen Individuen verbunden ist. Unter angebbaren Bedingungen kann die intrinsische Motivation auch gestärkt werden («Verstärkungseffekt»). Diese psychologischen Effekte werden durch die Ergebnisse empirischer Studien gestützt. Direkte staatliche Eingriffe schädigen die intrinsische Motivation stärker als Preise. Subventionen erweisen sich als günstiger, und handelbare Zertifikate und Emissionsgebühren als ungünstiger als sie gemäss der üblichen Umweltökonomie sind. Der hier vertretene Ansatz hilft empirische Phänomene im Bereich der Kriminalitätsbekämpfung, der Sozial-, Arbeitsmarkt-, Steuer- und Organisationspolitik zu erklären, die der Standardökonomik schlecht oder gar nicht zugänglich sind.

RÉSUMÉ

Le comportement humain est soumis aux influences des prix et de la réglementation, mais aussi à une troisième influence: la motivation intrinsèque. Dans des conditions identifiables, les individus rationnels réduisent leur motivation intrinsèque quand prix et règlements sont imposés. D'autre part, la motivation intrinsèque peut être fortifiée par des instruments politiques supportant et favorisant la motivation intrinsèque et l'autodétermination de l'individu. Ces effets psychologiques ont été prouvés par des études empiriques. La motivation intrinsèque est plus perturbée par la réglementation que par les prix et les subventions sont plus attrayantes que ne le suggère l'économie de l'environnement habituelle. Dans les domaines de la prévention de la délinquance, de la politique sociale, de la fiscalité, de la main d'œuvre, les observations empiriques sont mieux expliquées par la motivation intrinsèque que par la théorie économique.

