
3 Motivation crowding theory — a new approach to behaviour

Bruno S. Frey
University of Zurich

3.1 Standard theory: the relative price effect

The centre of modern microeconomics is a well-defined theory of human behaviour, often called *homo economicus*. The theory assumes that individuals act rationally (that is, consistently) when they are subject to external constraints. This model provides clear and empirically testable predictions about how individuals react to changes in relative prices, controlling for changes in income. This 'price effect' applied to demand implies that a price rise reduces the quantity demanded — the demand curve is negatively sloped. Applied to supply the price effect states that a higher price induces an increase in supply; the supply curve is positively sloped. This also means that paying a higher compensation unequivocally raises the effort and quantity of work.

This simple theory of human behaviour has been extremely successful.¹ What has become known as 'Economic Imperialism' (Hirschleifer 1985; Lazear 2000; Stigler 1984), or the 'rational choice approach', is mainly due to an application of the price effect to a large number of issues and problems, as pioneered by Gary Becker (1976). The more traditional applications are to education, health, the natural environment and politics; more unorthodox ones are to, for example, the family, the arts, crime, sports, and religion. This imperialism has not been without controversy both inside and outside economics. One of the major points of criticism has been that this theory of behaviour is much too simple to be able to account for human behaviour, especially outside the area dominated by explicit prices (for example,

¹ The empirical application is, however, not always easy especially because all other factors, except the price change, must be controlled for. For small price changes, and when only a small part of total expenditures is spent on the respective goods and services, the income effect can be disregarded because of its small magnitude. This helps to identify the Price Effect.

Lane 1991; Sen 1977). In these applications outside the market, the term 'price' is — used in its broad sense as a cost — often difficult to observe, as it takes the form of opportunity cost. As the large literature on the non-market applications demonstrates, a skilful use of the price effect yields fascinating and non-trivial insights.²

Indeed, economic imperialism has had a substantial impact on other social sciences and beyond. In political science, the corresponding field is called 'public choice' or 'political economics'; in sociology, 'rational choice'; in legal studies, 'law and economics'; and in historical studies 'cliometrics'.

3.2 A generalisation: a broader set of motivations

Over the past few years, there has been a dramatic change in how motivation is seen to affect behaviour.³ Based on results originally found in experimental social psychology (Deci 1971), an effect of a price change on behaviour has been identified, which predicts an exactly opposite effect on behaviour to that predicted by the classical price effect. In particular, a price increase is predicted to decrease, rather than increase, the supply of work offered. This is a remarkable result; it goes much beyond the many 'behavioural anomalies'⁴ that have been identified in other parts of what today constitutes 'psychology and economics'⁵ (sometimes also called 'behavioural economics'⁶). This 'crowding-out effect' is part of a larger theory that also encompasses neutral and 'crowding-in' effects. As will be argued, the crowding effect leads to a generalisation of the relationship between motivation and behaviour; it certainly does not substitute for the price effect. Rather, the price effect is taken to work always in the way suggested by standard theory, but an additional type of motivation is added, *intrinsic motivation*, which, under

2 See for example: Frey (1992, 2001); Kirchgassner (1991); McKenzie and Tullock (1975); Radnitzky and Bemholz (1987).

3 See for example, the papers by Gaechter, Meier, Bohnet, Benz and Oberholzer-Gee, in Frey and Stutzer (2007).

4 Such as the endowment, reference point, opportunity cost, anchoring, availability, representativeness, overconfidence effects and biases (for example see, Dawes (1988); Frey and Eichenberger (1994); Kahneman, Slovic and Tversky (1982); Thaler (1992)).

5 Important forerunners are: Akertlof (1984); Brennan and Pettit (2004); Frank (1988); Hirschman (1970); Leibenstein (1976); Schelling (1980); Schlicht (1998); Soltovskiy (1976). An effort to develop a 'psychological economics' independent of neo-classical economics has, for example, been undertaken by Furnham and Lewis (1986) and Lea, Tarpy and Webley (1987).

6 This is a misnomer because the 'behavioural' school in psychology posits a mechanistic response to outside interventions which is, of course, in clear contrast to what psychological economics stands for.

identifiable conditions leads to dramatically different behavioural responses to price changes.

The crowding-out effect may be illustrated by two examples:

- A boy on good terms with his parents willingly mows the lawn of the family home. His father then offers to pay him money each time he cuts the lawn.

The crowding-out effect suggests that the boy will lose his intrinsic motivation to cut the lawn (he may go on doing so, but now he does it because he is paid). Furthermore, 'motivational transfer' effects mean that he will not be prepared to do any type of housework for free.

- You have been invited to your friend's home for dinner, and he has prepared a wonderful meal. Before you leave, you take out your purse and give your friend an appropriate sum of money.

Probably nobody in his right mind would behave in this way, because virtually everyone knows that this would be the end of the friendship. By paying, the relationship based on benevolence is fundamentally transformed; if it survives at all, it becomes a commercial one. Yet there is one person who would not hesitate to pay his friend for dinner: classical *homo economicus* would do so, following the price effect — and ends up without friends, to his own chagrin.

The two examples indicate that the price effect, on which economics is founded, is not valid under all conditions and circumstances, and that the relationship between a monetary reward offered and supply must be analysed in a wider perspective. The 'holy cow' of modern economics needs to be reconsidered. External and, in particular, monetary incentives do not mechanically induce human beings to act in the desired way, because, under identifiable conditions, they crowd out intrinsic motivation. Thus, external and internal incentives are not cumulative, as has been assumed as a matter of course in economics. A more refined model of humans is needed in which behaviour relies to some extent on purely internal considerations, in particular on self-esteem and self-determination.

Section 3.3 develops Crowding Theory, discussing its basis in social psychology, integrating it into economics, and analysing the conditions under which the crowding-out effect takes place. Section 3.4 looks at crowding effects in a particular domain, taxation. Section 3.5 considers spill-over effects to related areas. Conclusions are drawn in section 3.6: both economic theory and policy are strongly affected by the existence of crowding effects. More care should be taken when applying incentive payments in firms, or in the public sector (for example, when following New Public Management ideas), or when using incentive instruments in economic policy (for example, with respect to the environment).

3.3 Crowding theory

Psychological background

Social psychologists have empirically identified that external intervention, in the form of a reward, reduces individuals' intrinsic incentives. This relationship has been variously termed the 'undermining effect', 'overjustification effect', 'the hidden cost of reward' (Lepper and Greene 1978), 'corruption effect' (Kruglanski 1978) or 'cognitive evaluation theory' (Deci and Flaste 1995; Deci and Ryan 1985) by the psychological scholars involved.

The hidden costs of reward rest on the distinction between internal and external motivation:

One is said to be intrinsically motivated to perform an activity when one receives no apparent reward except the activity itself. (Deci 1971, p. 105)

The distinction between intrinsic and extrinsic motivation is not clear-cut. Indeed, it might be claimed that, in the last instance, all motivation comes from outside. On the other hand, what matters, after all, is the inner satisfaction one derives from one's behaviour. While the precise distinction might be important for psychology, for the purpose of explaining economically and socially relevant behaviour, it suffices to distinguish between those activities which people mainly do just because they like them, and other activities which they mainly do because of monetary payment, or because they are ordered to do them. In many cases, the two kinds of motivation go together. What matters in our context is that an identifiable relationship exists between intrinsic and extrinsic motivation.

Three psychological processes have been identified to account for the 'hidden cost of rewards':

1. When individuals perceive the external intervention to be controlling, in the sense of reducing the extent to which they can determine actions by themselves, intrinsic motivation is substituted by extrinsic control. This *loss of self-determination* shifts the locus of control from the inside to the outside of the person affected. Individuals, who are forced to behave in a specific way by outside intervention, would feel 'overjustified' if they maintained their intrinsic motivation. They thus behave rationally when reducing the motivational factor under their control, that is intrinsic motivation.
2. Outside intervention undermines an individual's intrinsic motivation if their intrinsic motivation is not acknowledged. The person affected feels that his or her competence is not appreciated, which leads to impaired self-esteem, resulting in reduced effort. Self-esteem is of central importance for human beings.

3. Intrinsic motivation is reduced when a person is deprived of the chance to exhibit this intrinsic motivation to others. Thus, when a host is paid by her guests, the host can no longer show them that she values their company as such. As a reaction, the persons affected exhibit 'altruistic anger', and will in turn relinquish the inner motivation, and behave according to external motives.

Social psychology offers a theory that competes with the hidden cost of reward. Equity literature has repeatedly found that increasing pay *increases* productivity and, presumably, intrinsic motivation. In contrast, cognitive evaluation literature has found that increasing pay *decreases* intrinsic motivation and hence, presumably, productivity. It follows, and has been empirically supported, that, depending on the conditions, increased rewards raise or lower intrinsic motivation and, by extension, productivity. The reverse also holds: when inadequate rewards are provided, intrinsic motivation may sometimes *decrease*, and at other times *increase*.

Conditions

The following conditions determine which rewards negatively or positively affect intrinsic motivation:

- External intervention *crowds out* intrinsic motivation, if the individuals affected perceive the intervening individuals to be *controlling*. Self-determination, self-esteem, and the possibility for expression suffer, and the individuals react by reducing their intrinsic motivation in the activity controlled.
- External intervention *crowds in* intrinsic motivation if the individuals concerned perceive it as *supportive* (or informative in a positive way). Self-esteem is fostered, and individuals feel that their self-determination is encouraged which, in turn, raises intrinsic motivation.

Both conditions are formulated in terms of subjective perceptions. Psychologists, however, have gone further, and have identified conditions applying more generally. Thus, the undermining effect is found to be the stronger:

- the more the rewards are expected (unexpected rewards do not crowd out intrinsic motivation, or do so only weakly)
- the more salient the reward
- the more contingent the reward is on the task or on performance
- the more deadlines and threats are used
- the more intensive the surveillance
- the more routine the rewarded work.

Obviously, the hidden costs of reward are only relevant if the persons concerned have some amount of intrinsic motivation. Indeed, intrinsic motivation has been observed to be undermined particularly strongly for those who previously felt highly committed.

With respect to external intervention, psychologists have found that monetary rewards are more undermining than other material rewards. Praise and social approval are more likely to be interpreted as supportive rather than controlling.

Integration into economics

Crowding effects generalise the 'hidden costs of reward' in three important ways (Frey 1997):

1. Intrinsic motivation is potentially affected by all kinds of intervention coming from outside the person considered. Thus, not only rewards, but also *commands*, may crowd out intrinsic motivation.
2. Intrinsic motivation may be *reduced* or *raised* (crowding-out and crowding-in). Thus, there may not only be hidden 'costs' but also hidden 'gains'.
3. External intervention affects the *internally-held values* of individuals. Hence, they do not only affect narrowly defined intrinsic motivation, but also *norms* internalised by individuals. Moreover, external intervention may induce a shift from other-regarding or group-regarding to *more selfish* preferences and behaviour.

These three generalisations greatly enlarge the scope and applicability of Crowding Theory.

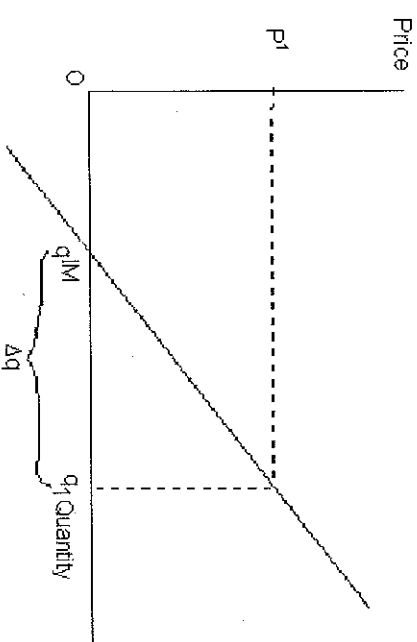
To apply crowding theory to issues dealt with in economics, it is necessary to simultaneously take into account the price effect normally considered in economics. Here, attention is focused on crowding-out, because its effects on behaviour act contrary to the price effect.

Supply falls

Consider a normal, positively-inclined supply function (S in figure 3.1) for an activity. At zero price, the individuals considered are prepared to supply the quantity q^M . That is, to some extent they are assumed to undertake the activity for its own sake, or be intrinsically motivated. Such behaviour is perfectly consistent with economic theory. Following the price effect, conventional economic theory predicts that a price rise (from O to p_1) raises supply from q^M to q_1 , moving along

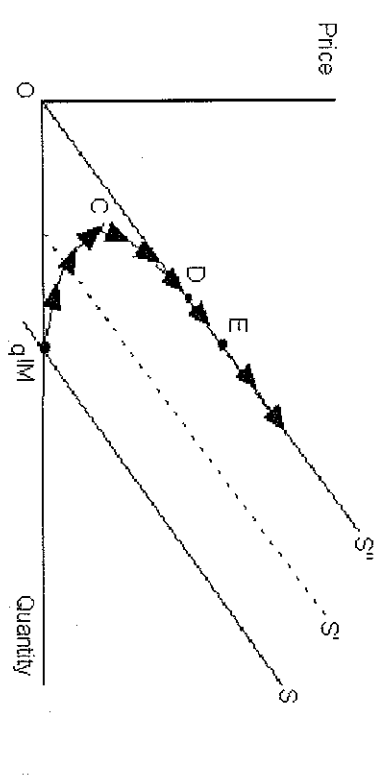
the supply curve. The extrinsically induced supply increase Δq is perfectly *additive* to the intrinsically supplied quantity q^M , thus $q_1 = q^M + \Delta q$.

Figure 3.1 Conventional supply theory



In contrast, the crowding-out effect induces a shift in the supply curve to the left (figure 3.2).

Figure 3.2 Supply including crowding-out effect



With a positive price offered, the supply curve moves to the left (from S to S'), until intrinsic motivation is completely crowded out (at S'). More precisely, each supply curve is associated with a given stock of intrinsic motivation. Once this stock is

exhausted, or at least constant, supply only moves along S" as the price effect exists.

The supply response is quite different from that suggested by conventional economic theory. In the figure, it is assumed at first that the crowding-out effect prevails over the price effect, and supply *falls*: the individuals concerned reduce the quantity of their activity. Beginning at point C, the price effect dominates. Only when point D is reached does the quantity supplied exceed the amount previously intrinsically supplied. At point D on supply curve S", the stock of intrinsic motivation is constant (and possibly exhausted), so that the price effect exclusively determines supply behaviour.

In stark contrast to the additivity assumption held in conventional economics, intrinsic and extrinsic motivation are *non-additive*. The figures serve merely as illustrations. They refer to only part of the crowding theory. What they do show is that crowding-out is not presented as an alternative to conventional economics, but rather as an extension. Moreover, it should be kept in mind that the crowding-out effect depends on particular conditions. The following propositions on the size of the crowding effect can be formulated, based on insights gained by psychologists. The crowding-out effect is the more pronounced:

- the more personal the relationship between a principal, and his or her agent, the larger the agent's participation possibilities
- the more uniform the external intervention is; that is, the less individual differences in intrinsic motivation are acknowledged by the principal
- the more the external intervention (in particular the rewards extended) are contingent on specific performance, instead of being directed at general behaviour.

Obviously, the crowding effect also has important consequences for policy. Thus, many seemingly 'modern' compensation systems have to be reconsidered. Pay-for-performance schemes negatively affect performance, insofar as they negatively affect work morale, a specific kind of intrinsic motivation. Under certain conditions, for example with volunteers who are essentially intrinsically motivated to work, it may be a mistake to introduce monetary compensation at all.

Supply is transformed

External intervention, in the form of a monetary reward, affects not only the quantity, but especially the *nature* and *quality* of the supply forthcoming. Quite generally, laboratory research indicates that quality tends to be substituted by quantity. Equally well established is the negative effect on incidental learning that

people acquire in complex tasks, because attention is focused on the central task that is rewarded. For tasks that are not well understood, monetary incentives can be dysfunctional, that is they can lead to lower performance. Finally, external rewards have been found to decrease artistic and verbal creativity. These results, observed by psychologists, must be seen in perspective. They only refer to how intrinsic motivation is affected and do not, or insufficiently, consider the more direct incentive effects of monetary compensation on performance. Thus, it has been well established in the study of the economics of culture that artists are able to create masterpieces, even when they are doing so for monetary gain.

In important cases, external intervention via money transforms the nature of a good or relationship even more fundamentally. Sometimes, the offer of a monetary reward completely destroys the existing commodity in question. At the beginning of this chapter, the example of paying a friend for his dinner invitation was given. Romantic love is an equally striking case: it simply cannot be bought, and if an attempt were made to buy it, the good is no longer unselfish love but, taken to the extreme, prostitution. The same is true for trust, admiration or friendliness, which change their intrinsic nature when they are bought. This is the problem of the millionaire woman, who never knows whether her suitors love her, admire her, and are friendly to her because of herself or because of her money. As long as money is involved, the suitors have no means of revealing 'sincere', that is intrinsic, love and admiration. Rulers essentially face the same problem. The literature is full of accounts of how such 'unfortunate' persons undertake experiments to try to differentiate between the two, usually by pretending to be poor and powerless — sometimes even with success, but (revealingly so) mostly only in fables.

The transformative effect of money on human relationships has been discussed under the term 'commercialisation effect'. It can vary greatly between historical periods. Thus, for example, from the 16th to the 19th century, the prevailing view in Europe was that the use of prices *improves* behaviour or, in other words, crowds in intrinsic motivation. Montesquieu (1961, p. 81), for example, believed that 'commerce ... polishes and softens ways of behaviour, as we can see every day'. Thus, the crowding effects have a considerably long history.

3.4 Empirical evidence on crowding theory

Experiments

Social psychologists have extensively studied the hidden costs of reward in the laboratory. There is such a large number of laboratory experiments on the crowding

effect that it is impossible to summarise the results. Fortunately, there have already been no less than five formal meta-analytical studies of crowding theory. The first meta-analyses undertaken essentially support the findings that intrinsic motivation is undermined if the externally-applied rewards are perceived to be controlling by the recipients. This view was challenged on the basis of a meta-analytical study referring to the period 1971–1991. It concluded that the undermining effect is largely 'a myth' (Cameron and Pierce 1994). This study attracted a great deal of attention, and many scholars, on that basis, seem to have concluded that no such thing as a crowding-out effect exists.

The most extensive and recent study by Deci, Koestner and Ryan (1999) shows that these conclusions are unwarranted: the crowding-out effect is indeed a robust phenomenon of significant size under the specified conditions. It identifies a number of significant shortcomings and misinterpretations. One is that Cameron and Pierce (1994) omitted nearly 20 per cent of the relevant studies as outliers, used mistaken control groups, and misclassified some of the studies. Another is that they included dull and boring tasks, for which a crowding-out effect cannot occur, as the participants had no intrinsic motivation to begin with. In order to correct these shortcomings, an extensive meta-analysis, including all the previous studies, as well as several studies which appeared since then, was undertaken. The 128 studies analysed span the period 1971–1997. It turns out that tangible rewards undermine intrinsic motivation for interesting tasks (that is, tasks for which the experimental subjects show an intrinsic interest) in a highly significant and very reliable way, and that the effect is moderately large. This holds, in particular, for monetary compensation, which is perceived to be controlling by the experimental subjects, and therefore tends to crowd out intrinsic motivation. The crowding-out effect is stronger with monetary than with symbolic rewards. It is also larger with expected than with unexpected rewards. When the problems at issue are complicated, the negative relationship between reward and performance is stronger than when the problems are simple. In all these cases, it is a requirement that the behaviour was initially perceived to be interesting, and, therefore, intrinsically rewarding. As a consequence, a bonus system usually, but not always, makes employees lose intrinsic interest in the immediate goal, such as serving the customers.

Experimental economic research has also identified various crowding effects on motivation in the economic setting. An increasing number of studies have been published on the subject. Several experiments demonstrate a crowding-out effect on intrinsic motivation in the form of a reduced tendency for reciprocity, that is, toward more narrowly conceived selfish behaviour.

Some experiments have estimated the exact relationship between pay and performance, as displayed in figure 3.2 above. Whenever money was offered, the

standard price effect was observed: that is, a larger amount of money resulted in higher performance. The mere incidence of payment, however, lowered performance in many cases. In these experiments, with all performing the same task, only those groups which received a considerable amount of pay did as well as the groups that worked for free. The evidence suggests that the type of contract, and the (monetary versus non-monetary) work environment, evoke different responses from the agents.

The crowding effects have also been studied in contract enforcement, with respect to the trustworthiness of the participants (Bohnet, Frey and Huck 2000). In an evolutionary game experiment, a first mover relies, to a certain degree, on the trustworthiness of a second mover, because the legal system allows only incomplete contracts. The first mover can either offer a contract, or not play at all, while the second mover has the choice of performing or breaching the contract. The level of contract enforcement is given by the probability of bearing the resulting costs of non-compliance. It was found that low levels of legal enforcement tend to crowd in trustworthiness: the first movers must make careful decisions on whom to enter a contract with, as they cannot rely on the legal system. As a consequence, the second mover is motivated to behave in a trustworthy way. In contrast, when contracts are near-perfectly enforced, there is no observable crowding effect taking place, as first movers enter the contracts because they know that the second movers are deterred from breaching the contract. Personal trust is replaced by institutional trust. With intermediate levels of law enforcement, however, trust is crowded out, as the first movers can neither rely on the second movers' reciprocal behaviour nor on the legal system, resulting in a non-monotonic relationship between trust and the degree of contract enforcement.

Crowding effects have not only been identified in experiments, but also are of great importance for practical, real world problems.

Case studies

Day care centres provide a striking case of monetary intervention achieving the opposite of what would be expected on the basis of the price effect. Such institutions are confronted with the problem that parents sometimes arrive late to pick up their children, which forces the employees to stay after the official closing time. To remedy the situation, economists would typically suggest imposing a monetary fine for collecting children late. Such punishment is expected to induce parents to be on time. A study on a day care centre in Israel revealed a completely different outcome (Gneezy and Rustichini 2000a, 2000b). After the introduction of a rather hefty fine, the number of parents arriving late increased substantially, which is in line with the crowding-out effect. Introducing a monetary fine transforms the

relationship between parents and day care employees from a mostly personal to a more monetary relationship. As a result, the parents' intrinsic motivation to keep to the time schedule was reduced or crowded out altogether, the perception being that the employees were now 'paid' for the disamenity of having to stay longer. Being late for picking children up was no longer associated with any feeling of guilt.

A crowding effect was also identified with respect to performance measurement in the airline industry (Austin and Gittel 1999; Frey and Osterloh 2002). The specific issue was how airline carriers deal with delays and the responsible factors or persons. Attributing a single delay as exactly as possible to its source (as suggested by the principal-agent theory) turned out to be negatively correlated with the achieved end, namely the airline's on-time flight performance. The most successful company was the one that used the general term 'team delay' to indicate the source of a delay caused by the personnel. It thereby crowded in the intrinsic motivation to help out other units and groups, instead of provoking disagreements, finger-pointing and cover-up activities.

Econometric studies

Work motivation is an area where crowding theory is particularly relevant (Frey and Osterloh 2002, 2005; Osterloh 2007; Osterloh and Frey 2000, 2004, 2006; Osterloh, Frey and Frost 2001, 2002). An econometric study (Barkema 1995) looks at firms where the intensity of the personal relationship between the principals and the agents depends on the form of *supervision*. In the case of managers as agents of a certain firm, three major types can be distinguished:

1. The managers are controlled by the parent company. This corresponds to a rather impersonal relationship so that, following our proposition above, a positive influence of monitoring on managers' performance is expected, because intrinsic motivation is little affected or not at all.
2. The managers are controlled by their firm's chief executive officer, which represents a personalised relationship. According to our proposition, monitoring in this case tends to reduce the agents' effort, as external intervention shifts the locus of control toward external preferences, and the agents perceive that their competence is not acknowledged by their superior.
3. The managers' behaviour is regulated by the board of directors. The crowding-out effect is, according to Crowding Theory, expected to be greater than in case (1) but smaller than in case (2).

The data set refers to 116 managers in medium-sized Dutch firms in 1985. They range from between less than 100 to more than 30 000 employees, and cover a wide

variety of industries. The managers' individual effort is operationalised as the number of hours invested. Three aspects capture the intensity of regulating: the regularity with which their performance is evaluated; the degree of formality of the evaluation procedure; and the degree to which the managers are evaluated by well-defined criteria. The results are consistent with the proposition advanced. The econometrically estimated parameters, capturing the effect of external intervention on work performance, turn out to be positive and statistically significant in case (1) of impersonal control. In case (2) of personalised control, on the other hand, the corresponding parameter is statistically significant and negative. This implies that regulating behaviour strongly crowds out intrinsic motivation, so that the net effect of control on performance is counter-productive. In the intermediate case (3) of somewhat personalised control, the estimated parameter does not deviate from zero in a statistically significant way.

Another econometric study looks at the voluntary sector, which is of substantial size in developed economies. Several studies have established that intrinsic motivation is important when it comes to volunteering. A unique data set from Switzerland is used to evaluate how financial rewards for volunteers affect their intrinsic motivation. The incidence of rewards is found to reduce volunteering. While the size of the rewards induces individuals to provide more volunteer work, the mere fact that they receive a payment significantly reduces their work efforts by approximately four hours. The magnitude of these effects is considerable. Evaluated at the median reward paid, volunteers indeed work *less*. These findings have important implications for policy towards volunteer work. Direct incentives may backfire, leading to less volunteering. Even individuals reacting to changes in relative prices, as they are in our data set, may be subject to motivational crowding-out.

We now consider in more depth another important social and economic issue, tax evasion. It will be shown that more intensive political participation possibilities, in the form of popular referenda and initiatives, result in lower tax evasion in the respective political units as intrinsic motivation, in the form of tax morale, is crowded in.

3.5 Crowding effects in taxation

The intrinsic motivation to pay one's taxes — or tax morale — depends strongly on the extent of trust the citizens have in the political system. When individuals are alienated from government, and do not think that they are treated fairly by the political process, they are more inclined to pursue their selfish interests, that is, to evade taxes, only taking into account the expected probability of being punished. A

crucial factor increasing trust in government is the extent to which the citizens can actively participate in the political process (Feld and Frey 2002, 2007; Feld and Tyran 2002; Murphy 2004; Pommerhne and Weck-Hannemann 1996; Torgler 2005, 2007; Torgler and Frey 2007).

Switzerland presents a suitable test case, because the various cantons have different degrees of political participation possibilities. It is hypothesised that the more extended political participation possibilities in the form of citizens' meetings, obligatory and optional referenda and initiatives are, and the broader the respective competencies are, the higher is tax morale and (*ceteris paribus*) tax compliance. In an empirical analysis, a Crowding-In Effect is hypothesised.

On the basis of these characteristics, about one third of the 26 Swiss cantons are classified as pure direct democracy (D), another third as pure representative democracies (R), and the rest satisfy only some of the characteristics. A cross-section time series (for the years 1965, 1970, 1978, that is 78 observations) multiple regression, explaining the part of income not declared Y_{nd} , yields the following results (t-values in parentheses):

$$Y_{nd} = 7.17 - 3.52p - 2.42f + 0.79t - 0.36d - 2.72Y(\ln) + 0.57NY - 1.09A - 7.70D$$

$$(-1.98) \quad (-0.62) \quad (2.10^{**}) \quad (-2.51^{*}) \quad (-0.30) \quad (2.98^{**}) \quad (-2.53^{*}) \quad (3.80^{**})$$

$$R^2(\text{adj.}) = 0.69, \text{ d.f.} = 41, F = 11.08$$

$$Y_{nd} = 8.98 - 3.22p - 2.32f + 0.59t - 0.42d - 1.03Y(\ln) + 0.60NY - 0.82A + 4.02R$$

$$(-1.72) \quad (-0.36) \quad (1.70) \quad (-3.47^{**}) \quad (0.22) \quad (3.07^{**}) \quad (-1.93^{*}) \quad (2.23)$$

$$R^2(\text{adj.}) = 0.65, \text{ d.f.} = 41, F = 9.43$$

(*) and (**) indicate statistical significance at the 95 per cent and 99 per cent levels, respectively.

The explanatory variables are:

p = probability of detection (the number of individual income tax audits per 1000 tax payers)

f = penalty tax rate

t = mean marginal tax rate

d = income deduction possibilities

$Y(\ln)$ = per capita income (in natural log)

NY = non-wage income

A = old-age taxpayers' share (reflecting experience in tax matters).

The coefficients of the variables indicating the type of democracy (D, R) — the other variables are used to control for other influences — have the theoretically expected signs. In cantons with a high degree of direct political control (D), tax morale is (*ceteris paribus*) higher. The share of income concealed falls short of the mean of the other cantons by 7.7 percentage points or, in absolute terms, the average amount of income concealed is about 1600 Swiss Francs (per taxpayer) less than the mean income concealed in the other cantons. In contrast, in cantons with a low degree of political control typical for more representative cantons (R), tax morale is (*ceteris paribus*) lower. The part of concealed income is four percentage points higher than the average income gap, and the mean income undeclared exceeds the mean of the other cantons by about CHF SF1500. The estimation results are consistent with the hypothesis that greater democratic participation possibilities lead to higher civic virtue, as reflected in taxpayer behaviour.

The empirical evidence collected for Switzerland suggests the existence of two (extreme) kinds of democratic tax institutions: one is based on the premise that the citizens are responsible persons and that, in principle, they are prepared to contribute to the provision of public goods and the redistribution of income by the state, provided this process is reasonably efficient and fair. The corresponding tax laws allow the citizens to declare their own income and to make generalised deductions. The tax statements are, in principle, accepted as trustworthy, and the tax authority bears the burden of proof if it doubts the declarations. Such a tax system supports a citizen's intrinsic motivations and strengthens his or her normative sense that everyone should carry a fair share of taxation. Tax morale is bolstered and tax evasion is reduced.

The second type of tax institution starts with the assumption that all citizens want to exploit the tax laws to the fullest, and cheat whenever they can. The corresponding tax laws deduct the taxes directly from gross income, and the citizens then reclaim from the government any deductions granted by the tax authorities. In the whole process, the burden of proof always lies with the individual citizen. Such a tax system crowds out intrinsic motivation and the normative notion that all citizens should help in carrying the tax burden. Tax morale is undermined and the citizens make an effort to evade taxes.

3.6 Motivational transfer effect

Remember the example of the boy willingly mowing the lawn that was presented at the beginning of this paper? Being paid by his father does not only crowd out his

intrinsic motivation to cut the grass, but also to do any other housework.

External intervention may thus have an *indirect* damaging effect on intrinsic motivation. The crowding-out effect may spread to further areas, even into those areas where the external intervention has not been applied. If intrinsic motivation is crowded out in areas where it is a major (or even the only) behavioural incentive, the overall outcome of an external intervention tends to be even more strongly against the principal's interest. There may thus be an indirect 'Motivational Transfer Effect', which has to be added to the direct crowding-out effect. A further example is provided by policy instruments, such as effluent charges or tradable permits. They work efficiently where they are applied, but an induced substitution of environmental ethics by monetary incentives may well lead people to protect the environment less in areas where no external incentives exist. This undesired motivation transfer effect not only takes place with monetary incentives, but also with rules and regulations.

That intrinsic motivation (in the broadest sense) may be linked across the board has been observed in several instances. Thus, norms may spread by analogy. If a similarity is perceived between an area in which a norm is valid, and another area where the norm is not yet applied, its validity can expand to the latter area too. The concept of 'attitudinal spillover' and 'reputational spillovers' has been employed in economic contexts. Neurological research suggests that the molecular construction of the brain limits the power to differentiate between varying circumstances, in our case between those areas where external interventions produce overjustification, and areas where a similar type of intrinsic motivation applies, but no external intervention takes place. This is known as the 'spread effect'.

Psychologists have collected considerable direct and indirect empirical evidence for the Motivation Transfer Effect. Intrinsic motivation is taken to transcend areas where the following conditions are met:

- Individuals strive to be consistent with their commitment to a moral principle.
- People are used to returning a favour with a favour, that is, to acting according to the principle of reciprocity. When this attitude is destroyed by a monetary reward, the resulting fall in intrinsic motivation tends to spread to related areas.
- Individuals frequently use the beliefs, attitudes, and actions of others, in particular, those of 'similar others', as a standard of comparison. The loss of intrinsic motivation, due to monetary intervention, tends to crowd out the respective intrinsic motivation of 'similar others'. With tax evasion, for example, 'there is a clear, positive relationship between self-reported evasion and the tax evasion of friends and relatives — that is, "similar others"' (Cialdini 1989, p. 215).

3.7 Conclusions

Crowding Theory introduces a so far disregarded, but crucial, and empirically well-supported, psychological effect into economics. Its integration into economics shows that it certainly does not substitute for the conventional price effect, but that it amends it.

Crowding theory has important implications for economic theory. In particular, a systematic relationship between intrinsic and extrinsic motivation is established; a negative relationship designates the crowding-out effect, a positive relationship the crowding-in effect. Both effects are well-supported by laboratory experiments under carefully controlled conditions. In order to show the relevance for actual social issues, crowding theory has also been applied to pressing policy problems. Crowding-out has been empirically analysed to take place when monetary compensations are offered, as well as in other circumstances pertaining to social and environmental policy. Crowding-in has been identified for the effect of direct citizen participation on tax morale and, more generally, different constitutional settings on citizens' behaviour.

It is important to interpret the crowding theory developed here correctly. Three crucial aspects should be taken into account when considering the relevance of this concept. First, the crowding-out effect works in the *opposite* direction to the price effect. The *net effect* depends on relative size. When crowding-out is small, the qualitative effects predicted by conventional economics hold. If, on the other hand, crowding-out is strong, the price effect may be dominated, and the unconventional effect of an external intervention is to be expected.

As far as I am aware, the crowding-out effect is the only effect systematically working in the opposite direction to the price effect. The many anomalies and paradoxes borrowed from social psychology certainly tend to weaken the effect of any given price change, but they do not reverse it. Thus, crowding theory makes a more far-reaching claim.

The policy consequence is straightforward: *take care not to intervene too much with what individuals want to achieve by themselves. Leave them as they are as much as possible, and give them the chance to follow their intrinsic motivation more fully.* This policy conclusion does not mean that one should exclusively rely on intrinsic motivation and disregard institutional conditions shaping external incentives. Nor should it be assumed that intrinsic motivation is always 'good' and 'socially beneficial'. Historical experience shows that many of the worst crimes in mankind were performed by people who followed inner motives and ideologies. Robespierre and Himmler provide vivid examples that intrinsically motivated people may create great evil. Passions are often uncontrolled and hazardous.

Second, crowding effects depend on *particular conditions*. They do not always take place, and can sometimes be neglected. In particular, when economic relationships are abstract, and when personal contacts are irrelevant, as is the case for the model of a perfectly competitive market, there is no crowding effect. Behaviour is fully determined by relative prices, that is by extrinsic motivation. As traditional economics has focused on such markets (or on markets close to it) to a large extent, it was correct to exclusively consider the relative price effect. However, as soon as one leaves such abstract, impersonal markets, the conditions identified may exist, and intrinsic motivation may be important. Then, it is necessary to carefully consider how far intrinsic motivation is affected by external intervention.

Third, crowding-out effects are due to people's perceptions of being *controlled* by external intervention. The resulting marginal shift in the locus of control from inside to outside the person tends to undermine intrinsic motivation. External intervention can come from a variety of sources, including government. Government intervention, however, need not be connected with a feeling of being controlled. There are certainly programmes which have the opposite effect, that is which *support* intrinsic motivation. In so far as this is the case, morality is crowded-in, and civic virtue, tax morale and other manifestations of intrinsic motivation are strengthened.

In contrast, the price system and, in particular, monetary rewards are often perceived to be a controlling external intervention by individuals, and can, therefore, lead to crowding effects. In particular, the price system is often looked at in this light. Thus, not only government programmes and intervention have the potential to negatively affect morality. The same holds, for instance, for pay-for-performance schemes. As they are defined to be contingent on a particular performance (output), they serve to strengthen external motivation and tend to crowd out work morale.

The social sciences and, in particular, economics should pay more attention to intrinsic motivation as an incentive, and as a viable possibility for policy-making. This applies to current policy, as well as to policy at the level of the constitution. It is an essential task to establish institutions, that is to take constitutional choices, which support individuals' own initiatives.