

Crowding effects on intrinsic motivation

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The basic idea that rewards, and in particular monetary rewards, may crowd out intrinsic motivation emanates from two quite different branches of literature in the social sciences. In his book *The Gift Relationship*, Richard Titmuss (1970) argued that paying for blood undermines cherished social values and would therefore reduce or totally eliminate people's willingness to donate blood. However, he was unable to come up with any serious empirical evidence.

A second strand of literature stems from psychology. A group of cognitive social psychologists identified that, under particular conditions, monetary (external) rewards undermine intrinsic motivation (Deci, 1971; Deci and Ryan, 1985; Deci with Flaste, 1995). People have intrinsic motivation when they just like to act in a certain way or because they have internalised social norms. Providing monetary rewards for undertaking an activity may have the negative consequence that people reduce their work effort.

The theories on intrinsic motivation emanating from social psychology have in the meantime been integrated into economic theory (Frey, 1992). Arguably, this 'crowding-out effect' is one of the most important anomalies in economics. It suggests the opposite of the most fundamental economic 'law' stipulating that raising monetary incentives increases supply of effort. If the crowding-out effect holds, raising monetary incentives reduces, rather than increases, this supply. Under certain circumstances, it is therefore not advisable to use the price mechanism to elicit a higher supply. Moreover, one should rely on a quite different type of incentive, namely intrinsic motivation.

This article discusses the crowding-out effect and its correlate, the 'crowding-in effect', with special regard to its empirical validity. It is demonstrated that these effects are empirically well-founded and have been observed in many different and important areas of the economy and society.

Intrinsic motivation in economic thinking

Monetary incentives crowding out the motivation to undertake an activity may be considered a major anomaly: it predicts the reverse reaction to the one expected according to the relative price effect, on which much of economics is based. The successes of the 'economic approach to human behaviour' (Becker, 1976; Frey, 1999) and its 'economic imperialism' (Lazear, 2000a) are due to the skilful application of the relative price effect. It is based on *extrinsic* motivation, i.e. on incentives coming from outside the person in question. By way of contrast, major schools in psychology emphasise the *intrinsic* motives coming from within the person.

Standard economic theory does not normally differentiate between different sources of motivation. Motivation is just seen as a manifestation of the underlying preference for the reward that is associated with performing a task. Intrinsic motivation is assumed to be an exogenously given constant, and often it is completely disregarded. Motivation crowding

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theory tries to mediate between standard economic thinking based on purely extrinsic motivation and psychological theories by stipulating a systematic interaction between extrinsic and intrinsic motivation.

For the analysis of economic issues, the 'hidden cost of reward' has been generalised in two respects:

- 1) All interventions originating from outside the person under consideration, i.e. both positive monetary rewards and regulations accompanied by negative sanctions, may affect intrinsic motivation.
- 2) External interventions may crowd-out or crowd-in intrinsic motivation (or leave it unaffected).

The figure below shows the interaction of the crowding-out effect and the price effect graphically. S is the traditional supply curve based on the relative price effect: raising the external reward for work effort from O to R increases work effort from A to A' leading to a location in point B. The crowding-out effect induces the supply curve to shift towards the left to S'. Thus, raising the reward from O to R leads to point C (instead of B). As the figure is drawn, the crowding-out effect dominates the relative price effect, and raising the reward from O to R *reduces* work effort from A to A". Once intrinsic motivation has been crowded out completely, the normal supply curve takes over again, and raising the reward unequivocally increases work effort (movement along S').

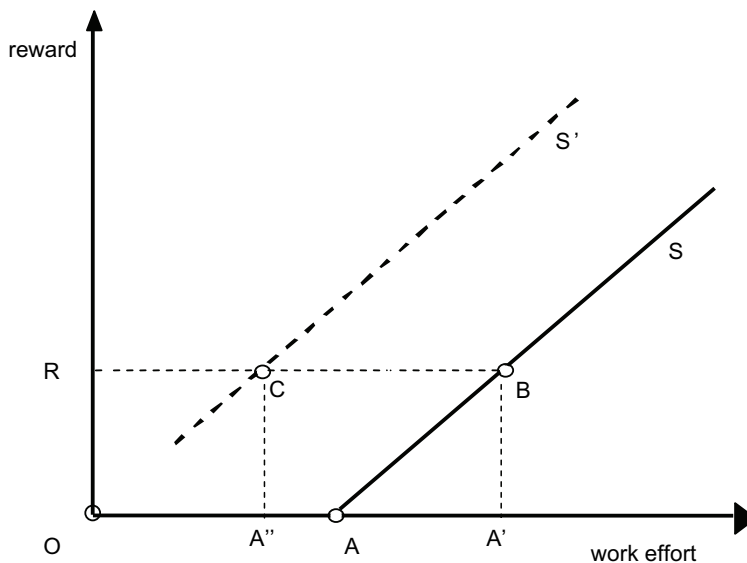


Figure 1: Net outcome of the price-effect and the crowding-out effect on work effort

The effects of external interventions on intrinsic motivation have been attributed to two psychological processes. The first is *impaired self-determination*. When individuals perceive an external intervention as reducing their self-determination, intrinsic motivation is substituted by extrinsic control. The locus of control shifts from inside to outside of the person affected. Individuals, who are forced to behave in a specific way by outside intervention, feel over-justified if they maintain their intrinsic motivation. The second is

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impaired self-esteem. When outside intervention carries the notion that the actor's motivation is not acknowledged, his or her intrinsic motivation is effectively rejected. The person affected feels that his or her involvement and competence is not appreciated, which debases its value. An intrinsically motivated person is deprived of the chance of displaying his or her own interest and involvement in an activity when someone else offers a reward, or orders them to do it. As a result of impaired self-esteem, individuals reduce their effort.

The two processes identified allow us to derive the *psychological conditions* under which the crowding-out effect appears:

- 1) External interventions *crowd-out* intrinsic motivation if the individuals affected perceive them to be *controlling*. In that case, both self-determination and self-esteem suffer, and the individuals react by reducing their intrinsic motivation in the activity controlled.
- 2) External interventions *crowd-in* intrinsic motivation if the individuals concerned perceive it as *supportive*. In that case, self-esteem is fostered, and individuals feel that they are given more freedom to act, thus enlarging self-determination.

Policy implications of motivation crowding

Crowding effects are potentially relevant in many different economic areas. Examples are the labour market, where the effect of higher compensation on work effort and, in particular, performance-related pay are at issue; the natural environment, where the effect of pricing instruments, such as pollution charges on environmental ethics, is in question; social policy, where it must be considered whether monetary incentives crowd out the notion of responsibility for one's own fate; subsidies, where a possible negative effect on entrepreneurship, innovation and creativity must be taken into account; organisation theory, where the limits of the firm must be reconsidered in view of the possible limits of relying purely on extrinsic incentives; and contract theory, where relational or 'psychological contracts' may require intrinsic motivation and hence crowding-out should be avoided (for further developments along this line see Frey, 1997a; Osterloh and Frey, 2000).

Standard economics largely relies on the skilful application of the price effect, and economists tend to overrate the power of payment-based measures. An important example is pay-for-performance, which has become *the* uncontested instrument for eliciting higher performance from employees. Such a view is well supported by the theoretical economic literature. According to principal-agency theory, incentives of employer and employee are best aligned when the latter's pay is performance-based. Recent empirical studies for a particular work setting (mounting glass windshields in cars) are used to support the presumed effectiveness of pay-for-performance (Lazear, 2000b). On this basis, far-reaching claims were made on behalf of a general positive effect of price incentives on work performance. Motivation crowding theory serves as a warning against rash generalisations of conclusions derived from simple task environments, where intrinsic motivation can be assumed to play no role, and therefore the crowding-out effect is far less likely to occur than under complex working conditions (see also Tom Powdrill's article in this issue).

Empirical evidence

Laboratory evidence

A large number of laboratory experiments on the crowding effect have been undertaken by psychologists. An extensive meta-study ably surveys the 'hidden cost' phenomenon in

social psychology (Deci, Koestner and Ryan, 1999). 128 well-controlled experiments exploring the effects of extrinsic rewards on intrinsic motivation provide a clear and consistent result. Tangible rewards have a significant negative effect on intrinsic motivation for interesting tasks. On the other hand, verbal rewards have a significant positive effect on intrinsic motivation. Tangible rewards do not crowd-out intrinsic motivation when they are unexpected or not contingent on task behaviour. Their overall conclusion for the use of rewards in the real world is that rewards are able to influence people's behaviour, which is presumably why they are so widely advocated. The main negative effect of rewards is that they undermine self-regulation. As a consequence of rewards, people take less responsibility for motivating themselves.

Economists have also engaged in testing motivation crowding theory. In laboratory evidence it has been shown that sanctions may crowd out human altruism (Fehr and Rockenbach, 2003). Crowding-effects in contract enforcement have been analysed in an evolutionary repeated contract game model (Bohnet, Frey and Huck, 1999). The goal of this experiment is to study how the participants' motivation and behaviour evolves, depending on the institutional setting. When contracts are near-perfectly enforced, first movers can rely on the legal system with a high probability of being fined to deter second movers from breaching the contract offered. Personal trust is hence replaced by institutional trust. Low levels of legal enforcement, i.e. a low probability of getting caught breaching the contract, tend to crowd-in intrinsic motives to treat others fairly. When first movers in such a game decide to offer a contract (despite the fact that both participants are aware of the low probability of being fined for non-compliance), they signal their trust that the second mover will not breach the contract. The number of contracts offered increases in the course of the game. This is contrary to standard economic expectations. An intermediate level of law enforcement turns out to be most detrimental to intrinsically-motivated trustworthiness and reciprocity-driven behaviour. First movers tend not to offer contracts. Starting with the observation of a surprisingly high rate of compliance by firms with pollution standards, Livernois and McKenna (1999) discuss a similar problem. They find that under plausible specifications of their model, higher compliance can be elicited with lower fines for non-compliance.

The potentially negative effect on individual intrinsic motivation of externally-imposed institutions is also found in a series of experiments designed as contribution games to a pure public good (Frohlich and Oppenheimer, 1998). Randomly reassigned individual pay-offs in the game lead to an expected increase in contributions to the public good; on the other hand, the experimenters found strong evidence that the institution of random pay-offs itself shifted individual motivation towards greater self-interest.

Field evidence

Work motivation

Motivation crowding theory has been subjected to econometric studies in the case of work motivation. Barkema (1995) analyses the behaviour of managers as agents in a firm. The managers are either controlled by the parent company, i.e. by an impersonal relationship, or by chief executive officers. It turns out that the former type of supervision raises managers' performance, because intrinsic motivation is little or not affected. In contrast, when the managers are controlled by their firm's chief executive officer there is a personalised relationship. Monitoring in this case tends to reduce the agents' effort, as external intervention shifts the locus of control towards external preferences, and the agents perceive that their competence is not acknowledged by their superior. Intrinsic motivation is

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crowded out. An econometric study looks at the voluntary sector (Frey and Götte, 1999). Intrinsic motivation is of great importance when it comes to volunteering. The incidence of monetary rewards is found to reduce the amount of 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. These findings have important implications for policy regarding voluntary work. Direct incentives may backfire, leading to less volunteering.

A comprehensive survey with decision-makers in the labour market provides another avenue (Bewley, 1995). Practitioners seem well aware of the possible traps of pay-for-performance schemes. They realise that external intervention via monetary incentives should not be used as a means of controlling, as it may undermine intrinsic motivations such as work morale or creativity:

Managers claim that workers have so many opportunities to take advantage of employers that it is not wise to depend on coercion and financial incentives alone as motivators. Also, employers want workers to operate autonomously, show initiative, and use their imagination while working, and workers who are scared or disheartened do not do these things. (Bewley, 1995, 252)

The next section shows that crowding effects are of particular importance outside the market sector.

Incentives and regulations in social and public policies

Day-care centres are confronted with the problem that parents sometimes arrive late to pick up their children, which forces teachers to stay after the official closing time. A typical economic approach would suggest introducing a fine for collecting children late. Such a punishment, economic theory predicts, induces parents to reduce the occurrence of belatedly picking up their children. The effect of such a policy has been studied for a day-care centre in Israel (Gneezy and Rustichini, 2000a; see also 2000b). The number of late-coming parents over a particular period of time was first recorded. In a second period, extending over twelve weeks, a significant monetary fine for collecting children late was introduced. After an initial learning phase, the number of late-coming parents *increased* substantially, which is consistent with the crowding-out effect. The introduction of a monetary fine transforms the relationship between parents and teachers from a non-monetary into a monetary one. As a result, the parents' intrinsic motivation to keep to the time schedules is reduced or is crowded-out altogether; the feeling now is that the teachers are 'paid' for the disamenity of having to stay longer. That parents' intrinsic motivation was crowded out for good by the introduction of a penalty system is supported by the fact that the number of late-coming parents remained stable at the level prevailing even after the fine was cancelled in the third phase.

Crowding-out effects were also identified with respect to performance in the airline industry (Austin and Hoffer Gittel, 1999). Different carriers use a variety of instruments to cope with delays. Attributing a single delay as exactly as possible to its source (as suggested by principal-agent theory) is negatively correlated with the achieved end, namely the airline's on-time flight performance. The most successful company in terms of departing on time is the one carrier that uses the general term 'team delay' to indicate the source of a delay caused by the personnel, independent of whether a single employee, or one specific unit, was in fact responsible. A loose attribution to the source of delay crowds-in the employees' intrinsic motivation to help out other units and groups.

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An econometric test of crowding theory refers to the important real life issue of finding a site for locally unwanted projects (Frey and Oberholzer-Gee, 1997). This is known as the 'not in my backyard' or NIMBY problem. For many different projects and major capital investments, a wide consensus exists that they are worth being undertaken. But no community is prepared to tolerate the vicinity of, for example, hazardous waste disposal facilities or airports. The hypothesis that external incentives crowd-out civic duty or intrinsic motivation, and therefore the willingness to accept the locally undesired project, was tested by analysing the reaction to monetary compensation offered for a nuclear waste repository in Switzerland. A survey was undertaken among the population of the community, which was chosen to harbour the site by the national government. More than half of the respondents (50.8 per cent) agreed to have the nuclear waste repository built in their community, 44.9 per cent opposed the siting, and 4.3 per cent did not care where the facility was built. Thus, the siting decision was widely accepted, in spite of the fact that a nuclear waste repository is mostly seen as a heavy burden for the residents of the host community. While 50.8 per cent of the respondents agreed to accept the nuclear waste repository without compensation, the level of acceptance dropped to 24.6 per cent when compensation was offered. Compensation fundamentally alters the perceived nature of a siting procedure. While external intervention, i.e. offering compensation, manages to address concerns regarding the costs of a noxious facility, it reduces the intrinsic motivation to permit the construction of such a facility. In the case studied, this latter effect even outweighs the benefits of external intervention, thereby reducing overall acceptance. A corresponding effect was found for the siting of a nuclear repository in Nevada, where raised tax rebates failed to increase acceptance (Kunreuther and Easterling, 1990).

Crowding effects occur not only as a result of monetary interventions but also of regulations. In a field experiment conducted in Colombia, South America, a regulatory approach imposed from the outside aimed at forestalling the exploitation of the local tropical forest (which should have brought about welfare improvements according to standard theory). However, it led to more egoistic behaviour on the part of the population involved, thus intensifying forest destruction (Cardenas, Stranlund and Willis, 1999). Introducing an external regulation crowds-out the existing level of intrinsically motivated other-regarding behaviour. Attempts to set incentives externally to lead people towards a more efficient choice do in fact backfire.

Crowding theory can be applied to how constitutional and other legal rules affect individual citizens. Civic virtue (a particular manifestation of intrinsic motivation) is bolstered if the public laws convey the notion that citizens are to be trusted. Such trust is reflected in extensive rights and possibilities for political participation. In contrast, a constitution implying a fundamental distrust of its citizens, and seeking to discipline them, tends to crowd-out civic virtue and undermines the support which citizens are prepared to give to the basic law. The effects of such a distrustful constitution manifest themselves in various ways. The citizens are dissatisfied with the political system and respond by breaking the constitution and its laws whenever they expect to be able to do so at a low cost (Frey, 1997b). An important reaction to distrustful public laws is a reduction of tax morale and, as a consequence, the evasion of taxes (Feld and Frey, 2002). It has been well established that tax-paying cannot be explained in an economically satisfactory way without taking tax morale into account.

Crowding-out effects have also been observed for public laws and institutions and for wages in the government sector. The fact that government employees in many countries willingly work for a significantly lower salary than their peers in the private sector may be attributed to the higher intrinsic motivation of people seeking employment in the public sector. An example would be those teachers who want to work in state schools because they believe in the virtue of public education for society. The increasing tendency to closely

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supervise government employees, and to curtail their discretionary room, has crowded out their work morale. This is consistent with a continuous reduction of private sector wage premiums.

On a more general level, there is a cumulative body of research indicating that people's perceptions of how they are treated by the authorities strongly affect their evaluation of authorities and laws, and their willingness to cooperate with them. Citizens who consider the constitution and its laws, and the authorities upholding them, to be fair and to treat them respectfully tend to be more compliant than those with more negative perceptions of government (Tyler, 1990). In contrast, the extensive use of adversary institutions for resolving public conflicts as they prevail for example in the United States tends to crowd-out civic virtue (Kelman, 1992).

Conclusion

This article shows that there is strong empirical evidence for important crowding-out and crowding-in effects, which has been collected in many different countries and time periods. This conclusion is based on circumstantial evidence, laboratory evidence from both psychologists and economists, and field evidence from econometric studies. The evidence refers to a wide variety of areas of the economy and society: monetary and symbolic rewards for undertaking various laboratory tasks; the tendency to reciprocate in a laboratory setting, reflecting work conditions in a firm; the amount of trust exhibited in a laboratory situation of incomplete contracts; the reaction of managers to various forms of supervision by their superiors; the readiness to offer voluntary work; the observation of time schedules in day-care centres; on-time flight performance in the airline industry; the readiness to accept nuclear waste repositories (and other locally unwanted sites); and the amount of civic virtue exhibited, in particular with respect to fulfilling one's tax obligations (tax morale).

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This article draws on a longer paper by Bruno S. Frey and Reto Jegen, 'Motivation crowding theory: a survey of empirical evidence', Journal of Economic Surveys 15 (5), 2001: 589-612.

References

- Austin, R. D. and Hoffer Gittell, J. (1999) *Anomalies of High Performance: Reframing Economic and Organizational Theories of Performance Measurement*, mimeo, Harvard Business School, Harvard University.
- Barkema, H. G. (1995) 'Do top managers work harder when they are monitored?', *Kyklos* 48 (1): 19-42.
- Becker, G. S. (1976) *The Economic Approach to Human Behaviour*, Chicago, University of Chicago Press.
- Bewley, T. F. (1995) 'A depressed labor market as explained by participants', *American Economic Review* 85 (2): 250-4.
- Bohnet, I., Huck, S. and Frey, B. S. (1999) *More Order with Less Law: On Contract Enforcement and Crowding*, mimeo, Kennedy School of Law, Harvard University.

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- Cardenas, J. C., Stranlund, J. and Willis, C. (1999) 'Local environmental control and institutional crowding-out', mimeo, Department of Resource-Economics, University of Massachusetts-Amherst.
- Deci, E. L. (1971) 'Effects of externally mediated rewards on intrinsic motivation', *Journal of Personality and Social Psychology* 18 (1): 105-15.
- Deci, E. L. with Flaste, R. (1995) *Why We Do What We Do: The Dynamics of Personal Autonomy*, New York, Putnam.
- Deci, E. L., Koestner, R. and Ryan, R. M. (1999) 'A meta-analytic review of experiments examining the effects of extrinsic rewards on intrinsic motivation', *Psychological Bulletin* 125 (3): 627-68.
- Deci, E. L. and Ryan, R. M. (1985) *Intrinsic Motivation and Self-Determination in Human Behaviour*, New York, Plenum Press.
- Fehr, E. and Rockenbach, B. (2003) 'Detrimental effects of sanctions on human motivation', *Nature* 422: 137-40.
- Feld, L. P. and Frey, B. S. (2002) 'Trust breeds trust: how taxpayers are treated', *Economics of Governance* 3 (2): 87-99.
- Frey, B. S. (1992) 'Tertium Datur: pricing, regulation and intrinsic motivation', *Kyklos* 45 (2): 161-84.
- Frey, B. S. (1997a) *Not Just for the Money: An Economic Theory of Personal Motivation*, Cheltenham and Brookfield, Edward Elgar.
- Frey, B. S. (1997b) 'A constitution for knaves crowds out civic virtues', *Economic Journal* 107 (443): 1043-53.
- Frey, B. S. (1999) *Economics as a Science of Human Behaviour*, Boston, Dordrecht and London, Kluwer Academic Publishers.
- Frey, B. S. and Götte, L. (1999) 'Does pay motivate volunteers?', unpublished manuscript, Institute for Empirical Economic Research, University of Zurich.
- Frey, B. S. and Oberholzer-Gee, F. (1997) 'The cost of price incentives: an empirical analysis of motivation crowding-out', *American Economic Review* 87 (4): 746-55.
- Frohlich, N. and Oppenheimer, J. (1998) 'Optimal policies and ethical behaviour: some unexpected contradictions', unpublished manuscript, meeting of the Preferences Network Research Group.
- Gneezy, U. and Rustichini, A. (2000a) 'Pay enough or don't pay at all', *Quarterly Journal of Economics* 115 (3): 791-810.
- Gneezy, U. and Rustichini, A. (2000b) 'A fine is a price', *Journal of Legal Studies* 29 (1): 1-17.
- Kelman, S. (1992) 'Adversary and cooperationist institutions for conflict resolution in public policymaking', *Journal of Policy Analysis and Management* 11 (2): 178-206.
- Kunreuther, H. and Easterling, D. (1990) 'Are risk-benefit trade-offs possible in siting hazardous facilities?', *American Economic Review* 80 (2): 252-6.
- Lazear, E. P. (2000a) 'Economic imperialism', *Quarterly Journal of Economics* 115 (1): 99-146.
- Lazear, E. P. (2000b) 'Performance pay and productivity', *American Economic Review* 90 (5): 1346-61.
- Livernois, J. and McKenna, C. J. (1999) 'Truth or consequences: enforcing pollution standards with self-reporting', *Journal of Public Economics* 71 (3): 415-40.
- Osterloh, M. and Frey, B. S. (2000) 'Motivation, knowledge transfer, and organizational forms', *Organization Science* 11 (5): 538-50.
- Titmuss, R. M. (1970) *The Gift Relationship*, London, Allen & Unwin.
- Tyler, T. R. (1990) *Why People Obey the Law*, New Haven, Yale University Press.