Karine Nyborg, 11.10.04

Project description:

Self-image and sustainability

I Aims and scope

The purpose of this project is to study the interrelationships between cultural, social and economic driving forces for sustainable development, by developing and testing empirically economic models for analysis of norms and social identity.
Specific sub-goals are as follows:

- Analyze the interrelationship between social identity and environmental behavior, emphasizing behavior in firms and/or in groups
- Test theoretical predictions using laboratory experiments
- Strengthen the research on the interface between behavioral economics and environmental economics through the education of a PhD student.

II Relationship to other Research Council projects

The project proposed here is part of a research program on behavioral economics and the environment, including recent projects financed by the Research Council through *Economy and Ecology, Sustainable Production and Consumption, SAMRAM* and *SAMSTEMT*. It is a continuation of the *RAMBU* project "Sustainable Consumption, Social Relations and Identity" (led by Kjell Arne Brekke), a project which has developed into two strands; one focusing on groups and identity, another on advertising. The project proposed here, to be led by Karine Nyborg, pursues the former strand, focusing mainly on environmental behavior within groups and firms. Moreover, a current *SAMSTEMT* project led by Nyborg is studying individual responsibility and attitude campaigns. While all these projects concern economic analysis of environmental behavior, their thematic focus will be different.
The project is relevant to RAMBU's theme IV (Culture, daily life and sustainable behavior).

III Relationship to the preliminary project proposal

In response to our preliminary project description, submitted to the Research Council in June 2004, the Program Council invited us to submit a full project proposal, but with a total budget limited to 3 mill. NOK. The total budget in the initial plan was 3.723 mill NOK. Since the Program Council requested that a PhD student should be included in the final proposal, the budget available for expenses other than the PhD student was reduced to less than two thirds of the original plan. We have thus had to reduce the ambitions of the project accordingly. The funding for each project participant was already modest, and the only reasonable solution, in our view, was to reduce the number of project participants.

We find it important that the PhD student should benefit from Professor Asheim's competence within game theory, and that he or she should be closely linked to Brekke's and Nyborg's research on environmental and behavior economics. Consequently, Bernt Bratsberg will not participate, implying that we will be unable to undertake the previously planned sub-

project on econometric estimation of wage differentials between green and brown firms. We regret this and hope to be able to return to this idea at some later occasion.

To reduce the budget sufficiently, Brekke's and Nyborg's participation have also been reduced. To strengthen the empirical part of the project, however, we have put more emphasis on conducting laboratory experiments, in particular as a part of the PhD student's work. Accordingly, we have increased the budget for data collection somewhat.

IV Research topics: Norms and roles

Behavioral economics is a growing research field internationally (see e.g. Camerer 2003, Rabin 1998), but with a few exceptions, this has had only a modest impact on environmental economics. Nevertheless, environmental behavior depends to a large extent on the *role* individuals assign to themselves in social contexts, their *beliefs* about environmental effects, and the personal *responsibility* they take on for environmental issues (Stern 1999, Dietz and Stern 2002). Combining environmental economics and behavioral economics is thus a promising research field.

This project extends our own research on this topic. Brekke et al. (2003) developed a model of moral motivation, demonstrating how a preference for a self-image as a socially responsible individual may modify conclusions from standard neoclassical consumer theory. In particular, we showed that economic incentives might have unexpected effects on voluntary contributions to public goods. The theory was applied and developed further by Bruvoll and Nyborg (2004) (on recycling behavior), Nyborg, Howarth and Brekke (2003) (on demand for green products), and Brekke and Nyborg (2004) on green producers. Nyborg and Rege (2003b) provide an analysis of the evolution of social norms for considerate smoking behavior. For overviews, see Nyborg (2003) and Nyborg and Rege (2003a).

IV.1 Self-image and group image: Global norms or group norms?

The above-mentioned papers do not distinguish between global norms and group norms. However, human beings seem to have a strong tendency to develop loyalty to smaller social groups (family, friends, school class, firm) rather than, or in addition to, their feeling of responsibility to society at large. Brekke, Nyborg and Rege (2004) analyze a simple model of endogenous group formation, and show how individuals' fear of exclusion can explain that different groups hold different norms for work effort and helping behavior. Nevertheless, this analysis has not yet been integrated with the self-image approach discussed above.

In almost every school class, firm, or other team, leaders spend time and energy on team building activities; e.g. parties, competitions against other teams, or going away together. Building group loyalty seems to be a process that can take place quite swiftly, and once initiated may continue in spontaneous and almost incontrollable ways (Sherif et al. 1961, Cialdini 2001). The "greenness" of a firm may be one element in the firm's effort to shape employees' feeling of group identity and firm loyalty.

There are many reasons why norms may differ between different groups, both formal (like firms) or informal (like groups of friends).[1] Norms may develop spontaneously within closed groups; development of group-specific norms may be actively stimulated by those having an interest in it (firm managers, school teachers); people may simply prefer to socialize or work

[1] An important background for discussions of these matters is Bourdieu (1979). See also Coleman (1990).

with others with similar norms; or group-specific norms or rules of conduct may function as a signalling device to distinguish committed group members from others.

The development of group identity may possibly be analyzed as an equilibrium strategy to overcome coordination or cooperation problems. Dixit (2003) proposes a model in which the individual can benefit from trading with distant trading partners, if the partner does not cheat; but with too large distance, social control breaks down, and trade partners cannot be trusted. Although Dixit's paper primarily discusses international trade, we believe that his model may be a useful starting point for analyzing group identity and signals of group affiliation. Observable consumption patterns may identify individuals as members of a sufficiently small group, even within a large world, and may sustain social control even when geographically distant trading partners interact. Similar ideas have been studied extensively by social anthropologists, in particular Richard Wilk at Indiana University (e.g. Wilk, 2001). We visited Professor Wilk in 2003 and discussed the topic with him, but time did not allow further pursuit of these ideas then. We now intend to develop a formal model, based on economic methodology but inspired by the anthropological literature, analyzing the links between visible consumption and group identity.

IV.2 Green vs. brown firms

Within environmental economics, there is a growing literature on voluntary approaches to "green" production (e.g. Arora and Cason 1996, Segerson and Miceli 1998). However, with a few exceptions, knowledge from behavioral economics has hardly been utilized within this literature.

In Brekke and Nyborg (2004) we show that morally motivated workers may be willing to accept lower wages in "green" than in "brown" firms, leading to lower equilibrium wages in green firms. Due to this, only workers with a strong moral motivation will want to work for green firms. Assuming that attitudes toward the environment and work morale originate from the worker's underlying ethical views, we show that those workers who prefer to work for green rather than brown firms are also less likely to shirk at work less than others. Thus, firms can use their corporate social responsibility profile ("green" or "brown") as a device to attract such workers. Consequently, green firms can survive, due to their ability to pay lower wages and hire more productive workers. If both green and brown firms exist in long-term equilibrium, we show that workers will in fact be sorted according to their moral motivation: Those with the strongest moral motivation, who are both more concerned about the environment and have a higher work morale, will work for the green firms, while those with lower moral motivation will work for the brown firms. Hence, in this model, workers' norms will tend to differ between firms, because of a kind of selection effect.

As mentioned above, the budget does not permit empirical estimation of actual wage differentials between "green" and "brown" firms. Nevertheless, several aspects of this theory are interesting to explore further, both theoretically and empirically.

First, the theory presented in Brekke and Nyborg (2004) hinges crucially on the assumption that different aspects of an individual's behavior (more precisely, an individual's willingness to contribute to different public goods or in different contexts) are correlated. There is little empirical evidence for this assertion; hence, the practical applicability of the theory depends to a large extent on whether the assumption can be verified or not. We believe that laboratory experiments can be a suitable way to explore this.

A second aspect which could be further developed in the present project is the relation between the model of Brekke and Nyborg (2004) and the theory of reciprocity (see below). The Brekke and Nyborg paper assumes that capital costs are fixed, implying that if every worker in the population worked harder, equilibrium wages would unambiguously increase. However, if the gains from harder work were instead reaped by capitalists (or firm managers), then even morally motivated workers might not feel obliged to work hard; if they did, they would only contribute to making capitalists richer, which they may not consider a highly worthy goal. This possibility, which has not been studied in depth in the Brekke and Nyborg paper, could explain some of the well-documented results from behavioral and experimental economics concerning *reciprocity* (see Camerer 2003, and below): Employers' intentions have a huge effect on workers' work morale and willingness to exert unobservable effort.

IV.3 Reciprocity

In recent years, substantial economic research has been done on the topic of *reciprocal behavior.* This research has been both empirical (see e.g. Fehr and Falk 2002) and theoretical (e.g. Dufwenberg and Kirchsteiger 2003). The main thesis is that individuals taking part in social interaction do not only care about the *outcome* of the interaction, but also on the perceived *intentions* of others: Good intentions lead to good deeds, while bad intentions are met with bad deeds. Through his game-theoretic research, Geir Asheim is familiar with this literature (Asheim 2003) and he has interacted closely with some of its contributors (e.g. Asheim and Dufwenberg (2003)[2]). The relationship between such theories of reciprocity and the self-image approach described above has not yet been satisfactory established.

IV.4 Law, game theory and environmental regulation

Finally, the boundaries between the literatures on "law and economics", game theory, and environmental regulation include research which is highly relevant to our project. Law and game theory has to quite some extent been utilized for analysis of environmental regulation (e.g. Franckx and de Vries 2004, Heyes 2002);[3] but to our knowledge, the topic of environmental *norms* has hitherto scarcely been explored within this type of framework.[4]

Nevertheless, there is reason to believe that there is a close relationship between social norms, on the one hand, and behavior that *can be enforced* by laws and regulations, on the other. Basu (2000, p. 117) proposes the following core theorem of law and regulation: "Whatever behavior and outcomes in society are legally enforceable are also enforceable through social norms". In particular, he claims that; "[i]f a certain outcome is not an equilibrium of the economy, then no law can implement it."

Basu's proposition may seem extreme. However, his assertion is based on the insight that not only must individual and firms consider how formal law enforcement may affect them; the legal system, in order to work as intended, must also rely crucially on the behavior of those officials and institutions that are set to *enforce* the laws and regulations. This is related to the classical problem of many game theoretic models: Who will sanction the sanctioners? Basu's claim is based on the premise that laws and regulation do not basically change the strategies

[2] This paper was awarded the Royal Economic Society Prize for the best paper published in the Economic Journal in 2003.
[3] The literature on voluntary approaches mentioned above is related to this.
[4] An exception is Nyborg and Telle (2004), who presents a "law and economics" analysis of environmental regulation, pointing out how their analysis could also be applied in cases where enforcement partially takes place via social approval/disapproval.

that the members of society have at their disposal, but may help coordinate behavior on a new equilibrium. In this way, a law will in many respects resemble (a system of) social norms.

This game theoretic perspective on legal enforcement is of particular interest when applied to environmental regulation. For example, in Norway it is now the case (in many contexts, at least) that any one of us can enforce the current smoking regulations simply by making violators aware of no-smoking signs (leading the errant smoker to stub his/her cigarette). This, however, does not mean that such regulation would have been enforceable when attitudes to smoking were different. The same kind of observations can be made for environmental regulation designed to ensure sustainable behavior: Environmental regulation may require that the underlying attitudes to such regulation are changed. This raises at least two questions: (1) For given attitudes in society towards sustainability and environmental management, what is the scope for environmental regulation through legislative means? (2) If society through democratic decision-making wishes to extend legal environmental restrictions beyond the limits that such attitudes set, what can be done in order to influence the attitudes held by consumers, firms, and public officials (those set to enforce the regulations)? This is an interesting research topic which is particularly relevant for Asheim to explore during his stay at Cornell, since Professor Basu is affiliated with the Economics Department at this university.

V Norms and Identity: PhD thesis

A main purpose of our project is to stimulate recruitment of new researchers into the field of behavioral economics and the environment. For this purpose, we wish to include a PhD student in our research team. Professor Geir Asheim at the Department of Economics, University of Oslo, will supervise the student and also participate actively in the project. Asheim is acknowledged internationally as a leading expert on environmental economics, in particular with regard to the literature on sustainability (see e.g. Asheim et al. 2001)[5], as well as in game theory (e.g. Asheim and Dufwenberg 2003, Asheim 2004). Professor Asheim has previously supervised doctoral candidates whose dissertations contain papers within experimental economics/game theory.[6]

The Ph.D. candidate's project will be within the field of behavioral economics and the environment, and will investigate the topics discussed above. The detailed description of the Ph.D. project will be made in cooperation with the person to be recruited for this position, in connection with his/her application to the Ph.D.-program, and it should at least partly depend on his/her abilities and interests. However, our intention is that the thesis should focus at least partly on experimental economics and behavioral game theory (Camerer 2003). This is a field which is in rapid development internationally, making it interesting to follow; further, conducting laboratory experiments provides a reasonably tractable methodology to work with for a student, and is moreover a suitable method for empirical assessment of behavioral theories. Our intention is that the thesis will be related to the topics already mentioned above.

[5] Asheim has also been a member of the Editorial Council of the *Journal of Environmental Economics and Management*.

[6] Mari Rege, whose experimental paper "The impact of social approval and framing on cooperation in public good situations" (co-authored with Kjetil Telle) is published in *Journal of Public Economics* **88** (2004) 1625-1644, and Ylva Søvik, who on the basis of her experimental paper "Strength of dominance and depth of reasoning – an experimental study" has been selected to participate in the prestigious Econometric Society's European Winter Meetings 22-23 October 2004, as one of 18 new Ph.D. candidates in Europe.

In addition, and depending on the preferences and capabilities of the student, the following can be relevant parts of a PhD thesis:

- Experimental testing of the moral motivation model (Brekke et al. 2003) against alternative theories, e.g. Andreoni (1990).
- Exploring experimentally and/or theoretically the relationship between models of social and moral norms (e.g. Brekke et al. 2003) and recent models of fairness and/or reciprocity (e.g. Fehr and Falk 2002, Bolton and Ockenfels 2000).
- Case studies on environmental norms and self-image: E.g. use of private cars vs. public transport, eco-labeled goods, or use of studded tires.

VI Methods

The theoretical part of the project will be based on modified and/or extended versions of neoclassical economic models, as well as game theory. The empirical part will be based on experimental economics.

However, to some extent we wish to leave choices of methodology to the PhD student.

VII International cooperation

Asheim has been invited to visit Cornell University for the fall of 2005 and the spring of 2006 (see earlier forwarded e-letter from Tapan Mitra), where he plans to do research on this project. At Cornell University, Asheim has contacts in various departments relating to sustainable development and game theory, including active researchers on topics discussed in this proposal. In particular, Kaushik Basu, mentioned above under the paragraph "Law, game theory and environmental regulation", is one of these contacts.

Since the student will be located at the Frisch Centre, and Nyborg will be a co-supervisor, supervision of the student during Asheim's absence will not be a problem. Asheim's wage costs are covered by the University of Oslo, but we apply for an overseas fellowship to cover extra costs relating to his stay.

Concerning international cooperation, the project will naturally benefit from – and contribute further to – the project participants' already quite extensive network of international contacts.

VIII Publishing plan

In addition to the PhD dissertation, corresponding to about three journal articles, we plan to produce at least three papers for international scientific journals (not including the papers of the PhD dissertation). Our results will be presented at conferences and research seminars, and in more popular articles in Norwegian and/or English (newspapers and/or magazines/journals).

IX Project personnel

Senior Researcher at the Frisch Centre, dr.polit. Karine Nyborg, will be project leader and co-supervisor for the PhD student.
Senior Researcher at the Frisch Centre, dr.polit. Kjell Arne Brekke, is project participant.
Professor Geir Asheim, Department of Economics, University of Oslo, is project participant and supervisor for the PhD student.

[7] Since final decisions concerning funding cannot be expected until late in 2004, the PhD student might not yet have been employed early in 2005. Thus, we have assumed that only 2/3 of a PhD grant (the Research Council's rate) is spent during 2005. To allow the student a total of 3 years to finish, we must then allow for the remaining 1/3 of a PhD grant to be spent in 2008.
[8] Covers the Research Council's grant ("Utenlandsstipend") for a single person August-December 2005 and January-June 2006, plus NOK 20 000 extra per year for travels and conference participation.
[9] Covers 1+2+2 months at the Frisch Centre's monthly rates applying for Nyborg: 119 000 (2005) , 123000 (2006), 127 000 (2007).
[10] Covers 1+1.5+0 months at the Frisch Centre's rates applying for Brekke.

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