



Working Papers

POLITICAL ECONOMISTS ARE NEITHER SELFISH NOR INDOCTRINATED

Bruno S. Frey
Stephan Meier

CESifo Working Paper No. 490

May 2001

CESifo

Center for Economic Studies & Ifo Institute for Economic Research
Poschingerstr. 5, 81679 Munich, Germany

Tel.: +49 (89) 9224-1410

Fax: +49 (89) 9224-1409

e-mail: office@CESifo.de



An electronic version of the paper may be downloaded

- from the SSRN website: www.SSRN.com
- from the CESifo website: www.CESifo.de

POLITICAL ECONOMISTS ARE NEITHER SELFISH NOR INDOCTRINATED

Abstract

Most professional economists believe that economists in general are more selfish than other persons and that this greater selfishness is due to economics education. This paper offers empirical evidence against this widely held belief. Using a unique data set about giving behavior in connection with two social funds at the University of Zurich, it is shown that economics education does not make people act more selfishly. Rather, this natural experiment suggests that the particular behavior of economists can be explained by a selection effect.

JEL Classification: A13, A20, H41

Keywords: Economists, public good, giving behavior, education, selection

Bruno S Frey
University of Zurich
Institute for Empirical
Economic Research
Blümlisalpstrasse 10
8006 Zurich
Switzerland
e-mail: bsfrey@jew.unizh.ch

Stephan Meier
University of Zurich
Institute for Empirical
Economic Research
Blümlisalpstrasse 10
8006 Zurich
Switzerland
e-mail: smeier@jew.unizh.ch

Most professional economists, and probably most other scholars, seem to believe that the following statements are a fact beyond doubt:

- (1) Economists are more selfish than other people;
- (2) Economists' higher selfishness is at least partly due to their economics education.

Frank, Gilovich and Regan (1993, 1996) seem to have convinced most of the academic community that this is the case.¹ Using Prisoner's Dilemma experiments, they found that economics majors (at a particular American university) are more self-interested than non-majors, and that this is caused in part by their education in economics.² They conclude that there is "... a heavy burden of proof on those who insist that economics training does not inhibit cooperation"(1996:192).

But the literature on the topic has reached much less uniform conclusions than this statement suggests. While Carter and Iron (1991:174), using an Ultimatum Game experiment find that "economists are born, not made", Yezer, Goldfarb and Poppen (1996:177) go as far as to claim that economists are "... actually substantially more cooperative than ... their counterparts studying other subjects"³. These inconsistent conclusions are mainly based on laboratory experiments with students. These studies have the weakness that they cannot exclude that economists see the experimental setting as "an IQ test of sorts" (Frank 1988:226). Economists may play the learned equilibrium while they do not apply it in real life. They may distinguish between playing a game and acting in real life. An exception is the "lost letter" experiment by Yezer, Goldfarb and Poppen (1996). But they cannot control for personal characteristics (e.g. gender and age) as they do not know who picks up the envelope. A second paper looking at 'real world' behavior is that of Laband and Beil (1999). They consider the differences in the professional associations' dues payment. These are income-based, however, income is self-reported (hence, the correct amount cannot be enforced). With that in mind, they undertake a survey of the members' "true" income and find that sociologists are more likely to cheat than either economists or political scientists. If the 'monetary' incentives for cheating (owing to different dues) are taken into account, the authors believe that there are no significant

¹ Of course, some academics do not agree with Frank et al.: "[...] I am among those who remain skeptical about the significance of self-reported contributions to charity, or about behavior in hypothetical or small-stakes Prisoners' Dilemma experiments." (Hirshleifer 1994:1)

² An indoctrination effect is also found by Blais and Young (1999), who test the impact of the rational choice model of voting on political participation in a national election campaign in Canada. Their 10-12 minute introduction to Downs' participation model c.p. reduced the turnout of the students involved by 7 percentage points. See also Brunk (1980) for a similar experiment.

³ Further studies unable to find a negative effect of economics education on cooperation are Marwell and Ames (1981), Frey, Pommerehne and Gygi (1993), Bohnet und Frey (1995), Seguino, Steven and Lutz (1996), Cadsby and Maynes (1998), Stanley and Tran (1998), and Frank and Schulze (2000).

differences between professional academics. But again, this study does not control for personality variables, and cannot reveal to what extent the phenomenon observed is the result of a selection or indoctrination effect. Therefore "[t]he effect of training and/or self-selection on cooperation remains a wide-open problem" (Ledyard 1995: 161).

We use a unique and extremely large data set (more than 96,500 observations) to study the behavior of economics students in a *natural setting*, to compare it with that of students of other disciplines, and to analyze whether a possible difference in behavior is due to indoctrination in economics education. We reach significantly different results than all the other studies do:

- (1) Political economists (to use the classical term) are not more selfish than the average student, but students of business economics are more selfish.
- (2) The higher selfishness of business students is due to self-selection, not indoctrination.
- (3) Students of the economic sciences (i.e. both political and business economists) are about as selfish as law students, but much less selfish than medical and veterinary students.

It follows that political economists should be more comfortable with their subject than most of them tend to be – it is in this respect not the dismal science it is often claimed to be. Professors of political economics cannot be faulted. But business schools, on the other hand, should be aware that they attract particularly selfish students and should take that fact into account in their education. Our findings also serve to reject the often-heard claim⁴ that political economists *create* the type of selfish persons (the homo oeconomicus) they axiomatically assume in their theories.

Section I discusses the data and section II presents the analysis and results of our inquiry. Section III draws conclusions.

I. The Data

Each semester, all the students at the University of Zurich have to decide whether or not they want to contribute to two official social funds – in addition to the compulsory tuition fee. On the official letter for renewing their registration, the students are asked if they want to voluntarily give a specific amount of money (CHF 7.-, about US\$ 4.20) to a fund which offers cheap loans to needy students and/or a specific amount of money (CHF 5.-, about US\$ 3) to a second fund supporting foreigners who study at the University of Zurich. Without their

explicit consent (by marking a box), students do not contribute to any fund at all. The students give their approval with their signatures. Our data refers to the decisions made in the five semesters from the winter semester 1998/99 up to and including the winter semester 2000/2001. The fact that every student of the University of Zurich has to decide anew each semester, if he or she is willing to contribute to one or both of the social funds, generates a large number of observations. We observe the decisions of 28,586 students who decide on an average 3.4 times, depending on their number of semesters. The decisions of the five semesters are pooled, which generates 96,783 observations. The data enable us to compare the effect of studying different disciplines⁵ on cooperative behavior and provides the opportunity of controlling for a possible effect of economics education.

The organization of the study of economics at the University of Zurich allows us to control for different levels of economic knowledge. In a first stage, the students undertake the *basic study*, which takes about 2 years. After passing an exam covering the basics of micro- and macroeconomics they enter the *main stage* and choose between political or business economics. After graduating, the students may take up their *PhD study*. However, students can already specialize in economics at high school. We control for this *pre-university knowledge* (in economics).

The strict official procedures applied when renewing student registration offer a controlled environment at the same time as using a natural setting. The results can therefore be compared to the results on giving in fairness games in economic laboratory experiments. Moreover, the amounts in question are similar to those that have been used in the experiments designed to analyze the issue mentioned.

II. Analysis and Results

A glance at the raw data seems to indicate that economists are more selfish than other students. 61.8 percent of the economics students (political and business economists) contribute to at least one of the funds, compared to 68.7 percent of the students with other majors. In the following sections, the two possible explanations for this pattern of behavior will be tested: (1) selfish individuals study economics (*selection hypothesis*). The difference in giving behavior is therefore independent of studying economics. (2) The students adapt their behavior over time to the basic axiom of the theory they study (*indoctrination*

⁴ See Kelman (1987) and Ostrom (1998). The latter warns: "We are producing generations of cynical citizens with little trust in one another, much less in their government. Given the central role of trust in solving social dilemmas, we may be creating the very conditions that undermine our own democratic ways of life" (p. 18).

⁵ The University of Zurich is the biggest university in Switzerland, with 20,000 students altogether, and offers the whole range of disciplines which can be studied in Switzerland.

hypothesis). Throughout their studies, economics students become more selfish according to the principles of economic theory. Because the two explanations are not mutually exclusive, it is important to discriminate between the two hypotheses.

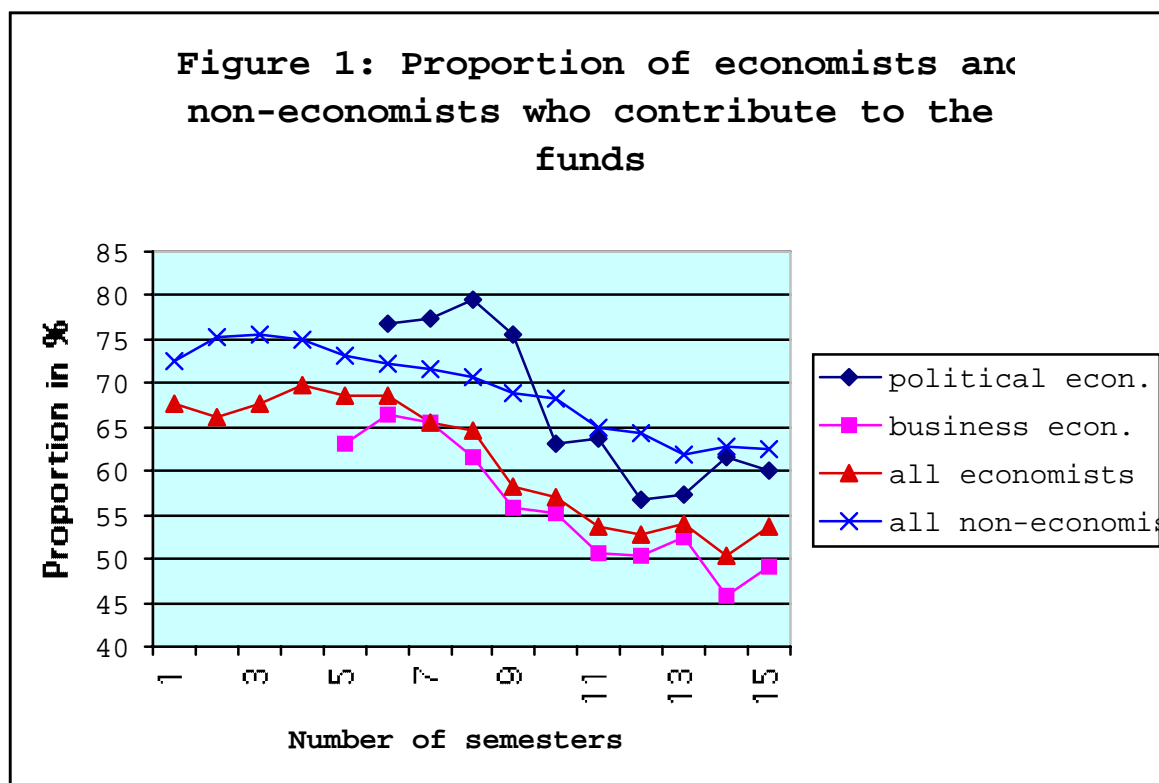


Figure 1 shows the proportion of economists and non-economists who contribute to at least one of the social funds, depending on how progressed they are in their studies. Three aspects catch the eye immediately:

- (i) The difference between economists and non-economists exists already at the very beginning of their studies, before the students have had a single lecture in economics. This supports the selection hypothesis.
- (ii) A clear behavior pattern over time is not obvious. The difference between economists and non-economists does not clearly widen as the students progress with their studies. Therefore, the raw data do not seem to clearly support the indoctrination hypothesis.
- (iii) There are big differences between political and business economists. The curve for the two subgroups of economists starts when the students enter the main stage of their studies in their fifth semester and choose one of the two directions in economics. Even after 2 years of studying economics, political economists are more prepared to give to one of the funds than the average student. And the readiness of political economists to donate even increases.

In the following sections, these patterns are tested, controlling for the gender and age structure of the different groups. Moreover, the extent of economic knowledge of the students is controlled for.

1. Is there a selection effect?

To distinguish between the selection and the indoctrination hypothesis, we take a closer look at the decision to contribute when first starting university (*freshmen*). Differences between students of various disciplines at the very beginning of their studies (without having been to a single lecture in economics) support the selection hypothesis. We control for economic knowledge acquired at high school, the main source of pre-university economics training. The dummy variable *pre-university knowledge* equals 1 if the students attended a high school with an economic orientation and 0 otherwise.⁶ A description of variables is provided in the appendix.

Table 1 presents the results of a probit analysis. The dichotomous dependent variable equals 1 if the student contributes to at least one fund, and equals 0 if the student decides not to give any money at all. Control variables are personal factors (age, gender and nationality) and dummy variables for the semester in question. As in a probit analysis the coefficients are not easy to interpret, the marginal effects are computed. They show how the probability of contributing changes compared to the reference group.

TABLE 1

The first part of Table 1 suggests that a selection effect exists. Economists in the broad sense (students cannot choose between business and political economics until they reach the main stage of their studies) donate less to the funds compared to non-economists. The probability that an economist contributes is over 3 percentage points less than for a non-economist. To show that this lower willingness to contribute exists at the very beginning of the studies, the variable for economists has to be jointly interpreted with "being a freshman in economics" (*freshman*economist*). The results suggest that already when the very first decision is made whether to contribute or not (it happens before the first lecture in economics), economics students act more selfishly than non-economists do.⁷ The differences between economists and

⁶ A special dummy variable for students who did not obtain their high school qualifications in Switzerland (and for whom no information about potential pre-university knowledge in economics was available) did not prove to have an effect. Hence, it was not taken into account.

⁷ The overall lower probability (-5.1 percentage points) at the time of the very first decision cannot be compared to first period decisions in fairness experiments, where contribution is normally highest (see e.g. Ledyard 1995).

non-economists at the very beginning of their studies remain if we run the same regression with the subsample for freshmen only.

The estimate also controls for pre-university education: having a high school education with an economics orientation is associated with a significantly lower propensity to donate to other students. The probability of contributing is 3.9 percentage points lower. This effect can either be a selection or an indoctrination effect. The important point for our study is that although pre-university economic education has an impact, it does not explain the selection process. Independent of the pre-university education, a selection of more selfish people into the study of economics takes place. The personality variables show the following effects: all other influences being equal, the older a student is, the more likely he or she is prepared to contribute to the fund. While the effect of age is insignificant until age 30, it becomes increasingly significant and important after age 30. Women and foreigners are less prepared to give. The same holds for the number of semesters a student stays at the university. This last variable suggests that repetition tends to reduce giving.

2. Is there an indoctrination effect?

A particularly interesting question is whether the teaching of economic theory has a negative effect on students' cooperative behavior. The more the students of economics learn about the Prisoner's Dilemma Game, the more aware they are that cooperation should tend towards the Nash equilibrium, i.e. towards no contribution. For students who are not familiar with economic theory, such a decline in cooperation is not expected to take place. If the difference in giving behavior between the students of economics and the other disciplines increases with every additional semester, the indoctrination hypothesis is not rejected. In order to capture specific knowledge in economics, we compare the behavior of the students at each stage of their studies. The reference group consists of non-economists in the basic stage of their studies. The results in Table 1 provide an inconsistent picture with respect to the indoctrination effect: Moving from the basic stage to the main stage of university education raises students' readiness to help other students financially by 3.9 percentage points. The coefficient on the dummy for *Main stage*Economist* measures the differences between economists and non-economists when entering the main stage, and hence serves as a test for

The freshmen at the University of Zurich decide before attending any classes and without meeting any other students. Thus, between the first and the subsequent decisions, an important variable changes, which can best be described in terms of 'social distance'. For the effect of social distance in games, see Bohnet and Frey (1999) and Hoffman et al. (1996).

possible indoctrination effects. For economics students entering the main stage of their studies, the probability of contributing to the fund is reduced by 6.7 percentage points – in addition to the general effect for entering the main stage. But this result does not necessarily indicate the impact of indoctrination because the probability of contributing increases for doctoral students in economics, while for doctoral students in other disciplines the willingness to donate decreases. If indoctrination really influenced the behavior of students, the effect should be strongest at the doctoral level, where the students have absorbed the largest amount of economics teaching.

The results and interpretation of an indoctrination effect presented above are problematic in especially one respect: students in the main stage of their studies can be a particular selection of people compared to students in the basic stage because a large proportion of students does not pass the exam enabling them to enter the main stage. The same argument can be raised with respect to Ph.D. students, who certainly differ in many respects from students working only for their Masters Degree. Thus, a sample selection bias cannot be excluded. To eliminate these doubts, we test the indoctrination effect in a conditional logit model with personal fixed effects. With this method, we can exclude any selection biases by holding unobserved personal characteristics constant.

Table 2 presents the results of the conditional fixed effects logit model. Because in this kind of model only students are of interest who have at least once altered their decision, i.e. changed their mind with respect to contributing to the funds, the sample is reduced to 7129 persons. These students decided on average 4.2 times, which leads to 29,874 observations.

TABLE 2

In table 2, a possible indoctrination effect is modeled in two ways: in model I, we look at the effect of an additional semester in economics, while in model II, the explicit economic knowledge is captured by the different stages in the studies. Both methods allow us to address the issue of whether students become less generous as they progress in their studies. The coefficients have to be interpreted as the effect of a change in economic knowledge – either through an additional semester in economics or through a shift from one stage to another. The results in table 2 do not support the indoctrination effect. Neither the coefficient of an additional *semester in economics* nor the coefficient of the relevant interaction terms *Main stage*Economist* and *Ph.D.*Economist* have the right sign for an indoctrination effect. Moreover, they are far from being statistically significant.

A robust effect seems to be that students contribute less the first time they have to decide. Thus, the coefficient shows that *freshmen* give less than students in the basic stage (reference group). For an *economist*, such a ‘freshman-effect’ does not exist. We have to interpret the coefficient for *freshmen* and the interaction term *Freshman*Economist* jointly and they cancel each other out. Freshmen in Economics do not show any different behavior compared to the basic study. Once the first decision has been made, the probability of economists contributing does not increase. This can already be seen in the descriptive analysis (figure 1).

Thus the data do *not* support a negative effect of economics education on giving. The data enables us to exclude selection biases. The possible indoctrination effects of table 1 are due to unobserved heterogeneity. This result is further supported first by looking at two groups of economics students and second by comparing the behavior of students of economics with students of other academic disciplines. This is done in the following section.

3. Behavior of students of political and business economics

Table 3 focuses on the differences in contributing to the fund between the two types of students of the economic sciences, on the one hand “political economists”, and on the other hand “business economists”. Students are allowed to choose between the two economics majors only in the main stage of their studies, i.e. after they pass the exams concluding the basic training stage of their studies (after approximately two years).

TABLE 3

Controlling for all the factors previously included in Table 1, political economists differ from other students to the same extent as when they started university. The effect of political economists entering the main stage (*Main stage*Political Economist*) is positive. Thus, the differences between economists and non-economists even decreases, but this effect is not statistically significant. In contrast, the probability of business students contributing to the social funds is – in addition to the general effect – over 7 percentage points lower in the main stage than in the basic study. The results do not support the effect of education in economics, because political economists do not show any (statistically significant) behavioral differences from non-economics students. But we are primarily interested in the behavior of political economists because they learn economic theory the most intensively. Thus, an alleged indoctrination effect should be the greatest in this group. Again we run a conditional fixed-effect logit model (model II in table 3) to control for unobserved heterogeneity. The results

support the conclusion that economics education does not have a negative impact on the willingness to contribute.

As already mentioned, students have to choose between studying political or business economics only after the initial 2 years and we therefore do not know if the general effect of *Economist* (in the widest sense) has to be attributed to political or business economists. But the five semesters enable us to observe how students, who later chose to study either political or business economics, behaved in their basic study. The raw data is already convincing: among business economists, whose behavior we know in the basic study, 61 percent donated money to at least one fund. In contrast, 73 percent of political economists contributed in the basic stage to at least one fund. This suggests that the selection effect identified is almost entirely due to business students.

4. Comparison with students of other disciplines

Most of the previous studies about the cooperation of economists only compare economists' behavior to one or two particular groups of persons, i.e. sociologists (Laband and Beil 1999; Isaac et al 1985), biologists and psychologists (Yezer et al. 1996), astrologists (Frank et al. 1993) or nurses (Cadsby and Maynes 1998). Our extremely large data set allows us to compare economists' behavior with students of other disciplines. Table 4 compares the contribution by the students of the various disciplines, again holding personal characteristics and other variables previously included in Table 1 constant.

TABLE 4

The reference group is composed of students from the faculty of arts, which constitutes the biggest faculty at the University of Zurich (roughly 8600 students). Looking at the "pure" effect of one's chosen subject, students of the economics faculty are about as selfish as law students, while a much higher proportion of theology students are prepared to subsidize other students.

When students move to the *main stage* of their studies, their probability of donating increases on average, as already stated. However, large differences between the different disciplines emerge. For instance, being a student of veterinary medicine lowers the probability of paying into the funds by more than 8.7 percentage points, compared to arts students (reference group). Business economics students give 8.4 percentage points less than art students when entering the main stage – this decrease in the willingness to contribute is as large as for

veterinary students. When entering the main stage, students of political economy change their willingness to donate to the same extent as the reference group (students of the arts faculty). The interaction term that captures the deviation from the reference group is statistically insignificant. Our results suggest that political economists' willingness to donate money does not diminish as they progress with their studies, compared to students of other disciplines.

When students graduate and take up their Ph.D. studies, the probability of their donating money increases by 3.7 percentage points. For students of medicine, law, and veterinary medicine, the readiness drops – in addition to the general effect (12.7, 9.1 and 9.4 percentage points, respectively). When moving into the *Ph.D.* stage, political and business economists' willingness to give does not fall in a statistically significant way compared to students in the arts faculty. And again, our results suggest that, in order to isolate an indoctrination effect, it is crucial who the economists are compared with.

5. Testing for other determinants of giving behavior

The question of whether there is an indoctrination or a self-selection effect was further studied with the help of an anonymous on-line survey among the same student population of the University of Zurich as the data set on giving behavior.⁸ The response rate was 18 percent. From this sample, we could use 2,321 answers containing answers to all relevant questions. This sample is not totally representative (not surprisingly, a larger number of economics students responded to the questionnaire sent out by two economists), but with respect to gender and age, the sample corresponds to the distribution of students at the University of Zurich. Model I in table 5 estimates a very similar model as in table 1 to see how biased the sample is. This procedure can be undertaken because the survey is closely linked to the natural decision at the university. The results show – compared to table 1 – that the sample is not strongly biased with respect to the effect of the different stages in the study and the control variables.

The most important question asked in the survey was again whether a person contributes money to one or both of the funds. 73 percent responded that they did, compared to the 68 percent who actually contributed. Such differences between survey answers and actual behavior have also been observed with respect to voting behavior (see Matsusaka and Palda 1999). Oberholzer-Gee and Eichenberger (1998) show in an experiment that distributional transfers are greater if they are hypothetical rather than real.

The main purpose of the survey is to better control for factors affecting giving behavior unconnected to the issue of indoctrination versus selection. The survey allows us to determine the income situation, assuming that the better off a student is, the more likely he or she is to help others (Andreoni 2001). Those students working on the market to help finance their studies (which is a significant number of students at the University of Zurich) are expected to donate the less, the more they finance their studies themselves (Thaler 1985). In contrast, when parents foot their studies (and therefore the contribution to the funds), it is likely that students are more generous with respect to their fellow students (Kirchgässner 1992). In addition, various motives for giving money to the fund were queried: expectations concerning the contribution of other students, one's political orientation on a left/right spectrum (ranging from 1 to 8; with 8= the furthest left), the fund's perceived necessity and effectiveness, and the perceived importance of individual participation (on a scale ranging from 1 to 8 with a 'No Opinion' option; with 8 = the strongest emphasis on necessity and effectiveness of the funds, and the importance of individual participation).

Model II in table 5 presents the probit estimates again controlling for age, gender and the number of semesters.

TABLE 5

The survey once more suggests that the giving behavior of political economists does not differ significantly from non-economists when they advance in their studies. Students of business economics give significantly less when they enter the main stage of their studies. Model II in table 5 reports a higher coefficient for economists in general than for non-economists, which is due to the differences in attitudes and political orientations in the sample. Economists are on average more critical about the funds and tend to be more on the right side of the political spectrum – both factors lower the probability of donation. Because we control for these variables in Model II, the coefficient for economists in the broad sense becomes positive. But the differences in values and political orientation do not change the behavior of business economists throughout their studies. They exist already at the beginning of their studies and are independent of economics education. They therefore also support the selection hypothesis that business economists are a special group of people.

The results on income and attitudes are not surprising. Income has the expected strong positive effect on giving. The more a student finances his own living, the less he or she is willing to contribute. The fact that the parents pay the fee does not, in a statistically significant

⁸ The on-line questionnaire is reproduced at <http://www.iew.unizh.ch/grp/frey/fragebogen.htm>

way, change the probability of one's own decision to donate. The variables reflecting students' values all have the expected sign and are statistically significant. Expectations regarding how many others donate money correlates positively with the decision to contribute. Of course, the causality is not obvious due to the 'false consensus' effect (Ross et al 1977, Dawes et al. 1977). The variables used as controls are (with one exception) all statistically significant and have the expected sign.

III. Conclusions

The analysis of the actual behavior of the students with respect to donating money to a fund as a pure public good, as well as an on-line survey of the same population, allows us to draw three conclusions:

- (1) Political economists' willingness to donate money does not diminish by studying economic theory;
- (2) It is the students of business economics who give significantly less than other students;
- (3) The lower contribution of business economists, compared to other students, is due to self-selection rather than indoctrination.

These conclusions are based on the real life behavior of roughly 30,000 students at the University of Zurich but they are likely to be of general relevance. Zurich provides a good example of a student body in a moderately large city. The students of economics, on which the study focuses, receive a similar education in their particular discipline as do their counterparts elsewhere, especially in the United States (for example, many of the textbooks used are American). As a considerable number of the students are at the same time in gainful employment, they tend to be in close contact with the rest of the population. The results reached may therefore well apply to the behavior of economists in general, i.e. outside of the university setting.

The conclusions drawn are important for two quite different reasons:

- Political economists need not fear that they have a negative effect on students' behavior with respect to altruistic giving. The students, and in particular the graduates studying for a doctoral degree, well understand that political economics does not offer any normative advice with respect to giving.

- The charge often made against political economists, that they produce the type of selfish homo oeconomicus they assume in their theories, is unfounded.

References

- Andreoni, James.** 2001. The Economics of Philanthropy. In: N.J. Smelser and P.B. Baltes (Hrsg.). *International Encyclopedia of the Social and Behavioral Sciences*. London: Elsevier. Forthcoming.
- Blais, André and Robert Young.** 1999. Why Do People Vote? An Experiment in Rationality. *Public Choice* 99, 39-55.
- Bohnet, Iris and Bruno S. Frey.** 1999. Social Distance and Other-Regarding Behavior in Dictator Games: Comment. *American Economic Review* 89, 335-339.
- Bohnet, Iris and Bruno S. Frey.** 1995. Institutions Affect Fairness: Experimental Investigations. *Journal of Institutional and Theoretical Economics* 151, 286-303.
- Brunk, Gregory G.** 1980. The Impact of Rational Participation Models on Voting Attitudes. *Public Choice* 35, 549-564.
- Cadsby, Charles Bram and Elizabeth Maynes.** 1998. Gender and Free-Riding in a Threshold Public Goods Game: Experimental Evidence. *Journal of Economic Behavior and Organization* 34, 603-620.
- Carter, John R. and Michael D. Irons.** 1991. Are Economists Different, and If So, Why? *Journal of Economic Perspectives* 5 (2), 171-177.
- Dawes, Robyn M., J. McTavish and H. Shaklee.** 1977. Behavior, Communication, and Assumptions About Other People's Behavior in a Commons Dilemma Situation. *Journal of Personality and Social Psychology* 35, 1-11.
- Frank, Björn and Günther G. Schulze.** 2000. Does Economics Make Citizens Corrupt? *Journal of Economic Behavior and Organization* 43:1, 101-113.
- Frank, Robert H., Thomas Gilovich and Dennis T. Regan.** 1993. Does Studying Economics Inhibit Cooperation? *Journal of Economic Perspectives* 7:2, 159-171.
- Frank, Robert H.** 1988. *Passions Within Reason*. New York: W.W. Norton.
- Frank, Robert H., Thomas Gilovich and Dennis T. Regan.** 1996. Do Economists Make Bad Citizens? *Journal of Economic Perspectives* 10:1, 187-192.
- Frey, Bruno S., Werner W. Pommerehne and Beat Gygi.** 1993. Economics Indoctrination or Selection? Some Empirical Results. *Journal of Economic Education* 24:3, 271-281.
- Hirshleifer, Jack.** 1994. The Dark Side of the Force. Western Economic Association International 1993 Presidential Address. *Economic Inquiry* 32, 1-10.
- Hoffman, Elizabeth, Kevin McCabe and Vernon L. Smith.** 1996. Social Distance and Other-Regarding Behavior in Dictator Games. *American Economic Review* 86:3, 653-660.
- Kelman, Steven.** 1987. "Public Choice" and Public Spirit. *The Public Interest* 87 (Spring), 80-94.
- Kirchgässner, Gebhard.** 1992. Towards a Theory of Low-Cost-Decisions. *European Journal of Political Economy* 8. 305-320.
- Laband, David N. and Richard Beil.** 1999. Are Economists More Selfish Than Other 'Social' Scientists? *Public Choice* 100, 85-100.
- Ledyard, John O.** 1995. Public Goods: A Survey of Experimental Research. In: John H. Kagel und Alvin E. Roth (Hrsg.). *Handbook of Experimental Economics*. Princeton: Princeton University Press, 111-194.
- Marwell, Gerald and Ruth E. Ames.** 1981. Economists Free Ride, Does Anyone Else? Experiments on the Provision of Public Goods IV. *Journal of Public Economics* 15, 295-310.
- Matusaka, John G. and Filip Palda.** 1999. Voter Turnout: How Much Can We Explain? *Public Choice* 98, 431-446.
- Oberholzer-Gee, Felix and Reiner Eichenberger.** 1998. Rational Moralists: The Role of Fairness in Democratic Economic Politics. *Public Choice* 94:1-2: 191-210.

- Ostrom, Elinor.** 1998. A Behavioral Approach to the Rational Choice Theory of Collective Action. Presidential Address, American Political Science Association 1997. *American Political Science Review* 92:1, 1-22.
- Ross, L., D. Greene and P. House.** 1977. The 'False Consensus Effect': An Egocentric Bias in Social Perception and Attribution Processes. *Journal of Experimental Social Psychology* 13, 279-301.
- Selten, Reinhard and Axel Ockenfels.** 1998. An Experimental Solidarity Game. *Journal of Economic Behavior and Organization* 34, 517-539.
- Seguino, Stephanie, Thomas Stevens and Mark A. Lutz.** 1996. Gender and Cooperative Behavior: Economic Man Rides Alone. *Feminist Economics* 2:1, 1-21.
- Stanley, T.D. and Ume Tran.** 1998. Economics Students Need Not Be Greedy: Fairness and the Ultimatum Game. *Journal of Socio-Economics* 27:6, 657-664.
- Thaler, Richard H.** 1985. Mental Accounting and Consumer Choice. *Marketing Science* 4, 199-214.
- Yezer, Anthony M., Robert S. Goldfarb and Paul J. Poppen.** 1996. Does Studying Economics Discourage Cooperation? Watch What We Do, Not What We Say or How We Play. *Journal of Economic Perspectives* 10:1, 177-186.

Appendix

Description of variables

Contribution to Funds Sample

Economic education: Dummies for economists in the broad sense, for political and for business economists, and for high school knowledge of economics. The reference group consists of non-economists, without any high school knowledge of economics.

Dummies for students of every faculty and interaction terms with the stage of study respectively. The reference group consists of students of the arts faculty.

Stage of study: Dummies for freshmen (students starting university), the main stage and the Ph.D. stage. The reference group consists of students in their basic study. Interaction terms linking the dummies for economists and the stage of study.

Demographic factors: Dummies for age 26-30, 30-35, 36-40 and over 40, for females, and for foreigners. The reference groups consists of people below 26 years of age, males and Swiss. The number of semesters at the University of Zurich and the number of semesters squared.

Survey Sample

Economic Education: See above.

Income situation: Log of income at one's disposal each month. Proportion of living costs financed by the students themselves. Dummy when parents cover the university fees. The reference group consists of students who pay the fee by their own.

Values: Perceived necessity and effectiveness of the funds and perceived importance of individual participation on a scale from 1 to 8 with a 'No Opinion' option; 8=the strongest emphasis on necessity and effectiveness of the funds and for the importance of individual participation. Political orientation on a scale from 1 to 8; 8= the furthest left. Expectations about the behavior of others in percent (the question was: What do you think is the proportion of students who contribute to one of the funds?).

Table 1
Contribution of Economists and Non-Economists
 University of Zurich 1998-2000
 Dichotomous dependent variable: 'Contribution to at least one fund' = 1
 Probit estimates

Variable	Coefficient	Z-value	Marginal effect
Economist (1 = economist)	-0.009**	-3.596	-3.0%
<i>Stages of study</i>			
Freshmen	-0.143**	-7.208	-5.1%
Freshman*Economist	0.034	0.661	1.2%
Main stage	0.109**	9.047	3.9%
Main stage*Economist	-0.189**	-6.092	-6.7%
Ph.D.	-0.118**	-8.806	-4.2%
Ph.D.*Economist	0.320**	6.695	11.4%
Pre-university knowledge	-0.109**	-9.543	-3.9%
<i>Control variables</i>			
Age 26-30	-0.006	-0.443	-0.2%
Age 31-35	0.187**	10.974	6.7%
Age 36-40	0.362**	16.120	12.9%
Age over 40	0.525**	21.510	18.7%
Gender (female=1)	-0.031**	-3.531	-1.1%
Nationality (foreigner=1)	-0.109**	-8.260	-3.9%
Number of semesters	-0.046**	-23.084	-1.6%
(Number of semesters) ²	0.001**	13.712	0.02%
Period 2 (summer semester 1999)	0.075**	5.561	2.7%
Period 3 (winter semester 99/00)	0.137**	10.438	4.9%
Period 4 (summer semester 2000)	0.134**	9.855	4.8%
Period 5 (winter semester 00/01)	0.173**	13.139	6.2%
Constant	0.673**	40.868	
N	96,783		
Log Likelihood	-59458.85		

Notes: Reference group consists of 'non-economists', 'basic study', 'without pre-university economic knowledge', 'aged below 26', 'male', 'Swiss', 'semester 1998/99'.

Level of significance: * 0.01 < p < 0.05, ** p < 0.01

Data source: Compiled from data provided by the accounting department of the University of Zurich.

Table 2
Contribution of Economists and Non-Economists
 University of Zurich 1998-2000
 Dichotomous dependent variable: 'Contribution to at least one fund' = 1
 Conditional fixed effects logit model

Variables	Model I		Model II	
	Coefficient	Z-value	Coefficient	Z-value
Number of semesters	-0.034	-1.361	-0.037	-1.489
Semesters in Economics	-0.023	-0.780		
Freshmen	-0.387**	-6.917	-0.440**	-7.431
Freshman*Economist			0.424**	2.745
Main stage	-0.100	-1.183	-0.146	-1.615
Main stage*Economist			0.340	1.446
Ph.D.	-0.266	-1.183	-0.272	-1.825
Ph.D.*Economist			0.338	0.493
Age	0.111**	2.414	0.111**	2.415
N	29,874		29,874	
Log Likelihood	-11153.76		-11149.07	
LR chi ²	0.021		99.96	

Notes: Reference group consists of 'non-economists', 'basic study', 'without pre-university economic knowledge', 'aged below 26', 'male', 'Swiss', 'semester 1998/99'.

Level of significance: * 0.01 < p < 0.05, ** p < 0.01

Data source: Compiled from data provided by the accounting department of the University of Zurich.

Table 3
Contribution of Political and Business Economists
 University of Zurich 1998-2000
 Dichotomous dependent variable: 'Contribution to at least one fund' = 1

Variable	Model I Probit estimate			Model II Conditional fixed effect logit	
	Coefficient	Z-value	Marginal effect	Coefficient	Z-value
Economist (in the broad sense)	-0.104**	-4.890	-3.7%		
<i>Stages of study</i>					
Freshmen	-0.144**	-7.261	-5.1%	-0.442**	-7.453
Freshman*Economist	0.051	1.003	1.8%	0.424**	2.743
Main stage	0.104**	8.784	3.6%	-0.133	-1.531
Main stage*Political Economist	0.090	1.429	3.1%	0.982	1.879
Main stage*Business Economist	-0.211**	-6.764	-7.5%	0.184	1.025
Ph.D.	-0.114**	-8.504	-4.1%	-0.259	-1.739
Ph.D.*Political Economist	0.090	0.885	3.2%	-0.389	-0.334
Ph.D.*Business Economist	0.311**	5.395	11.1%	0.207	0.263
Pre-university economic knowledge	-0.109**	-9.535	-3.9%		
<i>Control variables</i>					
Age				0.110**	2.407
Age 26-30	-0.007	-0.523	-0.2%		
Age 31-35	0.187**	11.001	6.7%		
Age 36-40	0.362**	16.121	12.9%		
Age over 40	0.525**	21.515	18.7%		
Gender (female=1)	-0.030**	-3.445	-1.1%		
Nationality (foreigner=1)	-0.110**	-8.279	-3.9%		
Number of semesters	-0.046**	-23.115	-1.6%	-0.037	-1.509
(Number of semesters) ²	0.001**	13.733	0%		
Period 2 (summer semester 1999)	0.077**	5.663	2.7%		
Period 3 (winter semester 1999/00)	0.140**	10.609	5.0%		
Period 4 (summer semester 2000)	0.136**	9.999	4.8%		
Period 5 (winter semester 2000/01)	0.176**	13.327	6.3%		
Constant	0.674**	41.067			
N	96,783			29,874	
Log Likelihood	-59453.408			-11147.988	
				(LR chi ²) 12.12	

Notes: Reference group consists of 'non-economists', 'basic study', 'without pre-university economic knowledge', 'aged below 26', 'male', 'Swiss', 'semester 1998/99'.

Level of significance: * 0.01 < p < 0.05, ** p < 0.01

Data source: Compiled from data provided by the accounting department of the University of Zurich.

Table 4
Contribution of Economists and Students of Other Faculties
 University of Zurich 1998-2000
 Dichotomous dependent variable: 'Contribution to at least one fund' = 1
 Probit estimates

Variable	Coefficient	Z-value	Marginal effect
Economics	-0.159**	-5.729	-5.7%
Theology	0.239**	3.349	8.5%
Law	-0.135**	-4.719	-4.8%
Medicine	0.058	1.775	2.1%
Veterinary medicine	-0.126**	-2.697	-4.5%
Natural science	-0.003	-0.086	-0.1%
Computer science	-0.085*	-2.131	-3.0%
Main stage [°]	0.113**	4.567	4.0%
Political economics	0.069	1.059	2.5%
Business economics	-0.235**	-6.554	-8.4%
Theology	0.030	0.277	1.1%
Law	-0.111**	-3.320	-3.9%
Medicine	-0.140**	-3.450	-5.0%
Veterinary medicine	-0.243**	-3.572	-8.7%
Natural science	-0.186**	-4.745	-6.6%
Computer science	-0.132*	-2.140	-4.7%
Ph.D. [°]	0.104**	4.724	3.7%
Political economics	-0.113	-1.102	-4.0%
Business economics	0.099	1.641	3.5%
Theology	-0.273*	-2.251	-9.7%
Law	-0.256**	-6.750	-9.1%
Medicine	-0.356**	-9.499	-12.7%
Veterinary medicine	-0.265**	-3.882	-9.4%
Natural science	0.012	0.322	0.4%
Computer science	-0.274**	-2.854	-9.8%
Pre-university economic knowledge	-0.084**	-7.321	-3.0%
N	96,783		
Log Likelihood	-59081.479		

Notes: Reference group consists of 'students of the arts faculty', 'basic study', 'without pre-university economic knowledge', 'aged below 26', 'male', 'Swiss', 'semester 1998/99'. Due to lack of space, the control variables of table 1 are not shown in the table.

[°] variables below are interaction terms.

Level of significance: * 0.01 < p < 0.05, ** p < 0.01

Data source: Compiled from data provided by the accounting department of the University of Zurich.

Table 5
Factors Affecting Giving Behavior

University of Zurich 2000

Dichotomous dependent variable: 'Contribution to at least one fund' = 1

Probit estimates

Variable	Model I			Model II		
	Coefficient	Z-value	Marginal effect	Coefficient	Z-value	Marginal effect
Economist (in the broad sense)	0.152	1.281	4.9%	0.391**	2.829	11.3%
<i>Stages of study</i>						
Main stage	0.045	0.603	1.5%	0.080	0.944	2.3%
Main stage*Political Economist	-0.245	-0.91	-7.9%	-0.208	-0.648	-6.0%
Main stage*Business Economist	-0.427*	-2.523	-13.8%	-0.413	-2.087	-12.0%
Ph.D.	0.011	0.103	0.4%	0.119	0.947	3.5%
Ph.D.*Political Economist	0.378	0.562	12.2%	1.234	1.614	35.7%
Ph.D.*Business Economist	0.250	0.481	8.1%	0.156	0.261	4.5%
<i>Income situation</i>						
Log (income)				0.188**	3.88	5.5%
Percent of earning one's own living				-0.003*	-2.249	-0.1%
Parents paying fees				0.067	0.785	2.0%
<i>Attitudes and Expectations</i>						
Expectation about behavior of others				0.019**	11.327	0.6%
Political orientation				0.061**	2.617	1.8%
Necessity of funds				0.095**	3.49	2.7%
Effectiveness of funds				0.085**	3.235	2.5%
Importance of contributing				0.241**	10.963	7.0%
No opinion on 'necessity'				0.367	1.893	10.6%
No opinion on 'effectiveness'				0.479**	3.065	13.9%
No opinion on 'importance'				0.851**	4.84	24.6%
<i>Control variables</i>						
Age	0.014*	2.153	0.4%	0.016	1.917	0.5%
Sex (female=1)	0.056	0.972	1.8%	-0.180**	-2.627	-5.2%
Number of semester	-0.019**	-2.83	-0.6%	-0.019*	-2.505	-0.6%
Constant	0.365*	2.253		-4.780**	-11.393	
N	2321			2321		
Log likelihood	-1322.2735			-979.11015		

Notes: Reference group consists of 'non-economists', 'basic study', 'males', who 'pay their fee themselves'.

Level of significance: * 0.01 < p < 0.05, ** p < 0.01

Data source: Own survey carried out at the University of Zurich.