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Do Business Students Make Good Citizens?

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ABSTRACT *Business students are often portrayed as behaving too egoistically. The critics call for more social responsibility and good citizenship behavior by business students. We present evidence of pro-social behavior of business students. With a large panel data set for real-life behavior at the University of Zurich, two specific hypotheses are tested: do selfish students select into business studies or does the training in business studies negatively indoctrinate students? The evidence points to a selection effect. Business education does not seem to change the citizenship behavior of business students.*

Key Words: Business Students; Public Good; Giving Behavior; Education; Selection.

JEL classification: A13, A20, H41.

This paper looks at the pro-social behavior of business students and how education influences their behavior with respect to engaging in charitable donations. Pro-social behavior (PSB) is related to organizational citizenship behavior (OCB) and includes all contributions to a common good (e.g. voluntary work, helping needy people, making donations and protecting the environment). Business students are often seen to behave more selfishly than the rest of the population. Already in 1966, based on a questionnaire, a sociologist suggested that "... business students are more concerned strictly with maximizing their own welfare, disregarding the other's ..." (Sawyer, 1966: 414). This result was further supported by studying behavior in experiments for economists: they tend to donate less money, cooperate less in social dilemma situations and give less money in dictator games (e.g. Marwell and Ames, 1981; Carter and Irons, 1991; Cadsby and Maynes, 1998). Moreover, some scholars claim that the behavioral differences between business students and non-economists are due to economics education (Frank *et al.*, 1993; 1996). This would mean that training in business administration negatively affects the PSB of students.

Previous research on this topic was mainly based on survey studies or laboratory experiments with students as subjects. But one cannot exclude that the

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students see their participation in survey studies and experiments as an 'IQ test of sorts' (Frank, 1988: 228) and play the equilibrium they learned in class, when they wouldn't do this in a real life situation. In contrast, we use a natural decision setting at the University of Zurich. We find that business students behave less pro-socially than other students. However, the behavioral differences are *not due to business education*, but rather to a *selection* effect. Already at the beginning of their studies, business students contribute less than non-economists. Our results suggest that business training does not lower cooperation and pro-social behavior.

Our results should be seen as a contribution to the discussion on how business education shapes the (ethical) behavior of future managers. In the last section we therefore put our results into perspective and discuss how the results in this study may be interpreted.

The paper proceeds as follows: Section I presents the hypotheses and previous research. Section II presents the data set. The empirical results are discussed in section III, which also discusses alternative hypotheses. A final section draws conclusions.

1. Hypotheses and Previous Research

Theoretical Considerations

Contributions to public goods are an important part of everyday life. Without cooperative and helpful behavior, firms and society as a whole could not function. Standard economic theory assumes that people are selfish and therefore predicts that they neither contribute sufficiently to a pure public good, nor do they cooperate in a social dilemma situation, due to the incentive structure. But empirical evidence shows that a substantial number of individuals do behave pro-socially. A large literature is devoted to analyzing the factors that drive pro-social behavior in general or in organizations.[1] There are, however, many studies which claim that business students show less cooperative and ethical behavior than other people, keeping everything else constant. Daboub et al. (1995: 156), for example, express the proposition that "[...] corporate illegal activity will be stronger for firms whose TMT's [Top Management Team] have a greater amount of formal management education (i.e., a greater percentage of MBAs)." If behavioral differences between business students and other people, e.g. students of other disciplines who differ from business students only in their education, are observed, such differences could be attributed to two effects:

> *Hypothesis 1 (Selection hypothesis)*: Less pro-social persons choose to study business administration. We would expect differences in the behavior of business students and other students to be present at the onset of their studies, without ever having attended a single lecture in economic theory.

This hypothesis is based on the notion that people differ in their pro-social preferences. With respect to their 'social value orientation' people may be divided, for example, into individualistic, competitive and cooperative types (Messick and McClintock, 1968; McClintock, 1978).[2] According to this hypothesis, 'selfish' types self-select into business schools and the observed behavioral differences are due

to this selection process and not to any effect of business education. However, there may be another explanation for behavioral differences between business students and other students, which has more serious implications for business education:

> *Hypothesis 2 (Indoctrination hypothesis)*: Business students are indoctrinated by training in management and economics theory. We would expect that behavioral difference between business students and others increase during the studies. In other words, the more business students learn the theory, the more selfishly they behave – compared to other students.

Students may, for example, take the expected utility theory (Von Neumann and Morgenstern, 1947), which is common in business education, as normative advice for their own behavior (Jones *et al.*, 1990). Due to their game theoretical education, business students reduce their expectations about the pro-social behavior of others. This would also lead to a reduction in their own pro-social behavior, according to theories of social comparison and reciprocity (e.g. Kelley and Stahelski, 1970; Fischbacher *et al.*, 2001; Frey and Meier 2004b). More generally speaking, the business education decreases cooperative behavior because the training "(a) teaches a language devoid of ethical symbols, (b) provides a set of simplified assumptions about how the world works, and (c) reinforces acceptance of the rational/economic world view" (Daboub *et al.*, 1995: 155). If Hypothesis 2 proves valid, business schools would educate their students to the type of selfish persons they axiomatically assume in their theories.

The two hypotheses are not mutually exclusive and have to be tested empirically.

Previous research

There are three ways of addressing the question of whether business education makes students less pro-social: (1) asking questions about students' attitudes, (2) analyzing their behavior in laboratory experiments, and (3) looking at real-life behavior.

(1) Already Sawyer (1966) finds substantial differences between the attitudes of business students and other students. Others, like e.g. Schein (1967), test the extent to which attitudes change with management education. His results do not show that students change their 'General Cynicism' between the beginning and the end of their studies. Later studies, more interested in the impact of ethics courses, found that "the decisions made by business students were significantly less ethical [...]" than law students (McCabe *et al.*, 1991: 955). A follow-up study shows that business students hardly change their ethical attitudes, whether they took an ethics course or not (McCabe *et al.*, 1994). Similar results are found by Gandal and Roccas (Gandal and Roccas, 2000), who analyze the values held by economists and non-economists. The differences identified already emerge before any economics indoctrination can take place. But business students may express their perceived appropriate behavior, while in reality they would have behaved in a different way.

(2) Taking into account some of the shortcomings of surveys, most studies in economics use laboratory experiments to analyze behavioral differences. Students

play, for example, a prisoner's dilemma game and earn the respective amount of money. Material incentives exist to behave 'selfishly'. The result by Frank, Gilovich and Regan (1993; 1996) that economics education has a negative influence on students' cooperative behavior (i.e. that there is an indoctrination effect of economics) has been widely accepted in the academic community. But the literature on the topic is less uniform than suggested by Frank *et al.* (1996: 192), who argue that there is: '... a heavy burden of proof on those who insist that economics training does not inhibit cooperation.' While Carter and Iron (1991:174) find that "economists are born, not made", there are many more experimental studies which do not find a negative effect of economics education on cooperative behavior (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); Frank and Schulze (2000)). Laboratory experiments, however, have their shortcomings. If economists make economic experiments with other economists to see whether they behave like economists, one shouldn't be surprised if they really do so. In laboratory experiments, it is unclear whether economic majors try to play the learned equilibrium. It is much more relevant whether students see economic theory as an normative device for behavior outside the laboratory.

(3) Only three of the previous studies on this topic go beyond laboratory experiments. One of them is a "lost letter" experiment by Yezer *et al.* (1996), where envelopes containing money are dropped in different class rooms. On the basis of the number of letters returned, the study concludes that economists are even more honest than students of other subjects. However, the authors 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, which are income-based. However, income is self-reported (hence, the correct amount cannot be enforced). With that in mind, the authors 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 differences between professional academics. Again, this study does not control for personal characteristics. Business students may differ from other students in their composition according to e.g. gender. When women behave more pro-socially, we would not observe an effect of business education but of gender composition. In addition, the setting in the two studies mentioned does not allow for discrimination between the two hypotheses. Frey and Meier (2003) show in their study on giving behavior in a real-life situation that economics students do not behave more selfishly than students of other faculties. They, however, concentrate on economics students instead of business students.

To sum up, the evidence about the effect of business education on students' behavior is mixed. Most previous studies concentrate on the behavior of economists and do not show the effects for *business* students. With the data set used in this paper, the question of whether business students behave less pro-socially can be addressed in a natural setting. The behavior of business students can then be compared to that of economics students. As both selection and indoctrination may be at work, it is useful to discriminate between the two hypotheses. The data set used allows us to address both hypotheses simultaneously.

2. The Data Set

All of the students at the University of Zurich are asked each semester by the University administration whether they want to contribute to two official funds – in addition to the compulsory tuition fee. Before the semester starts, the students must decide, based on an official letter, whether they want to donate money to needy students (CHF 7.-, about US$ 4.20), who then can receive an interest free loan from one of the funds (Loan Fund) and/or if they want to donate money to foreign students (CHF 5.-, about US$ 3), who can receive money in order to study for one or two semesters in Zurich (Foreigner Fund). By ticking the respective box, students consent to pay into the funds. We observe the decisions for the period from the winter semester 1998/99 up to and including the winter semester 2002/03 (i.e. nine semesters). The fact that every student has to decide each semester whether to contribute or not leads to a large number of observations. We can observe the giving behavior of 37,588 students, who decide on average 4.8 times, depending on how many semesters they have attended. The decisions of the nine periods are pooled, which generates 180,225 observations. With this panel data set, it is possible to test whether training in economic theory really erodes pro-social behavior in the form of charitable giving.

The way the study of economics is organized at the University of Zurich allows us to control for different levels of economic knowledge. Initially, students undertake their *basic study*, which lasts about 2 years (4 semesters). After passing an exam covering basic business administration theory and macro- and microeconomics, they enter the *main stage* of their study and choose between business administration and economics. After graduating, students may start their *Ph.D. study*. Some of the students get basic economics knowledge in high school. We control for this *pre-university knowledge* (in economics).

In addition, an anonymous on-line survey was undertaken among the same student group of the University of Zurich.[3] The response rate was 18%. From this sample, we were able to use 3,256 answers, containing responses to all the questions relevant for our context. 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. See table 1 for summary statistics of the survey data set. The survey again asked whether the person contributed money to one or both of the funds. 73% responded that they did, compared to the 68% who actually contributed. This difference between survey answers and actual behavior is found in a lot of survey-based studies. While the differences can be the result of people lying (see Eichenberger and Oberholzer-Gee (1998) and Bertrand and Mullainathan (2001) for differences between hypothetical and real decisions), a more convincing explanation is that people who actually contributed to the Funds are more likely to respond to the online survey. The differences should be kept in mind when interpreting the survey data.

The dataset analyzed in this study has three clear advantages compared to most other studies:

(1) We observe behavior in a naturally occurring situation. However, the amount of money at stake seems to be small. But, for at least some of the students the contributions represents a substantial amount of the money they have at their disposal. Moreover, the contributions to the two funds serve as a proxy for

Nationality	Foreigner	21,092	11.70	
	Swiss	159,133	88.30	
Number of semesters, Mean (s.d.)		**10.47 (8.21)**		**6.94 (5.07)**
Time dummy 1 (winter semester 1998/99)		19,507		
Time dummy 2 (summer semester 1999)		18,231		
Time dummy 3 (winter semester 1999/00)		20,060		
Time dummy 4 (summer semester 2000)		18,650		
Time dummy 5 (winter semester 2000/01)		20,335		
Time dummy 6 (summer semester 2001)		19,075		
Time dummy 7 (winter semester 2001/02)		21,004		
Time dummy 8 (summer semester 2002)				
Time dummy 9 (winter semester 2002/03)				
Income (CHF)				1372 (1924)
Percentage earning their own living				57.6 (34.7)
Parents paying				45.4%

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

Table 1. Summary statistics

Variables	Data set		Survey data
	Number of observations	Percentage of the student body	Mean (s.d.)
Total	**180,225**		
Business and Economics students	**18,603**	**10.32**	**12.9%**
Basic	9247		
Freshmen	1688		
Main stage	7708		
Business Students	5541		
Economics Students	887		
PhD	1648		
Business Students	1066		
Economics Students	434		
Non-Economists	**16,1622**	**89.68**	**87.1%**
Basic	44,664		
Freshmen	11,997		
Main stage	89,423		
PhD	27,537		
Pre-university economic knowledge	**31,480**	**17.47**	
Age, Mean (s.d.)	**27.78 (8.05)**		**26.657 (5.59)**
Aged below 26	86,385	47.93	
Aged 26-30	49,453	27.44	
Aged 31-35	22,847	12.68	
Aged 36-40	11,024	6.12	
Aged above 40	10,516	5.83	
Gender Women	91,062	50.53	47.5%
Men	89,163	49.47	52.5%

Descriptive Analysis

Table 1 shows the summary statistics of the data set. Only about 10% of the university students are economists in the broad sense (business and economics students together). This allows us to compare their behavior with a large range of students of other subjects. And, as can be seen from table 1, most of the economists study business administration. In the appendix, a matrix of correlation coefficients is included.

The raw data clearly show the differences between business economists and non-economists. Table 2 shows the descriptive statistics for the giving of economists and non-economists who contribute to at least one fund. Throughout the analysis, we concentrate on the minimal contributions ('to at least one of the funds'). The results do not change when we look at all four options (Loan Fund, Foreigner Fund, both funds or neither of the funds). The contribution rate seems high compared to the much lower extent of charitable giving in the Swiss population. Two features of the decision setting may be responsible for the high contribution rate. Firstly, students are directly asked whether they want to contribute. From a number of studies it is known that this increases pro-social behavior substantially (e.g. Freeman, 1997). Secondly, the identification with the University increases contributions.[4]

Overall, 64.5% of the economists (business and econ students) contribute to at least one fund, compared to 70.2% of the non-economists. This difference is highly statistically significant (t-test: $t=16.20$, $p<0.001$). This result supports the notion that there are differences in pro-social behavior (PSB) between economists and non-economists, and that the differences are quite big. To further detect

more general PSB. In the online survey, we asked people whether they donate money to other funds (apart from the two social funds) and whether they volunteer. People who contribute to at least one of the two funds are statistically significantly more likely to donate to other funds. 56.5% of people who contribute to the funds also donate to other funds, versus 48.7% who don't ($t=3.56$; $p<0.001$). And students who contribute to the two funds, donate more money: on average CHF 259.5 (s.d.=14.4) vs. 197.6 (s.d.=27.3) ($t=1.87$; $p<0.06$). Where volunteering is concerned, the situation is less clear. Students who donate to the two funds volunteer more, but the difference is not statistically significant. However, one can see that the contributions to the two social funds can indeed act as some sort of proxy for more general PSB.

(2) The decision setting is clear and anonymous. Characteristics not connected to business education, and which may influence giving behavior, are controlled for. The anonymous situation allows us to exclude motives such as prestige (e.g. Harbaugh, 1998) or social pressure (Ostrom, 1998).

(3) We observe the behavior of a large number of students. This allows us to compare the behavior of business students to students of other disciplines, in particular to economists.

3. Empirical Results

The first subsection looks at the raw data, followed by an in-depth analysis of the selection hypothesis and the indoctrination hypothesis. In the following subsection, alternative hypotheses will be tested using data from the survey.

Table 2. Contribution of Business and Economics students and others at different stages of their study

	University of Zurich 1998–2002											
	Total		Freshmen		Basic		Main			PhD		
	Business and Econ. students	Others	Business and Econ. students	Others	Business and Econ. students	Others	Econ. students	Business students	Others	Econ. students	Business students	Others
Contribution rate	64.5%	70.2%	70.7%	74.5%	68.3%	71.4%	69.2%	56.8%	71.7%	65.0%	63.9%	61.9%
T-test	t=16.204 p<0.001		t=3.351 p<0.001		t=5.278 p<0.001		t=6.980 p<0.001	t=23.683 p<0.001		t=0.4003 p<0.689	t=1.302 p<0.193	
N	18,603	16,1622	1688	11,997	7559	32,667	887	5541	90,703	434	1066	27,685

Source: see Table 1.

whether these differences are due to a selection or an indoctrination effect, we have to look at the beginning of the students' career at the University of Zurich and how charitable donations develop throughout their studies. With respect to these questions, table 2 shows three notable patterns:

(1) A big difference already exists at the very beginning of the University study. Freshmen, before attending a single lecture, differ in a statistically significant way in their behavior. 74.5% of non-economists contribute, compared to only 70.7% of the economists ($t=3.35$, $p<0.001$). This result seems to support the selection hypothesis.

(2) During the main stage of their study, the willingness to contribute decreases dramatically for business students. Only 57% contribute to the funds, while 72% of the non-economists behave pro-socially. The difference of 14 percentage points is statistically significant ($t=23.64$, $p<0.001$). The difference widens, thus supporting the indoctrination hypothesis. For economists on the other hand, the willingness to contribute changes in the same way as for non-economists. For political economists, no indoctrination effect is to expected based on the descriptive analysis.

(3) During their Ph.D. studies, the differences between business students and non-economists level off. 62.4% of business economists donate money in this stage of their studies, compared to 62% of non-economists. However, the difference is not statistically significant at a conventional level ($t=1.27$, $p<0.20$). For business students, this signifies an increase in charitable donations. For non-economists, we observe a respective decrease. This pattern does not fit the indoctrination hypothesis: If a possible indoctrination effect increases according to the number of semesters studied, one would expect Ph.D. students to be most affected.

The descriptive analysis clearly supports the selection hypothesis, while showing an unclear picture concerning the indoctrination hypothesis. However, business students and students of other subjects may of course differ in other respects. This can influence PSB besides business and economics training. For example, women in Zurich are less likely to choose to study business and economics studies than other subjects (e.g. humanities). A 'business education' rather than a 'gender' effect may result.[5] To exclude such alternative interpretations, the next sections control for such factors, using multiple regression analysis. First the selection effect is analyzed in detail and then the indoctrination effect is studied, using methods to control for personal heterogeneity.

Selection Hypothesis

In order to test whether individuals who choose to study business and economics behave less pro-socially, we take a closer look at the first decision to contribute to the two funds. Table 3 presents a probit analysis, which controls for personal characteristics. The dichotomous dependent variable equals 1 if the student contributed to at least one of the two funds and 0 if the students free-ride completely. Because some students acquired economics knowledge in high school, we control for this effect by the dummy variable *pre-university knowledge*, which equals 1 if the students had economics in their high school curriculum and 0 otherwise. We also control for personal characteristics: the dummy variable *gender* equals 1 for women, *nationality* is 1 for foreigners and 0 for Swiss citizens and *age* is controlled for. As this is a pooled data set, we control for the time when

the decision was taken by including *time dummies*. Because the coefficients in a probit analysis are not easy to interpret, marginal effects are computed. They show how the probability of contributing changes compared to the reference group.

The results support the selection hypothesis. The probability that a business or econ student contributes to one of the funds is 4.4 percentage points lower compared to the reference group of non-economists. The effect is statistically significant at a 99%-level. Thus, before attending a single lecture in business management or economics, business and econ students contribute less than other students do in their first semester. We can exclude the possibility that pre-university knowledge is responsible for the observed behavioral difference. However, pre-university knowledge in economics has an effect on contributions. The probability of contributing is 2.9 percentage points lower if students acquired economics knowledge in high school. This effect can either be a selection or an indoctrination effect, but it cannot explain the selection effect into the business and economics study. The control variables reveal the following information: women are less likely to contribute to the funds at this stage of their study. Foreigners do not show any difference with respect to pro-social behavior at this stage of the study. As will be seen later, however, they are overall less prepared to act pro-socially. While the effect for women is statistically significant, it is not the case for foreigners. The effect of age is in line with other studies about giving behavior (see for an overview, Andreoni, 2002): the older the students are, the more they behave in a pro-social way or contribute to the two funds.[6]

Table 3. Contribution of economists and non-economists in the first semester

	University of Zurich 1998–2002		
Variable	Coefficient	Z-value	Marginal effect
Business and Econ. students (1=Business and econ. students)	–0.133**	–3.67	–4.4%
Pre-university knowledge	–0.089**	–2.97	–2.9%
Control variables			
Gender (female=1)	–0.138**	–5.72	–4.4%
Nationality (foreigner=1)	–0.003	–0.07	–0.1%
Aged below 26	Reference group		
Aged 26–30	0.028	0.54	0.9%
Aged 31–35	0.115	1.39	3.6%
Aged 36–40	0.213	1.80	6.4%
Aged above 40	0.349*	2.61	9.9%
Time dummies	Included		
Constant	0.445**	14.48	
N	13,685		
Log Likelihood	–7719.7007		

Notes: Reference group consists of 'non-economists', 'without pre-university economic knowledge', 'aged below 26', 'male', 'Swiss'.
Level of significance: * $0.01<p<0.05$, ** $p<0.01$
Source: see Table 1.
Dichotomous dependent variable: 'Contribution to at least one fund' = 1, Probit estimates

Table 4. Contribution of Business and Econ. students in the first semester

	University of Zurich 1998–2002					
	Freshmen			Basic study		
	Econ. students	Business students	All Others	Econ. students	Business students	Others
To at least one Fund	76.9%	60.1%	74.2%	73.9%	65.3%	71.1%
T-test of differences	t=1.999 p<0.047			t=3.416 p<0.001		
		t=4.557 p<0.001			t=5.441 p<0.001	
N	39	203	13438	418	1914	37905

Source: see Table 1.

At the University of Zurich, students have to attend approximately two years of basic studies in business administration *and* economics. After that, they specialize in business or economics. Therefore, it is impossible to know whether the less pro-social students select business administration or economics. But, as we have a panel data set, we can observe how students, who later chose one or the other of the two subjects, behaved in their first semester or in their basic study. Table 4 shows the respective number of business and economics students who contributed to one of the two funds in either their first semester or the basic study. The descriptive statistic is already striking: business students behave significantly less pro-socially than economics students do. Therefore, less pro-social students tend to choose business administration. However, business administration is not the only subject which attracts individuals who are less prepared to contribute.[7]

To sum up, the results show that the behavioral differences can be explained by a selection effect. In their first semester, business students contribute substantially less than non-economists do. However, the indoctrination hypothesis also has to be tested because the hypotheses are not mutually exclusive. In the next section, we will therefore analyze if the evolution of behavioral differences between business students and non-economists is (also) due to their education in business economics.

Indoctrination Hypothesis

Does training in business studies have a negative effect on business students' cooperative behavior? It may be conjectured that the more the students learn about the maximization of firms' profits, the more they personally act in a profit maximizing way. For those students not confronted with business and economics theory in every lecture, such a decline should not take place. If the differences in giving behavior between business students and students of other disciplines increase with every additional semester, the indoctrination hypothesis is not rejected. Table 2 reveals an ambiguous picture. While the contribution from the basic stage to the main stage shows more of a decrease for business students than for non-economists (and economics students) – which would support the indoctrination hypothesis – (business and econ) students contribute

more than non-economists in the Ph.D. stage. If indoctrination really influences the behavior of students, the effect should – ceteris paribus – be most obvious at the doctoral level, where the students have absorbed the largest amount of economics training. But to test the indoctrination effect properly, two things have to be borne in mind. Firstly, business students can also differ from non-economists because of other factors influencing giving behavior (e.g. gender or age). We therefore control for such effects by way of a multivariable probit regression. Secondly, students in different stages of their studies can differ from each other in unobservable characteristics. Some do not pass the exams after the basic studies, making students in the main stage or the Ph.D. stage a special selection. It seems obvious that Ph.D. students may be an even more special selection and therefore hard to compare with general business students. With a conditional logit estimation including personal fixed-effects, we can control for such unobserved personal characteristics and exclude individual heterogeneity. We proceed in two steps to address the two important expansions of the descriptive analysis. The two models are presented in table 5.

Model I in table 5 presents the probit estimation. The dichotomous dependent variable equals 1 if students contribute to at least one fund and 0 otherwise. The variable *Business and Economics Students* in the estimation again supports the selection hypothesis: business and economics students contribute less to the funds – independent of the stage of study. The probability is 3.2% lower than for non-economists.[8] Model I supports the inconsistent picture with respect to the indoctrination effect for business students: moving from the basic stage to the main stage of university education raises students' propensity to contribute by 4 percentage points. The coefficient of the dummy for *Main Stage*Business Students* measures the differences between business students and non-economists when entering the main stage, and hence serves as a test for the indoctrination effect. For business students, entering the main stage of their studies lowers the probability of charitable donations by about 8 percentage points – in addition to the general effect for entering the main stage. This effect is statistically significant. In comparison, the probability of charitable donations even increases for economics students, and is statistically significant at a 95%-significance level. The results for business students does not necessarily indicate the impact of indoctrination, because the probability of PSB increases for doctoral students. The probability for business students increases about 6 percentage points, which is statistically significant at a 99%-level. As mentioned already, one would expect indoctrination to be most marked in the Ph.D. stage, where students have accumulated the largest amount of economics training. The argument that indoctrination should be highest in the Ph.D. stage assumes, however, that doctoral students differ from other students only in the stage of the studies. But Ph.D. students may be a different selection of people, which also has to be taken into account – and this has not yet been done in the probit regression.

The results and interpretation of the indoctrination effect presented above are problematic in one respect: as already mentioned for Ph. D. students, students in the main stage of their studies can be seen as a particular selection of people compared to students in the basic stage, because a large number of students fail to pass the exam enabling them to enter the main stage. Thus, a sample selection bias cannot be excluded. To eliminate these doubts, we use the panel structure of the data set and test the indoctrination effect in a conditional logit model with personal fixed effects (e.g. Greene, 1997: 612–647). With this method, we can

Table 5. Contribution of Business students and Economics students

	University of Zurich 1998–2002				
	Model I Probit estimate			Model II Conditional fixed effect logit	
Variable	Coefficient	Z-value	Marginal effect	Coefficient	Z-value
Business and economics students	–0.090**	–6.45	–3.2%		
Stages of study					
Main stage	0.116**	13.12	4.0%	0.254**	6.73
Main stage*Business Students	–0.228**	–10.26	–8.3%	0.114	1.18
Main stage*Economics Students	0.091*	1.95	3.1%	–0.278	–1.06
PhD	–0.021	–1.64	–0.7%	0.152	1.86
PhD *Business students	0.177**	4.17	5.9%	0.370	1.00
PhD *Economics students	0.164*	2.56	5.4%	–0.108	–0.18
Pre-university economic knowledge	–0.104**	–12.37	–3.7%		
Control variables					
Age	0.023**	30.88	7.9%	0.035	0.24
Age squared	–0.000**	–20.42	–0.0%	–0.000	–0.12
Gender (female=1)	–0.039**	–6.05	–1.3%		
Nationality (foreigner=1)	–0.134**	–13.85	–4.8%		
Number of semesters	–0.048**	–38.69	–1.7%	–0.099**	–3.58
(Number of semesters) squared	0.001**	24.08	0%	0.001*	2.29
Time dummies	Included				
Constant	0.148**	7.70			
N	180,225			74,982	
Log Likelihood	–108372.03			–27986.997 (LR chi^2) 507.37	

Notes: Reference group consists of 'non-economists', 'basic study', 'without pre-university economic knowledge', 'aged below 26', 'male', 'Swiss'.
Level of significance: * 0.01<p<0.05, ** p<0.01
Source: see Table 1.
Dichotomous dependent variable: 'Contribution to at least one fund' = 1

exclude any selection biases by holding unobserved personal characteristics constant.

Model II in table 5 presents the results of the conditional fixed effect logit model. In this type of model, because only those students are of interest who have at least once changed their pattern of decision making with respect to contributing to the funds, the sample is reduced to 12,035 persons. These students decided on average 6.2 times, which leads to 74,982 observations. The model used allows us to make intrapersonal comparisons. It looks at how individuals change their behavior when e.g. entering the main stage. Of course, variables, which do not change during the course of their studies, like pre-university knowledge, gender or nationality, have to be excluded from the analysis. The results do not support the indoctrination hypothesis. Neither of the two coefficients, which would measure the

effect of business and economics training on charitable donations, shows a statistically significant effect. The coefficient of *Main Stage*Business Students* and of *Ph.D.*Business Economists* even have the wrong sign. In Table A.1 in the Appendix, we replicated the results for different measurements of a potential indoctrination effect, e.g. whether charitable donations decreases with the number of semesters in business administration. These estimates also show that, when unobserved heterogeneity is not controlled for, the indoctrination hypothesis cannot be falsified. However, the results of the models with personal fixed-effects, which only look at intrapersonal differences, reveal another picture: business education does not have a negative effect on students' willingness to contribute money to the two social funds. The intuition behind this finding can be shown if we look at the aggregate behavior of people, who we observe in the basic *and* in the main study. It can then be observed whether this group of people changes its actual behavior. The evidence for business students is very clear. 64.9% (N=2150) contribute in the basic stage while 67.8% (N=1915) do so in the main stage. The slight increase in charitable donations is statistically significant ($t=1.955$; $p<0.051$). This again shows that business students do not change their behavior when entering the main stage.

The data do *not* support a negative effect of economics education on PSB.[9] When we control for possible selection biases, we do not find an indoctrination effect. The effects of the probit model in table 5 are due to unobserved heterogeneity. Students in the main stage differ from students in the basic or the Ph.D. stage in unobserved personal characteristics. Business students therefore do not see economic theory as a normative advice for pro-social behavior.

Discussion of Alternative Hypotheses

Four alternative hypothesis will be discussed in this section: (1) business students differ in other dimensions from non-economists (e.g. income), which may explain the differences observed; (2) other factors such as peer pressure can explain giving behavior and maybe differences between business students and others; (3) business students focus more on the 'efficiency' of fund management and may not contribute because of that; and (4) difference in expectations may cause behavioural differences.

Evidence from the online survey of the student population allows us to address the three alternative hypotheses:

(1) Income situation. Economists' income may differ from students of other subjects. This may explain the behavioral differences. 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. This hypothesis is based on empirical research that the percentage of households who donate increases with income, while the percentage of household income devoted to giving to charity is related to income in a u-shaped way (e.g. Andreoni, 2002: 11372). Those students working to help finance their studies (which is a significant number of students at the University of Zurich) are expected to donate less. In a recent study, students decreased their contribution in a dictator game substantially when they had to earn the money, compared to a situation where they received the money from the experimenter (Cherry *et al.*, 2002). In contrast, when parents pay for their studies (and therefore the contribution to the funds), it is likely that students are more generous with respect to their fellow students. Thus a classical low-cost decision situation may

Business and Economics students	0.152	1.281	4.9%	0.036	0.295	1.0%
Stages of study						
Main stage	0.045	0.603	1.5%	0.050	0.649	1.4%
Main stage*Business students	−0.427*	−2.523	−13.8%	−0.372*	−2.146	−10.0%
Main stage*Economics students	−0.245	−0.91	−7.9%	−0.362	−1.347	−9.8%
PhD	0.011	0.103	0.4%	0.018	0.155	0.5%
PhD *Business students	0.250	0.481	8.1%	0.016	0.031	0.4%
PhD *Economics students	0.378	0.562	12.2%	0.215	0.327	5.8%
Income situation						
Log (income)				0.207**	4.704	5.6%
Contribution (%) towards own upkeep				−0.004**	−3.135	−0.1%
Parents paying fees				−0.123	−1.645	−3.5%
Control variables						
Age	0.014*	2.153	0.4%	0.006	0.754	0.2%
Sex (female=1)	0.056	0.972	1.8%	0.138*	2.260	3.7%
Number of semesters	−0.019**	−2.83	−0.6%	−0.013	−1.778	−0.3%
Constant	0.365*	2.253		−0.418	1.300	
N	2321			2425		
Log likelihood	−1322.2735			−1177.2832		

Notes: Reference group consists of 'non-economists', 'basic study', 'males', who 'pay their fees themselves'.
Level of significance: * $0.01<p<0.05$, ** $p<0.01$
Source: Own survey carried out at the University of Zurich 2000.
Dichotomous dependent variable: 'Contribution to at least one fund' = 1

occur (e.g. Kirchgässner, 1992). Model I in table 6 presents the probit estimates, again controlling for age, gender and the number of semesters attended.

The survey results replicate the results of the analysis of the real data. Students of business administration give significantly less when they enter the main stage of their studies. The results also hold when controlling for the income situation, which can be seen in Model II in table 6, where income variables are added.

The results on income are not surprising. As expected, income has a strong positive effect on the probability to contribute to the two funds. The more a student finances his or her own living, the less he or she is willing to contribute. The fact that parents pay the fees does not, in a statistically significant way, change the probability of one's own decision to donate. The variables used as controls are not extremely stable, but do have the expected signs. The tested determinants of giving behavior are, however, not responsible for the differences between economists and non-economists.

Table 6. Income factors affecting giving behavior

	University of Zurich 2000 – Probit estimates					
	Model I			Model II		
Variable	Coefficient	Z-value	Marginal effect	Coefficient	Z-value	Marginal effect

(2) Other factors influencing charitable donations. Other factors may influence the charitable donations of students such as peer pressure or family background. It is certainly true that giving behavior is influenced by many variables, which are not explicitly controlled for. However, the data set presented allows us to exclude these factors as being irrelevant. First of all, the decision setting is completely anonymous. This leaves little room for motives like prestige or peer pressure. However, it could be that business students talk more about monetary issues like donating money. The survey results show that business students indeed talk significantly more with others about the funds. 30% of business students compared to 23% of others talk with each other about the funds ($t=2.31$; $p<0.02$). It is, however, completely unclear how the conversation between students would influence PSB. In various studies, conversation between people leads to more cooperation in social dilemma situations (Sally, 1995), suggesting that conversation leads to increased contributions. Because business students talk more with each other about the funds, they should contribute more, not less. If conversation is controlled for in an analysis analogous to table 6, the effect of being business students does not vanish.

(3) Awareness of efficient management. Business students may evaluate the funds' management efficiency to a greater extent than would other students. With more business education, this may be more extreme. A lower contribution rate may therefore be due to a higher awareness of the shortcomings of the specialized funds. Business students become more skeptical about the effectiveness of the funds with more business education. They also increasingly substitute these particular funds with other charities. In the online survey, we asked the students 'how do you evaluate the effectiveness of the funds?' on a scale from 8 = 'good' to 1 = 'bad' (with a 'no idea' option).

Table 7 shows that business and economics students indeed evaluate the funds in a much more critical way than others. Taking the 'no idea' answers into account, the mean for business and econ students is 4.87 compared to 5.27 for others ($t=3.37$; $p<0.01$). The perceived efficiency decreases slightly for business and economics students in the basic and in the main stage of their study. However, this decline is not statistically significant at any conventional level ($t=0.598$; $p<0.550$). This supports the selection hypothesis, claiming that business students differ from others already at the beginning of their studies. During their studies, students do not change their attitudes much. This conclusion can be supported by analyzing answers to other questions in the same way, for instance the perceived importance of funds, expectation about others' behavior or political orientation. Business students are a special selection of people and education does not change these attitudes. The limitation of the survey is that we cannot distinguish between business and economics students in the basic study, so the evidence presented holds only for the two groups taken together. If the alternative hypothesis was true, one should expect that business students substitute for other charitable funds during their studies. The survey results indicate that donating to other funds cannot explain the giving behavior to the two social funds. Business and economics students do not increase their donation to charities outside of the University in a statistically significant way.

(4) Expectations about pro-social behavior of others. One possible channel of an indoctrination could be that the economics training lowers expectations about the

Table 7. Perceived efficiency of the two funds

	How do you evaluate the effectiveness of the funds?' (On a scale from 8='good' to 1='bad')				
	Business and Economics students		Other students		t-test of differences
	Mean	s.d. (N)	Mean	s.d. (N)	t-value (P>t)
Basic study	4.96	1.65 (115)	5.31	1.62 (622)	2.15 (0.05)
Main study	4.82	1.83 (123)	5.31	1.80 (877)	2.79 (0.01)
PhD study	4.56	2.34 (16)	4.96	2.03 (194)	0.74 (0.23)
Total	4.87	1.78 (254)	5.27	1.77 (1693)	3.37 (0.01)

Notes: Without the 'No idea' answers.
Source: Own survey carried out at the University of Zurich 2000.

pro-social behavior of others, as mentioned in the section I. To test this idea empirically, the survey asks about students' expectation of the proportion of students who contribute to the two funds. The expectations about the behavior of others do, however, not decrease during the study.[10] The fact that economists' expectations are not much shaped by economics training is not surprising, as people build expectations on a real decision situation. The context of the decision situation is a crucial guide for building expectations in real life whereas in laboratory experiments students have to rely more on theoretical concepts for making expectations because contextual clues are excluded.

To sum up, the four alternative hypotheses cannot explain differences in charitable donations to the two social funds at the University of Zurich. Differences in material resources, other motives such as peer pressure or prestige, different levels of awareness of efficiency, and varying expectations cannot explain the differences in PSB between business students and other students. The evidence presented by the online survey supports the selection hypothesis even further, showing that business students differ right at the beginning of their studies from other students, but business education does not change their behavior afterwards.

4. Conclusions

The analysis of the actual behavior of students with respect to anonymously donating money to a fund allows us to draw three conclusions:

(1) The willingness to behave pro-socially is lower for economists (business and economics students) than for non-economists.

(2) The differences are due to business students who self-select into the subject. Business studies, therefore, attract more people who show less pro-social behavior (PSB).

(3) After controlling for personal heterogeneity, no negative effect of business education could be found. Business students' PSB is not eroded because they learn management theory.

These conclusions are based on the real life behavior of roughly 37,000 students at the University of Zurich. The city of Zurich provides a good example of a students' body in a moderately large city. The education the business students receive is similar to the respective education received elsewhere. As a considerable number of the students are in some kind of employment while studying, they tend to be in close contact with firms and general employment.

The results presented in this study suggest that business education has not the (anti-social) externalities often claimed. Managers with a business education are a special selection of people who behave less pro-socially. These people may be ill-equipped in coping with the potential future challenge of firms required to behave in a socially more responsible way.

The evidence presented is only one attempt at evaluating the effect of business education on PSB and leaves a lot of room for future research. Firstly, students in our study decide about a relatively small amount of money. Although this correlates with other dimensions of PSB, like donating in general, future studies may look at other behavior, e.g. illegal behavior in firms. Secondly, the differences between business students and students of other subjects are relatively modest, but due to the large number of observations, they are statistically significant. Therefore, it would be interesting to know whether behavioral differences are always that modest or whether in some areas of PSB larger differences emerge. Thirdly, the study took place in Switzerland, so allowance may need to be made for possible cultural differences between Switzerland and other countries with respect to giving behavior or PSB in general.

The conclusions drawn here are important, especially with respect to the recurring demand that business students should be educated to become good citizens. We show that business education does not change the citizenship behavior of business students. Therefore, teachers of business management should be quite comfortable with their subject, knowing they are not to blame for lowering PSB of their students. However, there may still be the possibility that ethics courses increase PSB of business students. But business schools should be aware of the fact that they attract more students with lower than average PSB.

Notes

1. See Ledyard (1995) for a survey on contribution to public goods in laboratory experiments, and Ostrom (1998) for an overview about contribution to a broader range of common goods.
2. There are many studies in experimental economics which detect different 'types' in the population. See, e.g., Andreoni and Vesterlund (2001) and Charness and Rabin (2002).
3. The on-line questionnaire is reproduced at http://www.iew.unizh.ch/grp/frey/fragebogen.htm.
4. For an extensive discussion on reasons to contribute to the two social funds, see Frey and Meier (2004a).
5. Various studies found that women tend to behave more pro-socially than men. See, e.g., Eckel and Grossman (1997), Nowell and Tinkler (1994) and Andreoni and Vesterlund (2001).
6. In the literature, a positive effect of age on donating is explained either by effects of wealth or income, which correlates with age or with some sort of cohort effect or life-cycle effect (Clotfelter, 1997). The discussion of these effects would, however, go beyond the scope of this paper.
7. For the contribution rate of student of other subjects, see Frey and Meier (2003a).

8. In order to make the table not too confusing, we didn't show the control for freshmen. The inclusion of the variable would, however, not change the effect of being a business or economics student when contributing.
9. The effects are insensitive to alternative dependent variables, such as a trichotomous variable taking a value 0 if the individual contributes to neither fund, 1 if a contribution is made to either fund, and 2 if a contribution is made to both funds. The results of the ordered probit model are presented in the appendix.
10. The results are not reported due to space restrictions, but are available from the others on request.

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Appendix

Table A1. Various measurements of 'Indoctrination'

Variables	University of Zurich 1998–2002			
	III	IV	V	VI
	Probit	Fixed-effect	Probit	Fixed-effect
Business and Economics students	–0.105** (0.017)		–0.099** (0.013)	
Number of Economics semesters	–0.005** (0.001)	–0.000 (0.012)		
Number of Business semesters			–0.011** (0.001)	–0.007 (0.009)
Number of Economics semesters			0.005* (0.002)	–0.017 (0.022)
Main stage	0.121** (0.009)	0.234** (0.036)	0.125** (0.009)	0.151 (0.080)
PhD stage	0.006 (0.013)	0.145 (0.080)	0.008 (0.013)	0.000 (0.003)
Pre-university economic knowledge	–0.101 (0.008)		–0.101** (0.008)	
Control variables	Yes	Yes	Yes	Yes
N	180,225		180,225	74,982
Log likelihood	–108422.16		–108393.66	–27992.061

Notes: Standard errors in parentheses. 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
Source: see Table 1.
Dichotomous dependent variable: 'Contribution to at least one fund' = 1

Table A2. Matrix of correlation coefficients

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Contributions to at least one fund	1.000													
2. Business and economics students	–0.038	1.000												
3. Basic stage	0.028	0.147	1.000											
4. Main stage	0.028	–0.085	–0.706	1.000										
5. Main stage*Business students	–0.050	0.525	–0.116	0.165	1.000									
6. Main stage*Economics students	–0.001	0.207	–0.046	0.065	–0.013	1.000								
7. PhD	–0.073	–0.068	–0.287	–0.475	–0.078	–0.031	1.000							
8. PhD*Business students	–0.010	0.227	–0.050	–0.083	–0.014	–0.005	0.176	1.000						
9. PhD*Economics students	–0.005	0.145	–0.032	–0.053	–0.009	–0.004	0.112	–0.004	1.000					
10. Pre-university econ. knowledge	–0.025	0.194	0.065	–0.000	0.112	0.037	–0.081	0.028	0.017	1.000				
11. Age	0.003	–0.095	–0.297	0.069	–0.023	–0.001	0.276	0.035	0.035	–0.087	1.000			
12. Gender (female=1)	0.008	–0.151	–0.026	0.071	–0.087	–0.042	–0.063	–0.037	–0.037	–0.089	0.007	1.000		
13. Nationality (foreigner=1)	–0.048	0.036	–0.018	–0.093	0.017	0.000	0.149	0.037	0.008	–0.091	0.039	0.004	1.000	
14. Number of semesters	–0.075	–0.087	–0.472	0.081	0.018	0.013	0.477	0.066	0.060	–0.104	0.599	–0.051	0.084	1.0

Table A3. Contribution of Business students and Economics students

	Model I		Model II	
Variable	Coefficient	Z-value	Coefficient	Z-value
Business and economics students	−0.088**	−3.94		
Stages of study				
Main stage	0.127**	8.90	0.052**	7.54
Main stage*Business students	−0.222**	−6.26	0.020	1.10
Main stage*Economics students	0.099	1.20	−0.036	−0.87
PhD	−0.013	−0.57	0.030	1.95
PhD *Business students	0.175*	2.16	0.069	1.09
PhD *Economics students	0.172	1.35	−0.037	−0.40
Pre-university economic knowledge	−0.096**	−5.90		
Control variables	Included		Included	
Time dummies	Included		Included	
N	180,225		180,225	
Log likelihood	−147990.86			

Notes: Model I presents an ordered probit model with robust standard errors (clustered for individuals). Model II presents a OLS regression with individual fixed-effects.
Reference group consists of 'non-economists', 'basic study', 'without pre-university economic knowledge', 'aged below 26', 'male', 'Swiss'.
Level of significance: * $0.01<p<0.05$, ** $p<0.01$
Source: see Table 1.
Trichotomous dependent variable: 'Contribution to neither fund =0, to either fund =1, and to both funds=2