Laying Off or Not? The Influence of Framing and Economics Education

Jeannette Brosig, Timo Heinrich, Thomas Riechmann, Ronnie Schöb, Joachim Weimann

Introduction

Ariel Rubinstein's (2006) sceptical comment on the study of economics hits a nerve with many economists who worry that what they teach and the way in which they teach may indoctrinate students. Rubinstein conducted a survey in which students had to decide whether to lay off workers, and thus meet a company's goal of making high profits, or to fire less, which results in lower profits. In his survey, it turned out that economists put, on average, a much higher weight on the company's profit than non-economists. Rubinstein's conjecture is that economics students' 'views on economic issues are influenced by the way we teach, perhaps without them even realizing it'. This is a serious accusation and our immediate response to his article was astonishment. Is the way we teach really flawed? There are some big clouds of doubt that make us reluctant to follow Rubinstein's recommendation to consider changing our teaching methods.

Firstly, the fact that economists put more emphasis on profit maximisation in a survey may be attributed to a self-selection bias (i.e. economic studies attract certain types of students) rather than indoctrination through teaching. As Rubinstein admitted, his questionnaire did not allow for any conclusive evidence. It is thus important to separate these effects before questioning the way we teach economics.

Secondly, it is a general phenomenon that the way a problem is framed can substantially affect decisions (see, e.g., the first demonstration in Tversky and Kahneman, 1981, the surveys provided by Kühberger, 1998, and Levin *et al*., 1998, or the more recent studies by De Martino *et al*., 2006, and Deppe *et al*., 2005). As defined by Tversky and Kahneman (1981, p. 453), a decision frame refers to 'the decision-maker's conception of the acts, outcomes, and contingencies associated with a particular choice. The frame that a decision-maker adopts is controlled partly by the formulation of the problem and partly by the norms, habits, and personal characteristics of the decision-maker'. The wording used in Rubinstein's survey puts students into the role of a manager. The problem is that the potential effect of this wording is not controlled for in Rubinstein's paper. Do subjects only consider the workers' welfare and the profit of the company as Rubinstein suggests? Or do they also think about what might happen to a manager who does not act in the interest of the company's owners? In order to clarify this point, we conducted a similar but modified survey with students from the University of Cologne and the University of Magdeburg in Germany and added a third question, which allows testing whether the particular role influences subjects' choices.

The first who reported a difference in the behaviour of economics students were Marwell and Ames (1981). In a public good experiment they found that first-year graduate students of economics invested only half as much into the public good as high-school students in a similar experiment. Subsequently several researchers have also found economics students to behave more in line with standard game-theoretic predictions than others, e.g. in the prisoners' dilemma (Frank *et al*., 1993; James *et al*., 2001), in the ultimatum game (Carter and Irons, 1991; Kahneman *et al*., 1986a) or in the solidarity game (Selten and Ockenfels, 1998; Ockenfels and Weimann, 1999).

Some authors have tried to pin down whether this difference is due to education or to a self-selection bias – with mixed results. In a laboratory experiment on the ultimatum game, Carter and Irons (1991) observe a difference regarding the amount kept and regarding the acceptance thresholds between freshmen students of economics and freshmen students of other fields. While this observation is in line with a self-selection bias, the results reported by Frank *et al*. (1993) also point to an effect of education. In particular, Frank *et al*. show that the rate of cooperative behaviour in the prisoners' dilemma increases among students of other fields with additional years of study while it stays almost constant for economics students. In one of the few field studies on the topic Frey and Meier (2003) analyse contributions students can make to charitable funds of their university every semester. They find support for a self-selection effect, i.e. freshmen students of economics contribute less than other freshmen students, but no evidence for an effect of education. Similar results are obtained in a field experiment on corruption conducted by Frank and Schulze (2000). They report that, already at the beginning of their study, economics students seem to be more prone to corruption than students of other fields.

Being a student of economics does not only affect strategic decision making, it also seems to influence the evaluation of market outcomes. Drawing from a survey by

Kahneman *et al*. (1986b), Ng (1988) provides some evidence for an education effect in this particular task: there are more fourth-year students than first-year students of economics who regard the price system as a fair mean of allocating seats in a crowded restaurant, although both groups of students regard it as fairer than do first-year science students or subjects drawn from the general population. In another survey following Kahneman *et al*. (1986b), Frey *et al*. (1993) asked students in an introductory economics course and advanced students of economics as to how fair they regard hypothetical price increases for goods with increased demand. They find no significant difference between the two groups, but both groups perceived the price increases as fairer than subjects in a control group drawn from the general population. In a recent study, Cipriani *et al*. (2009) build on this research and ask students to judge the fairness of different allocation mechanisms and market outcomes. In addition, they employ two questions from Rubinstein's (2006) questionnaire. Their observations suggest a difference between economics and non-economics students in both kinds of decision tasks. While teaching (micro-)economics seems to influence the perception of allocation mechanisms and market outcomes, the answers given to the two questions from Rubinstein's (2006) questionnaire rather point to self-selection. Explaining their observations the authors speculate that students of economics 'may be especially sensitive to the concept of an employee acting as an agent in the firm's interests and therefore may respond on this basis' (Cipriani *et al*., p. 7).

Our study takes up this speculation and investigates the role of framing and economics education in more detail. In the next section we briefly describe our survey design and then discuss the main results before concluding.

Modifying Rubinstein's questionnaire

We tried to design our survey in a way that, on the one hand, allows us to compare our data with those generated by Rubinstein (2006), but, on the other hand, also allows us to gain some more insights. In the first two questions we followed Rubinstein's experimental design as closely as possible. In total 469 students who earned 10 with a probability of 1/3 (every third answer was awarded) participated. Students were recruited from a variety of classes taught at the universities of Cologne and Magdeburg. We announced an online survey and handed out participation codes which allowed students to access a specified web page. Each code could be used only once and the codes were handed out anonymously. Cash was the only incentive to participate. In the survey we asked the students to consider the following situation:

> Assume that you are vice president of the company ILJK. The company provides extermination services and employs administrative workers who cannot be fired and 196 non-permanent workers who do the actual extermination work and can be fired. The company was founded five years ago and is owned by three families. The work requires only a low level of skills and so each worker requires only one week of training. All of the company's employees have been with the company for three to five years. The company pays its workers more than the minimum wage. A worker's wage, which includes overtime, amounts to 20,000 p er year and exceeds welfare benefit payments. The company provides its employees with all the benefits required by law.
>
> Until recently, the company was very profitable. As a result of the recent recession, however, there has been a significant drop in profits, although the company is still in the black. You will attend a board meeting at which a decision will be made as to how many workers to lay off.

Analogously to Rubinstein, the first question was presented in two different ways. A total of 339 economics and non-economics students received the following information:

ILJK's Finance Department has prepared the following forecast of annual profits:

Number of workers who will continue to be employed	**Expected annual profit in €millions**
0 (all the workers will be laid off)	Loss of 8
50 (146 workers will be laid off)	Profit of 1
65 (131 workers will be laid off)	Profit of 1.5
100 (96 workers will be laid off)	Profit of 2
144 (52 workers will be laid off)	Profit of 1.6
170 (26 workers will be laid off)	Profit of 1
196 (no layoffs)	Profit of 0.4

Of the 339 students 92 were economics students who had just started their first semester; 91 were advanced undergraduate economists who had been studying for at least two years. Of the non-economists 78 were in their first semester and 78 were advanced undergraduates. The non-economists came from a variety of subjects. The largest groups are students of science (15 per cent), engineering (12 per cent) and language and literature (11 per cent). Another 130 students who were either advanced undergraduate economists or advanced undergraduate engineers were informed that:

> ILJK's Finance Department has prepared a forecast of annual profits according to which the employment of x workers will result in annual profits of (in millions):
>
> $$2\sqrt{x} - 0{,}1x - 8$$

In both treatments students had to state the number of workers they would recommend to continue to employ (Q1). After that, we asked them to predict the recommendation of a real vice president (Q2). Q1 and Q2 are identical to the questions used by Rubinstein.

In contrast to Rubinstein, we asked a third question (Q3) in order to test how answers are affected by the framing of the questions. Do students only consider the workers' welfare and the profit of the company? Or do they also think about their own standing as the company's vice president? Since it is not clear what students have in mind when answering Q1, Q3 puts them into a situation in which they need not care about their own future as vice president:

> Assume that you are just before retirement and you only have this decision left to make. What would be your recommendation?

As Tversky and Kahneman (1981) argue, not only the formulation of the problem but also the habits, norms and characteristics of a decision maker may influence the frame he or she adopts. While the table and formula above change the frame by varying the formulation of the same problem, we also examine whether differences in the answers to Q1 are due to a different conception of the vice president's role. Q3 alters the problem in a way that should not change the decision of an indoctrinated student of economics, who would maximise profits in both questions. If the answers of economics students are driven by the perception that the vice president is an agent of the company's owners instead, we will observe fewer layoffs in response to Q3 than to Q1.

Findings

The most interesting message of Rubinstein's paper is that economists care more about profit maximisation than non-economists and that they do not think much about the fate of the workers who lose their jobs. Table 1 compares the observations for Q1 in the table treatment obtained in both surveys. For Q1, our study reproduces the results of Rubinstein's experiment. Our survey confirms Rubinstein's observation that there are 'sharp differences between the groups in dealing with the dilemma of profit maximisation vs. worker layoffs' (Rubinstein 2006, C3). The difference in the average number of layoffs chosen by economists and non-economists is 20 in Rubinstein's survey and 21 in our survey.

Table 1: Data obtained in Q1 using the table

	Hebrew/Tel Aviv			**Cologne/Magdeburg (Q1-Table)**		
	Economists	Non-economists	Total	Economists	Non-economists	Total
n =	224	368	592	183	156	339
100 (profit maximum)	47%	22%	31%	38%	15%	27%
101–195	40%	53%	48%	44%	52%	47%
196 (no layoffs)	10%	18%	15%	14%	29%	21%
Others	3%	7%	6%	4%	4%	4%
Average layoffs	66	46	53	61	40	51

Table 2: Average number of workers who will continue to be employed (table)

	Q1-Table		**Q2-Table**		**Q3-Table**	
	Economists	Non-economists	Economists	Non-economists	Economists	Non-economists
n =	161	138	161	138	161	138
100 (profit maximum)	40%	15%	64%	56%	23%	12%
101–195	45%	57%	34%	38%	40%	43%
196 (no layoffs)	15%	28%	2%	6%	37%	45%
Average layoffs	58	36	77	72	37	26
Mann-Whitney-U test (two-sided)		$p = 0.000$		$p = 0.155$		$p = 0.014$

Following Rubinstein we decided to exclude those students from our analysis who chose to employ less than 100 workers in at least one of the three questions. We assume that these subjects mixed up the number of employed and laid-off workers. We excluded 40 of 339 subjects in the table treatment, and 32 of 130 subjects in the formula treatment. Including these observations does not change our results, however.

Table 2 compares the numbers of workers who are still employed after the decisions of economists and non-economists using the table for all three questions.

In Q1 economists decided to employ significantly fewer workers than non-economists when their decision was made using the table. The difference between

economists and non-economists is no longer significant concerning question Q2. That is, both groups assess the behaviour of real managers in a similar way. Our survey thus confirms Rubinstein's observation that there are 'no significant differences between the groups as to what subjects thought a real vice president would do' (Rubinstein 2006, C5). When close to retirement (Q3), economists still decide to lay off significantly more workers than non-economists, though the average difference drops from 22 in Q1 to 11 in Q3.

This last observation leads to the question of whether the frame of the questions is important. Remember that Q1 was presented in two different ways. While we find no significant differences between the decisions of economists and non-economists working with the formula, there is a strong and significant difference between the two frames (Table 3). On average economists and non-economists let 149 workers continue to work in the table frame whereas only 123 were not laid off in the formula frame. This result also reproduces the findings obtained by Rubinstein.

Table 4 shows that with regard to Q3 the specific situation of the manager also turns out to be of importance. Economists, in particular, employ significantly more workers when they are forced to imagine that they are near retirement, i.e. are in a position in which their decision has far fewer personal consequences. Moreover, in Q3, the average decision of those economists equipped with the table is no longer significantly different from the average decision of students equipped with the formula.

Table 3: Average number of workers who will continue to be employed in Q1

	Economists		**Non-Economists**	
	Q1-Table	Q1-Formula	Q1-Table	Q1-Formula
n =	161	70	138	28
100 (profit maximum)	40%	70%	15%	61%
101–195	45%	17%	57%	32%
196 (no layoffs)	15%	13%	28%	7%
Average layoffs	58	72	36	74
Mann-Whitney-U test (two-sided)	Q1-Table vs. Q1-Formula p = 0.004		Q1-Table vs. Q1-Formula p = 0.000	
	Q1-Formula: Economists vs. Non-Economists p = 0.727			

Table 4: Average number of workers who will continue to be employed in Q1 and Q3

	Economists			**Non-Economists**		
	Q1-Table	Q3-Table	Q3-Formula	Q1-Table	Q3-Table	Q3-Formula
n =	161	161	70	138	138	28
100 (profit maximum)	40%	23%	30%	15%	12%	32%
101–195	45%	40%	33%	57%	43%	54%
196 (no layoffs)	15%	37%	37%	28%	45%	14%
Average layoffs	58	37	41	36	26	37
Wilcoxon test (two-sided)	Q1-Table vs. Q3-Table p = 0.000		–	Q1-Table vs. Q3-Table p = 0.000		–
Mann-Whitney-U test (two-sided)	–	Q3-Table vs. Q3-Formula p = 0.784		–	Q3-Table vs. Q3-Formula p = 0.000	

Rubinstein points out that economics students show a much stronger tendency to maximise profits than subjects in other groups, but he could not determine clearly whether differences were due to a self-selection bias or are the result of indoctrination. Since he found (significant?) differences between economics students and MBA students trained in doing case studies, he tentatively concluded that the difference might indeed be the result of the way in which economics is taught at universities: 'the study of cases might stimulate more comprehensive thinking about real life problems whereas the study of economics through mathematical exercises conceals the need to balance between conflicting interests' (Rubinstein 2006, C8).

To distinguish the self-selection bias from indoctrination, we compared decisions made by first-semester economics students and advanced undergraduate economics students. Our results reveal that education does not significantly matter for economics students. Instead of becoming more interested in profit maximisation they even seem to learn to give the workers' welfare more weight – although the increase of employment is not significant. All of the advanced undergraduates in our sample have been trained in microeconomics, therefore, these results are in line with the findings on indoctrination by Cipriani *et al.* (2009). Note that the education of non-economics students does not change their behaviour either. Table 5 reports the results.

Table 5: Number of workers to be employed in Q1 (table)

	Q1-Table Economists		Q1-Table Non-Economists	
	Beginners	Advanced	Beginners	Advanced
n =	78	83	71	67
100 (profit maximum)	47%	33%	18%	12%
144/10	41%	49%	59%	54%
196 (no layoffs)	12%	18%	23%	34%
Average layoffs	62	54	39	34
Mann-Whitney-U test (two-sided)	p = 0.173		p = 0.445	

Discussion

The comparison of our results and those obtained by Rubinstein shows that the empirical evidence is not as clear as Rubinstein's paper suggests. First of all, we demonstrate that the frames of the original Rubinstein questions are of great importance. We replicate Rubinstein's finding that presenting the decision with the help of a formula increases layoffs relative to the presentation using a table. But the first question in both surveys leaves much room for interpretation. What happens to the workers who were laid off? What consequences do employment decisions have for the vice president himself? Subjects answering Q1 may or may not have particular answers to these and other questions in mind when they decide. The problem is that we cannot control for the individual framing adopted by each subject.[1] The answers to our new question Q3 demonstrate that a slight change of the vice president's situation makes a significant difference. This question tries to separate two concepts of the vice president's role subjects might have. Profit maximisation can either be perceived as good idea in its own right or as the selfish decision necessary to please the company's owners. In the case of indoctrination we would assume that economists will maximise profits even on their last day of work since they believe it to be beneficial to all of us. However, we find that many economists do not choose profit maximisation when it is not in their self-interest anymore.

Thus, we cannot rule out the possibility that economists and non-economists differ systematically in their interpretations of the economic situation they are confronted with in Q1. For example, it seems plausible that students who plan to become managers and who are educated in management and economics are more likely to imagine that they are really involved in the situation as a *responsible* manager than

students of other disciplines. The Rubinstein interpretation that economists systematically put a higher weight on profit maximisation because they are trained to solve economic problems with the help of formal models is not coactive.

The different individual interpretations of a particular problem might also explain some of the conflicting results in the literature. Presenting some of the questions used in the original survey from Kahneman *et al*. (1986b), Gorman and Kehr (1992) already suppose that business executives might interpret the fairness of economic decisions very differently.

Another, more general question is how to interpret the observation that students of economics seem to care more about profit maximisation. The efficient use of resources is a core topic in economics and we emphasise this point over and over again. We also stress that markets can (under certain circumstances) do a good job in achieving efficiency and we should, therefore, not be surprised that students of economics might perceive the social cost of firing workers lower than others do. It should be no surprise when both groups, on average, do not find the same answer. By no means can we infer an indoctrination bias from that outcome. An elaborate discussion of this question is far beyond the scope of this paper, however, and leaves much room for future work.

Note

[2] There may be another cause for a different conception of the problem. Because of the hypothetical nature of the situation in which the students were asked, students might tend to answer based not on their own preferences, but rather what they believe to be the correct answer. Economics students might be more inclined to pick the answer they believe to be correct in terms of economic analysis, irrespectively of their moral beliefs. Only changes in these beliefs would reflect indoctrination through economic education.

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Contact details

Jeannette Brosig
University of Duisburg-Essen
Germany
Email: jeannette.brosig@ibes.uni-due.de

Timo Heinrich
University of Duisburg-Essen
Germany
Email: timo.heinrich@ibes.uni-due.de

Thomas Riechmann
University of Kaiserslautern
Germany
Email: riechmann@wiwi.uni-kl.de

Ronnie Schöb
Freie Universität Berlin
Germany
Email: ronnie.schoeb@fu-berlin.de

Joachim Weimann
Otto von Guericke University of Magdeburg
Germany
Email: joachim.weimann@ww.uni-magdeburg.de