

A SCEPTIC'S COMMENT ON THE STUDY OF ECONOMICS*

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A survey was carried out among two groups of undergraduate economics students and four groups of students in mathematics, law, philosophy and business administration. The main survey question involved a conflict between profit maximisation and the welfare of the workers who would be fired to achieve it. Significant differences were found between the choices of the groups. The results were reinforced by a survey conducted among readers of an Israeli business newspaper and PhD students of Harvard. It is argued that the overly mathematical methods used to teach economics encourage students to lean towards profit maximisation.

This research was motivated by my concern about the way economics is currently being taught in our universities. Students who come to us to 'study economics' instead become experts in mathematical manipulations. Furthermore, I suspect that their views on economic issues are influenced by the way we teach, perhaps without them even realising it.

I am not the first to have realised this. A number of economists have already argued that the study of economics influences students' views and, in particular, makes them more selfish; see for example Frank *et al.* (1993, 1996), Frey *et al.* (1993) and the references in Frey and Meier (2003). However, I do not feel that they provided decisive evidence to support this claim.

At the core of the article is an analysis of students' responses to a survey question in which the subject was asked to imagine that he is a vice president of a company who must decide whether to maximise the company's profits by laying off half its workforce or to make do with lower profits by firing less than that number. The subject is essentially presented with a dilemma of how to balance his commitment to meeting the company's goals and the sympathy he feels towards the workers. The survey was conducted among several groups of Israeli students, most of whom were studying at Tel Aviv University. The results show sharp differences between economics students and the rest. Supporting evidence is presented from two follow-up studies I conducted among several thousand readers of *Globes*, an Israeli business daily, and among several dozen Harvard graduate economics students.

Whatever the reasons for the differences between the choices of economics students and the others, the research will hopefully confront readers, especially the economists among them, with the reality of economics teaching and encourage them to consider changing our teaching methods.

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1. The Main Experiment

Six groups of Israeli students were contacted by e-mail. They were asked to visit a special web site (<http://gametheory.tau.ac.il/expEconEng/> is a demo of the site). Each group was from a different department: undergraduates in Economics, Law, Mathematics and Philosophy at Tel Aviv University, MBA students at Tel Aviv University and economics undergraduates at the Hebrew University of Jerusalem. I will refer to the six groups using the following abbreviations Econ-TAU, Law, Maths, Phil, MBA and Econ-HU. The students were asked to respond successively to four questions. They were told that NIS 150 (about \$33) in purchase coupons for the local bookstore would be randomly awarded to each of six students who completed the questionnaire, irrespective of what answers they gave. They were explicitly told that the questionnaire was not an exam and that there were no 'right' answers.

The core of the survey was the following question (translated from the Hebrew):

Q1-Table

Assume that you are vice president of ILJK company. 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 5 years ago and is owned by three families. The work requires only a low level of skills so that 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 minimum wage. A worker's wage, which includes overtime, amount to between NIS 4,000 and NIS 5,000 per month (the minimum wage in Israel was about NIS 3,335 at the time of the experiment). The company provides its employees with all the benefits required by law.

Until recently, the company was very profitable. As a result of the continuing recession, however, there has been a significant drop in profits though the company is still in the black. You will soon be attending a meeting of the management at which a decision will be made as to how many workers to lay off. 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 NIS 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

I will recommend continuing to employ _____ of the 196 workers in the company.

The question was intended to present the respondent with a dilemma which would force him to weigh his commitment to profit maximisation against his

concern for the fired workers who would be looking for a new job at a time of high unemployment. As can be seen from the Table, the company will still make a profit even if no workers are laid off. But the company has the potential to increase its profits five-fold if it fires close to half of its workers. There are also two intermediate options: either continue to employ 170 workers (laying off only 26), thus increasing profits by a multiple of 2.5 or continue to employ 144 workers, thus bringing the company close to profit maximisation.

All the subjects in Law and Phil received version Q1-Table. The students in the other four groups, who were better trained mathematically, were randomly assigned either Q1-Table or Q1-Formula. Version Q1-Formula is identical to version Q1-Table except that the Table was replaced with the following sentence:

‘The Finance Department has prepared a forecast of profits according to which the employment of x workers will result in annual profits (in NIS millions) of: $2\sqrt{x} - 0.1x - 8$ ’

About 80% of the subjects who logged on and filled in their personal details completed the questionnaire. A somewhat higher percentage of dropouts was recorded among those who were assigned Q1-Formula.

Following the completion of Question 1, all subjects were asked to respond to Question 2:

Q2: What do you think would be the choice of a real vice president in Question 1?

I think that he would recommend continuing to employ ____ of the 196 workers in the company.

(The subjects had the text of Q1-Table or Q1-Formula before them when answering Q2.)

2. Observations

OBSERVATION 1: *There were sharp differences between the groups in dealing with the dilemma of profit maximisation vs. worker layoffs.*

The following Table presents the 764 responses to Q1-Table that recommended retaining 100 or more workers (that is, laying off less than 96 workers, the number required for profit maximisation):

Q1-Table	EconHu	EconTA	MBA	Law	Math	Phil	Total	MRT
$n =$	94	130	172	216	64	88	764	110s
100 (profit maximisers)	49%	45%	33%	27%	16%	13%	31%	107s
144	33%	31%	29%	36%	36%	19%	31%	114s
170	7%	9%	23%	18%	25%	25%	18%	113s
196 (no layoffs)	6%	13%	12%	13%	11%	36%	15%	104s
Other	4%	2%	3%	6%	13%	7%	5%	
Average layoffs	69	63	54	52	45	31	53	

The differences between the groups are striking. The economics students, both at the Hebrew University and Tel Aviv University, are much more pronounced

profit-maximisers than the students in the other groups. Among the Econ students, 45%–49% chose the profit-maximising alternative, compared to only 13%–16% of the Phil and Maths students. The MBA and Law students were somewhere in between.

The response of ‘no layoffs’ was given by only a small number of respondents in five of the six groups (ranging from 6%–13%); the only exception was Phil – 36% of the Philosophy students chose to ignore the profit-maximising objective totally.

Following the methodology used in Rubinstein (2004) I analysed the response times of the various answers. One might speculate that the difference between the responses is related to the effort invested in cognitive reasoning by the subjects. If, for example, the response time of the profit maximisers were the lowest, we might speculate that profit maximisation is an instinctive outcome. However, this was not the case. The time differences between the various answers were small. The answer 196 had the lowest median response time of 104 seconds; the graph of this response time’s distribution was clearly, though only slightly, to the left of the graphs corresponding to all the other responses.

Comment: A problem which arose in the analysis of the responses to Q1-Table was how to treat the 5% (42 out of 806) of responses which were below 100 (i.e. firing more workers than required to achieve profit maximisation). In many of those cases it was clear that the subjects had been confused between the number of workers to be kept on and the number of workers to be laid off (for example, they chose 52 but had intended 144). Some were probably typos and a very small number were probably the result of random choice. Given the small number of answers below 100 and the fact that there is a reasonable interpretation of these results, I have decided to classify them as errors.

OBSERVATION 2: *The formula vs. the table*

Q1-Formula was identical to Q1-Table except that the Table was replaced with the formula $2\sqrt{x} - 0.1x - 8$. This profit function yields similar values to those presented in the Table. Its maximum is at $x = 100$. Note that in both versions of Q1 it was explicitly stated that if no workers were laid off, profits would still be positive.

The following Table summarises the 320 answers of 100 or more. (Of the 357 subjects who responded to Q1-Formula, only 10% answered with a number below 100. Once again I avoided trying to interpret these results. The number 25, for example, is clearly a mistake in solving the first-order condition.)

Q1-Formula	EconHu	EconTA	MBA	Math	Total	MRT
$n =$	62	79	131	48	320	217s
100	74%	77%	73%	75%	75%	222s
101–195	10%	9%	11%	15%	11%	245s
196	16%	14%	15%	10%	14%	174s
Average layoff	76	78	76	79	77	

Interestingly, there are no major differences between the groups. A similar proportion of subjects (73%–77%) in all groups chose the profit-maximising solution of 100.

We turn now to Q2 in which subjects were asked to predict what they thought a real vice president would do:

OBSERVATION 3: There were no significant differences between groups as to what the subjects thought a real vice president would do.

The responses to Q2-Table are summarised in the following Table:

Q2-Table	EconHu	EconTA	MBA	Law	Math	Phil	Total
<i>n</i> =	92	125	165	206	62	84	734
100	57%	54%	47%	58%	48%	45%	52%
144	23%	28%	27%	29%	21%	29%	27%
170	12%	10%	20%	6%	16%	15%	13%
196	4%	7%	3%	3%	2%	5%	4%
Other	4%	1%	3%	4%	13%	6%	4%
Average layoff	72	69	65	74	68	66	70

In this case a much larger proportion of subjects predicted that a real manager would maximise profits while only 4% believed that a real vice president would not fire anyone. The Table shows the similarity between the groups in their responses to this question:

OBSERVATION 4: There were large differences in how closely the subject's choice matched the one he attributed to a real vice president.

The following Table compares the subjects' own choices in Q1-Table and the choices they attributed to a real vice president in Q2-Table:

Table	Econ-Hu	Econ-Tau	MBA	Law	Math	Phil	Total
A real manager <i>n</i> =	92	125	165	206	62	84	734
Would choose like me	55%	42%	45%	34%	21%	29%	39%
Would fire more	28%	36%	40%	54%	66%	69%	47%
Would fire less	16%	22%	15%	12%	13%	2%	14%

The results for the two Econ groups showed the least dissonance between the subject's own position and the position he attributed to a real vice president. A majority of the subjects in Law and more than 66% of Maths and Phil felt that a real vice president would be tougher than they themselves would be in laying off workers. The formula version of the question seems to have strengthened the subject's confidence that a real manager would make the same choice that they

would. Thus, 48% of the subjects (64% of Econ HU and 55% of EconTA) gave the same answer to Q1 and Q2 formulas.

3. The Globes Survey

Globes is Israel's leading business daily. Its readership consists primarily of members of Israel's business community. In the summer of 2004, I was granted permission to conduct a survey of *Globes* readers. An e-mail was sent to their electronic subscribers asking them to respond on line to the same questionnaire (the Table version only) as that given to the students. Within a few hours, 4,612 *Globes* readers had responded to at least one of the questions, with 92% of them completing the entire questionnaire. The amount of time the readers devoted to responding to the questionnaire indicates the considerable degree of thought they gave it. About 80% of the respondents spent over 90 seconds on the main question before entering their reply and about half of the readers took over two and a half minutes.

An analysis was made of the 4,158 readers who chose to retain 100 or more workers. (Once again, I assume that those who chose to retain less than 100 workers probably confused 'number of workers employed' with 'number of workers laid off'. Including these respondents in the analysis and correcting the response according to this interpretation, would not have had a significant impact on the results.)

As a group, *Globes* readers responded similarly to the Law and MBA students at Tel Aviv University. Only 28% of the subjects chose to maximise the company's profits. To the extent that the readers' responses reflect what they would have done in real life, this seems to contradict the idea that the classic model taught in economics is a reasonable approximation of reality.

The *Globes* respondents were asked to report on their educational background in economics. 18% had a BA in economics while 21% had graduated from an MBA programme. The large sample allows us to determine whether an economics education affects the subjects' replies even years later. It turns out that the responses of economics graduates were clearly different from those of readers who lacked a formal background in economics. On average, those with a degree in economics decided to lay off 20% more workers than those who lacked any academic background in economics. Some 36% of the economics graduates chose to maximise profits as compared to only 25% of the subjects with no background in economics.

	Econ	MBA	No Economics
<i>n</i> =	763	891	2504
100	36%	27%	25%
144	30%	32%	28%
170	19%	21%	24%
196	13%	16%	19%
Average layoff	56	50	47

OBSERVATION 5: *Gender effects: women tended to fire less workers.*

Readers were also asked to report their gender – only 21% were females. Nonetheless, the large sample (876 females) allowed us to perform a gender comparison. In all three categories of economics education, we observed more compassionate behaviour among women:

Gender Effects	Econ	MBA	No Economics
Number of females	151	202	523
	f/m	f/m	f/m
Average layoff	52/57	47/51	43/48
Profit Maximisers	30/37%	24/28%	22/26%

4. The Harvard Survey

In September 2004, I had the opportunity to give the questionnaire to graduate students in economics, most of them studying at Harvard and the rest at MIT. The subjects were randomly assigned either the Table or the Formula version. The sample was small but the results are nonetheless significant since the subjects were members of the ‘elite’ of economics students worldwide.

The differences between the responses to the two versions were striking yet similar to what was observed earlier:

	Q1 Table	Q1 Formula	Q2 Table	Q2 Formula
$n =$	44	28	45	30
Average layoff	55	78	66	48
100	41%	71%	51%	27%
101–195	41%	18%	42%	60%
196	18%	11%	7%	13%

Once again the formula version led more students to choose the profit-maximising level of employment. However, the main finding was the following:

OBSERVATION 6: *Even Harvard PhD students disagree in their predictions of a real manager’s behaviour and those predictions are frame dependant.*

First, note that the PhD students’ predictions of the real manager’s choice strongly depend on the framing of the question in terms of a Table or a formula. (Among the Tel Aviv students, similar differences were observed only among the mathematicians.) However, what is more striking is that they sharply disagree as to what a real manager would do. When the data were presented to them in a table,

49% of the subjects predicted that a real manager would not maximise profits. When the formula was presented, 73% of the subjects made that prediction.

This raises a question about economics as a whole. The survey question was very simple and involved a basic question regarding firm behaviour. It is perhaps analogous to asking physics students the following question: 'A ball falls from a 10 m. tower – when will it hit the ground?' I cannot imagine that PhD students in physics would differ in their answer to this question. However, the PhD students in economics at Harvard were in sharp disagreement. If PhD students in economics cannot agree on such a basic issue, I wonder whether our expectation that economics will have significant predictive power is any more than an illusion.

6. Discussion

Our view of the results as economists cannot easily be separated from our personal beliefs about what an economic agent should do in such a situation. If you believe that the manager of a company is obliged morally or legally to maximise profits, then you should be pleased by the success of economics in educating its students. However, you might be disturbed by the fact that so many economics students did not show any tendency to maximise profits. Furthermore, you might be no less worried by the fact that even the Harvard PhD students differed in their prediction of what a real manager would do.

Alternatively, you might approach the results with the idea that a manager is committed not only to maximising profits but also to taking into account the welfare of his workers, particularly when the economy is in recession and unemployment is high (as stated in the questionnaire). Under these circumstances, striving to maximise profits regardless of the consequences appears to be 'ethically problematic'.

I consider the differences between the two groups of economics undergraduates and the other groups to be significant. The economics students had a much stronger tendency to maximise profits than did the subjects in other groups. Admittedly, a major drawback of the survey is its inability to determine clearly whether differences are due to selection bias or are the result of indoctrination. (Originally, I had intended to present the questions to economics students prior to the beginning of their studies but was unable to do so for technical reasons.) But even if the economics profession attracts certain types of people, the results still suggest that something is wrong in the way we relate to students in our undergraduate programmes. It appears that the MBA programme is more successful in producing students with more balanced views. In fact, I found it surprising that the results obtained from the MBA students were so different from those of the Econ students. Perhaps this has to do with the way that the MBA programme is taught. In other words, 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.

This conjecture is supported by the other results of the survey. In response to Q1-Formula, in which the choice was presented as a mathematical formula, a vast majority of the subjects in all disciplines (including the Harvard PhD students)

maximised profits though many of them were aware of the existence of a trade-off (evident from the fact that many of those who chose 100 said that they believe that a real vice president would fire less than the number required to maximise profits). This appears to support the intuition that presenting a problem mathematically, as we often do in economics, conceals the real-life complexity of the situation.

Of course, it may be that there is no connection between the responses of subjects to such a questionnaire and the choices they would make in practice. But if there is no connection, are we saying that what a student learns in economics will have no influence on his future behaviour? And if there is such a connection, shouldn't we be revising our curriculum?

In any case, we need to re-evaluate the use of mathematical exercises which lead students to focus on the task of maximisation rather than on real economic problems. In the best case, these mathematical exercises simply make the study of economics less interesting; in the worst case, they contribute to the shaping of a rather unpleasant 'economic man'.

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