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Johannes R. Suttner

Abstract

In this study, it was found that economists were sensitive to different commodities based on their attitudes in terms of fairness toward the price mechanism, whereas non-economists did not exhibit significant sensitivity. This sensitivity was so strong that no self-selection effect could be found in economists in the case of a survey of a basic commodity, whereas there was a clear self-selection effect with a luxury commodity. After one semester with intensive exposure to microeconomic theory, the market affinity of economists increased in both cases, but their sensitivity persisted. Surprisingly, it was the allocation mechanism of “first come, first served” and not the price mechanism that was affected more in terms of fairness. The latter reflects equal treatment in terms of general perceptions, thus this could be interpreted as an increased aversion to inequality among economists.

Keywords: Attitude change; economics teaching; fairness, selection

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Sensitivity of Economists during Market Allocation

Johannes R. Suttner

July 17, 2014

1 Introduction

There is broad evidence that economists favor the market system more than non-economists and that they act according to economic theory to a greater extent. This evidence has been obtained from surveys and laboratory and field experiments¹. Freshmen students of economics already exhibit a greater market affinity, thus their divergence from non-economists cannot be attributable to the training in economic issues that they receive during their studies. Indeed, there is evidence to contradict the latter issue, which is referred to as the *indoctrination* or *treatment* effect, in the sense that their market affinity does not increase or even decrease². Nevertheless, the fact that economists are already more market orientated before they begin their studies is unquestioned, which means that they self-select into the study of economics because of their market affinity.

The present study also focuses on this divergence among economists, but it provides a deeper consideration of whether economists are actually *always* different. This question was inspired by the survey of Frey et al. (1993) who

¹Kirchgässner (2005) provides a detailed literature survey and methodological discussion.

²Contradictory evidence is provided by, e.g., Carter and Irons (1991), Frey et al. (1993), and Frank and Schulze (2000).

provided a careful consideration of whether and to what extent economists differentiate between different commodities. By comparing their survey results with those of Ng (1988), they concluded that “in the case of luxury goods, better-trained students objected less to the application of the price system than in the case of an essential commodity, whereas the general population and beginning students did not judge the rationing of luxury and normal goods differently” (p. 278). Furthermore, they stated that their “inquiry indicated that students reacted to the type of commodity in a more sensitive way than the general population did” (p. 278). I refer to the claim that economists differentiate between different types of commodities as the *sensitivity of economists*. Nevertheless, the manner in which Frey et al. (1993) reached this conclusion was not convincing from a methodological perspective because the differences among groups of economists may have been due to sample selection as they did not control for socio-demographic data. Therefore, the results must be interpreted carefully from a statistical viewpoint. The current study addresses these challenges.

This study presents a survey that was designed according to Frey et al. (1993). In their survey question, bottled water was sold to thirsty hikers at a sightseeing point, where demand increased excessively on a hot day. The authors proposed four allocation mechanisms for evaluation by the participants: very fair, acceptable, unfair, or very unfair. The allocation mechanism with the highest interest was price allocation, where the price should be doubled in response to excess demand. Frey et al. (1993) reported that economics students judged that the price increase was fair compared with the control group, which comprised a random section of the general population. This result was confirmed in all cases, regardless of whether the situation of excess demand was mentioned explicitly or not, as well as when all four allocation mechanisms were surveyed and in the case of surveying the price mechanism only³. The same survey was also conducted by Haucap and Just (2010), but with the modification of one additional mechanism. They also found that

³Cf. table 1: Frey et al. (1993) asked question 2 only with respect to the price mechanism and excess demand was mentioned explicitly. In question 4, they asked about three additional mechanisms, but excess demand was again mentioned explicitly.

Table 1: Literature overview: proportion of people who consider that a price increase is fair

Commodity	Source	Economists		Non-Economists
		Freshmen	Advanced	
Bottled Water	Frey et al. (1993, Question 2)	57%	43%	22%
	Frey et al. (1993, Question 4)	65%	49%	27%
	Haucap & Just (2010)	41%	60%	28%
	Ruske & Suttner (2012)	48%	52%	20%
Snow Shovel	Kahneman et al. (1986, Question 1)	—	—	18%
	Frey et al. (1993, Question 3)	59%	62%	18%
	Cipriani et al. (2009)	54%	53%	32%
Seating Charge	Ng (1988)	38%	59%	29%

economists tended to judge the price mechanism as fairer significantly more often than non-economists.

The luxury commodity that Ng (1988) asked the respondents to assess was an additional seating charge for reservations in a popular restaurant on Saturday night when many people like to dine, where his results showed that only a small share of the general public considered that these seating charges were fair. However, economics students were generally more in favor of additional seating charges than the general public. Furthermore, there seems to have been a treatment effect because the share increased from 38.2% in the group of first year economics students to 59.2% in the group of fourth year economics students.

Table 1 summarizes the reported proportion of students who considered that a price increase for the corresponding commodity was fair. In the case where snow shovels were the commodity of interest, a heavy snow storm led to excess demand. The survey of Kahneman et al. (1986) did not compare economists with non-economists but I added this to the table because it provides evidence about the attitudes of the general population. The summary

shows that the results were replicated well by different studies of the differences between economists and non-economists. However, with the exception of question 3, the proportion of advanced economics students reported by Frey et al. (1993) contradicts the results of other studies.

Likewise, Ruske, and Suttner (2012) provided evidence that students with a greater market affinity self-select into the study of economics. They conducted the survey reported by Haucap and Just (2010). Furthermore, they could not identify a statistically significant treatment effect. They conducted the survey using almost the same selection of groups, but they came from a peer group who started their career one year before, thus I will refer to their results and use their data in the ongoing analysis.

2 Survey Design and Response Behavior

The sensitivity claim by Frey et al. (1993) may be attributable to a selection bias in the group of economists. In order to address this problem, two questionnaires were designed, each with a different commodity, and they were distributed randomly among the groups of interest. The two commodities selected for the survey came from the transport services sector. To test the assumed sensitivity of economists, one represented basic goods in the sense of a price-inelastic commodity, whereas the other one represented luxury good with a high elasticity of demand. First, the basic good should appeal indirectly to “social feelings.” This would be true of a ticket for a commuter train because the income elasticity of the demand for public transport is negative (Paulley et al. 2006, p. 304), which means that people with lower incomes are particularly dependent on that mode of transport. I assumed that this would be known by all people, at least intuitively. The reverse is true of a flight ticket for a shopping tour in London. This type of resource is only in demand among people with higher incomes. I expected that non-economists would judge the market system as unfair in both cases because the main reason for them to refute the market system is that “individual opportunities depend on the incomes of the individuals” (Kirchgässner 2005, p. 557). I cannot imagine that train ticket economists, especially freshmen

economists, would deny this claim totally. However, the self-selection effect was expected to be true in both cases because no contradictory evidence has been published. Furthermore, the self-selection effect was expected to be somewhat weaker for the train question, which would mean that economists are sensitive to the commodity. Finally, I only expected small treatment effects among this group of economists based on the results reported by Ruske and Suttner (2012), who surveyed the same selection of economists from the peer group who started their studies one year before.

The expected sensitivity of economists and the selection of the two commodities may test the claim that the differences between the studies of Frey et al. (1993) and Ng (1988) are due to the different selection of commodities. The former used a price-inelastic commodity whereas the latter was “dealing with a luxury commodity with a high elasticity of demand” (p. 278). This difference is also considered in the present study because the demand for public transport is price-inelastic (also see Paulley et al. 2006), whereas a shopping flight is a luxury commodity with a high price elasticity of demand.

Based on previous research, the questions were designed with regard to the following points: (1) the excess demand is mentioned explicitly, (2) the price increase is due to scarcity, and (3) alternatives to the price mechanism are mentioned. Furthermore, as in the case of bottled water, the market structure is not mentioned explicitly. It could be monopolistic and many participants may have thought that it is monopolistic, but this need not be the case. More important, is the fact that an active resale market does not exist for all commodities (including bottled water). Otherwise, the attitudes would change fundamentally, as suggested by Kahneman et al. (1986, p. 736). The questions are reported in Tables 2 and 3. The students had to evaluate each mechanism as “very fair,” “acceptable,” “unfair,” or “very unfair.”

The survey was conducted in October 2012 using about 1,500 students with various majors from the University of Münster (Germany). In order to exclude learning effects, the students of economics were surveyed during their first microeconomics lecture, whereas all other students were surveyed during the first two weeks of the semester. The group of economics students were sur-

Table 2: Survey: allocation of places on a commuter train

There is a daily train connection from Münster to Telgte at 8:00 AM. This train only has a capacity of 150 passengers. A train ticket (one-way) is sold for EUR 2.10. There is a plan to renovate the main road connection for traffic, thus the local transportation company expects 300 passengers to use this train to commute to work in the following weeks. Please assess the following methods for offering the train tickets to the passengers.

- a The price is increased to EUR 4.20 per ticket.
- b A ticket is sold for EUR 2.10 to the first 150 passengers on a “first come, first served” basis.
- c A ticket is sold for EUR 2.10 to 150 passengers whose last name happens to start with the letters A to K.
- d The local community buys all of the tickets for EUR 2.10 each and distributes them as it sees fit.

Table 3: Survey: allocation of places on an airplane for a shopping tour to London

There is a daily flight connection from Münster to London at 9:00 AM. The airplane only has a capacity of 150 passengers. A flight ticket is sold for EUR 120. It will soon be Christmas, thus the airline company expects that 300 passengers will use this connection to fly to London for Christmas shopping. Please assess the following methods for offering the tickets to the passengers.

- a The price is increased to EUR 420 per ticket.
- b A ticket is sold for EUR 120 to the first 150 passengers on a “first come, first served” basis.
- c A ticket is sold for EUR 120 to 150 passengers whose last name happens to start with the letters A to K.
- d The local community is twinned to London, thus it buys all of the tickets for EUR 120 each and distributes them as it sees fit.

veyed a second time during the last lecture of the semester to tested whether their attitudes toward the different allocation mechanisms had changed after intensive exposure to the theory of rational choice. The curriculum for these students included a one-semester course in microeconomics with a workload of 270 hours, where about 30% comprised lectures and courses. This was the only course with exposure to microeconomic theory in the curriculum during that semester, thus this survey allowed the virtually isolated effect of rational choice theory to be tested ⁴. It should be noted that these students were not pure economists because they studied an economics major, which was combined with political science or law. However, this does not preclude the identification of a self-selection effect because studying pure political science or law was possible, even given the lower requirements for access to the university. To ensure that the economics students all received the same questionnaire (train or flight) at the end of semester, their ID numbers were noted on an extra list. The groups of non-economists were freshmen students of law, mathematics, medicine, German philology, and Catholic theology. A second survey was not conducted with these students.

For all the surveyed commodities, Table 4 shows the proportions of freshmen students in the corresponding subgroups who assessed the price mechanism as “very fair” or “acceptable.” As noted by Frey et al. (1993, p. 278), bottled water may be considered as a form of basic goods. Ruske and Suttner (2012) conducted the water survey with majors students at the same university as the current study (with the exception of law and mathematics students), but one year earlier. An overview of the results from their study is provided in Table 4 to facilitate their comparison.

As shown in Table 4, more economists assessed the price system as fair. Comparisons of the train and flight questions showed that the proportions also differed by a large amount in the group of economists but by a smaller amount in the group of law students. Because the proportions were always higher for the flight question, I conclude that there was a *sensitivity* to the

⁴In addition, the microeconomics students attended a course in accounting during the first semester. However, this course only provided instruction about the performance of accounting and it contained no rational choice theory.

Table 4: Proportion of students who assessed that the price increase was fair (total numbers of students from each subgroup are shown in parentheses)

Lecture	Train	Water	Flight
Economics (1st survey)	25.3% (87)	47.7% (214)	47.1% (89)
Law	25.8% (198)	–	38.4% (206)
Medicine	22.9% (70)	24.3% (144)	29.7% (64)
Mathematics	23.7% (173)	–	28.9% (173)
German Philology	17.1% (105)	20.4% (113)	24.0% (100)
Theology	18.6% (102)	17.0% (141)	26.0% (104)
Economics (2nd survey)	47.8% (69)	52.4% (170)	70.8% (65)

diversity of the commodities within all subgroups of students. As expected, however, the economists had the highest sensitivity. From the perspective of a self-selection effect, I suggest that this was not identifiable in the case of the train question. If this is true, this represents a novel contribution to the research area. Compared with the water question, the results are rather surprising because I suggest that bottled water and the train tickets both represent basic goods, and economists tended to rate the bottled water and flight ticket in the same manner. The proportions of 47.7% and 46.7% are almost the same, but they are quite different from the proportion of 25.3% with the train question. In contrast to the proposition of Frey et al. (1993), the sensitivity of economists appears to be related to more than the price elasticity of demand. The income loss argument may also play a role, particularly in the context of a negative income elasticity of demand. At the end of the semester (second survey), the proportions increased by over 20 percentage points for the transport questions, whereas there was only a small increase for the bottled water question. Thus, there appeared to be clear learning effects with respect to the transport questions, but the difference in the response behavior persisted, thereby indicating that exposure to microeconomic theory did not override the sensitivity of economists.

3 Results

3.1 Self-selection: Strength of Sensitivity

The model employed for identifying a self-selection effect was taken from Cipriani et al. (2009). In this model, the enrollment in economics is explained by the attitudes toward the four allocation mechanisms, prior economic instruction at high school or at university, and socio-demographic data. In this model, a self-selection effect is identified if the variable that captures the attitude toward the price mechanism has a positive significant influence on the probability of being enrolled in economics. Thus, a student who already thinks that the price system is fair has a higher probability of selecting economics as their subject of study. Based on the preliminary evidence from the previous section, I only expected a significant positive effect of enrollment in economics for the flight question response.

In addition, I expected the sign to be positive for the “first come, first served” preference. However, I did not expect the coefficient to be significant for the methods of random distribution or distribution by an authority. All of the other variables included in the regressions are shown in Table 5. Cipriani et al. (2009) found that male students were more likely to enroll in economics. In the present, study there was no support for a gender effect in the data based on an initial inspection. However, I only expected a positive (but insignificant) influence, which would not contradict the findings of Cipriani et al. (2009). In contrast to the study of Cipriani et al. (2009), I only collected data related to the occupations of the students’ parents and not their income classes. A parent who works in a white collar job may have a positive effect on the decision of their child to study economics because white collar workers have some responsibility for dealing with staff, money, or capital. Instead of specifying the economic position of the parents, the students were asked to indicate the (monthly) gross income that they expected to earn after completing their studies. In general, it may be likely that someone who studies economics expects to achieve a higher financial return from their education (Beffy et al. 2012). However, the students who participated in this

Table 5: Overview of all the variables used in the regressions

Variable	Description
<i>econ_stud</i>	1 if student is enrolled in economics, 0 otherwise
<i>male</i>	1 if male, 0 if female
<i>age</i>	Age of student
<i>abigrade</i>	Grade of Abitur (German university entrance qualification)
<i>abiyear</i>	Year of having received Abitur
<i>econschool</i>	1 if student has subject on economics in school, 0 if not
<i>econlect</i>	1 if student has visited a lecture on economics or business in prior studies
<i>exp_inc</i>	Expected monthly gross income after university (in thousands of Euro)
<i>pol_att</i>	Political attitude (Likert scale from 1 = left to 5 = right)
<i>f_whitec</i>	1 if father works in a white collar job, 0 otherwise
<i>f_bluec</i>	1 if father works in a blue collar job, 0 otherwise
<i>f_unempl</i>	1 if father is unemployed/housekeeper, 0 otherwise
<i>m_whitec</i> , <i>m_bluec</i> , <i>m_unempl</i> are the corresponding variables for the student's mother	

study were not pure economists, thus it remains unclear whether the expected income had an influence or not and whether it was positive or negative. With the exception of Ruske and Suttner (2012), no previous studies have analyzed the impact of prior economics instruction on the response to this type of question. They found no significance effects of these variables, but they tested an ordered probit model based on the model used by Haucap and Just (2010). This model did not explain their enrollment in economics, but the attitude toward the market system was a function of enrollment in various fields of study. I did not expect a significant positive influence of economics education at school on enrollment in economics because the economics instruction provided in school generally comprises very basic level economics education. This is true of the economics instruction provided in the German state of Nordrhein-Westfalen, from where 75.7% of the students originates. However, if the students had already attended economics courses in a previous semester, there may have been two reasons for an enrollment in economics: (1) they attended because of a special interest in this subject and then decided to switch to economics; or (2) in the previous semester, they were not allowed to study economics because of a grade restriction, but they attended an economics course in preparation for studying economics, thus they already had an inclination toward economics. This was why I expected a positive but weak significant effect on the dependent variable.

For each transport question, I performed the same probit regression with enrollment in economics (variable *econ_stud*) as the dependent variable. The underlying probit model for the regressions is presented in equation 1:

$$P(econ_stud_k = 1|X) = \Phi \left(\beta_0 + \sum_i \beta_i att_{ki} + \sum_{\bullet} \beta_{\bullet} x_{\bullet k} \right) \quad (1)$$

where $k = 1, \dots, n$ are the observations, $i = a, b, c, d$ are the four allocation methods, X is the vector of all the explanatory variables, att_{ki} is the attitude of student k toward allocation method i , the last term in parentheses summarizes all the other variables, and Φ represents the cumulative

distribution function of the standard normal distribution. The results of the probit regressions for the two commodities are presented in Table 6.

The regression results confirmed the predictions made in the previous section, i.e., no selection effect could be identified for the train question, but there was a clear significant selection effect for the flight question, where students who assessed that the price increase for the flight ticket was fair selected economics as their major with a higher probability. What does this tell us? Economists are different from non-economists, but not in all cases. At the beginning of their studies, they usually lack a (strong) theoretical background in economics, thus it seems that they are sensitive to the diversity of commodities. This sensitivity was so strong that a selection effect could not be found for the train question. The entirely different results obtained when comparing both questions were robust to regressions with fewer variables, particularly without the insignificant variables and thus with a higher number of observations. They were also confirmed by the model of Haucap and Just (2010). No selection effect could be found for students with majors other than economics. Furthermore, I obtained similar results in each case with the corresponding logit models ⁵.

To summarize, it appears that Frey et al. (1993) were correct when they suggested that economists answer in a more sensitive manner than non-economists and that this sensitivity may be focused on the differences among commodities. The fact that no selection effect could be identified for the train question is a novel finding. Previous studies of the market affinity of economists have not shown that economists are not significantly more market orientated than non-economists. As a consequence, my expectation of a selection effect in each case was not confirmed and only the claim for sensitivity holds.

As expected, the coefficient that measured the influence of a “first come, first served” preference was negative. In contrast to my expectation, however, the impact was highly significant for the train question, which shows that a preference for assessing “first come, first served” as fair for an essential commodity also explains enrollment in economics. This was also true for the

⁵The results of all these regressions are available from the author upon request.

Table 6: Regression results for the probit models

Variable	— Train —		— Flight—	
	Coefficients of probit regression	Average marginal effects	Coefficients of probit regression	Average marginal effects
Price Increase	0.037 (0.089)	0.012 (0.028)	0.349 (0.090) ***	0.105 (0.025) ***
First come	0.251 (0.090) ***	0.079 (0.027) ***	0.159 (0.090) *	0.048 (0.027) *
Random	-0.119 (0.127)	-0.038 (0.040)	-0.028 (0.112)	-0.009 (0.034)
Authority	0.191 (0.098) *	0.060 (0.031) **	-0.030 (0.096)	-0.009 (0.029)
<i>male</i>	0.032 (0.163)	0.010 (0.052)	0.057 (0.162)	0.017 (0.049)
<i>age</i>	0.001 (0.072)	0.000 (0.023)	0.011 (0.039)	0.003 (0.012)
<i>abiyear</i>	-0.070 (0.086)	-0.022 (0.027)	-0.003 (0.007)	-0.001 (0.002)
<i>abigrade</i>	0.032 (0.148)	0.010 (0.047)	0.209 (0.139)	0.063 (0.042)
<i>econschool</i>	0.161 (0.168)	0.051 (0.053)	-0.030 (0.158)	-0.009 (0.048)
<i>econlect</i>	0.506 (0.309)	0.160 (0.097) *	0.834 (0.340) **	0.251 (0.100) **
<i>exp_inc</i>	-0.133 (0.047) ***	-0.042 (0.014) ***	-0.106 (0.047) **	-0.032 (0.014) **
<i>pol_att</i>	-0.084 (0.112)	-0.026 (0.035)	-0.059 (0.113)	-0.018 (0.034)
<i>f_whitec</i>	-0.084 (0.192)	-0.027 (0.061)	-0.262 (0.179)	-0.079 (0.053)
<i>f_unempl</i>	-0.173 (0.290)	-0.055 (0.092)	0.070 (0.314)	0.021 (0.094)
<i>m_whitec</i>	0.157 (0.209)	0.050 (0.066)	-0.371 (0.196) *	-0.112 (0.058) *
<i>m_unempl</i>	0.324 (0.234)	0.102 (0.073)	-0.027 (0.222)	-0.008 (0.067)
Intercept	139.234 (173.843)	—	4.998 (14.715)	—
<i>n</i>	334		351	
Log-likelihood	-186.620		-186.961	
LR χ^2	32.76 (16)		52.68 (16)	
Prob > χ^2	0.0079		0.0000	
Pseudo- R^2	0.0807		0.1235	

Standard errors are shown in parentheses. For the likelihood ratio (LR) χ^2 , the degrees of freedom are shown in parentheses. The significance levels are 1% (***), 5% (**), and 10% (*).

Table 7: Results of the second survey (matched samples): proportions of students who assessed that a price increase was fair (the total numbers of students are shown in parentheses)

Sample	Train	Water	Flight
Matched sample from 1st survey	24.5% (53)	47.2% (127)	46.4% (56)
Matched sample from 2nd survey	52.7% (53)	56.3% (127)	71.9% (56)

distribution by an authority, which is the “communist” solution, although the effect was less significant and smaller in absolute terms compared with the average marginal effects on each other. Is this the “social(ist) side” of economists? I will return to this claim in section 3.2, where we will see whether the claims hold with regard to the learning effect.

In addition, there were no unexpected effects among all other variables. Economic instruction at the university in a previous semester had a positive significant impact on enrollment in economics. However, since most of the students who had already attended a course in economics did not specify their previous major, I cannot conclude which of the claims mentioned above holds. Regardless, it is remarkable that the coefficient of *econlect* represented the largest effect among all variables for both questions. For the flight question, it should be noted that the effect was 2.5 times larger than the effect of the fairness attitude toward the price system. Surprisingly, the sign was negative for the coefficient of the expected income (*exp_inc*).

3.2 Learning: Persistency of Sensitivity

Based on the proportions shown in Table 4, we might conclude that there are substantial treatment effects for both transport questions. Table 7 provides an overview of the proportions for all three questions at the end of the semester for the samples that matched with the data from the first survey.

For both transport questions, the proportions increased by more than 20 percentage points. χ^2 -tests of homogeneity showed that the changes in the

response behavior were statistically significant compared with the first survey (train question: $\chi^2(3) = 9.3034$, $p = 0.026$; flight question: $\chi^2(3) = 7.6275$, $p = 0.054$), thereby showing that there was a significant treatment effect of learning microeconomic theory. Ruske and Suttner (2012) reported that this was not true for the bottled water question. There was only a small learning effect with the latter question and the changes were not statistically significant ($\chi^2(3) = 4.4365$, $p = 0.218$).

Moreover, the high difference of more than 20 percentage points persisted between the transport questions, which raised the question: what is the cause of the sensitivity of economists? In microeconomic theory, the students learned about the efficiency of market allocation and the price mechanism. Stigler (1959, p. 528) says that the economist “is drilled in the problems of all economic systems and in the methods by which a price system solves these problems.” Thus, if economists learn about market efficiency they will pay greater attention to the prices. Therefore, it is possible that a consequence of the learning process is that economists develop a sense of what price elasticities reflect. As freshmen students, they only may have an intuition about the efficiency of market allocation and they have not yet learned (at least not with the intensity of microeconomics) how prices exactly induce market efficiency. However, like all students, they know about income losses due to price increases.

From the perspective of income losses, the price increase for a train ticket is the most harmful, particularly for those in the lower income ranges, who are dependent on public transport (Glaeser et al. 2008) because private mobility is a great cost. By contrast, the income loss argument does not matter for the bottled water or the flight ticket. Non-alcoholic drinks have income elasticities between 0 and 1 (Hesse et al. 2002). The train ticket and the bottled water were assessed in almost the same manner at the end of the semester, thus the question is raised of whether economists lose their perspective on income and focus more on prices.

If the argument that economics students focus more on prices and less on income is true, the greatest change in the students’ assessments about fairness should have been related to price allocation. Thus, if they actually

Table 8: Results for the remaining allocation mechanisms (matched samples)

Sample	Train	Water	Flight
First come, first served (1st)	73.6%	70.1%	82.5%
First come, first served (2nd)	69.1%	52.8%	89.5%
Random distribution (1st)	3.8%	9.4%	16.1%
Random distribution (2nd)	5.5%	10.9%	5.3%
Authority distribution (1st)	22.6%	44.5%	31.6%
Authority distribution (2nd)	22.2%	42.5%	21.1%

favored the price system, they should have rated the other methods as less fair. The “first come, first served” method is generally seen as fair because it allocates without considering the incomes of individuals (Kirchgässner 2005). However, because queuing incurs time costs (Barzel 1974), this general perception is not true from the perspective of economic theory, where poor people have advantages in comparison to the market allocation under such a system (Sah 1987). Therefore, if the economists had changed their attitudes towards market affinity, I would have expected that queuing would lose at least some of its preference. A stronger loss of preference should be true in the cases of random distribution and distribution by an authority because there is no efficiency criterion at all. Table 8 shows the fairness ratings for the corresponding methods apart from price allocation. The shares are reported for the matched samples.

The suggested loss of preference for non-market allocation by economists appears to have been true in general, with the exceptions of “first come, first served” for the flight question and random distribution for the train and bottled water questions, although the differences were very small in the latter two cases. To test whether this suggestion was resistant to a stronger statistical treatment, I used the regression model proposed by Hennig et al. (2003) to compare the changes in the response behavior using a pretest-

posttest design with Likert scales. The results provide insights into whether one mechanism tended significantly more toward fairness/unfairness than the others. Thus, I treated the responses of each student to the allocation method as the corresponding Likert score.

Let $C_{ik} = L_{1ik} - L_{0ik}$ be the absolute change in the score for the allocation method i for student k between pretest (0) to posttest (1). The changes in the scores with all other methods $-i$ are summarized by $C_{-ik} = L_{1-ik} - L_{0-ik}$, where the scores are calculated using $L_{h-ik} = \frac{1}{n_q} \sum_{q \neq i} L_{hqk}$, where $h = 0, 1$ indicates pretest or posttest and n_q is the number of all other allocation mechanisms that are not i . \bar{L}_i is the overall mean pretest score with $\bar{L}_i = (\sum_{k=1}^n (L_{0ik} - L_{0-ik})) / (2n)$. The model of interest is represented by equation 2:

$$C_{ik} - C_{-ik} = \mu + \beta_1(L_{0ik} - \bar{L}_i) + \beta_2(L_{0-ik} - \bar{L}_i) + \epsilon. \quad (2)$$

The regressions were also run with a restricted model. The restricted model contained the additional assumption that $\beta_2 = -\beta_1$. Hence, the equation of the restricted model was simplified to

$$C_{ik} - C_{-ik} = \mu + \beta_1(L_{0ik} - L_{0-ik}) + \epsilon. \quad (3)$$

The variable of interest was the intercept μ . A value of 0 indicated no difference between the posttest and pretest scores with method i compared with all other mechanisms $-i$. Conclusions about significance were obtained using standard t -tests. The results for the intercepts are shown in Table 9.

The results obtained using the unrestricted and restricted models were very similar, thus I refer to the restricted model⁶. As expected, the intercepts of the price allocation reference point ($i = a$) were always positive and

⁶Hennig et al. (2003) challenged whether the additional assumption of the restricted model in equation 3 is justified in practice. However, since the results obtained using both models were quite similar in all cases, any discussion of this matter is irrelevant in this case.

Table 9: Relative treatment effects

Model	<i>i</i>	Train	Water	Flight
unrestricted	a	0.385 (0.126) ***	0.315 (0.071) ***	0.436 (0.102) ***
	b	0.430 (0.213) **	0.099 (0.099)	0.901 (0.200) ***
	c	-0.595 (0.148) ***	-0.402 (0.099) ***	-0.818 (0.159) ***
	d	-0.236 (0.126) *	0.078 (0.075)	-0.499 (0.119) ***
restricted	a	0.382 (0.125) ***	0.327 (0.071) ***	0.437 (0.100) ***
	b	0.553 (0.185) ***	0.035 (0.093)	0.898 (0.177) ***
	c	-0.590 (0.146) ***	-0.359 (0.097) ***	-0.787 (0.141) ***
	d	-0.226 (0.126) *	0.090 (0.076)	-0.505 (0.114) ***

Standard errors are shown in parentheses. The significance levels are 1% (***), 5% (**), and 10% (*).

Table 10: Relative treatment effects (binary scale)

Model	<i>i</i>	Train	Water	Flight
unrestricted	a	0.240 (0.070) ***	0.184 (0.047) ***	0.314 (0.068) ***
	b	0.215 (0.115) *	0.075 (0.060)	0.371 (0.077) ***
	c	-0.210 (0.075) ***	-0.170 (0.042) ***	-0.403 (0.058) ***
	d	-0.143 (0.065) **	0.011 (0.045)	-0.329 (0.072) ***
restricted	a	0.228 (0.070) ***	0.195 (0.049) ***	0.314 (0.067) ***
	b	0.218 (0.097) **	0.031 (0.056)	0.371 (0.074) ***
	c	-0.219 (0.072) ***	-0.171 (0.044) ***	-0.419 (0.055) ***
	d	-0.130 (0.065) **	0.011 (0.044)	-0.311 (0.069) ***

Standard errors are shown in parentheses. The significance levels are 1% (***), 5% (**), and 10% (*).

highly significant. Thus, the attitude toward fairness about price allocation was affected more than the other three non-market solutions. However, the results suggested a remarkable finding, i.e., for both transport questions, the intercepts where $i = b$ (“first come, first served”) were also positive, highly significant, and even greater than that when the price mechanism was used as the reference point. This was very surprising because we may conclude that economists do not become antisocial capitalists. Indeed, the exposure to intensive microeconomic teaching leads them to favor the “income-neutral” allocation by queuing more than previously. When considering bottled water as the commodity of interest, a different conclusion can be reached based on the results, where the assessment of the market mechanism toward fairness was affected the most. To confirm the robustness of these findings and to understand the seemingly contradictory result that there was a reduced preference for “first come, first served” whereas the relative treatment effect was positive, I performed regressions on reduced scales that only differentiated between fair and unfair. All of the results are shown in Table 10. As a consequence of the reduced information, the relative treatment effects for “first come, first served” were essentially reduced and, for the train question, it was even smaller than the effect of the price mechanism (0.218 for $i = b$ in comparison to 0.228 for $i = a$). The effect was still higher for the flight question (0.371 for $i = b$) than the price allocation (0.314 for $i = a$), but the difference was only about 18%, i.e., not more than the double. Again, this test was not significant for the water question. The results of the regressions based on a binary scale also questioned the validity of the argumentation based on proportions. This confirmed my intuition about not treating the proportions reported in previous studies as highly accurate. The test of robustness confirmed that the relative treatment effect for “first come, first served” was always positive. However, why was there a difference between the relative treatment effect for “first come, first served” between the transport questions and the bottled water question? A possible explanation may be that the commodities are derived from different sectors or that there may be a greater affinity for non-market allocation related to services. These open questions cannot be answered based on the survey because it did not include

a qualitative analysis.

The results of this study partly clarify one issue, i.e., economists do not become capitalistic machines after receiving instruction in rational choice. By contrast, they retain their sensitivity to different commodities and they exhibit greater fairness toward allocations that benefit people with lower wages. This contradictory claim may also support the view that no fundamental reasoning process led to the identified change in attitudes. Therefore, the change in attitudes toward the market mechanism was probably due to a socialization process. The students were instructed that there was no right or wrong answer and that they should answer the questions based on their intuition, which agrees with the primacy of intuition approach described by Zajonc (1980) and Haidt (2001). Therefore, it would be more precise to speak of an exposure effect rather than a learning effect. Economists can sense the harmful effects of market allocation on the welfare of individuals and this seems to be the overall explanation for the sensitivity of economists. Indeed, their sensitivity may reflect an inequity aversion, and this explanation is also consistent with the supposed contradiction of outcomes found in experimental setups (Fehr & Schmidt 1999).

4 Conclusion

To test the validity of the claim by Frey et al. (1993) regarding the sensitivity of economists, I conducted a survey at the University of Münster (Germany) using about 1,500 students with different majors. Two types of surveys were distributed randomly among all of the students, which asked for their views related to the distribution of different commodities. The luxury commodity was a flight for a shopping trip in London, while the basic commodity was represented by a ticket to use a commuter train. The questions used in the surveys were designed in a similar manner to those used in previous studies.

The results showed that economists were more sensitive than students from other majors. The economics students had not been exposed to economic theory at the time of the survey, thus I used regression models to identify a self-selection effect based on the two commodity samples. The

claim that market-prone students self-select into the study of economics was only identifiable in the case of the luxury commodity and there was no self-selection effect in the case of the train ticket. This finding is novel in this research area.

Furthermore, the group of economists were surveyed again using the same commodity after one semester of intensive exposure to microeconomic theory. The results obtained at the end of the semester showed that their market affinity increased significantly in both cases, but their sensitivity also persisted. In addition, I performed an analysis to determine the allocation mechanism that was affected the most. Surprisingly, the calculated relative treatment effects showed that allocation according to “first come, first served” was affected most, rather than the price mechanism. In addition, the analysis showed that interpretations of binary scales should always be considered carefully.

To summarize, Frey et al. (1993) were incorrect to conclude that advanced economists are more sensitive than non-economists. This sensitivity is already present at the start of their studies and it persists throughout learning. In addition, economists do not forget about income. Indeed, my results suggest that the income loss argument appears to become even more important, but a preference for the market system increases at the same time. The apparent contradiction between income and a simultaneous focus on price suggests that these results are attributable more to intuition than to reasoning. However, only a qualitative analysis can provide insights into this issue, which I leave for future research.

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The page features several teal-colored decorative elements: a horizontal bar on the right side, a horizontal bar on the left side, a horizontal bar at the bottom, and a small square in the top right corner.

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