Main Determinants of Difficulty in Understanding and Learning Macroeconomics Course

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Abstract

Humankind open his/her eyes to a life that has been strictly surrounded with economy throughout the all history and every increasingly. As we know from our daily life examples that each of us continuously takes economic decisions. These decisions that we take are mostly related to consumption, investment and savings. When viewed from this respect, we may say that we live in pocket of economics. Therefore importance of economic lessons has been on increase especially for economics and econometrics department students. As well as that macroeconomics is main mandatory courses of economics department, it also instructed at so many department at bachelor level. Object of this study is to determine main socio-demographic and academic variables that affect students who are educated at economics and econometrics departments learning and understanding the macroeconomics course within the frame of econometric model. According to the results that have been obtained, it was detected that variables such as age, graduation high school, high school diploma score and entry date to the department have effect in increasing difficulty in understanding and learning of macroeconomics course and department and love of department variables have reducing effect.

Keywords: macroeconomics, ordered logistic regression, comprehensive difficulties

1. Introduction

It is accepted that economic event and/or economic life is as rooted as humankind history and the first written records including economics analysis goes back to Ancient Greek period. The oldest and first written records that include efforts of analyzing economics events and that may be reached go back to Ancient/Hellenistic Greek period (the term from B.C. 8th century to B.C. 146). Each of the philosophers such as Pythagoras, Heraclitus, Democritus, Socrates, Plato and Aristoteles in Ancient Greek period took into hand the economics issues that are the subject of today's economics science even if just a drop (Bocutoğlu, 2012). The economics that is an independent science may able to participate in sciences family in 18th century when Adam Smith wrote his work named as "*Wealth of Nations*" in 1776. In this case, it may be said that the economics has an accumulation as old as humankind history beyond approximately 250 years scientific history.

The economics at the level of university/college was first took place in the courses such as philosophy, law and history in England in the midst of 1700s and named as "politic economics". As politic economics is not even a separate course subject, Adam Smith who was the leading name of the subject was assigned as Logic and then Moral philosophy to Glasgow University in 1751 (Uygur and Erdoğdu, 2012).

The literature study of economics training in Turkey that summarizes 1970s and following years was carried out by Ruben and it was presented in "National Economics Symposium" in 2005. This study was published at Turkey Economy Institution (TEK) as a discussion text in 2012.

As we learn from this study of Ruben (2012), economics training literature in Turkey may be summarized as follows: the first study that carried out within this subject was the book with the title of "Economics Education Taught Economics Education Universities in Turkey" that was prepared under the editorship of Fikret Görün. A part of the Journal of Economics (İktisat Dergisi) Issue No. 1986 January and the Journal of ODTU Development (ODTU Gelişme Dergisi) Issue No. 1987 14/1 was assigned for the subject of economics training. In 1993, TEK published a book with the title of "Economics and Economics Education in Turkey of 2000s". Again the Journal of Economics was assigned its 376th issue in 1998 and 415th issue in 2001 wholly for economics training. The Journal of Business Administration and Finance published an issue with the cover title of "Science and Economics". TEK organized a panel with the title of "Economics education" in 2003 (Ruben, 2012).

It is widely accepted that economic education is essential for preparing students for the rapidly changing world economy (Hahn and Jang, 2010). Introductory economics courses are an important vehicle for students to learn economic theory; they have the potential to contribute to the knowledge that students can mobilize to foster sustainability (Green, 2013). As well as that economics course is one the main mandatory courses of economics departments, it is instructed at so many departments at the bachelor level. Object of this study is to give responses to these questions: Is there a learning difficulty regarding to macroeconomics courses? What are the possible courses that may lead to difficulty in learning? Some socio-demographic and academic specifications of the students will be detected as relevant to general frame and it will be researched whether is there a significant relation between these specifications and learning difficulty? Remainder of the study is continuing as follows. At the 2nd part, literature research concerning to economics training is carried out. At the 3rd part of the study, research methods and data are introduced. At the 4th part, results of estimated model and comments are given. At the 5th part, discussion of the resultsare implemented.

2. Literature Review

Recently, many institutions started to encourage public with vast array of educatory programs with aim to enhance their economic knowledge and skills. Rising interest in economically educated public is not necessarily valued only because of it is own sake, but often it is believed that it may result in better market outcomes (Chytilova, 2013). There are many academic studies on economics teaching and learning. It is determined to be effective for understanding and learning when teach in the form of case studies of economics education in the classroom(Carlson and Schodt, 1995). The standard lecture is the most commonly used form in most other disciplines also, meaning that a student's day in the classroom is normally spent listening, taking notes, and preparing to repeat the material back to the instructor at some later date. Experiential learning, at least in small doses and with the appropriate subject matter, can be a valuable addition to the tool kit of the economics instructor. For students, the approach breaks up the routine and forces them to think and participate in a different way than with a lecture (Spencer and Van Eynde, 1986; Dalton, 2010). Nadler (1989) discuss the world view one commits oneself to when teaching macroeconomics from a loanable-funds perspective. The importance of the Loanable-Funds Approach strategy is that it provides students with a clearer paradigm of what motivates the demand side of the macro economy. Whiting (2006) present an active-learning classroom exercise developed for an introductory macroeconomics course. Rouch (2014) found that students respond positively to flipped learning, and that it is an instructional design that is beneficial across student groups in economics education. Reingewertz (2013) suggests that flowcharts could supplement graphs and algebra in the teaching of economics, especially in undergraduate courses. Olitsky and Cosgrove (2014) examine the effect of blended coursework on student learning outcomes in introductory economics courses. The results indicate no significant effects of blending on student learning.

Jones (2005) investigate the understanding of a critical thinking task (Critical and Analytical Learning in Macroeconomics, or the CALM project) in an Australian university setting of a group of Chinese-speaking international students. Although cultural and linguistic differences are important, the way in which a subject and assessment task is presented to students has a profound impact on learning. The development of critical thinking and communications skills, the application of economic concepts in an interactive experiential environment and the responsibility imposed upon students to reach an agreement that is mutually advantageous to all parties add a dimension to learning that goes beyond traditional classroom instruction (Truscott, Rustogi and Young, 2000).

There have been specific studies on economics education. Andrietti (2013) assess the impact of lecture attendance on academic performance and find a positive and significant effect of attendance in an introductory macroeconomics course taught at a public university in Italy.

Gunes (2012) examined performance in an economics course in an industrial design department in relationship to student expectation and acquisition on the subject matter. The result of the study shows high satisfaction on course content if they are connected or attached real life examples or currently practiced design projects. Cooper and Ramey (2014) discuss the results of a recent survey of graduates of a pluralist undergraduate economics program from the classes of 2000–2010 at a liberal arts college in the United States. Belfield and Levin (2004) estimates the effect of a state-imposed curriculum mandate on the academic achievement of US public school students about economics course examined the level of economics knowledge of Albanian 11th grade and 12th grade students who had completed their required economics course (Bushati and Phipps, 2013). Hwang (2013) found that the attendance, class size, GPA, and SAT scores have significant effects on student performance in Principles of Economics classes. Grades of students who work more than 20 h/week are significantly and negatively affected. Lan (2012) reveal the different learning motivations in the studying of economics for different studies. The investigation results show that students with higher score always have stronger intrinsic motivation. Okpala and Ellis (2000) found that the study habits/strategies and the behavioral confidence of students positively influenced their achievement scores in macroeconomics.

3. Research Method and Data

The data used in this study is formed from cross-section data that are obtained with survey methods. Population of the study is the students who were registered in Ataturk University Faculty of Economics and Administrative Sciences, Economics, Business Administrative and Econometrics day and night training departments and were receiving "Macroeconomics or Macroeconomics 1'' course in spring term 4th academic semester. Economics and econometrics department students received single term macroeconomics course in 2012-2013 fall term and macroeconomics 1 and business administration students received the course at spring term. The macroeconomics and macroeconomics 1 course contents are same. These courses were given to the department students within the scope of study by Kaya who was among the study authors. The number table relevant to those students is given at Table 1. 400 surveys were distributed as representative of the population that was formed from 772 people and some of these surveys were not returned and some surveys were not used at the analyses due to missing information. The data gained from 352 surveys were used at the conclusion.

Ordered logistic regression model was used with the aim of estimating the factors that affect difficulty statuses of students' macroeconomics course. In the study, dependent is the difficulty status of macroeconomics course that is formed from 5 classes.Independent variables are the variables of gender (0: male, 1: female), age (continuous), graduation high school (general high school, natolian high school, occupational high school and other), high school diploma score (continuous), education type (0: day 1: night training), department (economics, business administration and econometrics), department entry year (2009, 2010 and 2011), entry number of the university entrance exam (continuous), order of prefer (continuous), department request (0: no, 1: yes), department love (0: no, 1: yes), benefit of the department (0: no, 1: yes), weighted general score average(WGSA) (2 and lower , 2.1-2.5, 2.6-3.1-4), number of FF (none, one or two, three and upper), half year loss (0: yes, 1: no), career plan (1: yes, 0: no) and importance information (1: yes, 0: no). With the aim of looking effects of the categories belonging to all variables to be taken to ordered logistic regression model, ordinal and nominal variables were defined as dummy variables.

4. Application Results

4.1. Descriptive Statistics

Detailed definitions and descriptive statistics of nominal and ordinal variables taking place in the analysis are given at Table 2. When Table 2 is examined, 55% of the students who were participated the research were female and 79% of them were general high school graduated, 17% of them were anatolian high school graduated, 45% of them were evening education student and 41% of them were economics and 44% of them were business administration student, 75% of them were 2011 year entrance and 21% of them were 2010 year entrance. It is seen at table 2 that 73% of the students preferred their education department voluntarily, 87% of them loved their departments, 92% of them believed that their departments avails, WGSA of 22% was 2 and lower, %42 of them was 2.1-2.5, 21% of them was 2.6-3 and 24% of them had no any FF score, 53% of them had 1 or 2 FF score and 81% of them had no half year loss, 77% had a carrier plan and 65% of them knew weight and importance of the macroeconomics course subjects at occupational/employment tests.

4.2. Model Specification

It was tested whether there were multiple linear correlations between independent variables that will be taken to ordered logistic regression model. It is thought that the ones whose variance inflation factor (VIF) values was 5 and upper were moderate, the ones whose VIF was 10 and upper were severe and the variables of which 1/VIF value was so closed to zero lead to multicollinearity (Bagheri, Habshah and Imon, 2012). The VIF values belonging to the independent variables available at the model are given Table 3. As seen from Table 3, any of the independent variables taken to the model had no 10 or more VIF. According to that, any variables that lead to a severe multicollinearity problem was not available among the variables at the model.

Ordered regression model established with the aim of detecting the factors affecting difficulty status of macroeconomics course provides parallel linearity assumption (Chi-Square test = 71.326; df = 69, P = 0.40).

4.3. Estimated Model

After detecting independent variable and dependent variables to be taken to the model, reference category that is very difficult in understanding and learning is deemed and ordered logistic regression model belonging to macroeconomics course is written as below:

$$
\begin{aligned}
Y_i^* = {} & \beta_0 D_{gender,i} + \beta_1 X_{age,i} + \beta_2 D_{generalhighschool,i} + \beta_3 D_{anatolianhighschool,i} + \beta_4 X_{diplomascore,i} \\
& + \beta_5 D_{education\ type,i} + \beta_6 D_{economics,i} + \beta_7 D_{econometrics,i} + \beta_8 D_{2011,i} + \beta_9 D_{2009,i} \\
& + \beta_{10} X_{examnumber,i} + \beta_{11} X_{orderofprefer,i} + \beta_{12} D_{desire,i} + \beta_{13} D_{love,i} + \beta_{14} D_{benefit,i} \\
& + \beta_{15} D_{2.1-2.5,i} + \beta_{16} D_{2.6-3.0,i} + \beta_{17} D_{3.1-4.0,i} + \beta_{18} D_{noFF,i} + \beta_{19} D_{FF\ 1\ or\ 2,i} + \beta_{20} D_{half\ year\ loss,i} \\
& + \beta_{21} D_{plan,i} + \beta_{22} D_{importance,i} + \varepsilon_i
\end{aligned}
$$

$$i = 1,2,3,\dots,352$$

As the dependent variables at the study has five category (1: Very easy to understand and learn, 2: Easy to understand and learn, 3: Neither easy nor difficult to understand and learn (normal), 4: Difficult to understand and learn, 5: Very difficult to understand and learn), four threshold value or breakpoint will be calculated.

Estimated category values of dependent variable according to Y_i^* values are calculated as stated below.

$Y_i^* \le k_1 ise \widehat{Y}_i = 1$ (k_1, first threshold value or breakpoint)
$k_1 \le Y_i^* \le k_2 ise \widehat{Y}_i = 2$ (k_2, second threshold value or breakpoint)
$k_2 \le Y_i^* \le k_3 ise \widehat{Y}_i = 3$ (k_3, third threshold value or breakpoint)
$k_3 \le Y_i^* \le k_4 ise \widehat{Y}_i = 4$ (k_4, forth threshold value or breakpoint)

$$Y_i^* \ge k_4 ise \widehat{Y}_i = 5$$

The model results that are estimated with ordered logistic regression method at which difficulty status of macroeconomics course was generally taken into hand as dependent variable are given at Table 4. According to ordered logistic regression model, the variables of general high school (OR= 4.14; 90% CI= 1.09–15.77), anatolian high school graduated (OR = 4.67; 90% CI = 1.15–19.03), entry year to the department was 2009 (OR=4.55; 90% CI = 1.06–19.68) and entry year to the department was 2011 (OR = 2.56; 90% CI = 1.27–5.16) increases the odds ratio of that difficulty level of macroeconomics course is very difficult for the students according to reference categories. Also increasing changes on age (OR = 1.39; 90% CI = 1.13–1.71) and high school diploma score among the continuous variables of the analysis increases the odds ratio of that difficulty level of macroeconomics course is very difficult for the students according to reference categories. In the similar manner, the variables of economics department (OR = 0.23; 90% CI = 0.13–0.41), econometrics department (OR = 0.40; 90% CI = 0.18–0.88), department love (OR = 0.30; 90% CI = 0.12–0.70) and having no any lesson with FF score (OR = 0.38; 90% CI = 0.16–0.89) decreases the odds ration of that difficulty level of macroeconomics course is very difficult for the students according to reference categories.

Marginal effects of independent variables on difficulty status of macroeconomics course are given at Table 5. While average of other variables are fixed, it is expected that one unit change on age and high school diploma variables increases the possibility of that difficulty level of macroeconomics course is very difficult for the students respectively 1.2% and 0.1%. In the same manner, being general high school graduated increases possibility of that difficulty level of macroeconomics course is very difficult for the students at the rate of 3.9%, being anatolian high school graduated increases at the rate of 9.5%, entering to the department on 2009 increases at the rate of 11.2% and entering to the department on 2011 increases at the rate of 2.8%.

On the other side, being economics department student decreases the possibility of that difficulty level of macroeconomics course is very difficult for the students at the rate of 5.2%, being econometrics student at the rate of 2.7, department love at the rate of 7.1 and having no any FF score at the rate of 2.9%.

5. Discussion

In this study, main socio demographic and academic variables that affect students' understanding and learning the course in macroeconomics training were determined with ordered logistic regression model. In this study, it is emphasized on the possible learning difficulties that students come across in the field of macroeconomics as independent from current content discussion. Although an experience has been accumulated by experiencing the "*economy*" with its all reality along the humankind history and it has 250 years scientific history, how much humankind is successful in understanding principles of the economy and/or learning "*economics*"? This question is significant because affirmative or negative qualification of the response to be given for this question will be one of main determinants of development and wealth at individual, company and/or community level. When we look into economy both at country and world economy reality – effects of the global crisis has been still continued, it is not easy to give an affirmative response to that question. Within a wide perspective and within the scope of bachelor level, this study only seeks an answer for the question of "is learning/teaching economics difficult or how much it is difficult?" One of the remarkable aspects of the study is that half of the students has more than one course with FF score.

According to ordered logistic regression model, the possibility of learning and understanding macroeconomics course for the students who have no any FF score was lower than the ones who have 3 or more FF scores. Macroeconomics field includes so many simple but new concepts and analysis for the students. Almost all of the subjects are correlated with each other. It requires an integrative perspective. This makes continuance to the course compulsory. It is assessed as one of the reasons leading possible learning difficulty that continuance to the course is low (Hwang, 2013). Understanding and learning difficulty of macroeconomics course does not vary according to gender. At the studies that were carried out, it was detected that success status for the economics course was not different according to gender (Anderson, Benjamin and Fuss, 1994; Da Wan and Cheo, 2012). It was detected that high school diploma score of the student was effective at the understanding and learning difficulty status of macroeconomics course. Da Wan and Cheo (2012) detected that high school diploma scores of the students were a significant determinant on their academic success in the study that they concluded on economics department students in Malaysia and Singapore Universities. The age variable was detected as a variable affecting difficulty status of macroeconomics course. In the study that was concluded in the recent year, age variable was detected as significant at academic success of macroeconomics course of the students (Da Wan and Cheo, 2012). In another study, it was detected that there was no a linear correlation between ages of university students and their academic successes (Eze, Ezenwafor and Obi, 2015).

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Table 1: Population of the study

Department/Course	Formal Education	Evening Education	Evening Education
Economics/ Macroeconomics 1	146	148	294
Business Administration/ Macroeconomics	178	200	378
Econometric/Macroeconomics 1	50	50	100
General Total	374	398	772

Table 2: Dependent and independent variables included model

Variables	Definition	N*	Mean	Std. Dev.
Difficulty status of the macroeconomics course	Dependent Variable (1: Very easy to understand and learn, 2: Easy to understand and learn, 3: Neither easy nor difficult to understand and learn (normal), 4: Difficult to understand and learn, 5: Very difficult to understand and learn)	303	3.07	0.827
(1) Gender	Gender of the students receiving the course			
	1: Female, 0: Male	352	0.55	0.498
(2) Age	Ages of the students receiving the course	351	21.48	1.900
(3) Graduated high school	The high school that the students receiving the course			
	1: General high school, 0: Other	344	0.79	0.407
	1: Anatolian high school, 0: Other	344	0.17	0.380
	1: Occupational high school and Other, 0: Other	344	0.03	0.184
(4) High school diploma score	High school diploma scores of the students receiving the course	304	73.21	8.102
(5) Education type	Education type of the department at which students were educated			
	1: Night, 0: Day	348	0.45	0.499
(6) Department	The department of the students receiving the course			
	1: Economics, 0: Other	347	0.41	0.493
	1: Business Administration, 0: Other	347	0.44	0.496
	1: Econometrics, 0: Other	347	0.15	0.357
(7) Entry year to the department	Entry year of the students receiving the course to the department			
	1: 2011, 0: Other	343	0.75	0.434
	1: 2010, 0: Other	343	0.21	0.410
	1: 2009, 0: Other	343	0.04	0.191
(8) Number of entry to the university entrance exam	Number of entry to the university entrance exam until the students passed the department that they were educated	339	1.85	0.735
(9) Order of prefer	At which order the students passed the department that they were educated	339	6.55	6.561
(10) Department desire	Prefer status of the students in term of their departments			
	1: Yes, 0: No	348	0.73	0.445
(11) Department love	Whether the students loved the department that they were educated			
	1: Yes, 0: No	345	0.87	0.340
(12) Department benefit	Status of the students in term of whether students believed that their departments make any contribution to them and their future.			
	1: Yes, 0: No	338	0.92	0.272
(13) WGSA	Weighted general score average of the students receiving the course at the end of the course			
	1: 2 and lower, 0: Other	342	0.27	0.444
	2: 2.1-2.5, 0: Other	342	0.42	0.494
	3: 2.6-3, 0: Other	342	0.21	0.410
	4: 3.1-4, 0: Other	342	0.10	0.300
(14) FF number	Number of the courses with FF from previous term belonging to the students receiving the course			
	1: none, 0: Other	346	0.24	0.429
	2: 1 or 2, 0: Other	346	0.53	0.500
	3: 3 and upper, 0: Other	346	0.23	0.418
(15) Half year loss	Half-year loss of the students due to WGPS barrages			
	1: No, 0: Yes	344	0.19	0.397
(16) Carrier plan	Whether the students have carrier plans or not			
	1: Yes, 0: No	347	0.77	0.424
(17) Importance information	Whether the students know weight and importance of macroeconomics sub occupational/employment tests or not			
	1: Yes, 0: No	344	0.65	0.477

* Refers to number of the students that responded the questions at the survey. As the students who participated in the survey did not respond some questions, total number varies according to the variables.

Table 3: Results of multicollinearity

Variables	VIF	1/VIF
Gender	1.210	0.83
Age	1.850	0.54
Graduated high school (General high school)	7.060	0.14
Graduated high school (Anatolian high school)	6.950	0.14
High school diploma score	1.260	0.79
Education type (Night)	1.160	0.86
Department (Economics)	1.610	0.62
Department (Econometrics)	1.390	0.72
Entry year to the department (2011)	1.800	0.56
Entry year to the department (2009)	1.280	0.78
Number of entry to the university entrance exam	1.910	0.52
Order of prefer	1.230	0.81
Department desire	1.450	0.69
Department love	1.610	0.62
Department benefit	1.320	0.76
WGSA (2.1-2.5)	1.900	0.53
WGSA (2.6-3.0)	2.070	0.48
WGSA (3.1-4.0)	1.770	0.56
FF number (No)	2.690	0.37
FF number (1 or 2)	2.040	0.49
Half year loss	1.720	0.58
Carrier plan	1.220	0.82
Importance information	1.120	0.89

Table 4: Factors affected difficulty status of the macroeconomics course

Variables	OR	Std. Er.	Z	P	[%90 CI]	
Gender (Reference: male)						
Female	1.354	0.394	1.04	0.297	0.839298	2.186579
Age	1.389	0.176	2.59	0.010*	1.126887	1.711485
Graduated high school(Reference: Occupational high school and other)						
General high school	4.143	3.367	1.75	0.080**	1.088087	15.77137
Anatolian high school	4.668	3.987	1.80	0.071***	1.145221	19.02543
High school diploma score	1.031	0.019	1.65	0.099***	1.000107	1.062064
Education type(Reference: Day)						
Night	1.194	0.347	0.61	0.541	0.7405851	1.925455
Department (Reference: Business Administration)						
Economics	0.227	0.081	-4.15	0.000*	0.1259444	0.4085711
Econometrics	0.395	0.161	-2.28	0.000*	0.1774922	0.87862
Entry year to the department(Reference:2010)						
2011	2.556	1.091	2.20	0.028**	1.26696	5.156232
2009	4.547	4.050	1.70	0.089***	1.050745	19.6766
Number of entry to the university entrance exam	0.715	0.168	-1.43	0.152	0.4858699	1.05123
Order of prefer	1.006	0.021	0.30	0.765	0.9721801	1.041559
Department desire(Reference: No)						
Yes	1.068	0.377	0.19	0.853	0.5976242	1.907472
Department love(Reference: No)						
Yes	0.296	0.155	-2.32	0.020**	0.1249756	0.702076
Department benefit(Reference: No)						
Yes	1.241	0.700	0.38	0.703	0.4902782	3.138768
WGSA (Reference:2 and lower)						
2.1-2.5	0.910	0.338	-0.25	0.800	0.4938509	1.677075
2.6-3.0	0.949	0.445	-0.11	0.912	0.4039869	2.574003
3.1-4.0	1.020	0.574	0.03	0.972	0.4039869	2.574003
FF number (Reference: 3 and upper)						
none	0.383	0.197	-1.87	0.062***	0.1647096	0.8924072
1 or 2	0.696	0.261	-0.97	0.334	0.3752736	1.289628
Half year loss (Reference: Yes)						
No	1.129	0.574	0.24	0.812	0.4888543	2.60563
Carrier plan (Reference: No)						
Yes	1.475	0.514	1.11	0.265	0.8313328	2.616
Importance information (Reference: No)						
Yes	0.690	0.201	-1.28	0.202	0.4276613	1.113433
Dependent variable: Difficulty status of the macroeconomics course						
First threshold value	4.597	3.223			-0.704879	8.98068
Second threshold value	7.387	3.220			2.090219	12.68415
Third threshold value	10.111	3.261			4.747001	15.47477
Forth threshold value	12.213	3.287			6.805895	17.61967

*p<.01; **p<.05; ***p<.10

Table 5: Marginal effects for macroeconomics course

Variables	dy/dx
Age	0.012
Graduated high school (Reference: Occupational high school and other)	
General high school	0.039
Anatolian high school	0.095
High school diploma score	0.001
Department (Reference: Business Administration)	
Economics	-0.052
Econometrics	-0.027
Entry year to the department (Reference:2010)	
2011	0.028
2009	0.112
Department love (Reference: No)	
Yes	-0.071
FF number (Reference: 3 and upper)	
none	-0.029