The Choice is Yours:
You can Win with This or You Can Win with That

Chandini Sankaran *(Boston College)*
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The Choice is Yours

Extra Credit (EC) Points

EC Student Expenditure Basket (SEB)

Sankaran, et. al (2016)

Non-competitive

Points upon completion

One-time opportunity

EC Music

Suggest songs for class

Competitive

Points upon winning

Throughout the semester

Related Work

- The use of music in class (Hall and Lawson (2008); Hall et. al (2008); Harter (2003), Huey (2011); Medcalfe (2010); McClough and Heinfeldt (2012), Raehsler (2009); Tinari and Khandke 2000)
  - increases student enjoyment of economics
  - makes the classroom atmosphere more engaging
  - helps students apply their knowledge
  - results in higher classroom participation
  - increases student evaluations of teaching
  - increases students' understanding of economic concepts
  - generates discussions about economics outside the classroom.

- Allowing students to create their own lyrics can result in classroom participation and grade improvements (Raehsler (2013)).
- Recent examples:
  - student music video competitions in which students modify the lyrics of popular songs to reflect economic concepts (Al-Bahrani, Abdullah et. al (2017); Holder et. al (2015)).

A New Method

- On the course website's online Discussion Board, students
  - make their own song suggestions
  - provide a brief explanation as to how these songs relate to economics.

- Instructor picks the top two winners by reading all suggestions.
  - The winners are announced at the beginning of each class on the Announcements slide.
  - Music chosen by the first-place winner is played.

- Benefits:
  - Students feel that their opinions are valued.
  - provides students with a sense of visibility and importance.
  - Could positively impact student learning outcomes
    - brainstorm ideas while outside of the classroom setting.
    - enjoy competing with each other to win
    - eagerly look forward to each class to learn about the outcome.
  - Keeps songs played in class current and relevant.

Examples of Student Submissions

Song	Student Explanation
Opportunity Cost by G-Eazy	G- Eazy talks about ***the opportunity cost of being famou***s. He became famous but ***while becoming famous he "gave up"/ "lost" important relationships/ friendships in his life***. This is only one example, this song contains over 10 opportunity cost examples all relating to the opportunity cost of being famous. ***His opportunity costs include not being able to grow personal relationships, missing out on family events, and the list goes on.*** He sees a world of drugs, somberness, and missing the average life of having a family and living in a house. However, he mentions in the beginning of the song, "If I stayed I just went crazy" showing that it was a better choice for him to earn money by having the fame and become a rapper than the other way around. He created ***a cost-benefit analysis of his life and became a rapper since his Marginal Benefits of becoming a rapper was greater than his Marginal Cost.***
“Power” by Moon Boots	In this song, the artist is giving the "power" to someone he doesn't know that well yet but is hoping to know better soon. By giving this person the power, he is ***putting his trust in this mysterious person's hands***. This relates perfectly to what we are studying in class because if ***all the power was in the magical market forces of supply and demand, then a perfectly competitive market would exist.*** But ***if the power was in the seller's hand, then a monopoly would be taking place.*** The artist has decided to put the power in the magical market forces of supply and demand than in the seller's, just as in a perfectly competitive market.

Examples of Student Submissions

Song	Student Explanation
She Works Hard for Her Money by Donna Summers	"She Works Hard For The Money" by Donna Summer is about a woman who refuses to sell herself out for a dollar bill no matter how tough things may get. She works hard for her money even though she only receives a small amount of cash in return. In class we discussed ***income and production*** which relates to the song; for her to earn her money, she has to work long shifts. Why does she work long shifts and only earn a small amount of cash in return? According to economics, ***she has low human capital and therefore low productivity rates and low wages***.
Big Yellow Taxi by Joni Mitchell / Counting Crows	The lyric "they paved paradise and put up a parkin' lot" relates to an example discussed in class of ***a trade-off that our society faces: clean environment vs. high level income.*** By ***cutting down trees and putting in a parking lot***, businesses can open there, creating higher income for the society in return for destroying the environment. Another example of opportunity cost comes up in the lyrics, "Hey farmer put away the DDT I don't care about spots on my apples leave me the birds and bees please!" By ***spraying chemicals on the produce to increase the quantity***, animals like bees and birds will no longer be able to gain nutrients from the produce without ingesting the chemicals. Yet another example of ***clean environment vs. higher income, and a negative externality where the social cost is higher than the private cost.***
"ATM" by Jay Cole	This song is about the earning and saving of money, associates ***health to money. Health is a type of investment in human capital. Healthier workers are more productive*** and therefore earn more. We also learned that while ***how much money you have might not truly reflect your happiness,*** it can make things easier, as you can buy the things you need to ***enjoy a higher materialistic standard*** of living. However, ***you will be more stressed because you are working more.*** These concepts illustrate ***the strengths and weaknesses of the GDP.***

Research Questions

- Few studies have investigated the characteristics of students who complete optional extra credit assignments.

- Which students complete extra credit assignments?
  - Gender
  - Race
  - Aptitude
  - Effort

- Are the characteristics of students who complete two different types of extra credit assignment similar or different?

- Does a grade effect exist for students who complete the extra credit assignments?

Data

- Cross-sectional:
  - Spring 2017
  - 282 observations

- Course:
  - Principles of Macroeconomics lecture

- Course Gradebook:
  - Total points, extra credit points, classroom participation points, final letter grades

- Administrative Data on demographic information:
  - Race, gender, SAT/ACT scores, previous GPA, completion of Principles of Microeconomics

Summary Statistics

Variable	Mean	Std. Deviation	Min	Max	Observations
EC Points	1.99	3.05	0	17	282
EC Music	0.63	1.79	0	12	282
EC SEB	1.37	2.22	0	5	282
Gender	0.38	0.49	0	1	279
Race	0.92	0.27	0	1	256
ECON 221	0.61	0.49	0	1	282
Participation	23.51	4.98	0	28	282

Summary Statistics: Extra Credit

Extra Credit	Mean	Std. Error	[95% Confidence Interval]		Observations
EC Points	3.0359	0.0891	2.8592	3.2125	104
EC Music	3.2844	0.1219	3.0383	3.5304	43
EC SEB	2.9712	0.1023	2.7675	3.1749	79

Empirical Model (1): Extra Credit

$$EC_j = \beta_0 + \beta_1 Participation_j + \beta_2 Aptitude_j + \beta_3 Y_j + \beta_4 X_j + \epsilon_j$$

- EC_j : extra credit points of student j enrolled in a Principles of Macroeconomics course in spring 2017
  - $EC\ total$: total extra credit points of the individual student
  - $EC\ SEB$: EC from completion of the Student Expenditure Basket extra credit assignment
  - $EC\ Music$: EC from winning the music suggestion competition.

- Y_j : student j's year of study (freshman=1, sophomore=2, junior=3, senior=4).

- $Participation_j$: student j's participation points
  - attendance points and answers to the daily in-class clicker questions.

- $Aptitude_j$: student j's aptitude
  - cumulative college GPA before spring 2017
  - college entrance score (ACT or SAT).

- X_j: a set of individual specific control variables
  - $Gender$: 1 = female; 0 = male
  - $Race$: 1 = Caucasian; 0 = non-Caucasian.

Empirical Model (2): Grades

$$Grade_j = \beta_0 + +\beta_1 EC_j + \beta_2 Aptitude_j + \beta_3 ECON_j + \beta_4 X_j + \epsilon_j$$

- $Grade_j$: final grade of student j in Principles of Macroeconomics at the end of the Spring 2017 semester
  - total points (out of 400 possible points)
  - GPA points (A=4.0; B+=3.5, B=3.0, C+=2.5, C=2.0, D+=1.5, D=1.0 and F=0.0).

- $ECON_j$: dummy variable which indicates the student's completion of Principles of Microeconomics at the current institution before spring 2017.

- *Aptitude:* student's previous collegiate GPA before the spring 2017 semester.

- All other variables are as defined previously.

Empirical Model 1: Extra Credit

	Model 1 EC Total	Model 2 EC Music	Model 3 EC SEB	Model 4 EC Total	Model 5 EC Total	Model 6 EC Music	Model 7 EC SEB
Gender	1.4259*** (0.3687)	0.4793* (0.2212)	0.9466*** (0.2685)	1.1815** (0.3755)	1.0117** (0.3686)	0.2484 (0.2270)	0.7632** (0.2761)
Caucasian				-1.4946* (0.6787)	-1.3247* (0.6629)	-0.6456 (0.4082)	-0.6791 (0.4964)
Classroom participation					0.1467*** (0.0387)	0.0507* (0.0238)	0.0960** (0.0289)
Constant	1.4598*** (0.2262)	0.4540*** (0.1357)	1.0058*** (0.1647)	2.8911*** (0.6840)	-0.6967 (1.1565)	-0.0745 (0.7122)	-0.6222 (0.8662)
Observations	279	279	279	256	256	256	256
R-squared	0.0512	0.0167	0.04295	0.06258	0.11329	0.0386	0.0913

Standard errors in parentheses

***p<0.01, **p<0.05, *p<0.1

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Empirical Model 1a: Extra Credit

	Model 1	Model 2	Model 3	Model 4
SAT	0.0002			
	(0.0020)			
ACT		0.0130		
		(0.0713)		
Previous GPA			1.0708**	
			(0.4027)	
Year of Study				-0.2387
				(0.2610)
Gender	1.0115*	1.2357**	0.8472*	1.0359**
	(0.4316)	(0.4672)	(0.3695)	(0.3697)
Caucasian	-1.0562	-0.4435	-1.3097*	-1.3368*
	(0.7514)	(0.8494)	(0.6551)	(0.6632)
Classroom participation	0.1578***	0.1007*	0.1017*	0.1432***
	(0.0446)	(0.0513)	(0.0418)	(0.0389)
Constant	-1.4074	-0.9844	-3.1496*	-0.1936
	(2.6087)	(2.3862)	(1.4687)	(1.2811)
Observations	198	162	256	256
R-squared	0.1133	0.0781	0.1376	0.1162

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Empirical Model 2: Grades

	Model 1 Points	Model 2 Points	Model 3 Points	Model 4 Points	Model 5 Grade	Model 6 Grade	Model 7 Grade	Model 8 Grade
EC points	4.4059***	2.0992**		0.4078	0.0799***	0.0332*		0.0131
	(1.0764)	(1.0557)		(0.8336)	(0.0187)	(0.0180)		(0.0164)
Previous GPA		54.1331***	27.5181***	27.1082***		1.0824***	0.7741***	0.7608***
		(6.4351)	(5.3720)	(5.4467)		(0.1098)	(0.1057)	(0.1071)
Micro Principles		11.4924*	-2.2870	-2.1643		0.1462	-0.0202	-0.0163
		(6.1257)	(4.8803)	(4.8942)		(0.1043)	(0.0960)	(0.0962)
Caucasian		7.4934	10.1839	10.7247		0.0763	0.0975	0.1148
		(11.1736)	(8.6307)	(8.7143)		(0.1902)	(0.1698)	(0.1713)
Gender		-0.1650	-0.7111	-1.0581		0.0120	0.0125	0.0014
		(6.3163)	(4.8658)	(4.9244)		(0.1075)	(0.0957)	(0.0968)
Classroom participation			7.3241***	7.2796***			0.0880***	0.0866***
			(0.5631)	(0.5713)			(0.0111)	(0.0112)
Constant	305.9406***	117.8703***	42.7572*	43.9589*	2.5713***	-1.0775**	-1.9955***	-1.9570***
	(3.9180)	(24.2882)	(19.6201)	(19.8029)	(0.0682)	(0.4134)	(0.3859)	(0.3892)
Observations	282	256	256	256	282	256	256	256
R-squared	0.0565	0.2730	0.5595	0.5600	0.0609	0.3315	0.4591	0.4604
Prob > F	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Robust standard errors in parentheses

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Previous GPA		54.1331***	27.5181***	27.1082***		1.0824***	0.7741***	0.7608***
		(6.4351)	(5.3720)	(5.4467)		(0.1098)	(0.1057)	(0.1071)
Micro Principles		11.4924*	-2.2870	-2.1643		0.1462	-0.0202	-0.0163
		(6.1257)	(4.8803)	(4.8942)		(0.1043)	(0.0960)	(0.0962)
Caucasian		7.4934	10.1839	10.7247		0.0763	0.0975	0.1148
		(11.1736)	(8.6307)	(8.7143)		(0.1902)	(0.1698)	(0.1713)
Gender		-0.1650	-0.7111	-1.0581		0.0120	0.0125	0.0014
		(6.3163)	(4.8658)	(4.9244)		(0.1075)	(0.0957)	(0.0968)
Classroom participation			7.3241***	7.2796***			0.0880***	0.0866***
			(0.5631)	(0.5713)			(0.0111)	(0.0112)
Constant	305.9406***	117.8703***	42.7572*	43.9589*	2.5713***	-1.0775**	-1.9955***	-1.9570***
	(3.9180)	(24.2882)	(19.6201)	(19.8029)	(0.0682)	(0.4134)	(0.3859)	(0.3892)
Observations	282	256	256	256	282	256	256	256
R-squared	0.0565	0.2730	0.5595	0.5600	0.0609	0.3315	0.4591	0.4604
Prob > F	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Robust standard errors in parentheses

***p<0.01, **p<0.05, *p<0.1

Empirical Model 2: Grades

	Model 1 Points	Model 2 Points	Model 3 Points	Model 4 Points	Model 5 Grade	Model 6 Grade	Model 7 Grade	Model 8 Grade
EC points	4.4059*** (1.0764)	2.0992** (1.0557)		0.4078 (0.8336)	0.0799*** (0.0187)	0.0332* (0.0180)		0.0131 (0.0164)
Previous GPA		54.1331*** (6.4351)	27.5181*** (5.3720)	27.1082*** (5.4467)		1.0824*** (0.1098)	0.7741*** (0.1057)	0.7608*** (0.1071)
Micro Principles		11.4924* (6.1257)	-2.2870 (4.8803)	-2.1643 (4.8942)		0.1462 (0.1043)	-0.0202 (0.0960)	-0.0163 (0.0962)
Caucasian		7.4934 (11.1736)	10.1839 (8.6307)	10.7247 (8.7143)		0.0763 (0.1902)	0.0975 (0.1698)	0.1148 (0.1713)
Gender		-0.1650 (6.3163)	-0.7111 (4.8658)	-1.0581 (4.9244)		0.0120 (0.1075)	0.0125 (0.0957)	0.0014 (0.0968)
Classroom participation			7.3241*** (0.5631)	7.2796*** (0.5713)			0.0880*** (0.0111)	0.0866*** (0.0112)
Constant	305.9406*** (3.9180)	117.8703*** (24.2882)	42.7572* (19.6201)	43.9589* (19.8029)	2.5713*** (0.0682)	-1.0775** (0.4134)	-1.9955*** (0.3859)	-1.9570*** (0.3892)
Observations	282	256	256	256	282	256	256	256
R-squared	0.0565	0.2730	0.5595	0.5600	0.0609	0.3315	0.4591	0.4604
Prob > F	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

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Caucasian		7.4934 (11.1736)	10.1839 (8.6307)	10.7247 (8.7143)		0.0763 (0.1902)	0.0975 (0.1698)	0.1148 (0.1713)
Gender		-0.1650 (6.3163)	-0.7111 (4.8658)	-1.0581 (4.9244)		0.0120 (0.1075)	0.0125 (0.0957)	0.0014 (0.0968)
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Robust standard errors in parentheses

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Research Questions

- Which students complete extra credit assignments?
  - Gender:
  - Race:
  - Aptitude:
  - Effort:

- Are the characteristics of students who complete two different types of extra credit assignment similar or different?

- Does a grade effect exist for students who complete the extra credit assignments?

Research Questions

- Which students complete extra credit assignments?
  - Gender: **Females**
  - Race:
  - Aptitude:
  - Effort:

- Are the characteristics of students who complete two different types of extra credit assignment similar or different?

- Does a grade effect exist for students who complete the extra credit assignments?

Research Questions

- Which students complete extra credit assignments?
  - Gender: **Females**
  - Race: **Non-Caucasians**
  - Aptitude:
  - Effort:

- Are the characteristics of students who complete two different types of extra credit assignment similar or different?

- Does a grade effect exist for students who complete the extra credit assignments?

Research Questions

- Which students complete extra credit assignments?
  - Gender: **Females**
  - Race: **Non-Caucasians**
  - Aptitude: **Higher previous college GPA but not SAT/ACT**
  - Effort:

- Are the characteristics of students who complete two different types of extra credit assignment similar or different?

- Does a grade effect exist for students who complete the extra credit assignments?

Research Questions

- Which students complete extra credit assignments?
  - Gender: **Females**
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  - Effort: **Students with higher classroom participation**

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- Are the characteristics of students who complete two different types of extra credit assignment similar or different?
  - **Similar**

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Research Questions

- Which students complete extra credit assignments?
  - Gender: **Females**
  - Race: **Non-Caucasians**
  - Aptitude: **Higher previous college GPA but not SAT/ACT**
  - Effort: **Students with higher classroom participation**

- Are the characteristics of students who complete two different types of extra credit assignment similar or different?
  - **Similar**

- Does a grade effect exist for students who complete the extra credit assignments?
  - **Yes**
  - **EC and classroom participation capture effort**

Research Implications

For students:

"Kids, do the extra credit!"

For Instructors:

"Extra credit helps those who put in effort throughout the semester"

In general:

"Females and non-Caucasians are the most likely to take advantage of extra credit opportunities"

Thank You!

Questions/comments?

chandini.sankaran@bc.edu

Correlation Matrix

	Grade	Total Points	Classroom Participation	EC Points	EC Music	EC SEB
Grade	1.0000					
Total Points	0.8938	1.0000				
Classroom Participation	0.6030	0.7215	1.0000			
EC Points	0.2468	0.2376	0.2625	1.0000		
EC Music	0.2335	0.2044	0.1509	0.6947	1.0000	
EC SEB	0.1507	0.1615	0.2389	0.8136	0.1470	1.0000