

# Determinants of Student Performance in International Trade Course

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**Abstract** Using the probit model, this paper seeks to identify factors that influence student learning in college international trade course at a Thailand university. The study used 79 students completing questionnaire. Male students outperform their female counterpart. High parental income family has positive effect. Average-GPA students do better in class. The probability of high performance among students who feel comfortable commuting to campus was higher than students who feel uncomfortable. Students who graduated from public-high school did better in class. Surprisingly the probability of high performance was significantly lower for students who feel campus clean. Measure of attitude towards school having a good facility did have a significant impact on the likelihood to do better in class. Students who felt this class was fun and who have good attitude towards instructor were much more likely to do better in class. Personal tutor and perfect attendance has a positive effect.

**Keywords:** *academic performance, college international trade course*

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## 1. Introduction

Despite the fact that Thailand have established the Office for National Education Standards and Quality Assessment in 2000, understanding the factors that affect students learning and performance

This paper examines factors that influence student performance of international trade students in undergraduate economics programs. A number of studies have been carried out to identify factors of academic achievement in a number of institutions worldwide (See [Table 1](#)). Most of the studies focus on the four categories namely family background, influence of peers, school inputs, and innate. The numerous factors affecting academic performance, vary from one institution environment to another, from one set to students to the next, also from one courses to another.

As professor of international economics at a university where teaching is a top priority, understanding the relevant variables that influence the achievement of international trade student may significantly affect to improvement of the teaching in the future. In addition, improvement in student performance reflects that professor will be capable of providing better potential human capital into the country. Having hypothesized that student performance is influenced by the previously listed factors; I evaluated my International Trade students at School of Economics and Public Policy (SEPP), Srinakharinwirot University (SWU) from 2013 through 2014. The course is examined by a 3-hour written examination in mid-term and final. The total numbers of sample are of 79 students completing questionnaire.

The motivation underlying this whole area of research has been to identify factors associated with successful academic performance. It will help the school administration to design and implement the policies to enhance students' performance. Also it will help instructor to design the class to improve the quality of education by changing the attitude of the students towards learning, encouraging students, and improving the teaching style.

I provide a concise review of the literature on student performance in family backgrounds, peer influence, school resources, and innate abilities. The model was formulated by probit and logit regressions, then compared using log likelihood and Pseudo  $R^2$ , and lastly interpreted the marginal effects of each determinant.

## 2. Literature Evidence

This paper provides a survey of the recent studies which undertaken in the last decade (2004-2014) and focuses on tertiary institutions. The paper presents factors that affect academic achievement namely family background, influence of peers, school inputs, and innate abilities, as described in (1) in separate sub-sections. The above table summarized the conclusion of the paper.

### (1) Family Background

In the literature, family background is one important factor found to consistently affect students' academic performance. The main hypothesis under this topic is that a positive family background is usually associated with high academic performance. Factors such as parental support [3] and parental income [4] are two variables showing the positive effect.

Table 1. Selected recent studies concerning determinant of students' performance

Study	Dep. Var.	Estimation technique	Sample	Results (Only Significant Var.)			
				Family	Peer	School	Innate (Student)
[3]	CGPA	OLS	12,420 college students	Parental support(+)			Student's interest(+), Study habit (+)
[23]	GPA	OLS	2,609 students of Singapore Management University	Admission Interview(+),			Prior Academic Achievement(+), Critical Thinking(+), Mathematical Aptitude(+)
[13]	Grade, Overall points in %, In class test score in % (Investment Course)	OLS	39 students				GradeMake (+), Gradschool (+), Study hour (+), Homework (+), Math (+), OGPA (+)
[2]	Final Grade (Financial Accounting)	OLS	1,200students		Society (-), Socio-economic (-)	School (-)	Personality (+),
[4]	Test Score	OLS	100 graduate students, Pakistan	Income (+)			Age (+), Study hour (+)
[12]	Final Grade	OLS	119 business student of Private Higher Education Institutions			Lecture competence (+), Teaching method(+), Quality of learning(+),	Mathematic aptitude(-)
[16]	Final Grade (Accounting Course)	OLS	286 students				Prior Academic Achievement(+)
[22]	CGPA	Correlation Coefficient	170 students of Universii Tenaga Nasional				Motivation (+), Learning styles (-)
[20]	Average mark	OLS	200 students		Male (+), Full Time (+)		Age (-), Access to internet (+)
[1]	CGPA	ANOVA	78 students of Federal College of Education				Age(+)
[19]	GPA	OLS	155 students			Proper Guidance (+), Learning Facilities (+),	Communication (+)
(11)[25]	GPA	Descriptive analyses, Correlation analyses, stepwise discriminate analyses	199 university students from Rawalpindi and Islamabad				Academic competence(+), Test anxiety(-)
[26](12)	Final Grade (Accounting Course)	OLS	167 students in Istanbul Vocational School of Fatih University, Turkey				High school GPA (+), Prior knowledge of Accounting (+), GPA (+), Attendance (+), Math grade (+)
[5]	GPA	OLS	566 students		Nationality (Kuwaiti = 1) (+),		Score in the high school (+), age (+)
[15]	Final Grade (Principle of Economics)	Ordered Logit Model	744 students at the U of North Dakota and West Chester University		Male (+),		Macro (+), # of hr. worked at a job (-), SAT scores (+), # of miss class (-), whether to recommend the course (+)
[17]	Diff b/w the pre-test & the post-test scores	the stepwise regression	254 students in macroeconomics & 148 students in microeconomics		Male (+), Matching instructor and student gender (+)		

Source: Author's compilation.

## (2) Influence by Peers

Peer effect refers to a change in a student's behavior or motivation, caused by the influence of a social group. Gender and socio-economic status of the student are the key variables employed to analyze the effect of peers.

Many studies indicate that male students did better in class [15,17,20].

One study [2] has found a negative peer effect based on socio-economic status.

## (3) School Inputs

School inputs are another vital factor that affects students' academic achievement. Several variables are investigated under this topic. Lecturer competence, teaching methods, and quality of learning materials are the primary factors that significantly influence students' achievement [12]. Proper guidance and learning facilities cause positive direction in student performance [19].

#### (4) Student Abilities

The hypothesis is that the chance of an individual to developing into remarkably competent in certain fields depends on his/her ability. The effect of positive student abilities is confirmed in many papers. Adeyemi & Adeyemi [3] show that student's interest and study habit were significant predictors of academic achievement in the colleges. Seow, Pan, & Tay [23] suggest that prior academic achievement, critical thinking, and mathematical aptitude are the main significant determinant of performance of college students. Adeleke, Binuomote, & Adeyinka [2] identifies student personality has a positive effect. Ganyaupfu [12] confirms mathematic aptitude remains the good predictor of academic performance. Kukreja & Aali [16] confirms prior academic achievement is the key determinant of achievement.

Note that no studies were identified in the literatures that looked at determinants of success in an International trade course. Most of the studies employed OLS approach. There are a few studies that have not used OLS; one study used multinomial probit model [24], one used multinomial logit approach [21], one employed ordered logit model [15], and one study employed ordered probit model [9] as well as one paper used the stepwise regression [17].

### 3. Model

Here I follow the framework of Hanushek [14] who was first<sup>1</sup> introducing an education production function. Equation (1) is an education production function<sup>2</sup> explaining academic achievement with family backgrounds, peer influence, school resources, and innate abilities.

$$A_{it} = f\left(B_i^{(t)}, P_i^{(t)}, S_i^{(t)}, I_i\right) \quad (1)$$

where

$A_{it}$  = achievement at time t for i student,

$B_i^{(t)}$  = vector of family background influences cumulative to time t for i student,

$P_i^{(t)}$  = vector of influence of peers cumulative to time t for i student,

$S_i^{(t)}$  = vector of school inputs cumulative to time t for i student,

$I_i$  = vector of innate abilities.

Note that the term "innate abilities" refers to the set of cognitive skills, motivation, and personality traits.

Also I add several other variables based on Asarta, Jennings, & Grimes's review [6] student outcome. They posit that the effect of economic education depend on

students' beliefs, attitudes, behavior, as well as academic achievement.

I propose a simple adaptation of this approach where the probability of achievement for student i, denoted  $prob_i$  (achievement) rises with a positive family background (FB), a positive peer influence, a positive student academic background (SB1), a positive student behavior (SB2), and a positive student attitude toward school (SAS) and instructor (SAI), as well as a positive environment (E).

With these refinements, the achievement model encompasses many of the student behavior, attitude, and environment to the framework of Hanushek [14]. The resulting model is:

$$Prob_i(A_{it}) = F\left(\begin{matrix} FB_i^{(t)}, P_i^{(t)}, SB1_i^{(t)}, SB2_i^{(t)} \\ SAS_i^{(t)}, SAI_i^{(t)}, E_i^{(t)} \end{matrix}\right) \quad (2)$$

$$\text{Achievement} = \begin{cases} 1: \text{Final Grade} \geq B \\ 0: \text{Final Grade} < B \end{cases}$$

I assume that the high performance of the course is at least student has final grade<sup>3</sup> equaling to "B" or "higher".

### 4. Results

Logit and probit regression analyses were conducted. I make a comparison between logit and probit. Since those two models have the same number of parameters, so this reduces to choosing the model with the higher log likelihood. The probit model has a log likelihood of -16.45193, which is 0.15017 higher than -16.6021 for logit. Also the probit model has Pseudo  $R^2$  of 0.6992 which is 0.0027 higher than 0.6965 for probit. Even through the difference is not great, this favors the probit.

The marginal effects (at mean values) from the probit and logit regressions are presented below in Table 3. Probit model indicates that male students outperform their female counterpart. This result is consistent with many studies namely [15,17,20]. The marginal -effect estimate indicates that probability of achievement would be 97.23 percentage points more for male student. The result is supported by the studies of MaCarty, Padgham, and Bennett [17] that matching gender for students and professor had significant positive effects.

High parental income family has a positive effect. Considering the marginal effect results presented in Table 3, the probability of high performance would be 52.72 percentage points more for high parental income students than low parental income students. Parental marital status affects student performance. The probability of high performance among students, who have parents stay together, is 21.54 percentage points more than for students who have parents do not stay together.

With regard to overall GPA, probit model does not indicate that students with a higher GPA are associated with higher performance. On the other hand my result shows that average-GPA students do better in class. Only the coefficient of "GPA 2.50 – 2.99" has positive and statistically significant.

<sup>1</sup>Since the landmark report of Coleman et al [8] – which found evidence that poor black children did perform better in integrated middle-class schools – researchers from a number of disciplines have sought empirical evidence of which inputs influence student performance.

<sup>2</sup>Note that there are certain studies showing there is the inconsistency of the use of Cobb-Douglas specifications for the estimation of educational production functions [7,10,11].

<sup>3</sup>Note that the letter grade treats a student earning the lowest end of the grade range as having the same exact performance as that of a student earning the highest end of the grade range [13].

Table 2. Probit Model and Logit Model Estimation

Variable	Probit	Logit
Male	6.4950 *** (1.6812)	11.2975 *** (3.2114)
High Parental Income	1.5683 ** (0.6394)	2.7927 ** (1.2701)
Parental Married / Living in a marital cohabitation	-1.004 (0.7268)	-1.8123 (1.3232)
GPA 2.50 – 2.99	0.8646 *** (3.91)	5.8966 *** (1.7307)
Convenience of Commuting to College	0.8078 * (0.4371)	1.4331 * (0.8410)
Public School Grad	1.831** (0.8739)	3.2553** (1.6487)
Attitude toward School Environment (Clean U)	-2.6679*** (0.7832)	-4.7617 *** (1.6933)
Attitude toward School Environment (Good Facility)	1.9360*** (0.6524)	3.4078 *** (1.2365)
Having Tutor	6.3516*** (1.7252)	11.2588 *** (3.3334)
Using Library	0.5014 (0.5943)	1.0167 (1.2455)
Attitude toward Class (Fun learning)	1.0962*** (0.3211)	1.8317 *** (0.5299)
Attitude toward Class (Bored)	-0.7883 (0.4817)	-1.3426 (0.8939)
Never Missed Class	1.9003** (0.7837)	3.4617 ** (1.5328)
Attitude toward Lecturer (Encourage st. to study)	1.7126*** (0.5329)	2.9958 *** (0.9884)
Constant	-13.529*** (4.0699)	-23.4238 *** (7.6736)
Pseudo R2	0.6992	0.6965
Log pseudolikelihood	-16.45193	-16.6021
# of Obs.	79	79

\*Statistically significant at the 10% level, \*\* at the 5 % level, \*\*\* at the 1 % level.

I find that student-high-school background influenced the probability of student performance. Students who graduated from public-high school do better in class. The marginal effect estimate shows that probability of student performance would be 64 percentage points more for public high school graduated. The probability of high performance among students who feel comfortable commuting to campus is 32.18 percentage points more than for students who feel uncomfortable.

Probit model indicates that student attitude has an impact on students' performance. Surprisingly the probability of high performance is significantly lower for students who feel campus clean. Measure of attitude towards school having a good facility has a significant impact on the likelihood to do better in class. Students who felt this class was fun are much more likely to do better in class. For students who have good attitude towards instructor, the likelihood of high performance is higher for students with lower degree of attitude towards instructor.

Personal tutor also in fluencies high performance. The probability of high performance is significantly higher for students who have personal tutors, with the probability of high performance of 66.5 percentage points more.

I also expect to find that class attendance would be associated with higher levels of achievement. Probit model shows that perfect attendance has a positive effect. The marginal effect estimate indicates that probability of achievement would be 65.27 percentage points more for students with perfect attendance.

Table 3. Factors Influencing Student Achievement

Variable	Marginal Effects (dy/dx)	
	Probit	Logit
Male	0.9723 *** (0.0376)	0.9653 *** (0.0366)
High Parental Income	0.5272 *** (0.1829)	0.5515*** (0.2079)
Parental Marital Status or Like Status	0.2154 * (0.2155)	-0.3933 * (0.2243)
GPA 2.50 – 2.99	0.9085 *** (0.0844)	0.8996 *** (0.0822)
Attend Public School	0.6400 *** (0.2291)	0.6717 *** (0.2260)
Convenience of Commuting to College	0.3218 * (0.1729)	0.3574 * (0.2071)
Attitude toward School Environment (Clean University)	-1.0626 *** (0.3095)	-1.1877 *** (0.4153)
Attitude toward School Environment (Good Facility)	0.7711 *** (0.2575)	0.8500 *** (0.3037)
Attitude toward Class (Fun learning)	0.4366 *** (0.1266)	0.4568 *** (0.1304)
Attitude toward Class (Bored)	-0.3139 * (0.1884)	-0.3348 (0.2168)
Attitude toward Lecturer (Encourage st. to study)	0.6821 *** (0.2143)	0.7472 *** (0.2486)
Having Tutor	0.6650 *** (0.1342)	0.6811 *** (0.1446)
Using Library	0.1977 (0.2284)	0.2483 (0.2890)
Attendance (Never Missed Class)	0.6527 ** (0.1909)	0.6922 *** (0.1912)
Pseudo R2	0.6992	0.6965
Log pseudolikelihood	-16.45193	-16.6021
# of Obs.	79	79
Y = Pr(B) (predict)	0.5224	0.5239

\*Statistically significant at the 10% level, \*\* at the 5 % level, \*\*\* at the 1 % level.

## 5. Conclusion

This paper examined the factors that affect students' performance on International Trade course at the School of Economics and Public Policy (SEPP), Srinakharinwirot University (SWU), Bangkok, Thailand. A sample of 79 students who complete questionnaires was used covering 2013 through 2014. Logit and probit regression analyses were conducted. Given the higher log likelihood and Pseudo  $R^2$ , this paper prefer probit. Probit model shows that male students outperform female students. The factors with positive effect on students' performance are high parental income family, graduated from public-high school, students' attitudes, and personal tutor. Average-GPA students do better in class Even though my class has not make attendance compulsory, student with perfect attendance outperform student missing class. This study will help students, professor, and school administration to pay close attention on these determinants.

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