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The Relation between University GPA and Family Background:
Evidence from a University in Vietnam

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Abstract:

Based on three data sets of information on students of a university in Vietnam, we estimate the factors affecting GPA by using the two-stage least squares (2SLS) method. The results of estimation highlight that parents' occupation as farmers and living location in rural areas have an adverse impact on the GPA of students at university (University GPA). Causally, the government does not control or monitor the hours of part-time work of students earning a living cost and tuition fee, which rise dynamically in city located the university. Furthermore, we also find a positive relation between national university entrance point and the university GPA.

Keywords: university GPA, family background, inclusive education

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1 Introduction

The economic reform that Vietnam embarked upon in the late 1980s in order to change from a centrally planned economy to the market economy has brought many remarkable economic achievements for Vietnam. High and continuous GDP growth rates and successful economic development over the period have resulted in overall improvement of people's welfare and significant poverty reduction. It is expected that by 2020 Vietnam will attain the status of a middle-income industrialized country while science and technology (S&T) are key driving forces of the country's industrialization and modernization program.

To achieve these goals, higher education should be considered as a significant issue since it helps to create high-quality human resources for the development of Vietnam. However, economic growth should be beneficial for most people, especially the poor; including accessibilities in higher education for the poor and habitants in rural areas. According to Vu, Le, and Giang (2012), they pointed out that has the inequality of accessibilities in higher education between rural and urban areas, among ethnicities and among income quintiles. Meanwhile, in our research, we study from a different view, which is the relation between the family background, namely parent's occupation, living locations, and their children's university GPA. Our results show that family background has a negative impact on the children's university GPA. The explanation for such outcome would be the fact that the financial support of the family was not enough for their children, making the children spend more time for part-time jobs instead of studying.

The remaining of the paper is organized as follows. Section 2 presents a literature review on the influence of family background on the academic achievement of a student. Details on data and the research methodology employed in the paper are in section 3, while discussion on the results and policy implications will be presented on section 4 and section 5, respectively.

2 Literature review

The importance of education was validated by the all researchers around the world. As a result, almost all families want their children to have a good education and the children are expected to not only gain a degree from university but also to graduate with great GPA. University admission and university graduation are two important milestones, which decide the future of students. However, the students' performances sometimes do not match with the grades they have got in the national university entrance exam; for instance, some students that

got high scores in their admission test do not get good achievements in university. Many studies argue that the admission criteria play a key role in evaluating the performances of students at university. Meanwhile, there are also studies debating that family background of students is the significant element to predict their performances. Weiser & Riggio (2010) mentioned that family background also make a huge effect to academics outcomes. The issue of how these two factors influence students' study and which one is more important is widely debated. The literature review in this paper focuses on investigating the two factors, admission criteria and family background, and evaluating them to compare with the data in the case of higher education in Vietnam.

The student recruitments of most universities and colleges in the world are based on admission criteria. However, there is a variety of criteria that a university can choose to apply. Gabriel & Marius' article (2011) is the most useful study as they not only present a diversity of worldwide admission criteria but also show that high school grade point average is the only one of the admission criteria that is efficient in predicting academic performance. In that study, baccalaureate exam, high school GPA, Scholastic aptitude/assessment test (SAT) are mentioned as the tests reflect the future academic performances. However, Gabriel & Marius (2011) indicate that a great number of studies attempted to recognize high school grade point average (GPA) and general success in high school as two factors remarkably interdependent with university GPA and graduation. For instances, high school rank and high school GPA are found to be the most effective predictor of success in college (Fletcher, Halpin, & Halpin, 1999). A large quantity of other researches indicate that GPA is the most powerful predictor for not only evaluating academic performances of students but also bearing a strong relationship with family income (Geiser & Santiceles, 2007). Hoffman & Lowitzki (2005) find that GPA is stronger predictors of success than other standardized test scores for both racial and religious minority students. Gabriel & Marius (2011) in their study also evince that standardized admission tests like the baccalaureate test or the college admission exam reflect student performance in a single evaluation, it means they fail to assess test preparation, repeat test-taking and other "test wise" strategies aiming at boosting scores. The reason is that these tests do not show the whole capacity of students. Elizabeth et al., (2011) present that some characteristics including motivation, leadership skills, teamwork skills, problem-solving skills, compassion are not assessed in the university entry tests. Brown & Conley (2007) explain that sections on the exit exams such as the baccalaureate exam measure only a small piece of the knowledge and skills which are expected from college and employers while GPA can measure

the students' ability more comprehensively. Hoffman & Lowitzki (2005) find that high school grades are stronger predictors of success than standardized test scores for both racial and religious minority students. The Maryland State Higher Education Commission (1996) also identifies high school GPA as the best predictors of college GPA among the SAT Verbal score, average grades in high school English and social studies courses. However, the study of Gabriel and Marius is only a pilot study, thus they did not consider about the other factors such as socioeconomic status, places or parental effects of students.

There are some other studies also included other factors such as gender, age, marital status. Elizabeth et al., (2011) present that some old students have to work together with study and join more community activities, thus they might have poorer academic performance than younger students. Moreover, in some specific majors like nursing, female students perform better than the male students but in contrary research identified male gender as an indicator of academic performance of undergraduate nursing students (Ali, 2008).

While some researchers argue that the GPA is the best measure of students' academic performances, there are others indicators such as family structure, socioeconomic status, parental relationship quality, parent school involvement, and parental school aspirations, parental income, parent's investments, childhood development and environment number of children and education of parents. Weiser & Riggio (2010) present that family background features, covering family structure, socioeconomic status, parental relationship quality, parent school involvement, and parental school aspirations, are the most frequently linked to academic outcomes. Studies explain that family structure is related to academic achievement as children and adolescents from intact families perform better than their peers from single-parent homes on a wide variety of outcomes including grades, standardized achievement test scores, high school completion, and college graduation (Amato & Keith 1991; Amato 2001; Astone & McLanahan 1991; Naevdal & Thuen 2004). Besides, socioeconomic status strongly links to academic achievement as well. Researches show that the higher socioeconomic levels students have, the higher grades, better tests achievement, and longer education they get (Gottfried et al., 2003; Matsen et al., 1999; Teachman 1987). Many researchers suppose that the greater cultural and educational resources are enjoyed by higher socioeconomic individuals due to this relationship (De Graaf et al., 1986). However, Cheung & Andersen (2003) indicate that even when controlling for these resources, family socio-economic status still has a powerful impact on educational performance. High quality relationships between parents and child are featured by positive influence and warmth, emotional support, and facilitation of independence (Kenny

& Sirin, 1987). In addition, parent relationship quality is definitely connected to academic performance, school engagement, and standardized test scores (Dornbusch et al., 1987; Ginsburg & Bronstein 1993; Grolnick & Ryan 1989). Matsen et al., (1999) explain that parent relationship quality gives a large impact to children cognitive competence and growing up procedure, thus it has a special and noteworthy relationship with academic achievement. Parental school involvement, which includes parents' participation in school activities, communication between parents and children about school, support to homework, and supervision and monitoring of schoolwork, is a major influence on students' academic achievements as well (Ho & Williams, 1996; Mji & Mbinda, 2005). With the assistance of parents, children will have huge advantages and motivation to get higher academic outcomes including standardized test scores, GPA, and subject specific grades (Catsambis 2002; Fan & Chen 2001; Ho & Williams 1996; Keith et al., 1993). Parental educational aspirations are also linked to academic performance. Parents with high educational aspirations expect their children to finish high school, be involved in, and complete college, and receive good grades. Higher levels of parental educational aspirations positively bring their children to join more challenging classes, and get higher test scores (Astone & McLanahan 1991; Catsambis 2002; Milne et al., 1986). Furthermore, parental aspirations significantly forecast whether students should continue their education after high school and college completion (Bank et al., 1990; Catsambis 2002; Leung et al., 1987). Although this study presents a great deal of knowledge, it only investigates in one university. Moreover, the reliance of students' responses is not high because their perception about the parent's expect may be not clear.

Anders et al., (2003) mentioned that there are a powerful tie between parental income and education achievements of their children by a quote which is expressed by politicians many times "Children's life changes should not depend on the size of their parents' wallets". This study approached the relationship between pupils' school performance and their family background in two interesting ways. The former captures a broad notion of equality of opportunity. It means they study the samples of siblings who grow up together with similar outcomes and in the same neighborhood, including the peers and the schools that were available where they grew up. The latter captures a narrower notion of family background by estimating the relation between grade averages and parental earnings ("parents' wallets"). They do analysis for 13 cohorts of pupils born in 1972-1984 who graduated from compulsory school at the age of 16 between 1988 and 2000. They separately analyzed for father's and family earnings, as well as for boys and girls. Although this study obtained some results, the limitation

is that it is based on the old data in Sweden from the 1980s and 1990s when a turbulent era of school reforms occurred.

Orley & Cecilia (1998) also make a study about the interaction between family background and school performance with quite similar evidence that is based on twins. Their results are more specific in terms of the differences between two children and genders. With female twins, the response is that the less educated twin is caused by marriage (or the converse, “got divorced and needed to get a job”). With males, it is said that the two twins have different interests in occupation. Only small proportion of the responses, 11 percent, include such explanations of schooling differences as, “one twin was better at books,” which might (obviously) be clarified as ability differences (Orley & Cecilia, 1998). In addition, Orley & Cecilia also mention that birth weight may affect childhood development and thus perhaps schooling level attained. This study implies that individuals with higher levels of ability get rather higher levels of schooling. It means that the higher ability individuals may gain a slightly lower marginal benefit to schooling.

The number of children and the knowledge of parents are also significant factors affecting the academic performance. There is an interaction between the educational level of parents with the number of children they born. The quantity of children affects the resource that parents invest in children, which in turns, influences the quality of them. Becker & Lewis (1976) argue that an intention in the education of mothers has a positive effect on the quality but a strong negative influence on the number of their children. The common trust is that vital advances in birth control knowledge not only remarkably reduce the number of children but also significantly increase their quality.

In conclusion, although the previous studies present many interesting and useful results about the correlation between academic performances and admission criteria as well as family background, the answer has not been fully proved yet. While some studies only focus on the specific fields, others have problem with the number of sample, research scope or become obsolete. Most of the studies are applied for the oversea universities where the economy, culture, society, and education are considerably different from those in Vietnam. Therefore, a study about this issue and in particular case of Foreign Trade University is really important as it can contribute to the future extension supporting the development of higher education in Vietnam.

3 Data and methodology

3.1 Data

The paper uses three data sets of students' batch 50 (2011-2015) of Foreign Trade University (FTU). The first data set includes information such as national university entrance point, gender, ethnicity, block test, subjects, national or international prize, TOEIC. The second one contains cumulative GPA of four years naming college GPA and the last includes information on the student's family background as the year of birth of parents, parental occupation, and number of siblings in the family. The data is collected from the undergraduate studies department of FTU. In details, the first data set contains about 2,200 students in which enrollment is 96 percent and it covers the two remaining data. The third data set was collected by conducting an email survey, which was sent to all students; however, and only about 1,500 students responded to this survey. Finally, there are around 1,471 observations in our sample with descriptive statistics of the variables as shown in Table 1. Specifically, the average college GPA of students is around 3.27, as 35 percent of the sample achieve excellent study results while 53 percent have good results, leaving 13 percent with average results. Additionally, FTU is the only university having training programs in social sciences, therefore, female students account for 70% of the university's total number of students. Such rate is the same in case of Vietnamese population. Next, a majority of students (97%) are in the Kinh ethnic group and students in economic field account for more than half of the total number of students, follow by the business administration field; making banking and finance and business foreign language field arrive at the last place.

Annually, Vietnam has national university entrance exam with some subjects such as mathematics, physics, chemistry, literature, history, and geography, foreign languages.

In every province in Vietnam (64 provinces), competitions are held for local high school students. According to the results of such competition, the best students will be sent to take the national exam in selected subjects. If the students receive the prize, they will be given priority mark in the national university entrance exam. The table shows that about 17 percent of students enrolling at the university are those with national prizes.

At FTU, all freshmen have to undergo examinations of English proficiency, TOEIC, except business foreign language in French, Russian, Chinese, Japanese. The average TOEIC of the freshmen is 500 points.

Two final variables related to family background of students, “farmer” variable, and “rural” variable. “Farmer” variable equals 1 if father’s occupation is farmer and zero if otherwise; and account for about 20 percent. Similarly, “rural” variable has the value of 1 if the family lives in rural areas and zero if otherwise. Table 1 shows that there are about 20% of the studied students whose fathers are farmers and approximately 24% of the sample whose families live in rural areas.

Table 1: Descriptive statistics of variables

Variable	N	Mean	Std. Dev.	Min	Max
GPA (continuous variable)	1471	3.27	0.29	2.37	3.96
Grade					
Excellence (dummy)	1471	0.35	0.48	0	1
Very good (dummy)	1471	0.52	0.50	0	1
Good and average (dummy)	1471	0.13	0.34	0	1
Female (dummy)	1471	0.71	0.45	0	1
Kinh ethnic (dummy)	1471	0.97	0.16	0	1
Economics (dummy)	1471	0.53	0.50	0	1
Banking and finance (dummy)	1471	0.10	0.30	0	1
Business administration (dummy)	1471	0.31	0.46	0	1
Business foreign language (dummy)	1471	0.06	0.23	0	1
National university entrance point (dummy)	1471	24.05	2.00	14	28.75
A block (dummy)	1471	0.44	0.50	0	1
D1 block (dummy)	1471	0.43	0.50	0	1
Others (dummy)	1471	0.13	0.33	0	1
National prize (continuous)	1471	0.17	0.37	0	1
Toeic/100 (continuous)	1466	5.03	2.91	0	9.8
Farmer (dummy)	1471	0.20	0.40	0	1
Rural (dummy)	1471	0.24	0.43	0	1

Source: Authors’ calculation from data

3.2 Research methodology

In Vietnam as well as in other countries, cumulative GPA of students (college GPA) is one of the important criteria, which initially assesses the capacity of students to participate in

the labor market. Therefore, we construct a simple model to estimate the factors affecting college GPA as follows.

$$GPA_i = \beta_0 + \beta_1 Farmer_i + \sum_{j=2}^8 \beta_j Control_{ij} + \beta_9 EntryPoint_i + \beta_{10} NationalPrize_i + \beta_{11} TOEIC_i + u_i$$

Where:

- The university GPA is the accumulated final grades in four years of students with the point scale ranging from zero to four.
- “Farmer” dummy variable equals 1 if father’s occupation is farmer and zero if otherwise. We expect that this variable will have a negative impact on student performance because families do not provide enough financial support for students; hence the students have to spend more hours working part-time to cover their own living expenses. Furthermore, in Vietnam, it is very difficult for universities to manage the hours spent on part-time jobs of students or introduce restrictions on the number of hours per week that students can work part-time.
- The control variables include female variable (1 if students are female, 0 if students are male), and the Kinh ethnic (1 for Kinh and 0 for non-Kinh) and group variables related to study field including economics, banking and finance, business administration, business foreign language.
- The test blocks variables are built on the selection of subjects that contestants decide to take examination with. For example, the block A includes mathematics, physics and chemistry; D1 includes mathematics, literature, English; others consist of mathematics, literature, and foreign language (non-English).
- National prize variable is established on whether students achieved the national award or prize when they were in high school. Thus, we expect that this variable will have significantly positive influence on the university GPA.
- Finally, the variable of English test scores is measured by the TOEIC result of freshmen. We assume that if the student have a higher TOEIC point and the better he/she will access and update to new materials in the world and therefore it can positively affect university GPA.

Methodologically, for the first step, we estimate the above equation by OLS method. In particular, occupation of father variable is the farmer is interesting because we want to answer the question whether these families provide monthly living expenses for students is less than other families or not enough living costs of student, they work more hours to get extra income and thus it may affect academic performance, college GPA. If this is true, or the coefficient of farmer is negative and statistically significant, government or universities should have policies to provide financial support to the students who come from families with parents doing farming and living in the rural areas.

We understand that the model possess endogenous problem, which is solved partially by instrumental variable (IV) method. In our case, instrumental variable is “rural” variable and if the parents work in agricultural sector, the families is more likely to live in rural. To determine valid instrument, we perform the test statistics and the results in Table 2 show that all tests are passed and it means our instrument is valid. Finally, we estimate the “farmer” variable, endogenous variable, using 2SLS method with “rural” variable as instrumental variable.

Table 2: Instrumental Variable Model - Test statistics

	Value	P-value
Wu-Hausman F test	7.28662	0.00703
Durbin-Wu-Hausman chi-sq test	7.32014	0.00682
Underidentification test (Anderson canon. corr. LM statistic)	83.315	0.0000
Weak identification test (Cragg-Donald Wald F statistic)	87.552*	

*Note: Stock-Yogo (2005) weak ID test critical values: 10% maximal IV size is 16.38; 15% maximal IV size is 8.96; 20% maximal IV size is 6.66; and 25% maximal IV size is 5.53

For sensitivity analysis, our dependent variable, college GPA is classified into three categories, as mentioned in the data section above. According to regulations of the Ministry of Education and Training of Vietnam, GPA from 3.6 to 4.0 is excellent (outstanding); GPA from 3.2 to less than 3.6 is very good and GPA less than 3.2 is good and average. Our oGAP variable

receives a value of 1 if the type of grade is good and average; 2 for very good; and 3 for excellence (outstanding). Finally, we use ordered Probit model to estimate the above equation with the dependent variable, oGPA and the same independent variables.

4 Analysis results

Table 3 presents the results of the regression estimations, the first column shows results of OLS estimation, the second column displays the results of 2SLS and the last one reveals results of ordered Probit model. We interpret the results sequentially from top to bottom in the Table.

Table 3: Regression estimation results

	(OLS)	(IV ³)	(Ordered Probit)
	GPA	GPA	oGPA
Farmer	-0.0307* (0.017)	-0.2191*** (0.075)	-0.1535** (0.077)
Female	0.1278*** (0.017)	0.1305*** (0.017)	0.4855*** (0.079)
Kinh	-0.0249 (0.043)	-0.0040 (0.043)	-0.0020 (0.218)
Economics (base group)			
Banking and finance	0.1083*** (0.027)	0.1170*** (0.027)	0.4579*** (0.120)
Business administration	0.0279* (0.016)	0.0273* (0.016)	0.1392* (0.072)
Business foreign language	0.0799*** (0.028)	0.0803*** (0.029)	0.2779** (0.138)
A block (base group)			
D1 block	-0.0173 (0.021)	-0.0180 (0.021)	-0.0950 (0.095)
Others	-0.0991***	-0.1379***	-0.5747***

³The authors will provide the result estimation in first stage if requested

	(0.026)	(0.030)	(0.130)
National university entrance point	0.0555***	0.0551***	0.2214***
	(0.005)	(0.005)	(0.021)
National prize	0.1467***	0.1386***	0.6093***
	(0.019)	(0.019)	(0.094)
TOEIC/100	0.0243***	0.0174***	0.0962***
	(0.003)	(0.004)	(0.016)
_cons	1.7224***	1.7873***	
	(0.117)	(0.119)	
<hr/>			
cut1			
_cons			5.7640***
			(0.574)
<hr/>			
cut2			
_cons			7.5057***
			(0.585)
<hr/>			
<i>N</i>	1466	1466	1466
pseudo <i>R</i> ²	0.229	0.232	0.113

Robust standard errors in parentheses; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Source: Authors' calculation from data

Firstly, the results show that if the student's father is a farmer, a negative influence on college GPA and sign of coefficient of farmer variable is consistent in all the columns in the Table. In Vietnam, students' parents who work in agricultural sector or have unstable income have trouble in covering the living expenses for their children to live and study in the city where university is located. These students are able to work part-time to earn extra income, which, unfortunately, affects their academic performance. In addition, it is difficult or impossible for universities in Vietnam to manage the number of hours per week spent on part-time jobs of student as those universities with higher education system in advanced countries can do. Currently, Vietnam still has policies for poor students with low-interest loans, nevertheless, the effectiveness of such program should be re-considered. For the universities, they should create more opportunities for students whose families live in rural areas and parents are farmers to access financial support or support services or manage the working hours of these students. It will help them achieve better learning outcomes.

In terms of control variables, the female students have better performance than male students do. However, this finding should be re-evaluated at other universities as the female student ratio in FTU is very high, around 70%, which may be different in case of other universities in basic science fields. Besides, we do not see the difference in performance between students from ethnic minorities and Kinh group. This would probably because students from ethnic minorities only account for only about 3 percent of the total studied sample. Furthermore, students studying banking and finance; business administration and business foreign language perform better than those studying in economic field. The block A students also have better performance than others except block D1.

In addition to the efforts of students themselves in the learning process at the university, the national university entrance point should also taken into account since the results show that students who have higher point in the national university entrance point, they also have higher college GPA and we found it is consistent in all columns. Furthermore, winning national prize has positive and strong impact on GPA. Therefore, it can be concluded that the recent policies of the universities are good and appropriate and they help to attract many of these students.

Finally, the TOEIC point has a positive impact on college GPA. In fact, the students with a high TOEIC point have better abilities to access documents in English and as a result, they have better performance.

5 Implications for policy

This paper emphasizes that being born in rural areas in Vietnam and having parents working in agricultural sector have negatively effect on the students' college GPA. Because these students spend more time to work to offset the cost of living, leading to poor academic performance. Therefore, the policies that both the government and the universities should focus on are providing financial support to help them improve their performance.

There have been many effective policies to support the ethnic minorities. Our results do not find the differences in college GPA between ethnic minorities and Kinh group. Similar to the results of previous studies in the world, our study also show that the high school GPA has positive effect on college GPA and we find the same evidence with national university entrance point. We think that Vietnam as well as China, South Korea should still maintain national university entrance exam in whole country since it helps to create more transparency in the national university entrance exam and it is important to create fairness for rural students.

Current policy, the national prize winners go direct enrollment into universities and add one condition that they must pass a threshold point of MOET in national university entrance exam. According to the authors, this is not necessary because the results show that they have strong performance compared to the rest.

In the process of international integration, students who are good at English will acquire new knowledge and update themselves better, leading to better performance than those who are bad at English. Hence, we propose to have policies requiring the graduate students to pass a basic English exam.

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