

American University of Central Asia

Determinants of Academic Performance: The Case of American University of Central Asia

by

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Abstract

This paper investigates the determinants of academic performance in case of American University of Central Asia. The representative sample consists of 151 current AUCA senior students and graduates who filled out and submitted a specially prepared for this purpose questionnaire. 2SLS estimation procedure was applied to get consistent results. According to them, number of hours spent studying off-class per day and the presence of plans to get MA/PhD Degrees are considered to be the crucial factors determining student's GPA.

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Chapter 1

Introduction

What explains the difference in student's academic performance? Such measures of academic progress at universities as Grade Point Average (GPA) show a substantial variation. American University of Central Asia prepares more than a hundred bachelor degree graduates each year. Each of these graduates has a certain, often unique, cumulative GPA. This diversity is explained by a lot of different factors which could be divided into several groups. One of them is a group that contains health factors, which certainly play an important role in explaining the variation in GPA. The time student spends sleeping every day is considered to be the most important factor of academic achievement by the majority of professors, scientists and students themselves. Such variables as nutrition, alcohol and cigarettes consumption are also believed to have a significant impact on student's GPA. Other factors that have a substantial influence on GPA include demographic and personal background characteristics. Demographic factors, such as gender, marital or relationship status, living situation, distance from university are all taken into account by scholars when they investigate the determinants of students academic success. Gender is always a topic of discussions in various fields of study, in case of this work, it is especially important. Some people believe that males are supposed to do better than females in academics, because they are more talented and virtuous in general, other people state that females are more oriented towards studies and academic career due to their inner-built diligence and, therefore, should have a better academic performance in general. There is no univocal and right answer, and will never be, and it just makes this variable as important as the air to breath. Gender may play different role in different societies as well. In western culture the status of females is almost equal to that of males, whereas in Central Asian countries women are mostly housewives, which surely affects the result of male/female academic performance. Very similar reasoning can be applied to other demographic factors of GPA, hence, determining the effects of demographic variables in case of Central Asia and AUCA in particular is a topic that worth discussion. Personal factors of students such as time spent studying, entrance exams, plans to continue education and getting

higher degrees, the choice of the major of study, the presence of part-time or full-time job in addition to studying at the university are assumed to have a substantial influence on GPA. This research should help AUCA policy makers to design and implement policies to improve students' performance and the efficiency of education, therefore, the results of this work will be beneficial both for AUCA administration and students.

Chapter 2

Literature Review

A number of studies have been done on determinants of academic performance. All works could be classified in two groups: those which concentrate on health factors, and those which discuss the effects of demographic and personal determinants of GPA. Each paper represents the research for a certain University. In most papers the data was collected from surveys at those Universities. The number of observations in the literature varies from about a hundred to thousands of students depending on the access to data and specifications of the topic. The results for the same variables reported in papers could differ both in the size of the effect and its statistical significance. Alcohol consumption, for example, is usually reported as a significant determinant of academic performance, however in some works it is said to be not a crucial factor. Some variables, on the contrary, are found to have the same qualitative effect and statistical significance across all works in which they had been observed. What results suggest is that main factors that explain students' academic success are not the same across Universities. Moreover, although there is a bunch of academic papers, empirical and theoretical, there is no such a research made for the Central Asia and Kyrgyz Republic. The contribution of this work is to fulfil this gap in central Asia and investigate the main determinants of academic performance at AUCA with its specific characteristics of academic policies, learning environment, and spirit combining post-soviet faculty with that of the western school and the students, who have been growing up in the country with a transitional economy and unstable political situation, with those from United States, Europe and other countries of Central and Eastern Asia.

Several papers are published relating the overall health to academic performance. [George et al. \(2008\)](#) used the data consisting of 231 students from a liberal arts university in Central Alberta, Canada. Their findings suggest that emotional stability, overall health (as a cumulative index of healthy diet, waking up early, and doing cardio work out), turned out to be insignificant predictors of GPA. Surprising findings of their research can be explained by endogeneity problem, which was not solved by OLS estimation technique that the authors had used. Another research was done by [Zajacova et al. \(2005\)](#). The

aim of their research was to uncover the effect of stress level on the variation of GPA of students at one of the City University of New York (name remains confidential due to the agreement the authors made to gain access to the data) with the sample of 107 students. According to the results, stress negatively affected GPA, however its significance was not that strong – only 10%. Very interesting research on health as the main factor of GPA was made for the College of New Jersey by [DeMartini \(2009\)](#) who used a representative sample of 1,458 undergraduate students for their estimations. Their survey included items concerning students' health, lifestyle, vitamin intake, consumption of fruits and vegetables, consumption of alcohol and cigarettes, and hours of sleep. In accordance with their hypotheses, consumption of fruits, vegetables, vitamins and hours of sleep had a positive and significant effect on GPA. The effect of alcohol index and consumption of cigarettes also supported authors' hypotheses of their negative correlation with GPA. Results of this work are justified by a sophisticated non-linear estimation technique Probit and a very large number of observations for such type of a research. Another empirical research by [Kremer and Levy \(2008\)](#) concentrated on the effect of alcohol use on GPA. This study took advantage of the Cooperative Institutional Research Program's Entering Student Survey, which contains data on a rich set of student characteristics; the study was conducted using the data from one Midwestern state university in USA (name is confidential due to the agreements between authors and the university). Results from using non-linear estimation technique Logit propose substantial negative effect of alcohol use on students' GPA, however statistically significant only at 10% level. The findings of [DeBerard et al. \(2004\)](#) demonstrating predictive power of smoking and drinking for academic achievement were expected and aligned with results of [DeMartini \(2009\)](#) as well as with those of [Kremer and Levy \(2008\)](#), reporting that students who consume alcohol and cigarettes tend to have lower GPA in general. A very strong emphasis on health-related variables as the main predictors of academic performance was made by [Trockel et al. \(2000\)](#), who used a random sample of 200 students living in on-campus residence halls at one private university (name was not provided due to agreement between authors and university). The set of health-related variables included exercise, hours of sleep, perceived stress, number of times of having a breakfast per week and some other. Results of this empirical research unveiled the positive and statistically significant effect of eating breakfast and doing physical trainings, and the negative effect of hours of sleep, although only at 10% significance level. Summarizing the literature on health-related factors, it should be noted that the factors that were considered to be crucial in some papers may lose their predictive power in other works, thus, such predictors of GPA as consumption of alcohol and cigarettes, eating breakfast, intake of fruits, vegetables and vitamins, susceptibility to stresses are of the highest interest for this research.

Many researchers have documented the effects of personal and demographic factors

on academic achievement measured by GPA. One of the most significant works belongs to [Betts and Morell \(1999\)](#) who took advantage of using the dataset containing the information on more than 5,000 undergraduates at the University of California, San Diego. Including in their research personal background, and a variety of demographic factors, they came up with the results that SAT scores and High school GPA strongly affect university GPA of students; sex, ethnicity, and family income were reported as highly-statistically significant determinants of GPA. These results supported the hypotheses and served as a basis for a number of subsequent works made by other researchers. Another empirical research discovering the effect of academic background on GPA was done by [Geiser and Santelices \(2007\)](#), who made a strong emphasis on the high school GPA explaining undergraduate GPA. Having a sample of almost 80,000 students admitted to the University of California, Berkeley, their findings suggest that out of age, gender, marital status, SAT scores, family income, and other demographic and personal factors high school GPA was consistently the strongest predictor of a four-year university GPA. [Sacerdote \(2000\)](#) has also very similar results for the Dartmouth College reporting that gender, SAT scores and high school GPA are the main determinants of the variation in college GPA. So far, all papers that have been reviewed propose that academic background and demographic factors were statistically significant and bring qualitative effects in accordance with the hypotheses stated. However, there are several works that are noteworthy for the results that do not highly support and even contradict hypotheses and common sense. Very interesting results were reported by [Naylor and Smith \(2002\)](#) who investigated the determinants of academic performance at the University of Warwick, UK. The population sample contained data on as many as 48,281 students from Universities Statistical Record for a full cohort of UK university students. For the estimations a non-linear Probit estimation technique was used. According to their findings, gender was statistically significant only at 10%, the same outcome was observed with academic background – 10% significance level. [Swope and Schmitt \(2006\)](#) using the large dataset available at U.S. Naval Academy reported that gender was not a significant predictor of GPA, which breaks the hypothesis that either males or females are supposed to perform better in academics than their counterparts. As for the personal factors other than academic background, the work of [Stinebrickner and Stinebrickner \(2003\)](#) deserves attention. Operating the data from the University of Western Ontario and Berea College, they came up with the IV estimation technique solving for the endogeneity problem. The topic of interest was the relationship between having a job and academic performance. The common hypothesis here is that having a job decreases student's GPA on average. The presence of job in addition to academic workload is very actual issue within AUCA since there are a lot of students having at least part-time job, hence the results obtained in this research are of high interest. According to the results, working has a harmful impact of students' GPA, which

supports the general hypothesis. The last, but not least, the paper of [Cohn et al. \(2004\)](#) discusses the effects of the number of demographic and personal factors including race, gender, age, and time spent studying on high school GPA and SAT scores. Though previously, the majority of researchers tried to uncover the effects of high school GPA and SAT scores as academic background variables on university GPA, this particular work tries to estimate the determinants of pre-university academic performance, results of which could be a very important basis for this thesis and further investigations. The data for the estimations was obtained from the University of South Carolina data base, in which the complete data were available for 521 students. The findings follow the general trend in that race and gender are significant predictors of GPA (high school GPA in this case), but what is more interesting is that such variable as hours of study, though having a positive effect, was reported to be significant only at 10%. Out of the literature that discusses the personal and demographic determinants of GPA the following must be noted: academic background (high school GPA and SAT scores), hours of study, working, gender, marital or relationship status are usually reported as crucial parameters, hence, these variables have to be taken into account to control for in case of AUCA, keeping in mind that they are not necessarily going to be statistically significant and follow the general pattern.

Summing up the literature, there are a lot of factors that are believed to influence students' GPAs ([Allen and Carter, 2007](#); [Cyrenne and Chan, 2012](#); [Grove and Wasserman, 2004](#); [Horowitz and Spector, 2005](#); [Loury and Garman, 1995](#); [Maani and Kalb, 2003](#); [Park and Kerr, 1990](#); [Rothstein, 2004](#); [Stater, 2009](#)). Plenty of empirical analyses have been done on this topic so far, however there have been no such researches made in Central Asia. This work could be a very useful contribution and become a basis for further development of the topic in Central Asia, and particularly at AUCA. Also, the findings of this research will be of great importance and value for the AUCA policy makers, admissions offices and administration.

Chapter 3

Model Specification and Description of Variables

This part of study describes the empirical steps that were used to proceed with estimations. Using the literature as the basis, at the same time applying own reasoning and analysis, the model relating the dependent variable GPA to independent demographic, health and personal factors is the following:

$$\begin{aligned} \text{GPA}_i = & \gamma_i + \alpha_1 \text{male}_i + \alpha_2 \text{relat}_i + \alpha_3 \text{livpar}_i + \alpha_4 \text{timecomm}_i + \beta_1 \text{breakfast}_i + \\ & + \beta_2 \text{frveg}_i + \beta_3 \text{cigarettes}_i + \beta_4 \text{alcohol}_i + \pi_1 \text{MA/PhD}_i + \pi_2 \text{job}_i + \\ & + \pi_3 \text{social}_i + \pi_4 \text{studyhours}_i + \pi_5 \text{entrexam}_i + \pi_6 \text{major}_i + \epsilon_i, \end{aligned} \quad (3.1)$$

where demographic factors are represented by those that are next to α , health factors – next to β , and personal factors – next to π ; γ_i – constant; *male* – dummy variable; equal to 0 if a student is female, to 1 – otherwise; *relat* – dummy variable; equal to 0 if a student is single, to 1 – otherwise; *livpar* – dummy variable; equal to 0 if a student lives separate from parents, to 1 – otherwise; *timecomm* – time spent on the road to university; discrete variable valued from 0 to 5 (0 – less than 15mins; 1 – 15mins; 2 – from 15 to 30 mins; 3 – from 30 to 45 mins; 4 – 1 hour; 5 – more than an hour); *breakfast* – number of times per week a student has a breakfast; discrete variable valued from 0 to 7; *frveg* – number of times per day a student has servings of fruits and vegetables; discrete variable valued from 0 to 6 (equal to 6 if there are more than 5 servings per day); *cigarettes* – number of cigarettes smoked per day; equal to 0 if a student does not smoke, to 1 – otherwise; *alcohol* – discrete variable valued from 0 to 5 (0 – does not consume; 1 – consumes, does not have problems with alcohol; 2 – consumes and the probability of having problems with alcohol is 25%; 3 – consumes and the probability of having problems with alcohol is 50%; 4 – consumes with the probability of 75%; 5 – consumes with the probability of 95%)¹; *job* –

¹ Measurement of *alcohol* will be discussed further in [chapter 4](#)

discrete variable valued from 0 to 3 (0 – does not have a job; 1 – has only part time job; 2 – has only full-time job; 3 – has both); *social* – dummy variable; equal to 0 if a student is not involved in extracurricular activities, to 1 – otherwise; *MA/PhD* – dummy variable; 0 if a student is planning to get higher degrees, to 1 – otherwise; *studyhours* – continuous variable; number of hours a student spends studying off-class per day; *entrexam* – two continuous variables: math entrance exam, valued from 0 to 1 (1 if a student got 100 out of 100) and TOEFL (valued as usual); *major* – 10 dummy variables representing the department of a student.

In equation (3.1) model suffers from the endogeneity problem which is due to the plausible correlation between explanatory variables and the error term ϵ_i , which includes omitted variables such as ability, EGO, *ambitions* and other factors. Endogenous variables, i.e. variables that cause endogeneity in (3.1), are *studyhours*, *MA/PhD*, *social*. These variables cause the inconsistency of results if OLS estimator is to be applied, because: *studyhours*, *MA/PhD* are endogenously chosen by the abilities of a student; *social* is endogenously chosen by the *ambitions* of a student. The logic behind these correlations is the following: the more able is a student, less time he/she needs to spend on understanding the material, hence, there is a correlation between *studyhours* and abilities; the more able is a student, the more likely it is that he/she is going to get higher degrees, hence, there is a correlation between *MA/PhD* and abilities; the more ambitious is a student, the more likely it is that he/she will participate in social life of the university (singing, dancing, different clubs, extracurricular activities and like) in order to satisfy his/her *ambitions*, hence there is a correlation between *social* and *ambitions*. Therefore, endogeneity problem makes coefficients obtained from OLS regression of the (3.1) model biased and inconsistent.

With the presence of endogeneity in the model, the usual practice that helps to estimate coefficients on the variables with cross-sectional data is to use 2SLS estimation procedure. The nature of 2SLS estimator lies in instrumenting the variables that cause endogeneity. The difficulty that usually arises using 2SLS estimator is to find the suitable instrumental variables or, simply, IVs. First, endogeneity problem was solved for *MA/PhD* and *studyhours* variables. Standard IVs – mother's education (*meduc*) and father's education (*feduc*), which were measured as the years of schooling of student's parents – were applied to *MA/PhD*. The logic behind this is that the more educated are the parents of a student, the more educated he/she is going to be, because more educated people value education and knowledge a lot, therefore such parents will try to educate their child as good as possible. *Studyhours* was instrumented by *motivation to keep GPA above 3.0 level* variable, which was implemented and included in the questionnaire that will be discussed further in data description part. So far, the only endogenous variable remained, which is *social*. In case of inconsistency of OLS caused by the correlation between *social* and *ambitions*, no IV has been found. However, the problem was solved by measuring the

Table 3.1: Variables' Type

Exogenous	Endogenous	Error Term	Instruments
male	MA/PhD	abilities	feduc(for MA/PhD)
relat	studyhours	EGO	meduc(for MA/PhD)
livpar			
timecomm		other omitted	motivation for GPA > 3.0
breakfast		variables	(for studyhours)
frveg			
cigarettes			
alcohol			
job			
social			
entrexam			
ambitions			

level of *ambitions* and, thereby, taking this variable out of the error term². Table 3.1 summarizes the discussion and the solution of endogeneity problem. According to the above transformations, the final model that was used for the estimations is the following:

$$\begin{aligned}
 GPA_i = & \gamma_i + \alpha_1 male_i + \alpha_2 relat_i + \alpha_3 livpar_i + \alpha_4 timecomm_i + \beta_1 breakfast_i + \\
 & + \beta_2 frveg_i + \beta_3 cigarettes_i + \beta_4 alcohol_i + \pi_1 MA/PhD_i + \pi_2 job_i + \\
 & + \pi_3 social_i + \pi_4 studyhours_i + \pi_5 entrexam_i + \pi_6 major_i + \\
 & + \pi_7 ambitions_i + \epsilon_i,
 \end{aligned} \tag{3.2}$$

Gender (male). The effect of this factor as a predictor of student's GPA has been the subject of ongoing debate among educators, scholars, and policy makers. Still there is no true answer whether males or females are doing better in academics. Different papers report different relationships between gender and GPA, therefore, the resulting coefficient on the variable that will be obtained in this study is ambiguous.

Relationship status (relat). This is an equivalent to marital status that has been used in some literature. In general, being in a relationship negatively affects academic performance of students. Dating requires a lot of time, money, moral and physical resources, which are diverted from studying, hence, the expected correlation between relationship status and student's GPA is negative.

Living situation (livpar). The majority of students at AUCA are in the period of transition from being a child and becoming a mature person, hence the influence of parents in life of students during this 4-year period cannot be overestimated. However, there is

² This issue will be discussed further in chapter 4, where it will be explained how and using what sources the level of *ambitions* was measured. Briefly, *ambition* will be measured on the 0-100% scale and will be coded as a continuous variable from 0 to 1

no certainty in this influence, i.e. it can be positive or negative, each particular case is individual. Those students who are living separate from parents are obviously in different conditions, therefore, the effect of living situation on GPA can be both positive and negative.

Time committed on the way from home to AUCA (timecomm). The fact that living closer to university increases student's academic success is plausible enough. Though some literature describes this factor directly, as a location or a distance, in this survey it is described by time spent on getting to AUCA, because in the end it is all about the time that, not the distance, because taking advantage of transport one can easily overcome the problem of living far from the university. The less time student spends to get to AUCA, the more time could be spent on studying, hence, the expected effect of *timecomm* on GPA is negative.

Number of times per week a student has a breakfast (breakfast). Some literature suggests that eating breakfast is a crucial health-related variable [DeMartini \(2009\)](#). The relationship between *breakfast* and GPA is straightforward. The higher the number of breakfasts student has, the better should he/she perform during classes.

Intake of fruits and vegetables (frveg). This variable is very similar to the previous. Being an indicator of overall health of a student, the equivalent of vitamins intake, the number of servings of fruits and vegetables by a student per day should positively affect his/her GPA.

Consumption of cigarettes (cigarettes). The majority of works made on the relationship between health-related factors and GPA treat this variable as one of the crucial together with alcohol consumption. The expected effect of *cigarettes* on GPA is negative.

Consumption of alcohol (alcohol). This variable is an invented index of alcohol, which measures the level of alcohol use. The lowest level is 0 when a student does not consume alcohol at all. The highest level is 5 when a student has a 95% probability of having problems with alcohol [see [chapter 4](#)]. The expected effect of *alcohol* on GPA is negative.

MA/PhD plans (MA/PhD). Generally, students who are planning to get higher degrees, tend to have higher on average GPA, because GPA is one of most important criteria to be accepted for the serious MA or PhD program. Thus, the effect of MA/PhD on GPA is expected to be positive.

Presence of job (job). Several papers include this factor as the strong predictor of GPA [Stinebrickner and Stinebrickner \(2003\)](#). As the results suggest, working and studying at the same time usually has a harmful effect on academic performance, therefore, the expected results for this study is that job should negatively affect GPA.

Involvement in different extracurricular activities and social life of AUCA (social). Different non-academic activities do not support academic success in general, because they require additional time and resources. In its effect, this factor is very similar to job, hence, I expect negative relationship between social and GPA.

Hours of studying off-class per day (studyhors). This variable belongs to the crucial factors in determining *GPA*. It is hard to find the more direct relationship between *GPA* and one of its predictors than the relationship between *studyhours* and *GPA*. The obvious effect of *studyhours* on *GPA* is positive.

Scores of entrance exams on mathematics and TOEFL (entrexam). *Entrexam* contains in itself 2 factors, which stand as proxy variables for academic background. Almost all authors included SAT scores and high school *GPA* as strong predictors of *GPA*, and they in fact are. Since students in Central Asia do not usually have SAT scores and high school *GPA*, the equivalent for them are the entrance exams, which represent the stock of knowledge and skills of students for the moment of enrolment in AUCA. The straightforward effect of *entrexam* on *GPA* is positive.

Student's major (major). There are 10 variables included in *major* as it stands for 10 departmental dummy variables. The choice of department was considered as an important determinant of academic performance in some papers, therefore it is reasonable to check whether there is a difference in the difficulty of programs among departments at AUCA. The expected effect of *major* on *GPA* is ambiguous.

The level of ambitions (ambitions). Including *ambitions* factor in the model has a sort of innovation, as no studies have discussed the effect of *ambitions* on student's academic performance. Therefore, it is not that obvious what effect this factor will have on *GPA*.

Chapter 4

Data Description

The data for the estimations was collected through surveying students. The questionnaire was designed partially based on the literature and on the model and contained 40 questions on different items including demographic factors (age, relationship status, living situation, time spent on the way to AUCA), health factors (eating breakfast, intake of fruits and vegetables, consumption of alcohol and cigarettes), personal factors (MA/PhD plans, having part/full-time job, involvement in social life/activities, time spent studying, entrance exams' scores, parental education level; and a set of questions regarding the level of ambitions of each student), and, of course, cumulative GPA. Under the model specifications, it was necessary to measure alcohol and ambitions variables. Measurements of these variables were found from two internet sources which offered a variety of psychological tests that let to give numerical values to alcohol and ambitions. The so-called "CAGE" questionnaire from "The Alcoholism Guide" internet source was used to measure alcohol. This test contains 4 questions concerning alcohol consumption, on the basis of which alcohol index was measured as a probability of having alcohol problem on the 0-95% scale¹. The ambitions variable was measured with the help of "Noanxiety" web-source, which provided "Ambition test" containing 15 questions, and valuing the resulting level of ambitions on 0-100% scale². See [Appendix A](#) for the complete list of questions.

The survey was conducted in several ways. First, there was prepared the special e-mail³, from which participants sent their filled forms to my mailbox. This was done for the purpose of confidentiality, because the questionnaire contained a lot of private questions. However this way of collecting data was not the best one, since it required students performing a lot of actions (downloading the form, filling it out, logging into the account, sending it and like), which decreased their stimulus to participate in the survey. Sec-

¹ <http://www.the-alcoholism-guide.org/cage-questionnaire.html>

² <http://www.noanxiety.com/tests/ambition-test.html>

³ aucaeco110@gmail.com

Table 4.1: Number of Students by Department

Department	# of Participants
Economics	25
Business Administration	13
Psychology	14
Sociology	13
Journalism & Mass Communications	12
International & Business Law	18
International & Comparative Politics	17
Software Engineering	15
Anthropology	7
American & European Studies	17
Total	151

ond method that was used, which turned out to be much more productive, was simply distributing questionnaires directly among students during the classes. Here I want to express my gratitude to the professors from Sociology, Anthropology, Journalism & Mass Communications, Psychology, International & Business Law, International & Comparative Politics, and Software Engineering departments who made it possible. Also, some data was collected using the social networks via internet.

The population of interest included AUCA current senior students and graduates. The logic behind this is that the cumulative GPA of freshmen, sophomores and juniors is not representative, because the majority of AUCA students begin to think about their future after second and third year of study, and, during the next year or two, their cumulative GPA might change drastically depending on their motivation, hours of study and a lot of other factors, thus, there was a possibility of getting biased results. Also, such questions as “Are you planning to get MA/PhD degrees?” required that for the moment of filling out the form the student definitely knows his future plans.

A total of 151 current seniors and graduates from 10 departments of AUCA took participation in the survey. Out of 151 participants 61 (40%) were males and 90 (60%) were females. [Table 4.1](#) presents the information on the number of students participated in the survey and departments that they came from.

Descriptive Statistics for the variable of interest, *GPA*, and all explanatory variables is presented in [Table 4.2](#). The highest GPA in the sample is the highest possible – 4.0, also there are high mean GPA and min GPA, which states about quite a competitive learning environment. Statistics on health-related variables shows that AUCA seniors are very healthy with an average of 4.5 breakfasts a week and more than 2 servings of fruits & vegetables per day, and maximums of 7 and 6 correspondingly. Also, students at AUCA prefer refrain from smoking and drinking too much. Although there are very high maxi-

mum values for cigarettes consumption and alcohol index (30 cigarettes per day and 4th level of alcohol out of 5), mean values are very low showing that the majority of students lead a healthy lifestyle.

As for demographic factors, around the half of respondents are in relationship and are living together with parents. The majority of seniors spend from 15 to 30 minutes to get from home to AUCA, which is good for the students as more time can be devoted to studies.

Statistics describing personal background factors illustrates that the majority of participants are planning to continue their studies at the graduate level with the mean MA/PhD of 0.82. About a half of students have part-time or full-time job, and more than a half have been involved in extracurricular activities and social life of AUCA. Students are diligent enough which is justified by the maximum of 15 hours spent on studying off-class and an average of 3.4 hours. Nevertheless, there are such people who do not study at all, but somehow became seniors, which is a usual thing for an undergraduate institution. In general, students earned average scores on entrance exams and demonstrate moderate level of ambitions.

This study takes advantage of a fairly representative sample of 151 AUCA senior students and graduates for such a narrow group of respondents. The probability of getting biased and not valid responses have been reduced as much as possible due to the high level of certainty among survey participants. Nonetheless, some students did not manage to fill out the questionnaire properly leaving some questions not answered. Due to such missing data several observations have been lost. Students did not receive any incentive for participating in the survey other than their strong will to help this study being developed. They were free not to participate without any penalty. Also, there was little cooperation from the departments in conducting the survey, which, if improved, can be a big advantage for further works on this topic.

Table 4.2: Descriptive Statistics

Variable	Min	Max	Mean
<i>Dependent Variable</i>			
GPA	2	4	3.25
<i>Health-related factors</i>			
# of breakfasts per week	0	7	4.59
# of servings of fruits & vegetables per day	0	6	2.62
Consumption of cigarettes	0	30	1.11
Alcohol index	0	4	0.7
<i>Demographic factors</i>			
Gender	0	1	0.4
Relationship status	0	1	0.47
Living situation	0	1	0.63
Time committed on the way from home to AUCA	0	5	1.79
<i>Personal background factors</i>			
MA/PhD plans	0	1	0.82
Presence of job	0	3	0.62
Extracurricular activities and social life of AUCA	0	1	0.73
Hours of studying off-class per day	0	15	3.4
Mathematics entrance exam score	0.21	1	0.55
TOEFL entrance exam score	300	643	523.4
Level of ambitions	0.35	0.86	0.59

Chapter 5

Results

Results of estimating the model (3.2) with 2SLS estimator are presented in Table 5.1. The estimations fully support the main hypotheses concerning *MA/PhD* plans and *studyhours* as both variables are highly-statistically significant and have large positive effect on *GPA*. One additional hour of studying off-class increases student's *GPA* by 0.155, which is a huge increase. If a student decides to spend on studying say, 3 hours more each day, his/her cumulative *GPA* is expected to increase by $0.155 \times 3 = 0.465$ on average. The effect of *studyhours* is even more impressive if we remember that some students spend more than 10 hours on studying off-class with the maximum value of 15 hours [see chapter 4]. The effect of *MA/PhD* on *GPA* is very strong as well, if a student is planning to get higher academic degrees, his/her *GPA* is expected to be 0.62 points higher on average.

The hypothesis is partly supported for *alcohol* variable with its statistical significance at 10% level. However its effect is almost unobserved with the coefficient of 0.08, which leaves no sense to interpret it as "a one point increase in the level of alcohol index leads to an expected increase in student's *GPA* of 0.08", hence, *alcohol* is not crucial predictor of *GPA* for the AUCA sample of 151 seniors and graduates, though statistically significant.

Results suggest that there is no practical difference in students' *GPA* based on the choice of the major. Out of 10 variables only International & Business Law is estimated to be statistically significant, however only at 10% significance level. This could be explained by the strict faculty members of IBL department or the program of IBL is in fact that difficult. The majority of departmental variables have negative effect on *GPA*, except for Business Administration department, positive effect of which is barely felt. This outcome certainly has the logic behind. In case they are statistically significant, that would mean that it is hard to have high *GPA* being a student of any department, and the relative difficulty would be measured by the size of the negative coefficients at each of the departmental variable – the higher is the coefficient for say, Software Engineering, the harder it is to study this particular field at AUCA.

Few words should be said concerning those variables which were considered as crucial

in the majority of literature, but turned out to be statistically insignificant in case of AUCA, and those which brought the sort of innovation to this study. Starting with demographic factors, gender and relationship status are estimated to have positive effects on *GPA* of about 0.1 each, which is not that much. There was observed a positive correlation between living with parents and *GPA*, however the effect is not that big, again only 0.13. This would mean that demographic differences are not that critical in determining the variation in *GPA* at AUCA. Other than demographic, there are two variables that were very close to the cherished significance level of 10% - TOEFL entrance exams score and involvement in social activities. Nevertheless, the effect of TOEFL score is almost vanished with the effect of 0.002. This result partially supports the findings of [Naylor and Smith \(2002\)](#). The resulting correlation coefficient between social and *GPA* is as it was expected – negative effect of about 0.16 on *GPA*. As for the health-related variables, there were no statistically significant variables other than alcohol, moreover, the quantitative effects of breakfast, frveg, and cigarettes are almost 0 each. As for the ambitions, the variable that is new for such kind of a research, it proved neither its statistical significance, nor its quantitative effect.

Summarizing the results of the regression, several variables have established their statistical importance and supported the general hypotheses. However, some variables that were considered as the main determinants of *GPA* by a number of authors behaved differently under the conditions of AUCA.

Table 5.1: Results of 2SLS Estimation

Variable	Coefficient	Standard error	t-statistics
Constant	1.484	0.686	2.163
Gender	0.107	0.109	0.985
Relationship status	0.102	0.096	1.062
Economics	−0.153	0.26	−0.59
Business Administration	0.004	0.274	0.014
Psychology	−0.253	0.256	−0.987
Sociology	−0.314	0.263	−1.193
Journalism & Mass Communications	−0.102	0.276	−0.37
International & Business Law	−0.446	0.245	−1.821 *
International & Comparative Politics	−0.017	0.246	−0.067
Software Engineering	−0.186	0.280	−0.664
American & European Studies	−0.325	0.247	−1.32
Living situation	0.128	0.106	1.21
Time committed on the way from home to AUCA	0.01	0.04	0.258
# of breakfasts per week	−0.01	0.022	−0.485
# of servings of fruits & vegetables per day	−0.002	0.027	−0.084
Consumption of cigarettes	−0.013	0.013	−0.995
Alcohol index	0.08	0.049	1.657 *
MA/PhD plans	0.617	0.134	4.596 ***
Presence of job	−0.039	0.069	−0.56
Extracurricular activities and social life of AUCA	−0.159	0.107	−1.482
Hours of studying off-class per day	0.155	0.022	7.203 ***
Mathematics entrance exam score	−0.08	0.29	0.275
TOEFL entrance exam score	0.002	0.001	1.638
Level of ambitions	−0.14	0.43	−0.327

Note: * significant at 10% ** significant at 5% *** significant at 1%

To avoid dummy variable trap Anthropology department dummy has been dropped

Chapter 6

Conclusion

This study provides some insights into investigating the determinants of academic performance at American University of Central Asia. There are a lot of different factors that are believed to affect GPA. A bunch of literature has been written discussing the determinants of academic performance for the universities all over the world which is the evidence of the increasing importance of this topic. However, no empirical works have been done so far in Central Asian region. This paper can fill this empty space for Central Asia and make the first step in the development of this topic in the region.

The data was collected through surveying current AUCA senior students and graduates. The total of 151 people participated in the survey, which is quite a good result for such a narrowed representative sample. The sample could have been increased by adding freshmen, sophomores, and juniors, but this would probably cause biases in the responses and the loss of representative power of cumulative GPA.

2SLS estimation technique was applied in this research and results obtained from the regression are considered to be consistent, because the endogeneity problem has been solved via successful instrumenting of endogenous variables. The resulting estimates support the general hypotheses. According to them, the crucial factors in predicting the variation in students' GPA are hours of studying off-class and MA/PhD plans of each certain student. Also, the topic has a sense of innovation from including in the model such variable as the level of ambition, which is the first time this factor was measured and its effect estimated in the regression.

The research leaves space for further development and improvement. There could be more cooperation from the university in conducting the survey in future, which would lead to the increased number of respondents and more precise results. AUCA policy makers should be interested in this type of topics as their findings might be very useful for the enhancement of the academic process and the quality of education, which is beneficial both for the university and its students.

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Appendix A: Questionnaire

1. Age: _____
2. Cumulative GPA: _____
3. Gender: ☐Male ☐Female
4. Are you in a relationship with anyone (do you have girlfriend/boyfriend)?
☐Yes ☐No
5. Department: _____
6. Are you living with your parents? ☐Yes ☐No
7. How much time do you usually spend to get to AUCA?
☐Less than 15 mins
☐15 mins
☐15-30 mins
☐30-45 mins
☐1 hour
☐More than an hour
8. How many times a week do you have breakfast?
☐0 ☐1 ☐2 ☐3 ☐4 ☐5 ☐6 ☐7
9. How many times per day do you have servings of fruits and vegetables?
☐0 ☐1 ☐2 ☐3 ☐4 ☐5 ☐more than 5
10. How many cigarettes do you smoke per day (put 0 if you do not smoke)? _____
11. Do you consume alcohol? ☐Yes ☐No
If yes, consider questions 13-16:
12. Have you ever felt you needed to cut down on your drinking? ☐Yes ☐No
13. Have people annoyed you by criticizing your drinking? ☐Yes ☐No
14. Have you ever felt guilty about drinking? ☐Yes ☐No
15. Have you ever felt you needed a drink first thing in the morning (eye-opener) to steady your nerves or to get rid of a hangover? ☐Yes ☐No
16. Are you planning to get MA/PhD degrees? ☐Yes ☐No
17. Do you have a full-time job(≥ 35 hours a week)? ☐Yes ☐No
18. Do you have a part-time job(< 35 hours a week)? ☐Yes ☐No
19. Have you been involved in any type of extracurricular social activity (ex.: debate club, AUCA football team, other clubs/teams)? ☐Yes ☐No
20. How many hours on average do you spend on studying off-class per day? _____
21. What was your score on AUCA Math entrance exam? _____
22. What was your TOEFL score when you enrolled in AUCA? _____

23. What level of education does your father have (put 10 if high school; 13 if professional technical education; 15 if university; 17 if MA; 20 if PhD)? _____
24. What level of education does your mother have (put 10 if high school; 13 if professional technical education; 15 if university; 17 if MA; 20 if PhD)? _____
25. How is it important for you to keep GPA above 3.0 level?
- ☐very unimportant
 - ☐somewhat unimportant
 - ☐of medium importance
 - ☐somewhat important
 - ☐very important
26. When you play a game with your friends or participate in a competition, do you feel like you're going to win? ☐never ☐sometimes ☐frequently ☐always
27. Do you think you have some above-average qualities?
- ☐never ☐sometimes ☐frequently ☐always
28. Do you think you possess all necessary skills to obtain what you want?
- ☐never ☐sometimes ☐frequently ☐always
29. Do you desire to be an important, influent and respected person?
- ☐never ☐sometimes ☐frequently ☐always
30. Do you have certainty that you will obtain what you want?
- ☐never ☐sometimes ☐frequently ☐always
31. Does the idea to have people working for you allure you?
- ☐never ☐sometimes ☐frequently ☐always
32. Do you know exactly what you want?
- ☐never ☐sometimes ☐frequently ☐always
33. Do you exactly know how to obtain what you want?
- ☐never ☐sometimes ☐frequently ☐always
34. Would you lie to a friend to obtain something important for you?
- ☐never ☐sometimes ☐frequently ☐always
35. Would you move to another nation to catch a good job offer?
- ☐never ☐sometimes ☐frequently ☐always
36. Would you be able to act illegally if this could help you realize your most important objectives? ☐never ☐sometimes ☐frequently ☐always
37. Would you sacrifice a friendship for an important objective?
- ☐never ☐sometimes ☐frequently ☐always
38. Do you think that you should never be satisfied with what you already have?
- ☐never ☐sometimes ☐frequently ☐always
39. Would you prefer a less paid and less responsibility job, or a better paid and more responsibility job? ☐less paid, less responsibility ☐better paid, greater responsibility
40. Do you believe that opportunities just happen, or do you think that they have to be built up? ☐they have to be built up ☐they just happen