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Determinants of university students' performance: Evidence from undergraduate economics students from a Bangladeshi University

Sayed Chandra Tabassum ^A	A	Lecturer, Department of Economics, United International University, Bangladesh
Md. Farid Dewan ^B	B	Assistant Professor, Department of Economics, Noakhali Science and Technology University, Bangladesh
Musharrat Shabnam Shuchi ^C	C	Department of Economics, United International University, Bangladesh
MMK Toufique ^D	D	Associate Professor, Department of Economics, Noakhali Science and Technology University, Bangladesh

Keywords

Attendance;
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Abstract

There is currently a research gap since no study systematically explored the factors impacting the performance of Bangladeshi university students, especially those studying economics. In this paper, we define and estimate an econometric model to explain the variation in the academic performance of undergraduate economics students. A student's ability, effort and motivation, and household attributes explain significant variation in university economics students' performance in semester final examinations. Among the ability variables, performance in previous semesters, higher secondary performance, English proficiency, having studied economics at the pre-university level, and having a science background come out as important determinants. Among the variables grouped as 'effort and motivation,' daily study time, the number of courses retaken, and best friend's past performance matter significantly. Up to a certain level, students with higher household incomes tend to perform better. Also, students from the local district tend to outperform others. With a mandatory attendance policy, making a minimum percentage of attendance binding in place, attendance fails to register any substantial impact. Also, the endogeneity of attendance could not be established.

Correspondence

mokammel.eco@nstu.edu.bd^A

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Introduction

Like other growing economies around the world, Bangladesh is increasingly becoming knowledge-driven. The service sector contributes more and more to the GDP each successive year. The share of the service sector in GDP was 54% in the fiscal year 2020-2021. The size of the service sector was 18.98 trillion Bangladesh taka (BDT) in the fiscal year 2020-21, experiencing an increase of BDT 8.92 trillion in the last 5 years (BER, 2021). During the previous several years, the number of public and private universities has increased significantly, and so did the number of economics departments and the number of students enrolled in economics. There are 161 universities in Bangladesh (University Grants Commission of Bangladesh, 2022). The quality of education affects productivity and social development and thus impacts economic growth (Hanushek & Woessmann, 2007; Raitano & Vona, 2013). Hence, policymaker needs to keep an eye on student performance (Giambona & Porcu, 2015). Currently, significant changes are taking place in the universities of Bangladesh as the Government has undertaken various programs to ensure quality higher education. Universities are now under greater performance scrutiny for their crucial role in a knowledge-based economy.

A university's performance is reflected in the graduate's capacity to serve society, which cannot be measured directly. However, a university has its performance evaluation system to appraise how much its students are imbued with knowledge, measured by academic grades. Since students' ability to contribute to the development of society is a major concern for policymakers and educators at higher learning institutions, it is imperative to study the factors affecting students' performance, which would help policymakers devise policies to raise students' contribution to the country.

A cursory glance at a recently published result of the term final examination of a batch of 63 undergraduate economics students at a Bangladeshi university reveals that on a scale of 4, 35 students achieved 3.00 and above, only four of them achieving 3.50 and above. 28 students, i.e., 44.45%, scored below 3.00. Given that a grade point average (GPA) of at least 3.00 is usually considered as reflecting a satisfactory performance, these statistics bring forth an essential question: What determines university-level economics students' performance? To address this question, we need to identify the factors that affect the performance of a university economics student.

Presently, there is a research gap in the context of Bangladesh, as no study has advanced to diagnose the factors responsible for students' performance at the tertiary level. Although Asadullah et al. (2007) examined the determinants of the performance of high school students, no study explored the factors impacting the performance of Bangladeshi university students. Using data on undergraduate economics students, this paper investigates how students' attributes and household attributes impact their academic performance.

The paper's organization is as follows: this introductory section is followed by a brief literature review. Section 3 describes the methodology. Section 4 estimates the model and reports the results. Section 5 provides a discussion of

the results, and section 6 concludes.

Literature review

Existing literature in the field has identified several factors exerting substantial influence on student performance in different settings. The determinants identified include student effort and previous schooling (Siegfried & Fels, 1979; Anderson & Benjamin, 1994), parental education and family income (Devadoss & Foltz, 1996), self-motivation, age and learning preferences (Aripin et al., 2008), and attendance (Romer, 1993).

Following Newman-Ford et al. (2009), factors contributing to a decline in student attendance in recent years include assessment pressures, poor lecture delivery, lecture schedule, and job constraints. Also, advancements in information technology and financial constraint have increased the number of 'part-time' students. However, many studies support the notion that students missing classes perform poorly compared to students who attend classes (Devadoss & Foltz, 1996; Durden & Ellis, 1995; Romer, 1993; Park & Kerr, 1990; Schmidt, 1983). Many such studies failed to separate attendance from other characteristics like motivation, intelligence, prior learning, and time-management skills.

In an influential paper, Romer (1993) reports the presence of rampant absenteeism, based on data on economics courses at three U.S. universities. Absence was related to the poor performance of the student. However, no causal effect was established due to the potential endogenous relationship between attendance and performance. Romer's article (1993) led to a slew of research. Durden and Ellis (1995) surveyed 346 students on a single course at a U.S. university. They found a critical level of absenteeism, after which the average 'modest' adverse impact becomes substantial. Cohn and Johnson (2006), who studied first-year economics students from a U.S. university from 1997-2001, also support the view. Devadoss and Foltz (1996) surveyed students across four U.S. universities taking a course in agricultural economics. They estimated a positive impact of attendance on performance. The study used proxies to measure unobserved characteristics like prior attainment, effort, and motivation. Stinebrickner and Stinebrickner (2008) also exploited survey data to generate proxies and carry out Instrumental Variable (IV) estimates. Stanca (2006) used panel information on microeconomics students at an Italian university. Considering the unobserved characteristics, he found a significant positive causal impact of attendance on performance. Arulampalam et al. (2012) used panel data for economic students at a U.K. university. They controlled for unobserved heterogeneity across students to address the endogeneity between absence and academic performance. The findings identified a causal effect from absence to performance, especially true for better-performing students.

Marburger (2001), analyzing information on 60 first-year microeconomics students, found a significant positive relationship between attendance and performance. Marburger (2006) found that mandatory attendance policy enhances student performance in a later study. Kirby and McElory (2003) used the travel time to college as the

instrument. They saw attendance having a positive and diminishing marginal effect on performance at an Irish university. Dobkin et al. (2007) employed a discontinuity design approach. They found that making attendance compulsory improves attendance and final examination performance significantly. Neri and Meloche (2007) found similar results using Australian data for students enrolled in microeconomics courses.

Rodgers (2002) used data for an introductory statistics course at an Australian university and found a robust positive association between attendance at tutorials and performance. However, a policy aimed at raising attendance did not improve performance. For the U.K., Martins and Walker (2006) found no significant impact of class attendance on performance for economics students at a university.

Gamazo et al. (2015) pointed out that girls are usually better at reading than boys in mathematics and science. They argued that the sign and degree of the impact of gender could depend on the subject matter. Woodfield and Earl-Novell (2006), using a sample of around two million graduates, found female students doing better, which was attributed to their higher conscientiousness lowering their chances of missing lectures. Haist et al. (2000) showed a context-specific role of gender. Though Borde (1998) found no evidence of gender affecting performance, Borde et al. (1998) found gender (male), quality of the previous institution, performance in prerequisite courses, part-time work status as important determinants. Male students did better in class in Nyikahadzoi et al. (2013). Age and student organization membership had no impact in this study. Agasisti and Vittadini (2012) reported students enrolled a year before the usual age and students who lost a year in the past were performing less, i.e., age having a negative impact. Also, in Newman-Ford et al. (2009), older students had lower educational achievements than younger students. Also, Pholphirul (2017) and Karakolidis et al. (2016) underscores the role of age in student performance. However, in Richardson (1994), mature students' performance was not worse than younger students.

Dolton et al. (2003) had information on students' time in class and self-study activities at a Spanish University. Both activities had significant positive impacts on examination scores. Raychaudhury et al. (2010) and Kernann et al. (2011) listed several factors like attendance, family income, parental education, teacher-student ratio, number of trained teachers, gender, the distance of schools as factors affecting the performance of students. Hijaz and Naqvi (2006), analyzing data from private colleges in Pakistan, found a negative relationship between family income and students' performance. Yu (2011) found that math proficiency, English proficiency, relevant high school courses, and academic aptitudes affected student performance. Zimmerman et al. (1992) discovered a positive relationship between self-motivation and academic performance. Sirin (2005) found a moderate to a strong relationship of socioeconomic status, including income, with academic performance. Also, studies like Pholphirul (2017), Karakolidis et al. (2016), Adeyemi and Adeyemi (2014), and Ali et al. (2013) emphasize the importance of socioeconomic background.

Sattayanuwat (2015) used data on 75 students and estimated both logit and probit models to identify factors affecting student performance in a single course. The study chose the probit model for giving a higher log-likelihood ratio and pseudo R². In this paper, gender played a role with male students performing better. Attendance also generates a positive impact. Other factors positively affecting performance are family income, if studied at public high schools, having a personal tutor, and students' attitudes. Sattayanuwat (2015) analyzed none of the papers that addressed attendance's endogeneity.

Bonacini et al. (2021) used student-level data on 8 EU countries and evaluated their performance in reading and mathematics. Their cross-country analysis identified the number of books at home, and school characteristics like the quality of a school and class size matter the most. Some of the few other studies that carried out the multi-country study are Lee and Barro (2001), Woessmann and Fuchs (2004), Hanushek and Woessmann (2013), and Masci et al. (2018). Almost all the multi-country studies used the same dataset, namely, the PISA survey dataset.

Some studies found immigrant students performing worse than native students (Giannelli & Rapallini, 2016; Tonello, 2016). However, Ammermueller (2007) and Schneeweis (2011) argued that the channel through which immigration status works is the relatively less well-off family background of the immigrant students than natives.

Students who perform well at high school or college are anticipated to do better at university. Many studies like Koh and Koh (1999), Duff (2004), Seow et al. (2014), and Jansen and de Villiers (2016) found prior academic achievement wielding significant impact on performance. Duff (2004), Byrne and Flood (2008), and Seow et al. (2014) identified prior academic performance as the most important determinant of students' current performance. Studies by Bartlett et al. (1993), Brahmasrene and Whitten (2001), and Gammie et al. (2003) found no significant impact of previous performance on current performance. However, all these studies focused on accounting students. Gracia and Jenkins (2003) and Gammie et al. (2003) accentuated the importance of past performance. They put forward the need to provide counseling to poor students.

Barlett et al. (1993) studied specifically if students had passed three particular courses. For Koh and Koh (1999), the measurement tool was a student's mean high school achievement. Seow et al. (2014) treated mathematical and non-mathematical aptitudes separately. Qualitative variables were used by Jansen and de Villiers (2016) to represent students' final year grades at high school.

Given the above literature review, there has not been any study that systematically analyzed the determinants of student performance at a Bangladeshi university to the best of our knowledge. In this paper, using the information on undergraduate economics students, we aim to achieve the following:

1. To investigate how student attributes such as ability, effort, and motivation, among others, influence university students' academic performance.
2. To examine how different household attributes impact student performance.

Methodology

Studies varied regarding the measure of prior performance. Often Grade Point Average (GPA) or Cumulative Grade Point Average (CGPA) have been used to quantify academic performance (Gracia & Jenkins, 2003). Some measured performance in a particular semester (Galiher, 2006; Darling, 2005; Broh, 2000; Stephens & Schaban, 2002), some looked at the result of a particular subject or the previous year result (Jansen & de Villiers, 2016; Hijazi & Naqvi, 2006; Gammie et al., 2003; Hake, 1988; Tho, 1994). In this paper, rather than analyzing student accomplishment on specific subjects, we analyze a student's performance in a semester and use GPA as the dependent variable. Following Coleman (1966) and Hanushek (2008), we conjecture that student performance, i.e., GPA, is the output of an education production function that reflects the relationship between academic performance and student attributes and household attributes. Assuming linearity in the parameters, we describe the multiple regression model,

$$y_i = \alpha_1 + \beta_1 x_{1i} + \beta_2 x_{2i} + u_i$$

y_i = student's academic performance
x_{1i} = student attributes
x_{2i} = household attributes
u_i = error term capturing all other factors affecting performance
i = 1, 2,, N

The variation in GPA is explained using several student and household characteristics. GPA in the most recent semester is assumed to indicate a student's academic performance. The prime traits that affect students' academic performance are factors like a student's ability, effort, and motivation, all of which are unobservable. The accurate estimation of β_2 is feasible if $E(x_{1i}u_i) = 0$. Nevertheless, ability, effort, and motivation are likely associated with performance. Abler students can give high effort, are more motivated, and are expected to perform better. Estimating β_2 , omitting x_{1i} , would generate a biased and inconsistent estimator owing to omitted variable bias. We circumvent this problem by finding proxy variables for student attributes and thus, estimate

$$y_i = \alpha_1 + \beta_1 x_{1i}^* + \beta_2 x_{2i} + u_i$$

$$x_{1i}^* = \gamma_0 + \gamma_1 x_{1i} + v_i$$

A consistent estimator of β_2 requires $E(x_{2i}, v_i) = 0$.

The University has varying prerequisites and entry exams for different faculties and students from different college education strands. We use past performance at the

university level, Higher Secondary Certificate (HSC) GPA, English proficiency, prior economics courses, and, where applicable, studies in the arts/commerce/science group at the higher secondary level as proxies for ability. To measure effort and motivation, we use attendance, daily study time, number of retakes, if receiving any scholarship, daily time spent on social media, if the student studies in a group, and the performance of the best friend in the Department. The last variable also captures the peer effect. Apart from these traits, other student characteristics considered include age, gender, religion, and if the student is from the local district. Household characteristics included in the paper are the father's education, the mother's education, and the family income. Family incomes are grouped into six categories.

The University has a mandatory attendance policy. A student must have at least 70% attendance to sit for the finals in a semester. As identified by several studies, attendance can be endogenous. We will use the Instrumental Variable – Two-Stage Least Squares (IV-2SLS) technique to quantify the impacts of the performance determinants. The Durbin-Wu-Hausman test will be employed to check for the phenomenon of endogeneity. We surveyed undergraduate Economics students of a Bangladeshi University who have completed at least one semester. 139 students participated in the survey.

We expect that abler students will perform better. This will be vindicated if the proxies for ability collectively increase the model's explanatory power significantly. An F test can verify this. Also, the magnitude and the significance of the coefficient associated with a proxy can bring out meaningful insights. The importance of effort and motivation can be evaluated similarly. Likewise, the associated coefficient's sign and significance will appraise the impacts of other variables and their importance.

Because of the potential endogeneity of attendance, we use the Instrumental Variable Two-Stage Least Squares (IV-2SLS) regression technique to estimate the model. We use 'if the student lives on campus' and 'if s/he faced any problem including health and family issues in the previous semester' as the instruments for attendance. We argue that if a student lives on campus, it requires less time to travel to the class and positively affects attendance. Also, if a student faced health, finance, and family problems, attendance would be affected negatively.

Results

The second column of Table 1 reports the IV-2SLS estimates and the post-estimation statistics. The test of endogeneity, followed by the 2SLS estimates, reveals that both the Wu-Hausman F test statistic and the Durbin-Wu-Hausman Chi-sq test statistic have large p-values. Hence the null hypothesis that the endogenous regressor is orthogonal to the error term, i.e., attendance is exogenous, cannot be rejected, and 2SLS estimation is not required. This inference is similar to Kirby and McElroy (2003), who found no endogeneity of attendance and used and reported OLS results.

Table 1: Determinants of student's performance.

Dependent Variable = Student Performance (GPA in the last term)		IV-2SLS Coefficient (Std. Error) N=139	OLS Coefficient (Std. Error) N=139	OLS Coefficient (Robust Std. Error) N=139
Constant		-.84 ^{**} (.48)	-.49 ^{**} (.24)	-.49 (.30)
<i>Student Attributes</i>				
<i>Ability</i>				
Past Performance		.60 ^{***} (.05)	.62 ^{***} (.05)	.62 ^{***} (.06)
GPA in Higher Secondary		.13 ^{***} (.05)	.13 ^{***} (.05)	.13 ^{***} (.06)
Score in English in the Admission Test		.07 ^{***} (.03)	.06 ^{***} (.03)	.06 ^{***} (.02)
If studied economics at the pre-university level		.04 ^{***} (.01)	.05 ^{***} (.01)	.05 ^{***} (.01)
Group in Higher Secondary (Science = 1)		.06 ^{***} (.01)	.06 ^{***} (.02)	.05 ^{***} (.01)
Group in Higher Secondary (Commerce = 1)		.03 [*] (.02)	.02 (.02)	.02 (.01)
<i>Effort and Motivation</i>				
Attendance		.15 (.10)	.07 [*] (.04)	.07 (.05)
Time spent in studying (hours/day)		.01 (.01)	.01 [*] (.00)	.01 [*] (.00)
Number of Retakes		-.02 ^{**} (.01)	-.02 ^{**} (.01)	-.02 ^{**} (.01)
Number of Retakes squared		.00 (.00)	.00 (.00)	.00 (.00)
If receiving any scholarship (yes = 1)		.02 (.01)	.02 (.01)	.02 (.01)
Time spent on social media (hours/day)		.01 (.01)	.02 (.01)	.00 (.01)
If studied in a group (yes = 1)		.01 (.01)	.00 (.00)	.00 (.00)
Best Friend's CGPA		.13 ^{***} (.04)	.13 ^{***} (.05)	.13 ^{***} (.04)
<i>Others</i>				
Age (years)		.01 (.01)	.00 (.00)	.00 (.00)
Sex (male = 1)		-.01 (.01)	-.01 (.01)	-.01 (.01)
Religion (Islam = 1)		-.01 (.01)	-.01 (.04)	-.01 (.01)
If hails from the local district (yes = 1)		.02 [*] (.01)	.02 [*] (.01)	.02 [*] (.01)
<i>Household Attributes</i>				
Father's Education (years)		-.01 (.01)	-.00 (.01)	-.00 (.01)
Mother's Education (years)		-.02 (.01)	-.02 (.01)	-.02 (.01)
Income Category II		.03 ^{***} (.01)	.03 ^{***} (.02)	.03 ^{***} (.01)
Income Category III		.04 ^{***} (.02)	.04 ^{***} (.02)	.04 ^{***} (.02)
Income Category IV		.06 ^{***} (.02)	.06 ^{***} (.02)	.06 ^{***} (.02)
Income Category V		.04 ^{***} (.02)	.03 ^{***} (.02)	.03 ^{***} (.02)
Income Category VI		.02 (.02)	.02 (.02)	.02 (.02)
Centered R ² (Centered R ²)		.91 (.99)		
R ² (Adjusted R ²)			.92 (.89)	.92
F _{1, 113}		F _{25,113} = 47.04 (p = .00)	F _{25,113} = 48.82 (p = .00)	F _{25,113} = 97.62 (p = .00)
Test of endogeneity (H ₀ : Attendance is exogenous)	Wu-Hausman F test	F _{1,112} = .58 (p = .45)		
	Durbin-Wu-Hausman chi-sq test	χ ² (1) = .72 (p = .39)		
Test of omitted variable (H ₀ : Model has no omitted variable)	Ramsey RESET test		F _{1,110} = .86 (p = .47)	
Test of heteroscedasticity (H ₀ : Constant variance)	Breusch-Pagan / Cook- Weisberg test		χ ² (1) = 3.57 (p = .06)	
	White's Test		χ ² (138) = 139 (p = .46)	

The third column in Table 1 presents the Ordinary Least Squares (OLS) estimators. The diagnostic tests show that though the model does not suffer from the omitted variable bias, it does suffer from heteroscedasticity. Furthermore, the mean VIF is 2.58, and none of the individual VIF is as large as 10, i.e., a high correlation is not present here. The only problem here is heteroscedasticity.

Thence we estimate the model with heteroscedasticity-adjusted robust standard errors, as reported in column 4 of Table 1. These are our final results which will be interpreted. According to the diagnostics, the model's overall predictive power is significant and explains around 92% of the variations in student performance.

First, we look at the 'ability' variables. Past performance, score in English in the admission test, if studied economics at the pre-university level, if s/he was a student of the science group at higher secondary (the benchmark category is the arts group) – all exert positive impacts significant at less than 1% level of significance, on the performance of the student. The effect of GPA in higher secondary is also positive but significant at a 5% level. A student's commerce background fails to register any significant difference from the base category.

Among the variables representing 'effort and motivation,' the CGPA of the student's best friend exerts a positive influence that is significant at a 1% level. The impact of

the number of retakes is negative, linear, and statistically significant. Study time is also a positive determinant, though significant only at the 10%. Scholarship, time spent on social media, and group study turn out to be insignificant determinants. The University has a mandatory attendance policy, and attendance plays no vital role in enhancing student performance.

Of the other characteristics, age, gender, and religion are unimportant determinants. However, if the student is from the local district, their performance is better (significant at 10% level). This finding may be because local students stay with their families and are under a higher degree of monitoring by the family or guardians. Among the household attributes, father's and mother's education do not significantly affect performance. However, the level of household income is an important determinant of performance.

Student's 'ability' increases the predictive power of the model significantly. The corresponding F statistic is $F_{6,113} = 49.20$ with a p-value = .00. The variables representing student's 'effort and motivation', when taken together, also increases the overall significance of the model appreciably ($F_{8,113} = 3.09$ with a p-value = .00). Similar inferences can be drawn for the household attributes ($F_{7,113} = 2.31$, p-value = .03).

Discussion

To find the determinants of students' academic performance, we estimate a multivariate regression model. Our data did not support an IV-2SLS model. Hence, we estimated the model using the OLS approach and calculated the robust standard errors.

As a group, the 'ability' variables affect student performance significantly. Except for one, all the variables in this group are individually significant. If past performance increases by 1 unit, on average, and holding all else equal, student performance increases by .62 units. So, on average, students who performed better in the past perform better today. Similarly, if a student's GPA in the Higher Secondary is raised by 1 unit, their academic performance in a semester at the university level increases by .13 units. All the coefficients can be interpreted similarly. In a typical economic course, all the reading materials are in English, a foreign language. Our evidence suggests that students' English proficiency affects their academic performance positively. Students come to study economics from different educational backgrounds. If we look into that, we find that if someone has studied economics at the pre-university level, it affects their performance positively and significantly. Many economics courses are mathematical. Students with a good mathematical background are likely to do better in economics. Our study supports this. Students who studied in the Science group (the most mathematics-oriented group) in the Higher Secondary, compared to students who studied Arts (the least mathematics-oriented group), perform significantly better. However, studying Commerce in the Higher Secondary has no important impact on performance.

Efforts and motivation are also significant determinants of performance. However, only three variables in this group are significant. The most important is the peer effect. A best friend's performance affects a student's performance positively and significantly. Time spent studying also exerts a significant favorable influence on performance. Another determinant is the number of retakes which generates a significant negative impact. This is expected because a student needs to study more subjects and sit for more exams in a semester with retakes. Often, it is assumed that as the number of retakes increases, performance falls at a higher rate, i.e., the impact of the number of retakes is nonlinear. To capture this, we also included 'number of retakes squared' in our model. The findings suggest that such a nonlinear impact is absent here. Other variables like scholarship, time spent in social media, and group study are not important determinants of performance. Among the other student attributes, only one is important. A local student does better than someone from outside the district.

Household attributes are also important determinants of student performance. Individually, three of the income category dummies exert significant positive influence when compared to the base category. For income categories II, III, and IV, the impact on performance is positive and significant, compared to income category I. However, being in income categories V and VI does not increase performance significantly compared to the reference income category. This implies that higher household income is an essential determinant of performance up to a certain level. Once that level is reached, income fails to improve performance further.

Our results show that attendance does not improve academic performance. This is in contrast to Romer (1993), Durden and Ellis (1995), Devadoss and Foltz (1996), Dolton et al. (2003), Kirby and McElroy (2003), Cohn and Johnson (2006), Stanca (2006), and Arulampalam et al. (2012) that found that attendance influences student performance positively and significantly. The University's mandatory attendance policy might have played a role here.

Similar to Devadoss and Foltz (1996), we found motivation as an important determinant. Park and Kerr (1990) and Durden and Ellis (1995) confirm our findings that GPA and entrance exam scores are important determinants of achievements in economics courses. Prior GPA was also a strong and positive factor in Martin (1989), Devadoss and Foltz (1996), and Borde et al. (1998). Also, consistent with Brasfield et al. (1992) and Durden and Ellis (1995), who found that previous exposure to calculus affects performance positively, students from the science group, the group with the highest number of mathematical courses, perform better. Our results are consistent with Myatt and Waddell (1990), Brasfield et al. (1993), Durden and Ellis (1995), who reported previous economics courses improving performance and thus contradict the findings of Siegfried and Fels (1979) and Kirby and McElroy (2003).

We diverge from Durden and Ellis (1995), as the impacts of father's and mother's education are insignificant in our study. Like Borde et al. (1998), age has no remarkable effect on performance. Gender plays no role in performance, a

finding consistent with Williams et al. (1992), Durden and Ellis (1995), Kirby and McElroy (2003), Cohn and Johnson (2006), and Stinebrickner and Stinebrickner (2007), but contrary to Siegfried (1979), Lumsden and Scott (1987), and Borde et al. (1998). Cohn and Johnson (2006) found no significant impact of 'if the student attempted the class before.' In our paper, the number of retakes played an important role. We provide strong evidence that peer effects matter, similar to Stinebrickner and Stinebrickner (2007). Similar to Dolton et al. (2003) and Stinebrickner and Stinebrickner (2007), a student's study time positively impacts performance in our study.

Conclusion

There is a gap in the literature as no study systematically explored the determinants of Bangladeshi university students' academic performance. In this paper, we estimate an econometric model to investigate how student attributes such as ability, effort and motivation, and household attributes impact the academic performance of undergraduate economics students.

We use past performance at the university level, higher secondary level GPA, English proficiency, pre-university economics courses, and if studied in the arts/commerce/science group at the higher secondary level as proxies for ability. To measure the level of effort and motivation, we use attendance, daily study time, number of retakes, if receiving any scholarship, daily time spent on social media, if the student studies in a group, and the best friend's performance. Apart from these traits, other student characteristics considered include age, gender, religion, and the student from the local district. Household characteristics included in the paper are the father's education, the mother's education, and family income.

Because of the potential endogeneity of attendance, we use the Instrumental Variable Two-Stage Least Squares (IV-2SLS) regression technique to estimate the model. We use 'if the student lives on campus' and 'if s/he faced any problem including health and family issues in the previous semester' as the instruments for attendance. The test of endogeneity, followed by the 2SLS estimates, reveals that attendance is exogenous, and hence OLS is the justified method.

The paper's findings indicate that a student's ability, effort and motivation, and household attributes individually explain significant variation in university economics students' performance in semester final examinations. Among the ability variables, performance in previous semesters, higher secondary performance, English proficiency, having studied economics at the pre-university level, and having a science background come out as important determinants. Among the 'effort and motivation' variables, daily study time, the number of courses retaken, and the best friend's performance matter significantly. Students with higher household incomes tend to perform better up to a certain level. Also, students from the local district tend to outperform others. With a mandatory attendance policy, which makes a minimum percentage of attendance binding, attendance fails to register any substantial impact.

A limitation of our study is that due to data inaccessibility, we could not control for department-level or university-level characteristics. Such an analysis requires data from the country's different economics departments or different universities. Nevertheless, this research paves the way for further research in this area.

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