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What explains the academic success of second-year economics students? An exploratory analysis[1]

PIETIE HORN, ADA JANSEN AND DEREK YU[2]

ABSTRACT

The factors influencing academic success of first-year Economics students have received much attention from researchers. Very little attention, however, has been given to the determinants of success of senior Economics students. In the USA, Graunke and Woosley (2005: 367) indicate that college sophomores (second years) face academic difficulties, but this receives little attention in the literature.

Economics is an elective subject for second-year students at Stellenbosch University. The academic performance of the second-year students has shown a decline, as compared to the first-year Economics performance and the faculty's average performance. An observed phenomenon at Stellenbosch University is the poor attendance of lecture and tutorials by second year students, some of the factors than can perhaps explain why students perform poorly. This phenomenon may be explained in part by second year students losing interest in academic activities, focusing on other social commitments.

This study investigates the academic success of second-year Economics students. It adds to the existing literature on the factors affecting the academic success of Economics students by focusing on the second-year students (a much neglected group in empirical studies, particularly in South Africa).

The empirical analyses confirm some of the existing findings in the literature, namely that lecture and tutorial attendance are important contributors to academic success. We also find that as students progress to Economics at the second-year level, their performance in individual matriculation subjects is less relevant, except for those students who had taken Additional Mathematics. However, the matriculation aggregate mark is significant in explaining the academic performance, in a non-linear way. An important finding is that non-White students tend to perform more poorly in essay writing (one of the components of the course mark in the second year) than White students.

Keywords: Education, Undergraduate, Second-year economics, Academic performance
JEL codes: A2, A22, A29

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1. *Introduction*

The academic success of first-year Economics students has received much attention from researchers in their attempt to explain the factors influencing performance. This is due to students in Economics generally performing worse as compared to other social sciences. Very little attention, however, has been given to how successful senior Economics students are. Graunke and Woosley (2005: 367) indicate that American college sophomores[3] face academic difficulties, but they do not receive much attention in the literature.

Studies have revealed that the academic performance of first-year students depends on numerous factors, ranging from attendance of lectures, tutorial attendance, their age and gender, as well as the matriculation results obtained. The question that arises is what determines the success of Economics students after completing their first year of study? Can one assume that the same factors identified in the first year of study are still applicable, or are there other (new) determinants of success? Some reference is made in the literature to a general slack in academic performance in the second year of study, referred to as the 'sophomore slump' (Gump, 2007).

Economics is an elective subject for second-year students at Stellenbosch University (SU). This gives an indication that those students who choose Economics as one of their second-year subjects do so because they have developed some interest in the subject from their first-year. However, the second-year students' academic performance tends to deteriorate, as compared to the first-year Economics performance and the faculty's average performance. What has been observed at SU is the poor attendance of lecture and tutorials. This may be explained in part by students losing interest in academic activities, focusing on other social commitments (Gardener (2000) in Graunke and Woosley (2005)).

This study investigates the academic success of second-year Economics students. It adds to the existing literature on the factors affecting the academic success of Economics students by focusing on the second-year students (a much neglected group in empirical studies, particularly in South Africa).

The outline of the paper is as follows: section 2 provides a concise overview on the literature discussing factors influencing the academic success of second-year students. Section 3 introduces the second-year Economics modules at SU and provides an overview on the data used in the study. This is followed by descriptive statistics and analyses in sections 4 and 5. Section 6 discusses the econometric models and results, and section 7 concludes.

2. *Literature review*

Extensive research has been completed on the factors affecting the success rate of first-year students such as gender, matriculation subjects, class attendance as well as the effect of attendance of structured tutorials classes, (see Horn and Jansen 2008). Some of these factors could also have an effect on the pass rate of second year Economics students.

When using the education production function approach, inputs are changed into outputs as discussed in Hanushek (1979). The quality of the outputs can be facilitated by adaptations to technology, one being tutorial programmes. This study will not only look at the latter but also the effect of the environment from which the student originates and the effect this has on the student. Parker (2006) and Edwards (2000) also discuss the so called "black box" which is perceived to be positioned between the inputs and the outputs. This "black box" refers to students within educational institutions, where the transformation process occurs. The

[3] In the USA, students in their second year of study are referred to as sophomores.

effectiveness of this "black box" in transforming the inputs of second year students into specific outputs is what is examined.

Both Romer (1993) and Kirby and McElroy (2003) found positive relationship between class attendance and performance for first year students. This should also apply to second year students and was confirmed in a study by Gump (2007). This study also found that the age of the students correlated positively with class attendance and performance, i.e. the older the student, the better his/her class attendance and therefore the better the performance. The findings by Stanca (2006) also hold, namely that with voluntarily class attendance only the more motivated students would attend classes and by being motivated, their performance would also be better. Friedman, Rodriquez and McComb (2001) found that the better the performance of the second year student in a specific course, the less likely that the student would be absent. The same applies to those students who would like to improve their marks or those who would like a better mark. At Stellenbosch University it was found that the academically stronger students do attend classes more regularly.

In Gump's (2007) investigation into the co-called sophomore slump, it was found that second year students perform better than first year students in an elective specific course taken by both. Sophomores outperform both first and third year students. Absence from class was also not a characteristic of the sophomores. The course that was under scrutiny by Gump was an elective course and Friedman, Rodriquez and McComb (2001) confirm that there is a positive correlation between elective courses and class attendance. This indicates that students attend those courses that they elected more regularly than courses that are mandatory for a specific degree programme. Intrinsic motivation might play a role here. They also found that there is correlation between class size and attendance – the bigger the class the more absenteeism. This result was also found in the studies regarding first year students (see Hutcheson and Tse (2006); Romer (1993)).

Referring to class size and the effect it has on students' attendance, Swope and Schmidt (2006) indicate that personality type might be more important for large class settings and that this could affect attendance. Certain personality types do not function adequately in large classes. Friedman, Rodriquez and McComb (2001) support this finding as there is an increase in absenteeism of sophomores in large classes, especially if there is no penalty for being absent. Students prefer small classes as they can be more actively involved in discussions.

Although insignificant differences between male and female students were found in most of the studies, significant differences where found when comparing performance. Lanius (1997) found that women generally outperformed men in written assignments and the final examination while Greene (1997) found that women had stronger skill in composition than men, although this did not indicate that they necessarily understood the work better. Women were just able to articulate better what they have learnt. Although it is expected of second year students at Stellenbosch University to write an essay as part of their assessment, it has been found that the performance here depends more on the type of course that the students are taking. In courses where written assignments are more common, students are more geared to this form of assessment. These students outperform students majoring in Economics.

Flowers (2002) indicated that senior students appear to be more goal orientated than freshmen. They have a clearer view of their potential careers and the steps they have to follow to attain this. Graunke and Woosley (2005) do however discuss a major issue of a potential sophomore slump, namely that although senior students are more goal orientated, they do not receive the same institutional support that freshmen do. This study found that sophomores who were actively supported by an academic faculty member performed better in such a lecturer's course. Sophomores are not as actively involved in the institution's activities as are freshmen and

therefore these activities do not contribute to sophomores' performance. Gahagan and Hunter (2006) support the above and also indicate, as did Graunke and Woosley (2005), that the institution should pay greater heed to the specific needs of the sophomore as those sophomores who had made definite career choices in their subject selection do perform better than those who had not. Graunke and Woosley (2005) also indicate that the institution, or the different faculties, should redesign their support systems for the first years so that it can be continued into the second year. At Stellenbosch University the support systems offered by the Department of Economics for first year students are not continued in the same intensive manner into the senior years. Second year students receive tutorial classes but these tutorials are not as aimed at the individual needs of the students as during the first year. No specific evaluations of the needs of the sophomore and the academic difficulties experienced by these students have ever been done. In the first year special committees gather to address the follow-through and attrition rates of first year students. Specific support systems are also in place for first years. This does not continue into the sophomore year.

3. The second-year Economics modules at SU and the data

3.1 General information about the second-year programme

The Economics Department at SU offers two second-year modules, namely ECO214 and ECO244. The former includes the core Economic theory, namely Microeconomics and Macroeconomics, while ECO244 focuses on Monetary Policy and International Trade. The modules are offered in the first and second semesters respectively. ECO214 is the focus of this paper.

3.2 Evaluation structure of ECO214

In 2008, 574 students were enrolled for the ECO214 module, but due to incomplete demographic information on four students, only the remaining 570 students are included for the forthcoming analyses. There were thirteen weeks of lectures in total, with three lecture periods per week (i.e., 39 lectures in total). Students could also attend voluntary tutorial sessions, of which there were nine sessions presented during the semester. Students can also make use of online-learning (the WebCT Vista system). Here they can access information on the course, download course material and interact with other students.

The assessment of the module consisted of four tests, an essay and an examination. The students had to write any three of the four tests. They could opt to write all four tests if they wanted to improve their class mark by writing the fourth test[4]. The course mark was calculated according to the formulae shown in Table 1 below.

[4] Some students had to write the fourth test because they were absent in one of the first three tests for reasons like illness, etc. On the other hand, other students (25 in total) opted to write all four tests because they wanted to improve their course mark for the module.

Table 1: Calculation of the course mark

Test1 (Max: 100%)	Course mark – if the student only wrote 3 tests: [Test1 ×0.4 + Test2 × 0.3 + Test3 × 0.3 + Essay × 0.4] / 1.4 or [Test2 ×0.3 + Test3 × 0.3 + Test4 × 0.4 + Essay × 0.4] / 1.4 or [Test1 ×0.4 + Test2 × 0.3 + Test4 × 0.3 + Essay × 0.4] / 1.4 or [Test1 ×0.4 + Test3 × 0.3 + Test4 × 0.3 + Essay × 0.4] / 1.4 Course mark – if the student wrote all 4 tests: [Test1 ×0.4 + Test2 × 0.3 + Test3 × 0.3 + Test4 × 0.4 + Essay × 0.56] / 1.96
Test2 (Max: 100%)	
Test3 (Max: 100%)	
Essay (Max: 100%)	
Test4 (Max: 100%)	

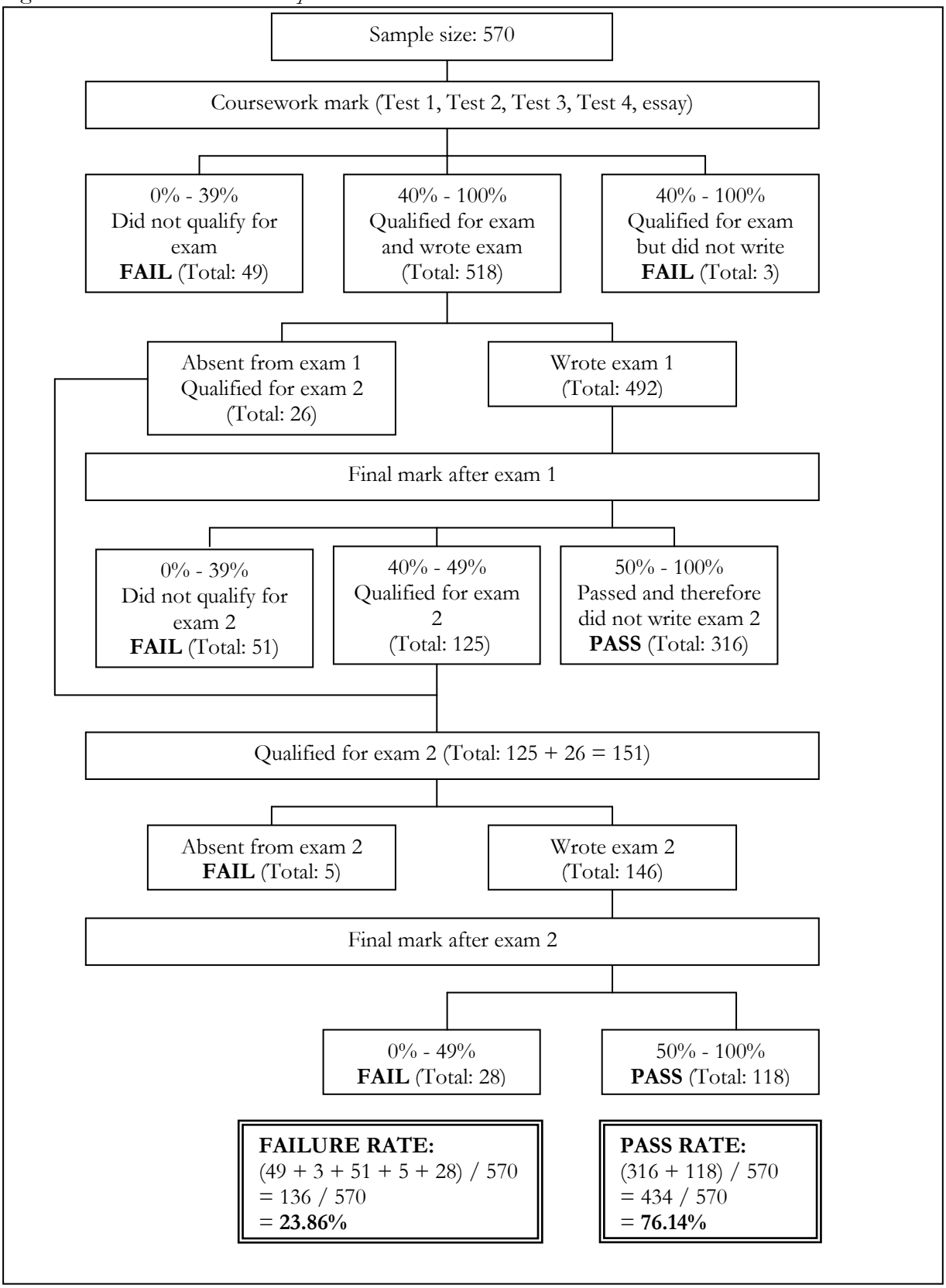
If students did not comply with the course requirements (i.e. they did not write three tests and/or did not submit the essay), they did not qualify to write the examination.[5]. Furthermore, if the student's course mark was below 40%, he/she was not allowed to write the examination. From the sample of 570 students, 26 students obtained a course mark below 40%.[6] However, three other students with a course mark at or above 40% dropped out of the module and did not write the examination. Therefore, 52 students in total did not write the final examination.

For those who were qualified to write the examination (518 in total), there were two examinations. After the first examination (exam 1), the student's final mark was calculated as follows: course mark × 0.4 + exam 1 mark × 0.6. If the student was absent from exam 1 for valid reasons like illness, he or she was allowed to write the second examination (exam 2), and his/her final mark was calculated as: course mark × 0.4 + exam 2 mark × 0.6. On the other hand, if the final mark after exam 1 was between 40% and 49%, the student could write exam 2, and the final mark was calculated as: course mark × 0.4 + exam 1 mark × 0.3 + exam 2 mark × 0.3.[7]
Of the 518 students who attained entry into the examination, 492 wrote the first examination with the other 26 students being absent.[8] Of those who wrote the first examination, 176 students' final mark was below 50%, with 125 students obtaining a mark of between 40% and 49%. Therefore, in total, 151 students (125 + 26) had a final mark below 50% and were given the option to write the second examination.

Finally, 5 of these 151 students opted not to write exam 2 (thus, their final mark remained below 50% and they therefore failed the module). With regard to the remaining 146 students, after exam 2, 28 obtained a final mark below 50%. Therefore, 136 students (out of the 570) failed the module, and the pass rate of the module was 76.14% (434/570). Figure 1 summarizes the explanation in this section.

[5] 23 students did not qualify for the examination because they did not comply with the course requirements.
[6] In total 49 students did not qualify to write the examination.
[7] However, students whose final mark was below 50%, but their exam 2 mark was above 50%, were awarded a final mark of 50%.
[8] Students qualified to write the second examination if they had obtained a final mark of between 45 and 49%. Some students also write the second examination because they were absent from the first examination for medical reasons or other personal reasons (e.g., attending a funeral).

Figure 1: The 2008 ECO214 sample



4. *Demographic and educational attainment characteristics of the students*

4.1 Demographic characteristics

Table 2 presents the demographic characteristics of the students, which can be summarized as follows:

- Almost all of them are South Africans
- Nearly two-thirds of them reside in the Western Cape Province
- Nearly 90% of them are Whites
- Nearly two-thirds of them are males
- Looking at the gender composition by race, the male share is higher in Whites (nearly two-thirds) compared to Blacks (36.8%) and Coloureds (43.8%) – See Figure A.1.
- Slightly more than 70% of them are aged either 19 or 20 years

Table 2: Demographic characteristics of the ECO214 students

Nationality		
South Africa	552	96.8%
Namibia	11	1.9%
Zimbabwe	2	0.4%
Germany	2	0.4%
Switzerland	1	0.2%
UK	2	0.4%
	570	100.0%
Race		
Black	19	3.3%
Coloured	48	8.4%
Indian	2	0.4%
White	501	87.9%
	570	100.0%
Gender		
Male	356	62.5%
Female	214	37.5%
	570	100.0%
Age		
18 years	7	1.2%
19 years	202	35.4%
20 years	208	36.5%
21-25 years	153	26.9%
	570	100.0%
Province or country of residence		
Western Cape	362	63.5%
Eastern Cape	42	7.4%
Northern Cape	14	2.5%
Free State	7	1.2%
KwaZulu-Natal	38	6.7%
North West	4	0.7%
Gauteng	80	14.0%
Mpumalanga	3	0.5%
Limpopo	3	0.5%
Other African countries	15	2.6%
Outside Africa	2	0.4%
	570	100.0%

4.2 Study characteristics in Stellenbosch

Table 3 shows the study characteristics of the students in Stellenbosch, which can be summarized as follows:

- More than 80% are enrolled for a Bachelor Degree from the Faculty of Commerce
- Nearly 90% indicate that 2008 is not their final year of study in Stellenbosch
- Nearly two-thirds of them started studying at Stellenbosch in 2007 or 2008 (the latter transferring from other universities)
- A very high proportion of students stay in the residences at or close to the campus. Only about 10% live with their families.

Table 3: Brief study characteristics of the ECO214 students

Faculty		
Agriculture	7	1.2%
Arts	84	14.7%
Commerce	471	82.6%
Law	8	1.4%
	570	100.0%
When did the student start studying in Stellenbosch?		
2001	1	0.2%
2002	2	0.4%
2003	6	1.1%
2004	16	2.8%
2005	37	6.5%
2006	126	22.1%
2007	374	65.6%
2008	8	1.4%
	570	100.0%
Is 2008 the final study year for the student?		
Only first year	5	0.9%
Not final year	507	88.9%
Final year	58	10.2%
	570	100.0%
Age		
18 years	7	1.2%
19 years	202	35.4%
20 years	208	36.5%
21-25 years	153	26.9%
	570	100.0%
Student residence status		
University residence	261	45.8%
University house	4	0.7%
Private accommodation	222	38.9%
Private hostel	11	1.9%
Living with family	61	10.7%
Others	11	1.9%
	570	100.0%

4.3 Matriculation[9] subjects and results

As far as the Matriculation results of the ECO214 students are concerned[10], Tables 4 and A.1 show the following:

- Slightly above 50% of the students did Matriculation at schools from the Western Cape Education Department
- Nearly three quarters wrote exams on 6 subjects, while approximately 25% wrote exams on 7 subjects[11].
- Looking at the Matric aggregate mark[12], almost half of them obtained a distinction.
- Only 96 students (out of 558) or 17.2% took Economics in Matriculation. Approximately half took Biology and Accounting. Furthermore, two-thirds of them took Physical Science (Table A.1)
- Table A.1 also shows that the proportion of students obtaining an A symbol (regardless of grade) is the highest – slightly above 40% – in the following subjects: English second language, Afrikaans first language, Economics, Geography, History and Accounting. The mean entry points is the highest in Afrikaans first language (7.16), followed by English second language (7.07), Geography (7.07) and History (7.03).

Table 4: Matriculation subjects information of the students

Education Department		
Western Cape	311	55.2%
Eastern Cape	33	5.9%
Northern Cape	11	2.0%
Free State	12	2.1%
KwaZulu-Natal	14	2.5%
North West	3	0.5%
Gauteng	52	9.2%
Mpumalanga	3	0.5%
Limpopo	1	0.2%
Independent Education Board (IEB)	99	17.6%
Foreigners	24	4.3%
	563	100.0%
Number of subjects		
Fewer than 6 subjects	5	0.9%
6 subjects	402	71.4%
7 subjects	142	25.2%
8 subjects	14	2.5%
	563	100.0%
Total Matriculation marks		
50%-59%	19	3.4%
60%-69%	100	17.8%
70%-79%	171	30.5%
80%-100%	271	48.3%
	561	100.0%

[9] Matriculation refers to the final school examination written. The results of this examination usually determine the students' access to university.

[10] The Matriculation results are only available in 563 (out of 570) students.

[11] 5 students claimed they had fewer than 6 Matriculation subjects. Thus, only the remaining 558 students will be included when the Matriculation results are analyzed.

[12] It is possible that a student's Matric aggregate mark exceeds 100% if he/she took more than the required subjects at the Higher Grade.

4.4 First-year Economics results

Of the 570 students in the sample, 552 passed first-year Economics (i.e., module ECO178[13]) at Stellenbosch after summer school (see Table 5). Looking at these 552 students in greater detail, more than 90% of them passed the module on their first registration. Furthermore, after summer school[14], nearly half obtained a final mark[15] of between 50% and 54%, while only 8% obtained a distinction (i.e., 75% or above).

Table 5: ECO178 marks of the students in the sample

Where did the student pass first-year Economics?		
Stellenbosch	552	96.8%
Other universities	18	3.2%
Number of ECO178 registration		
One	509	92.2%
More than one	43	7.8%
	552	100.0%
ECO178 final mark (before summer school)		
0%-49%	53	9.6%
50%-54%	244	44.2%
55%-59%	72	13.0%
60%-64%	77	13.9%
65%-69%	43	7.8%
70%-74%	21	3.8%
75%-100%	42	7.6%
	552	100.0%
ECO178 final mark (after summer school)		
50%-54%	260	47.1%
55%-59%	87	15.8%
60%-64%	90	16.3%
65%-69%	50	9.1%
70%-74%	21	3.8%
75%-100%	44	8.0%
	552	100.0%

[13] In 2008, the ECO178 year course was split into two semester modules, namely ECO114 and ECO144.

[14] The ECO178 summer school program began in the 2007 academic year. A student whose ECO178 final mark was below 50% was allowed to attend the summer school lecture in January 2008. If they passed the summer school exam, then they were allowed to enrol the second-year Economics module in the 2008 academic year.

[15] This stands for the final mark of the students before taking the summer school results into consideration. In fact, of the 552 students, 53 actually failed ECO178 after the exam, but then qualified to attend summer schools and passed the module after the summer school exam.

4.5 ECO214 information

4.5.1 Results

Table 6 below shows the number of times students have been registered to take ECO214 (more than once implies that they are repeating), lecture and tutorial attendance, as well as the final mark of the students in the ECO214 module. The results could be summarized as follows:

- Nearly 85% of the students enrolled for this module for the first time in 2008.
- As far as tutorial attendance is concerned, nearly 20% of students never attended the tutorials. In addition, only approximately one-third of students attended at least 5 out of the 9 tutorials.
- Looking at the lecture attendance, slightly above half of the students attended more than 4 lectures of the 8 lectures where attendance was recorded[16], while only 10% attended all these lectures Note that the correlation coefficient between lecture attendance and tutorial attendance is 0.64.
- 9.1% of students did not qualify to write the final ECO214 exam, while about 15% failed the module after the final exam. Nearly half of the students got 50%-59%, and only 6.3% obtained a distinction. The correlation coefficient between ECO214 and ECO178 final marks is 0.60.

Table 6: ECO178 marks of the students in the sample

Number of times registered for ECO214		
1	482	84.6%
2	85	14.9%
3 or more	3	0.6%
	570	100.0%
ECO214 final mark (after exam1 and exam2)		
Not qualified to write exam or dropped out before exam	52	9.1%
0%-39%	53	9.3%
40%-49%	31	5.4%
50%-54%	216	37.9%
55%-59%	64	11.2%
60%-64%	63	11.1%
65%-69%	34	6.0%
70%-74%	21	3.7%
75%-100%	36	6.3%
	570	100.0%
Tutorial attendance		
0	110	19.3%
1 – 2	141	24.7%
3 – 4	135	23.7%
5 – 6	102	17.9%
7 – 8	61	10.7%
9	21	3.7%
	570	100.0%
Lecture attendance		
0	37	6.5%
1 – 2	100	17.5%
3 – 4	114	20.0%
5 – 7	262	45.9%
8	57	10.0%
	570	100.0%

[16] Despite the fact that there were 39 lectures in total, the authors took attendance registers in only 8 lectures between February and April 2008.

4.5.2 Further analysis of the ECO214 final mark

The ECO214 final mark was only analyzed briefly in the previous section (4.5). In this section, the students are divided into the following five groups, according to their final mark (after the two examinations):

- Fail: Did not qualify to write exam or dropped out of the module before exam
- Fail: Final mark – (0%-49%)
- Pass: Final mark – (50%-59%)
- Pass: Final mark – (60%-69%)
- Pass: Final mark – (70%-100%)

Table 7: General characteristics of the students by ECO214 final mark

	Did not qualify	Fail (0%-49%)	Pass 50%-59%	Pass 60%-69%	Pass 70%-100%	All ECO214 students
Number of students by race in each group						
Black	1	3	13	1	1	19
Coloured	8	5	29	4	2	48
Indian	1	0	0	1	0	2
White	42	76	181	91	54	501
Race – racial composition in each group						
Black	1.9%	3.6%	4.6%	1.0%	1.8%	3.3%
Coloured	15.4%	6.0%	10.4%	4.1%	3.5%	8.4%
Indian	1.9%	0.0%	0.0%	1.0%	0.0%	0.4%
White	80.8%	90.5%	85.0%	93.8%	94.7%	87.9%
	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Race – % of students in each group by race						
Black	5.3%	15.8%	68.4%	5.3%	5.3%	100.0%
Coloured	16.7%	10.4%	60.4%	8.3%	4.2%	100.0%
Indian	50.0%	0.0%	0.0%	50.0%	0.0%	100.0%
White	8.4%	15.2%	47.5%	18.2%	10.8%	100.0%
All	9.1%	14.7%	49.1%	17.0%	10.0%	100.0%
Gender – Gender composition in each group						
Male	59.6%	70.2%	65.0%	52.6%	57.9%	62.5%
Female	40.4%	29.8%	35.0%	47.4%	42.1%	37.5%
	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Gender - % of students in each group by gender						
Male	8.7%	16.6%	51.1%	14.3%	9.3%	100.0%
Female	9.8%	11.7%	45.8%	21.5%	11.2%	100.0%
All	9.1%	14.7%	49.1%	17.0%	10.0%	100.0%
Age – Mean years						
Mean age	20.2	20.4	20.1	20.0	19.5	20.1
Number of students by Faculty in each group						
Agriculture	0	0	3	3	1	7
Arts	5	19	38	15	7	84
Commerce	45	63	235	79	49	471
Law	2	2	4	0	0	8
	52	84	280	97	57	570
Percentage of students from each Faculty in each group						
Agriculture	0.0%	0.0%	1.1%	3.1%	1.8%	1.2%
Arts	9.6%	22.6%	13.6%	15.5%	12.3%	14.7%
Commerce	86.5%	75.0%	83.9%	81.4%	86.0%	82.6%
Law	3.9%	2.4%	1.4%	0.0%	0.0%	1.4%
	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Table 7: Continued

	Did not qualify	Fail (0%-49%)	Pass 50%-59%	Pass 60%-69%	Pass 70%-100%	All ECO214 students
Percentage of students in each group by Faculty						
Agriculture	0.0%	0.0%	42.9%	42.9%	14.3%	100.0%
Arts	6.0%	22.6%	45.2%	17.9%	8.3%	100.0%
Commerce	9.6%	13.4%	49.9%	16.8%	10.4%	100.0%
Law	25.0%	25.0%	50.0%	0.0%	0.0%	100.0%
Total	9.1%	14.7%	49.1%	17.0%	10.0%	100.0%
Matriculation points score for six subjects (max: 48)						
Mean	38.2	38.2	38.6	41.6	44.9	39.7
% of students doing the following subjects in Matriculation						
Maths HG	69.6%	66.7%	71.8%	78.4%	91.2%	74.0%
English 1st	76.1%	72.8%	75.5%	79.4%	82.5%	76.5%
Afrikaans 1st	50.0%	60.5%	52.7%	53.6%	56.1%	54.1%
Add. Maths	2.2%	2.5%	4.3%	8.3%	33.3%	7.5%
Economics	21.7%	14.8%	20.2%	11.3%	12.3%	17.2%
Physical Science	63.0%	66.7%	63.2%	63.9%	89.5%	66.5%
Biology	56.5%	46.9%	48.7%	52.6%	40.4%	48.9%
Geography	32.6%	28.4%	31.8%	33.0%	14.0%	29.8%
History	21.7%	25.9%	21.3%	21.7%	28.1%	22.8%
Accounting	50.0%	54.3%	56.7%	52.6%	61.4%	55.6%
Computer	15.2%	17.3%	18.4%	9.3%	15.8%	16.1%
ECO178 final mark (%)						
Mean	53.5	53.7	55.9	60.3	74.2	58.0
Std Dev.	5.1	5.1	6.1	8.0	9.2	8.8
% of students passing ECO178 by attending summer school						
%	9.3%	14.7%	14.0%	1.1%	1.8%	10.1%
Lecture attendance (max: 8)						
Mean	2.9	3.7	4.4	5.4	6.4	4.5
Tutorial attendance (max: 9)						
Mean	1.9	2.6	3.2	3.9	5.1	3.3
Mean test, essay, exam and final mark (%)						
Test1	43.89	58.34	58.45	63.47	68.82	59.41
Test2	26.55	36.20	40.06	51.97	62.81	42.77
Test3	35.45	46.75	55.00	67.00	79.58	57.08
Test4	38.49	49.90	56.84	69.17	78.25	59.17
Essay	24.50	33.00	38.66	44.57	62.00	35.17
Coursework	19.37	47.56	51.88	61.85	71.32	51.92
Exam1	n/a	28.89	46.74	63.48	77.42	50.43
Exam2	n/a	39.86	59.50	67.80	77.50	56.26
Final mark	n/a	36.64	52.25	63.13	75.39	54.31
Proportion of students achieving at least 50% in the test, essay, exam and final mark						
Test1	0.0%	17.1%	22.0%	60.8%	91.2%	33.3%
Test2	16.2%	45.6%	62.1%	94.7%	100.0%	66.2%
Test3	22.6%	53.1%	69.7%	93.5%	100.0%	71.8%
Test4	0.0%	7.7%	17.1%	42.9%	100.0%	15.6%
Essay	35.1%	81.0%	78.6%	88.7%	93.0%	79.3%
Coursework	0.0%	29.8%	59.3%	97.9%	100.0%	60.2%
Exam1	n/a	0.0%	37.6%	100.0%	100.0%	50.2%
Exam2	n/a	0.0%	87.4%	100.0%	100.0%	71.2%
Final mark	n/a	0.0%	100.0%	100.0%	100.0%	83.8%

The results from Table 7 can be summarized as follows:

Approximately two-thirds of the Coloured population obtained only between 50%-90% in their final mark, while only 5% of obtained a final mark above 70%. (Results for smaller race groups are not representative.) The mean final mark for Whites is slightly higher (54.6%, compared to 52.1% for Coloureds).

About one-third of female students obtained at least 60% in the final mark, while this proportion is only slightly above 20% for males. In addition, the mean final marks of the two groups are 56.0% and 53.3% respectively. The mean age of the last group (pass: 70% - 100%) is the youngest (19.5 years).

The number of students from most other faculties is too small to draw conclusions. However, students from the Law Faculty did worse – none of them had a final mark above 60%. Students who performed well in ECO214 also performed better in their Matriculation final mark (above 40 marks), did Mathematics HG and/or Additional Mathematics in Matriculation, performed better in ECO178 (final mark above 60%), and passed ECO178 without attending summer school.[17]

Furthermore, Figures 2 and 3 as well as Table 8 show that, for those obtaining at least 70% in ECO178 without attending summer school, more than half also obtained 70% in ECO214. On the other hand, of those students passing ECO178 only after attending summer school, more than 60% only obtained a final mark of 50%-54%, and one-third either failed or did not qualify to write the examination.

Students performed better in ECO214, the more lectures they attended. The same applies to tutorial attendance – it shows a positive correlation with the final mark of ECO214. However, in both these cases no controls have yet been added for earlier performance and other explanatory variables.

Finally, the pass rate of test 1 is much lower than for the other tests. It is possible that the standard of the test was more difficult. However, another possible explanation lies in the fact that this is the first time students are exposed to assessment in the second year. Unlike in the first year, the second year test papers no longer contain short questions such as multiple choice questions, and students are for the first time also exposed to longer, more comprehensive questions.

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Figure 2: 100% stacked column chart on the relationship between ECO178 (after summer school) and ECO214 final marks

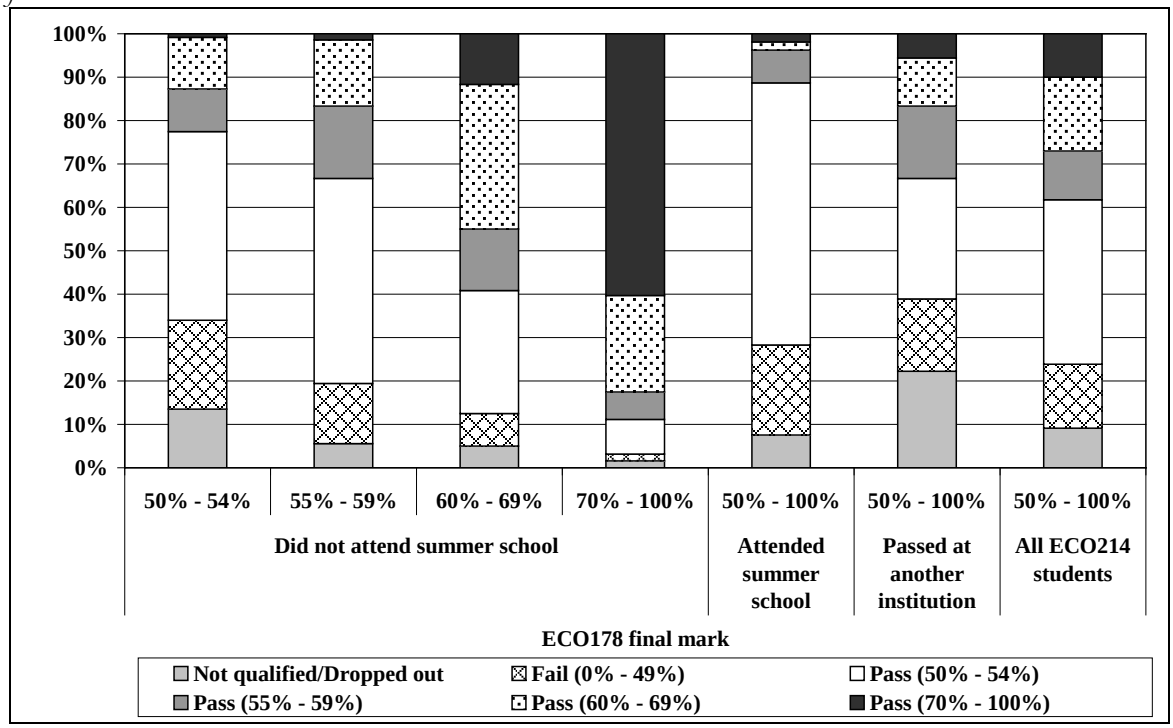
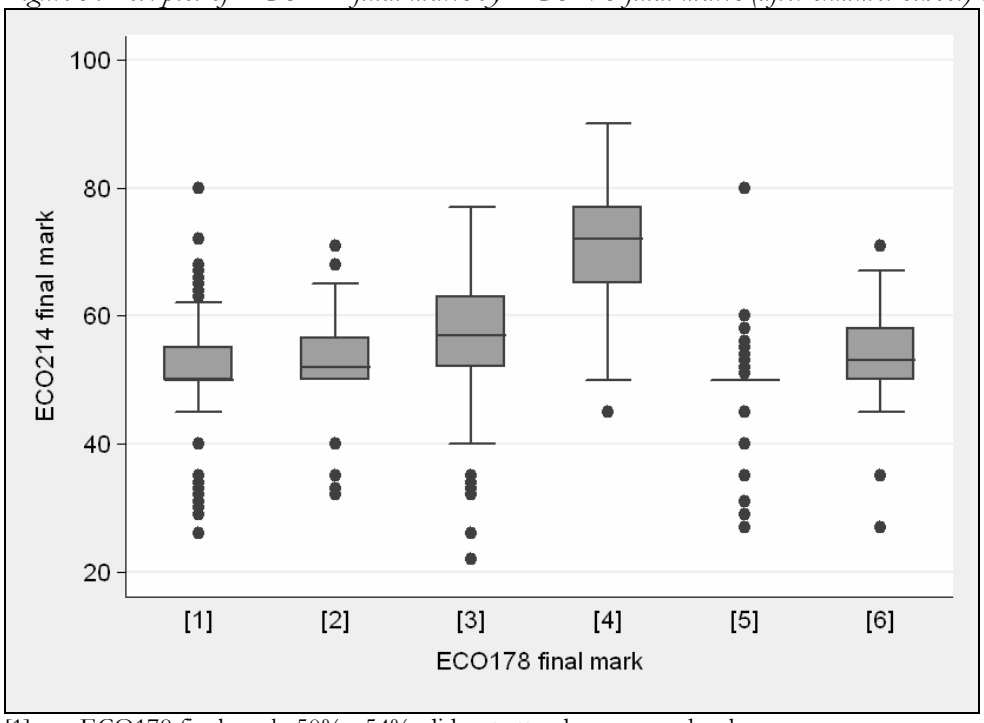


Figure 3: Box plot of ECO214 final mark by ECO178 final mark (after summer school) category



[1]: ECO178 final mark: 50% - 54%, did not attend summer school
[2]: ECO178 final mark: 55% - 59%, did not attend summer school
[3]: ECO178 final mark: 60% - 69%, did not attend summer school
[4]: ECO178 final mark: 70% - 100%, did not attend summer school
[5]: ECO178 final mark: 50% - 100%, attended summer school
[6]: Passed first-year Economics outside Stellenbosch University

Table 8: Relationship between ECO178 and ECO214 final marks

	ECO178 performance		ECO214 final mark						
			Not qualified/ Dropped out	Fail (0% - 49%)	Pass (50% - 54%)	Pass (55% - 59%)	Pass (60% - 69%)	Pass (70% - 100%)	All
ECO 178 final mark (after summer school)	Did not attend summer school	50% - 54%	13.5%	20.5%	43.4%	9.8%	11.9%	0.8%	100.0%
		55% - 59%	5.6%	13.9%	47.2%	16.7%	15.3%	1.4%	100.0%
		60% - 69%	5.0%	7.5%	28.3%	14.2%	33.3%	11.7%	100.0%
		70% - 100%	1.6%	1.6%	7.9%	6.4%	22.2%	60.3%	100.0%
		All	8.8%	14.0%	35.9%	11.4%	18.8%	11.0%	100.0%
	Attended summer school	50% - 100%	7.6%	20.8%	60.4%	7.6%	1.9%	1.9%	100.0%
	Passed at another institution	50% - 100%	22.2%	16.7%	27.8%	16.7%	11.1%	5.6%	100.0%
	All ECO214 students	50% - 100%	9.1%	14.7%	37.9%	11.2%	17.0%	10.0%	100.0%

5. *The ECO214 Student Survey*

The ECO214 student survey took place towards the end of the first semester. Students were asked to complete the questionnaire in the last 10 minutes of a lecture. In addition, the students were emailed an electronic copy of the questionnaire and were requested to complete and submit the questionnaire. There were 25 questions in total, as shown in Appendix II. Participation was voluntary. At the end, 283 students (out of 570) participated in the survey (i.e., the response rate is 49.7%). An analysis of the survey responses revealed that the response rate was higher for the better-performing students, as presented in Figure 4. This has implications for the reliability of the survey responses being a true reflection of the population (i.e. the ECO214 class)

Figure 4: Percentage of students taking in survey by ECO214 final mark category

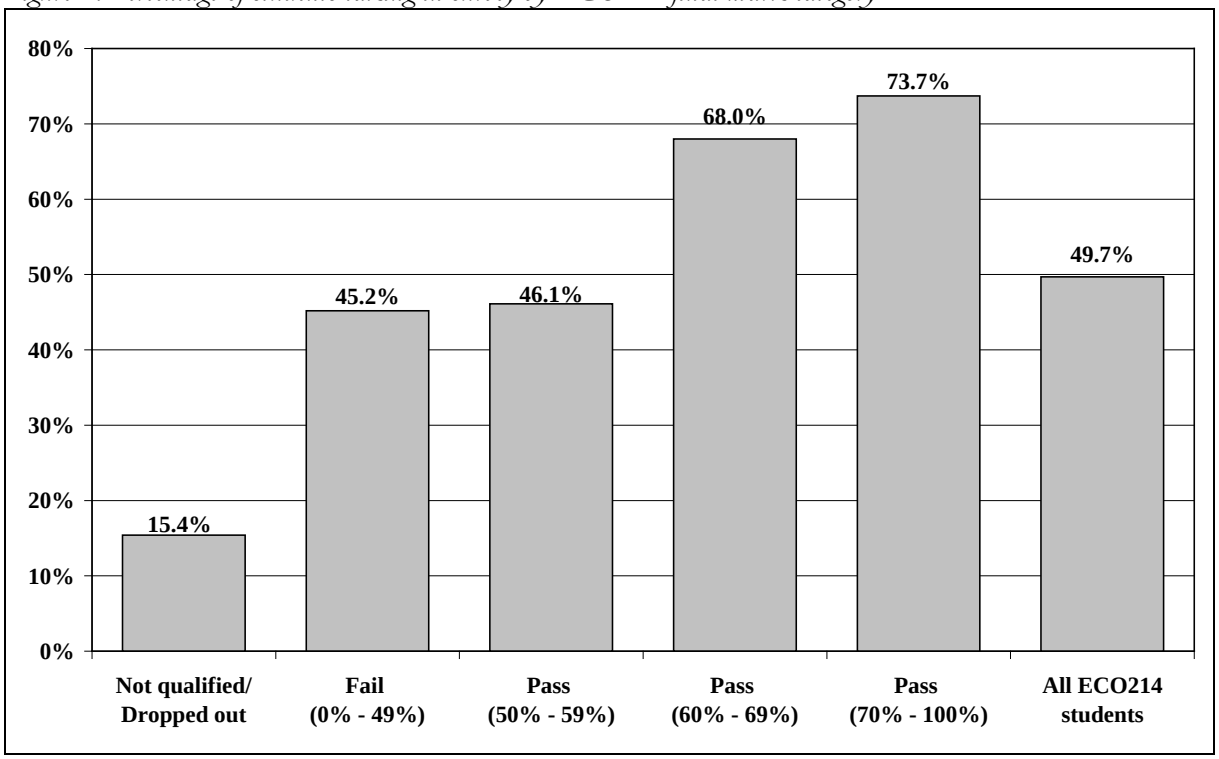


Table 9 shows the results of the survey from selected questions, and can be summarized as follows:

- More than two-thirds of the respondents indicated that the tutorials contributed to their understanding.
- A high proportion of the respondents indicated that they did not prepare tutorials and lectures in advance, and most of them alluded to a lack of time being the primary reason thereof.
- Nearly a quarter of the respondents work on a part-time basis.
- More than 90% made their own study notes.
- Only slightly above 20% joined a study group.
- Nearly two-thirds of the respondents enrolled for between 6 and 10 modules[18] in the 2008 academic year.
- Approximately 75% of the respondents were somewhat or very interested in studying Economics. In addition, about 60% of them found it enjoyable when studying Economics.
- Only 6% of students consulted the lecturers during the semester.

[18] From the information given, it is not possible to determine the total course load of the students, since the credit weight of modules are different.

Table 9: Selected results from the ECO214 student survey

Do tutorials contribute?		
Yes	197	69.6%
No	80	28.3%
Unspecified	6	2.1%
Total	283	100.0%
Preparing tutorials?		
Yes	71	25.1%
No	212	74.9%
Total	283	100.0%
Preparing lectures?		
Yes	27	9.5%
No	256	90.5%
Total	283	100.0%
Working part-time?		
Yes	61	21.6%
No	222	78.4%
Total	283	100.0%
Making study notes?		
Yes	258	91.2%
No	25	8.8%
Total	283	100.0%
Joined a study group?		
Yes	58	20.5%
No	225	79.5%
Total	283	100.0%
Number of modules registered (incl. ECO214) in 2008 (first + second semesters)		
1-5 modules	42	14.8%
6-10 modules	177	62.5%
11+ modules	55	19.4%
Unspecified	9	3.2%
Total	283	100.0%
Interest in studying Economics		
Very interested	94	33.2%
Somewhat interested	114	40.3%
Indifferent	56	19.8%
No interest	11	3.9%
Very uninterested	6	2.1%
Unspecified	2	0.7%
Total	283	100.0%
Enjoyment when studying Economics		
Very enjoyable	34	12.0%
Enjoyable	139	49.1%
Indifferent	79	27.9%
Not enjoyable	22	7.8%
Hate economics	6	2.1%
Unspecified	3	1.1%
Total	283	100.0%
Consulting the lecturers during the course		
Yes	17	6.01%
No	266	93.99%

6. *Econometric analyses*

The preceding descriptive analyses are limited since it only considers some variables when describing the characteristics of the students. The purpose of this section is to expand the descriptive analyses by investigating the role of various factors that influence the students' mark in each test, the essay mark, the course mark and final mark[19]. All econometric models use robust ordinary least square regressions.[20]

The explanatory variables are as follows:

- Race[21]: the groups are White (reference group), Coloured and Black.
- Gender: the reference group is female.
- Age category: the reference group is 20 years or younger.
- Residence status:
  - University residence or house
  - Private accommodation or hostel
  - Living with family (reference group)
  - Others/Unspecified
- Faculty:
  - Agriculture
  - Arts
  - Law
  - Commerce (program name: Actuarial Science)
  - Commerce (program name: anything other than Actuarial Science - reference group)
- A dummy variable that indicates whether the student wrote all 4 tests or not
- Lecture attendance (minimum: 0, maximum: 8)
- Tutorial attendance (minimum: 0, maximum: 9)
- ECO178 final mark (before summer school)
- A dummy variable that indicates the student passed ECO178 only after attending the summer school program
- Matriculation subject dummy variables (example: English 1st language & Afrikaans 1st language, English 2nd language & Afrikaans 1st language, Mathematics higher grade, Science, Biology, Accounting, Computer Science, Additional Mathematics, etc.)
- Matric aggregate mark (%) and Matric aggregate mark squared (to capture non-linearity)
- A dummy variable that indicates the student did not take part in the ECO214 survey
- Other variables derived from the student questionnaire (example: dummy variables that indicate the students join a study group, make study notes, are very interested in studying Economics, find Economics very enjoyable, etc.)

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[19] Students (4 in total) who neither wrote any tests nor submitted the essay were excluded from the regression. Those students who only wrote one test (but submitted the essay), this test mark was used as a proxy for what their performance would have been in the other two tests. If they did not submit the essay, this test mark was also used as a proxy for the essay mark. For students who wrote two tests (and submitted the essay), the average of the two test marks was used as a proxy for the third test. If they did not submit the essay, the average of the two tests was also used as a proxy for the essay mark. Finally, for those who wrote three (or four) tests, but did not submit the essay, the average of all the tests was used as a proxy for the essay mark. The imputed course mark was then calculated using the formulas in table 1. For the 52 students who did not write the examination, the imputed course mark was used as a proxy for the exam mark, allowing us to calculate an imputed final mark.

[20] Since students were effectively excluded from the final examination if they did not obtain a course mark of at least 40%, this could have lead to sample selection bias. However, as few students were excluded (only 23 did not obtain the required course mark), the OLS econometric model is used instead of a Heckman selection model.

[21] Due to the fact that there are only 2 Indian students in the sample, it was decided to group Coloureds and Indians together in the regressions.

Table 10: OLS regressions on imputed final mark

	Dependent variable: Imputed final mark (after 2 exams)							
	[A]	**[B]**	**[C]**	**[D]**	**[E]**	**[F]**	**[G]**	**[H]**
Demographic variables								
Black	-3.7362 [1.80]*	-3.2454 [1.54]	-3.7570 [1.79]*	-4.9024 [2.61]***	-5.8498 [2.77]***	-4.8422 [2.63]***	-4.3989 [2.18]**	-3.5622 [1.69]*
Coloured/Indian	-0.7032 [0.53]	-0.8371 [0.57]	-0.5751 [0.44]	-1.1633 [0.88]	-3.4437 [2.53]**	-3.8523 [2.49]**	-3.9696 [2.59]***	-4.1762 [2.66]***
Male	-0.3231 [0.40]	-1.0557 [1.22]	-0.4461 [0.56]	-0.8115 [1.03]	-0.4919 [0.52]	-1.9707 [1.93]*	-1.8833 [1.79]*	-2.3707 [2.20]**
Over 20 years	2.3766 [2.42]**	0.7219 [0.73]	2.4797 [2.54]**	1.6897 [1.77]*	1.4871 [1.39]	-1.0065 [0.91]	-1.5071 [1.35]	-3.2104 [2.89]***
Residence status variables								
Staying at university residence/house	2.3558 [2.60]***	1.9853 [2.11]**	2.3354 [2.59]***	3.2077 [3.86]***	6.2496 [6.75]***	5.7029 [5.62]***	6.2965 [6.11]***	
Faculty variables								
Agriculture	3.0154 [1.45]	2.4553 [0.98]	2.9561 [1.50]	2.8361 [1.66]*	8.3194 [3.21]***	9.4811 [3.78]***		
Arts	-1.9924 [1.77]*	-0.9615 [0.83]	-1.8612 [1.64]	-1.7468 [1.54]	-2.3337 [1.73]*	-0.4656 [0.32]		
Law	-9.0572 [1.62]	-9.7802 [1.75]*	-8.4696 [1.58]	-7.9040 [1.83]*	-7.9447 [1.94]*	-8.9554 [2.07]**		
Commerce: Actuarial Science	-3.254 [1.77]*	-2.9003 [1.41]	-3.6814 [2.04]**	-0.0194 [0.01]	10.6802 [5.47]***	11.5100 [4.85]***		
ECO214-related variables								
Lecture attendance#	1.1128 [4.77]***		1.2145 [5.33]***	1.1115 [4.85]***	1.5274 [6.13]***			
Tutorial attendance##	0.3669 [2.05]**		0.4259 [2.39]**	0.4108 [2.27]**	0.6173 [2.91]***			
ECO178-related variables								
ECO178 final mark before summer school	0.5977 [10.64]***	0.6994 [12.25]***	0.5979 [10.78]***	0.6918 [13.62]***				
Attended ECO178 summer school	6.3690 [4.11]***	6.9907 [4.31]***	6.6849 [4.45]***	7.8456 [5.17]***				
Matriculation variables								
Matriculation subject: Additional Mathematics	4.5285 [3.12]***	3.3184 [2.16]**	4.5214 [3.14]***					
English 1st language & Afrikaans 1st language	-0.7251 [0.71]	-0.8072 [0.77]	-0.6232 [0.62]					
English 2nd language & Afrikaans 1st language	0.1667 [0.17]	0.4393 [0.43]	0.1452 [0.15]					
Matric aggregate mark (%)	-0.7725 [1.97]**	-0.5555 [1.41]	-0.8342 [2.12]**					
Matric aggregate mark squared	0.0056 [2.23]**	0.0040 [1.58]	0.0060 [2.38]**					
ECO214 survey variables								
Did not take part in the survey	-0.9021 [0.99]	-3.8167 [4.29]***						
Prepared prior to lectures	2.4240 [1.40]	2.1510 [1.21]						
Prepared prior to tutorials	1.6587 [1.26]	1.6845 [1.22]						
Constant	37.2686 [2.28]**	33.2121 [2.01]**	38.7300 [2.35]**	5.9090 [2.00]**	40.9200 [27.99]***	51.4383 [47.04]***	51.7490 [48.89]***	55.4272 [61.40]***
Observations	539	539	539	548	566	566	566	566
R-squared	0.50	0.45	0.49	0.47	0.29	0.15	0.09	0.03

Absolute value of t statistics in brackets

*** Significant at 1% ** Significant at 5% * Significant at 10%

Table 11: OLS regressions on imputed course mark

	Dependent variable: Imputed course mark							
	[I]	**[J]**	**[K]**	**[L]**	**[M]**	**[N]**	**[O]**	**[P]**
Demographic variables								
Black	-4.4494 [2.27]**	-3.9389 [2.14]**	-4.5045 [2.26]**	-6.2498 [3.53]***	-7.0019 [3.64]***	-6.037 [4.57]***	-5.7423 [3.58]***	-5.0366 [2.99]***
Coloured/Indian	-1.4069 [1.06]	-1.4855 [0.96]	-1.2718 [0.97]	-1.9408 [1.43]	-3.8135 [2.88]***	-4.1519 [2.56]**	-4.3417 [2.69]***	-4.5159 [2.72]***
Male	-1.2388 [1.75]*	-2.0061 [2.69]***	-1.3337 [1.87]*	-2.0455 [2.80]***	-1.8475 [2.15]**	-3.2824 [3.55]***	-3.3600 [3.48]***	-3.771 [3.82]***
Over 20 years	2.7711 [2.99]***	1.0354 [1.10]	2.8380 [3.14]***	1.8635 [2.14]**	1.6853 [1.76]*	-0.7297 [0.74]	-1.1859 [1.18]	-2.6224 [2.61]***
Residence status variables								
Staying at university residence/house	1.6489 [2.12]**	1.2819 [1.58]	1.6501 [2.10]**	2.6931 [3.53]***	5.2828 [6.48]***	4.7862 [5.33]***	5.3100 [5.78]***	
Faculty variables								
Agriculture	4.4867 [1.52]	3.8575 [1.25]	4.5226 [1.54]	4.5486 [1.42]	9.0177 [3.82]***	10.0654 [6.43]***		
Arts	-0.0035 [0.00]	1.1010 [1.19]	0.1008 [0.11]	0.3440 [0.38]	-0.0835 [0.07]	1.7535 [1.41]		
Law	-8.2953 [2.05]**	-9.0109 [2.06]**	-7.5996 [1.91]*	-4.6118 [1.29]	-5.4786 [1.45]	-6.4113 [1.51]		
Commerce: Actuarial Science	-2.6512 [1.80]*	-2.1679 [1.35]	-3.0769 [2.15]**	0.8414 [0.59]	9.9766 [6.03]***	10.9159 [6.12]***		
ECO214-related variables								
Lecture attendance#	1.2839 [6.56]***		1.4009 [7.39]***	1.2730 [6.36]***	1.6207 [7.70]***			
Tutorial attendance##	0.2798 [1.75]*		0.3312 [2.12]**	0.3080 [1.91]*	0.4709 [2.53]**			
ECO178-related variables								
ECO178 final mark before summer school	0.4572 [9.65]***	0.5656 [11.16]***	0.4538 [9.61]***	0.5794 [13.64]***				
Attended ECO178 summer school	4.9696 [3.49]***	5.6694 [3.72]***	5.2043 [3.70]***	6.5337 [4.60]***				
Matriculation variables								
Matriculation subject: Additional Mathematics	3.9443 [3.33]***	2.6451 [2.01]**	3.9886 [3.40]***					
English 1st language & Afrikaans 1st language	-0.6704 [0.78]	-0.7294 [0.79]	-0.5937 [0.68]					
English 2nd language & Afrikaans 1st language	-0.8414 [0.99]	-0.5719 [0.63]	-0.8744 [1.03]					
Matric aggregate mark (%)	-0.8181 [2.20]**	-0.5881 [1.62]	-0.8964 [2.41]**					
Matric aggregate mark squared	0.0062 [2.64]***	0.0045 [1.96]**	0.0067 [2.86]***					
ECO214 survey variables								
Did not take part in the survey	-1.0294 [1.27]	-4.1014 [5.20]***						
Prepared prior to lectures	3.2291 [2.25]**	3.0590 [1.84]*						
Prepared prior to tutorials	1.1858 [1.18]	1.1494 [1.03]						
Constant	46.0045 [2.95]***	41.7284 [2.71]***	48.1702 [3.09]***	13.441 [5.36]***	42.7602 [31.73]***	53.1408 [52.01]***	53.9288 [53.50]***	57.0307 [67.04]***
Observations	539	539	539	548	566	566	566	566
R-squared	0.54	0.47	0.53	0.49	0.33	0.17	0.11	0.05

Absolute value of t statistics in brackets

*** Significant at 1% ** Significant at 5% * Significant at 10%

Table 12: OLS regressions on imputed test marks and essay mark

Dependent variable:	Imputed test 1 mark		Imputed test 2 mark		Imputed test 3 mark		Imputed essay mark	
	[Q]	[R]	[S]	[T]	[U]	[V]	[W]	[X]
Demographic variables								
Black	-1.1704 [0.36]	-1.1979 [0.37]	-4.7565 [1.41]	-4.5183 [1.33]	-4.8533 [1.32]	-5.1400 [1.39]	-5.1643 [2.06]**	-5.1988 [2.08]**
Coloured/Indian	3.1213 [1.63]	3.4792 [1.82]*	-0.4039 [0.16]	-0.2515 [0.10]	-0.4595 [0.18]	-0.3234 [0.13]	-6.664 [3.15]***	-6.4281 [3.04]***
Male	-0.7777 [0.71]	-0.9923 [0.91]	-3.3744 [2.52]**	-3.5122 [2.65]***	1.7525 [1.28]	1.6821 [1.22]	-2.0482 [1.76]*	-2.1985 [1.91]*
Over 20 years	2.2878 [1.71]*	2.4596 [1.88]*	4.1786 [2.45]**	4.227 [2.50]**	2.4324 [1.43]	2.6211 [1.59]	2.7220 [1.86]*	2.8768 [1.99]**
Residence status variables								
Staying at university residence/house	-1.562 [1.31]	-1.4787 [1.24]	4.4403 [2.93]***	4.3347 [2.85]***	2.0300 [1.35]	2.1226 [1.42]	2.8696 [2.48]**	2.8983 [2.49]**
Faculty variables								
Agriculture	-3.1750 [1.29]	-2.9495 [1.24]	9.1723 [1.30]	8.3328 [1.18]	3.0448 [0.51]	3.7847 [0.66]	5.9555 [2.21]**	6.3061 [2.46]**
Arts	-0.7452 [0.55]	-0.5269 [0.38]	-1.8052 [0.89]	-1.5904 [0.78]	-2.1137 [1.15]	-2.0488 [1.13]	4.2492 [3.02]***	4.4034 [3.11]***
Law	-3.6968 [1.25]	-2.4245 [0.84]	-7.0978 [1.68]*	-6.6414 [1.51]	-8.522 [1.83]*	-7.9034 [1.71]*	-13.8207 [1.82]*	-12.9517 [1.74]*
Commerce: Actuarial Science	-2.0082 [0.84]	-2.5253 [1.08]	1.8483 [0.70]	1.2419 [0.48]	1.4132 [0.59]	1.1629 [0.50]	-7.2945 [2.53]**	-7.7135 [2.75]***
ECO214-related variables								
Lecture attendance#	3.1976 [5.05]***	3.5100 [5.74]***	1.7526 [4.34]***	1.7803 [4.67]***	1.0436 [2.80]***	1.2044 [3.34]***	0.9629 [2.57]**	1.1401 [3.14]***
Tutorial attendance##	0.7441 [1.28]	1.0772 [1.97]**	1.1951 [2.46]**	1.2491 [2.64]***	0.3533 [0.88]	0.4618 [1.20]	-0.2061 [0.51]	-0.0639 [0.16]
ECO178-related variables								
ECO178 final mark before summer school	0.5746 [7.09]***	0.5790 [7.21]***	0.6254 [6.47]***	0.6312 [6.57]***	0.5715 [6.48]***	0.5696 [6.52]***	0.1606 [1.87]*	0.1610 [1.93]*
Attended ECO178 summer school	8.3785 [3.89]***	8.8032 [4.20]***	6.2446 [2.38]**	6.6633 [2.59]***	8.8413 [3.11]***	9.0869 [3.20]***	-2.7709 [1.19]	-2.4651 [1.08]
Matriculation variables								
Matriculation subject: Additional Mathematics	2.9941 [1.65]	2.9554 [1.67]*	3.6086 [1.75]*	3.5117 [1.68]*	3.384 [1.69]*	3.4145 [1.67]*	5.0353 [2.22]**	5.0030 [2.22]**
English 1st language & Afrikaans 1st language	-0.3601 [0.28]	-0.1291 [0.10]	1.0850 [0.65]	1.1677 [0.71]	-0.7891 [0.46]	-0.6743 [0.40]	-2.8208 [2.11]**	-2.6784 [2.02]**
English 2nd language & Afrikaans 1st language	-1.9164 [1.50]	-1.9322 [1.51]	1.5024 [0.89]	1.4919 [0.88]	1.1413 [0.68]	1.1309 [0.67]	-3.2127 [2.40]**	-3.2458 [2.43]**
Matric aggregate mark (%)	-1.4351 [2.62]***	-1.5742 [2.88]***	-0.9304 [1.29]	-0.9391 [1.32]	0.4041 [0.52]	0.2939 [0.38]	-0.7871 [1.42]	-0.8915 [1.62]
Matric aggregate mark squared	0.0105 [2.98]***	0.0113 [3.25]***	0.0059 [1.31]	0.0060 [1.33]	-0.0008 [0.17]	-0.0001 [0.02]	0.0058 [1.66]*	0.0065 [1.88]*
ECO214 survey variables								
Did not take part in the survey	-2.4582 [1.91]*		0.543 [0.35]		-2.3241 [1.54]		-1.8356 [1.46]	
Prepared prior to lectures	4.1987 [1.79]*		2.7925 [1.00]		0.9816 [0.32]		2.7007 [1.34]	
Prepared prior to tutorials	1.3065 [0.76]		3.5991 [1.65]*		-0.3505 [0.16]		0.8975 [0.58]	
Constant	50.6344 [2.19]**	53.463 [2.32]**	44.1791 [1.45]	44.8797 [1.48]	-8.1752 [0.25]	-6.3833 [0.20]	73.8921 [3.09]***	76.0005 [3.21]***
Observations	534	534	520	520	514	514	539	539
R-squared	0.40	0.38	0.35	0.35	0.30	0.3	0.22	0.22

Absolute value of t statistics in brackets *** Significant at 1% ** Significant at 5% * Significant at 10%

The maximum number of lectures attended could only be 3, 5, 6 and 7 before test1, test2, essay and test3 took place respectively.

The maximum number of tutorials attended could only be 3, 7, 7 and 8 before test1, test2, essay and test3 took place respectively.

Table 10 indicates that, even after controlling for earlier performance and other explanatory variables, non-White students obtained a relatively poorer final mark than White students. One of the reasons for this result is the performance of non-White students in the essay, and not necessarily in the tests, as the Black and Coloured/Indian dummies are not significant in the regressions on the tests (see table 12). It therefore seems that non-White students may have poorer (essay) writing skills that hold them back in the second year compared to their first year performance and their test marks.

In addition, males performed weaker, but this negative relationship is only significant in regressions [F] to [H], where some other explanatory variables are dropped. Moreover, older students seem to perform better.

Table 10 also shows that students staying in the university residence or house performed better in general, once other factors have been considered. This may be because students on campus save time by not having to travel to and from campus, have access to learning and study facilities after hours, and also have the benefit of connecting with their peers.

The dummies indicating registration in different faculties are only significant in some regressions. The small group of students from the Agriculture only do significantly better than students from other faculties in regressions [D] to [F], where their better matric performance is not controlled for..

Lecture and tutorial attendance are significant in all the regressions. The coefficient of the former is always greater than that for latter, indicating lecture attendance matters more than tutorial attendance. However, it should be mentioned that less emphasis was place on tutorial attendance (i.e. these sessions were voluntary).

The matriculation subject choice dummies are not significant in explaining the performance of ECO214 students, except the dummy for Additional Mathematics. Those students who did Afrikaans 1st language, regardless of whether they did English 1st or 2nd language, they did not do significantly better. There is a significant but non-linear relationship between the matric aggregate mark and the ECO214 final mark. Students who obtained a very high matric aggregate mark performed well in the ECO214 course.

Almost all the variables obtained from the ECO214 student survey do not help to explain performance. The exception is the dummy that indicates that the student did not take part in the survey (only in regression [B]). It should be noted that the survey information may be biased since there is an obvious correlation between the poorly-performing students and lower survey participation. This explains why all of the survey variables were dropped for regressions [C] to [H].

Table 11 reflects the results of the regression with the dependent variable being the imputed course mark. The results for all the regressions are similar to the findings in table 10.

Table 12 shows the regressions results when using the imputed tests and the imputed essay marks as dependent variables. The findings indicate that Black and Coloured/Indian students perform relatively worse than White students in all tests and the essay. However, the results are only significant for the essay mark. This may provide an explanation for the relatively poorer performance in the course mark and the final mark. Figure A.2 shows a box plot of the imputed essay mark, by race.

Males tend to perform significantly worse in test 2 and the essay. This latter finding is supported by the literature, where reference is made to female students performing relatively better in

descriptive questions. According to the literature (see Greene, 1997), this does not imply that male students know less, but rather that they have more difficulty expressing themselves. A similar result is found for test 2. The test content is primarily based on Macroeconomics, which generally contains more descriptive type questions than Microeconomics.

In terms of age, students older than 20 years tend to perform better in most of the tests and the essay, after controlling for repetition.

Students staying at the university residences generally perform better in test 2 and the essay than students staying in private residence or with their families. The faculty variables are not significant in all the test regressions, except for the few students from the Law faculty who performed relatively worse in tests 2 and 3 compared to the reference group, i.e. Commerce students not registered for Actuarial Science. For the essay, students from the Arts and Agriculture faculties performed relative better, which may reflect the fact that they have better writing skills and get more opportunity to write. Actuarial students also performed relatively worse than the reference group for the essay. This may be due to Actuarial students being more analytically inclined.

Tutorial attendance is positively and significantly related to tests 1 and 2 imputed marks. It is not significant for test 3 and the essay mark. For the latter finding, this result is expected as the tutorial is not linked to the essay submission. However, the result for test 3 may depend on the structure of the tutorials and the content focus. Lecture attendance is positive and significant for all three tests and the essay. The essay topics are generally based on lecture topics, which may explain the latter result.

As found in the regressions with the course mark and the final mark, the coefficient for ECO178 final marl is positive and significant. The summer school is also positive and significant, except for the essay mark.

The matriculation subjects of the ECO214 students reflect that those students who had taken Additional Mathematics performed significantly better in all three tests and the essay. The languages are not statistically significant for the tests. However, in the case of the essay, students who had taken English 1st language and Afrikaans 2nd language performed better. Figure A.3 shows a box plot of the imputed essay mark, by language.

7. Conclusion

The second-year Economics student is often a forgotten group. They have passed the first-year and the general expectation is that they need less academic support. However, judging from the academic performance of second-year Economics at Stellenbosch University, this seems to be an unwarranted assumption. Absence from lectures and tutorials seems to increase, contributing to the deterioration in their academic performance.

This study performed an in-depth analysis of the factors playing a role in the academic success of second-year students. One of the expected findings is that lecture and tutorial attendance contribute positively to academic success. Another finding is that non-White students perform relatively worse than White students in the final mark, particularly the essay and the examinations. This may be explained by non-White students not having the same essay writing ability and finding it more difficult to deal with the large volume of work for the examinations. This may reflect both a selection issue and inadequate preparation in school.

Another important finding is the strong and significant relationship between the ECO178 final mark and the students' ECO214 performance. Students who had taken Additional Mathematics,

English1st language and Afrikaans 2nd language performed better. Lecture and tutorial attendance does matter for the academic performance of second-year Economics students, with the former being relatively more important.

The outcome of the empirical analysis leads to some suggestions that could be considered in improving the academic performance of second-year Economics students, such as making the tutorials compulsory (especially those who performed poorly in the first test); providing more intensive essay- writing sessions and making more extensive use of online-learning opportunities.

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Appendix I

Figure A.1: Gender share by race

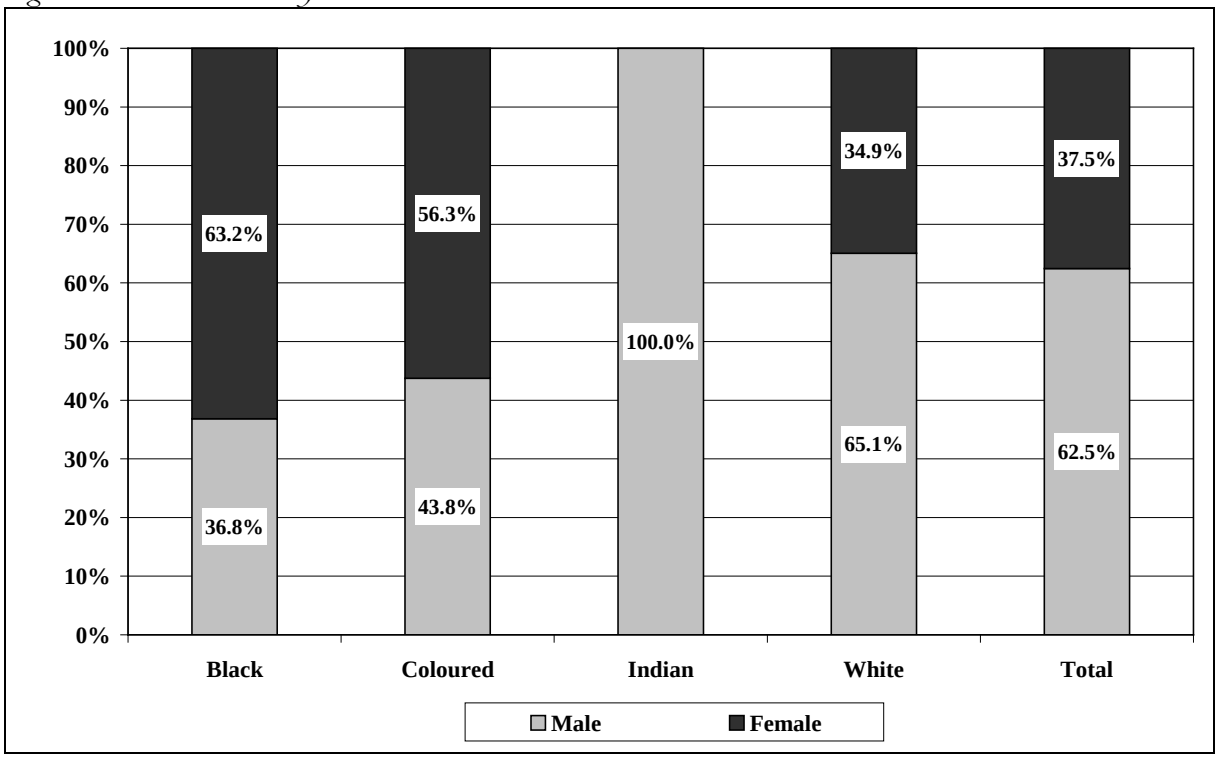

Figure A.2: Box plot of imputed essay mark by race

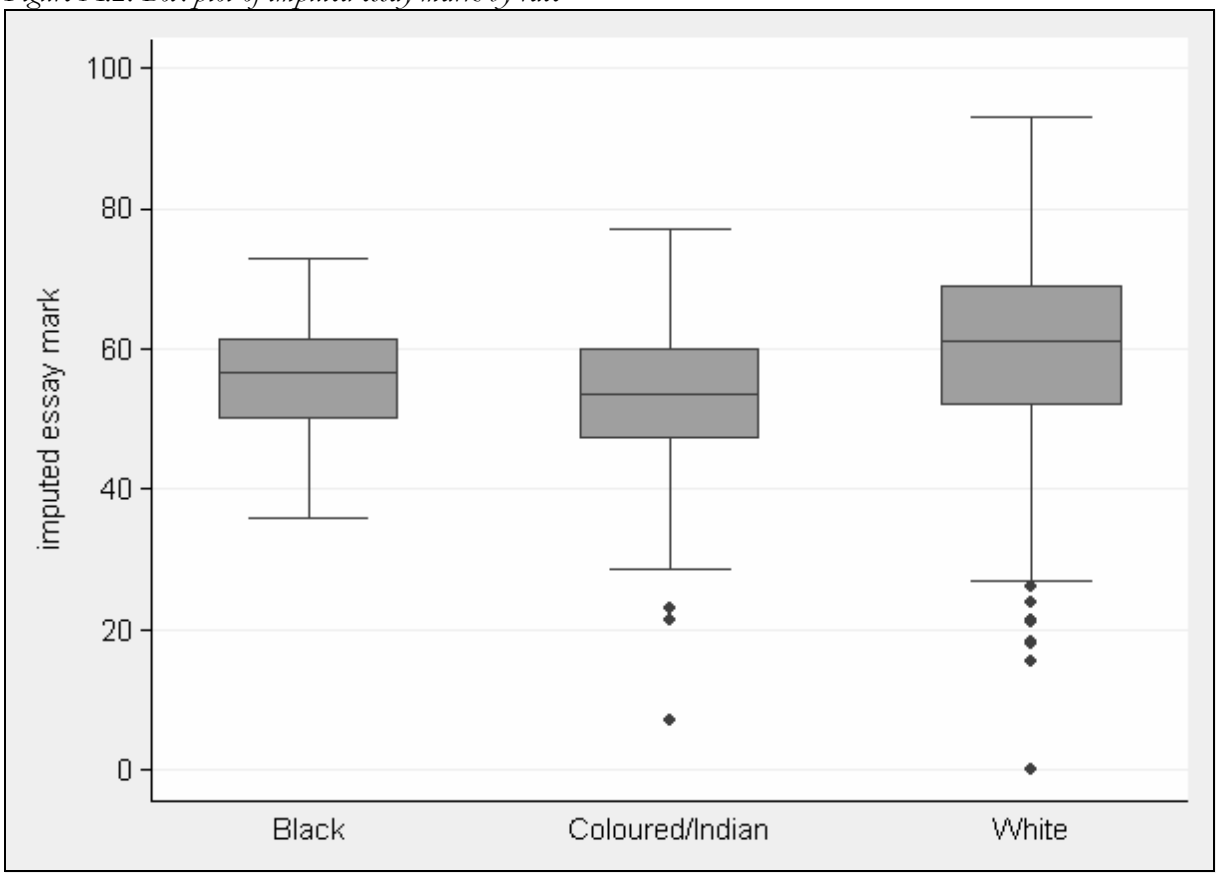

Figure A.3: Box plot of imputed essay mark by language

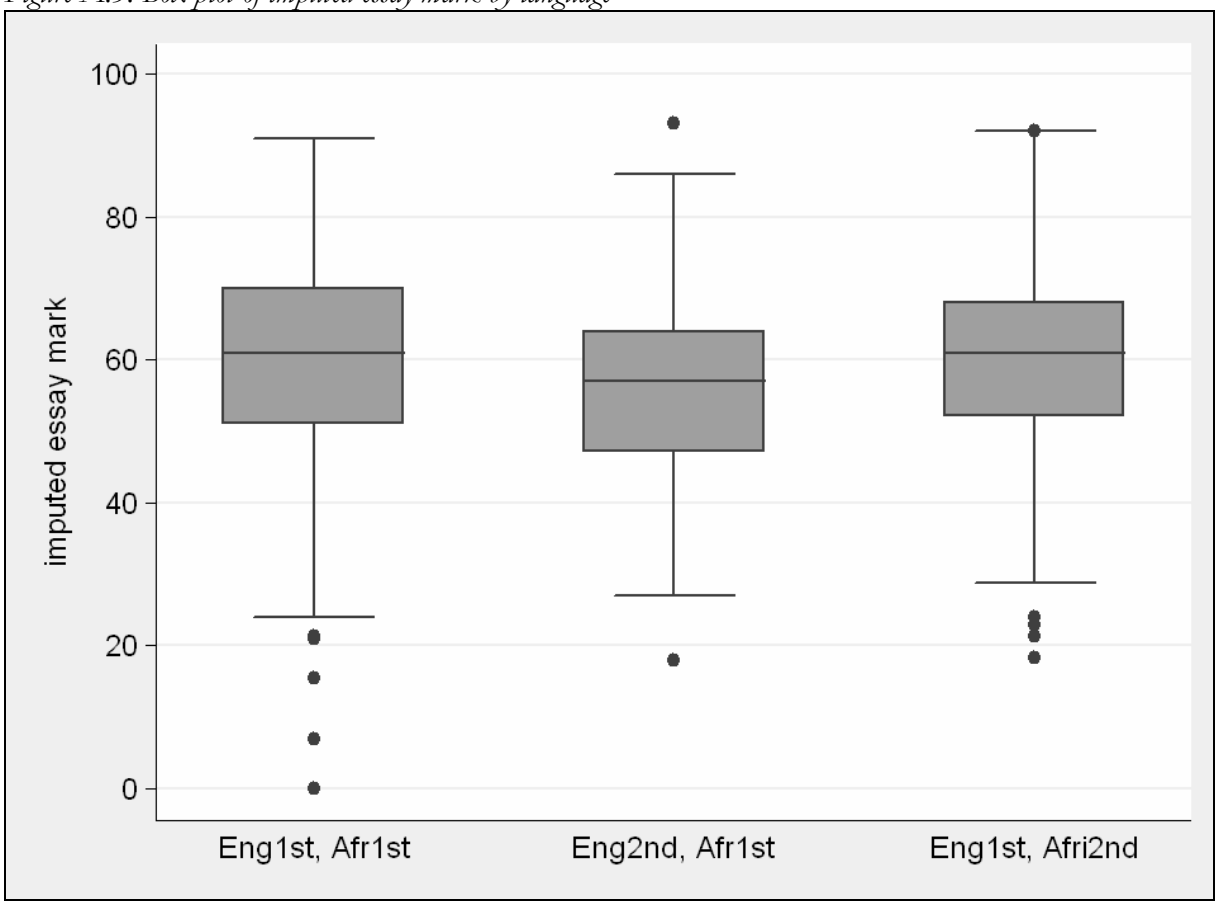

Table A.1: Matriculation results of the students by subject

Subject	Grade			% of students (out of 558) writing this subject	% getting A symbol	Mean entry points (min: 0, max: 8)
	HG	SG	Total			
Mathematics	413	145	558	100.0%	34.59%	6.06
English 1st	426	1	427	76.5%	22.72%	6.74
English 2nd	131	0	131	23.5%	41.98%	7.07
Afrikaans 1st	301	1	302	54.1%	42.72%	7.16
Afrikaans 2nd	241	2	243	43.5%	37.04%	6.60
Additional Mathematics	40	2	42	7.5%	35.90%	6.12
Economics	95	1	96	17.2%	41.67%	6.90
Business Economics	129	5	134	24.0%	28.36%	6.48
Physical Science	342	29	371	66.5%	20.00%	6.00
Biology	266	7	273	48.9%	30.77%	6.69
Geography	163	3	166	29.7%	42.17%	7.07
History	126	1	127	22.8%	40.16%	7.03
Accounting	291	19	310	55.6%	41.61%	6.74
Computer Studies	54	36	90	16.1%	20.00%	5.44

Appendix II The ECO214 student survey questionnaire

Ekonomie 214 / *Economics 214*
Vraelys / *Questionnaire*

Studentenommer / *Student number*.....

(1) Bly u in 'n koshuis in Stellenbosch? / *Do you live in residence in Stellenbosch?*
1 ☐ Ja / *Yes*
0 ☐ Nee / *No*

(2) Indien u antwoord by 1 "Nee" was, hoe ver ry u daagliks (in kilometres) na Stellenbosch? / *If your answer to 1 was "No", how far do you travel daily (in kilometres) to Stellenbosch?*..... km

(3) Hoe reis u na kampus? / *How do you travel to campus?*
1 ☐ Motorvoertuig / *Motor vehicle* 3 ☐ Trein / *Train*
2 ☐ Bus / *Bus* 4 ☐ Taxi

(4) Is u vervoer betroubaar sodat u betyds by lesings is? / *Is your mode of transport reliable so that you are on time at lectures?*
1 ☐ Ja / *Yes*
2 ☐ Nee / *No*
3 ☐ Wisselvallig / *Varies*

(5) Dink u dat die tutklasse bydra tot u insig in die vakgebied? / *Do you think that the tut classes contribute to your understanding of the subject matter?*
1 ☐ Ja / *Yes*
0 ☐ Nee / *No*

(6) Indien "Ja" kan u aantoon hoe dit bydra? / *If "Yes" can you say how it contributes?*
.....
.....

(7) Indien u nie tutklasse bywoon, kan u aandui hoekom nie? / *If you do not attend tut classes, can you indicate why not?*
1 ☐ Geen belang nie / *No interest*
2 ☐ Dra nie by tot my leerondervinding nie / *Does not contribute to my understanding*
3 ☐ Klasse te vol / *Classes too full*
4 ☐ Roosterbotsings / *Clashes on timetable*
5 ☐ Ander / *Other*.....

(8) Wat is u huistaal? / *What is your home language?*
1 ☐ Afrikaans / *Afrikaans*
2 ☐ Engels / *English*
3 ☐ Ander / *Other*
.....

(9) Voel u dat die gebruik van 'n handboek in 'n taal anders as u huistaal u prestasie affekteer? / *Do you feel that the use of a textbook in a language different to your home language affects your performance?*
1 ☐ Ja / *Yes*
2 ☐ Nee / *No*
3 ☐ Handboek is in my huistaal / *Textbook is in my home language*

(10) Indien u antwoord "Ja" is verduidelik asseblief hoekom. / *If your answer is "Yes" please explain why.*.....

(11) Hoe betaal u vir u studies? / *How do you pay for your studies?*
1 ☐ Beurs / *Bursary* 3 ☐ Self / *Self*
2 ☐ Ouers / *Parents* 4 ☐ Ander / *Other*.....

(12) Werk u deeltyds? / *Do you work part-time?*
1 ☐ Ja / *Yes*
0 ☐ Nee / *No*

(13) Indien "Ja" het hierdie deeltydse werk 'n impak op u bywoning van lesings en tutklasse? / *If the answer is "Yes" does your work impact on your attendance of lectures or tut classes?*

.....

.....

(14) Hoe geïnteresseerd is u in Ekonomie? / *How interested are you in Economics?*

1 ☐ Stel baie belang / *Very interested*
2 ☐ Stel belang / *Somewhat interested*
3 ☐ Neutraal / *Indifferent*
4 ☐ Geen belangstelling / *No interest*
5 ☐ Besonder onbelangstellend / *Very uninterested*

(15) Geniet u dit om Ekonomie te studeer? / *Do you enjoy studying Economics?*

1 ☐ Baie genotvol / *Very enjoyable*
2 ☐ Geniet / *Enjoyable*
3 ☐ Neutraal / *Indifferent*
4 ☐ Geniet dit nie / *Not enjoyable*
5 ☐ Haat Ekonomie / *Hate Economics*

(16) Maak u gebruik van u dosent se konsultasie-ure? / *Do you make use of your lecturer's consultation hours?*

1 ☐ Ja / *Yes*
0 ☐ Nee / *No*

(17) Indien "Ja" hoe gereeld? Indien "Nee" hoekom nie? / *If "Yes" how often? If "No" why not?*

.....

.....

(18) Berei u voor vir lesings deur die betrokke hoofstuk voor die lesing deur te lees? / *Do you prepare for lectures by reading the chapter prior to the lecture?*

1 ☐ Ja / *Yes*
0 ☐ Nee / *No*

(19) Indien "Nee" verduidelik hoekom nie. / *If "no" explain why not.*

.....

.....

(20) Maak u studienotas? / *Do you make study notes?*

1 ☐ Ja / *Yes*
0 ☐ Nee / *No*

(21) Berei u die tut vooraf voor vir die tutoriaalklas? / *Do you prepare the tut prior to the tutorial class?*

1 ☐ Ja / *Yes*
0 ☐ Nee / *No*

(22) Indien "Nee" verduidelik hoekom nie. / *If "No" explain why not.*.....

.....

(23) Het u 'n studiegroep met klasmaats? / *Do you have a study group with fellow classmates?*

1 ☐ Ja / *Yes*
0 ☐ Nee / *No*

(24) Indien wel, dink u dat dit u effektief help om die werk beter te verstaan? / *If so, do you think that it is effective in helping you understand the work better?*

1 ☐ Ja / *Yes*
0 ☐ Nee / *No*

(25) Vir hoeveel modules in totaal is u hierdie jaar ingeskryf? / *For how many modules in total are you enrolled this year?*.....