DOES SOCIO-ECONOMIC BACKGROUND AFFECT FIRST YEAR ECONOMICS PERFORMANCE? A PRELIMINARY STUDY[*]

Kerry Hunter
Institute of Interactive Media and Learning,
University of Technology, Sydney

Harry Tse
Business School Economics Group,
University of Technology, Sydney

ABSTRACT

It is widely reported that previous study in economics and maths play an important role in determining student performance in tertiary economics. This paper examines the determination of academic performance by adding a slightly broader range of factors that include socio-economic background to the main factors already identified in the literature. The paper regresses overall subject results for students enrolled in a core, first year economics subject at a large cosmopolitan university against a set of variables previously shown to have affected student performance as well as socio-economic background. Results are consistent with those from the existing literature but the innovative finding is a negative effect of low socio-economic background on performance. The effect of English language background is also identified as an important factor and the view put that correlation between these two variables remains under-researched. This is important to economics education since universities are enrolling increasing numbers of students from low socio-economic backgrounds. Limitations of the study are identified and suggestions made for further work.

Keywords: socio-economic background, student performance.

JEL classification: A22

1. INTRODUCTION

Since the 1970s a growing body of literature has sought to quantitatively identify the determinants of student performance in tertiary economics classes. The key determinants have been shown to be fairly consistent across studies and countries, and have allowed teachers and educators to identify areas of weakness in economics students and to consider implementing programs to target those areas. A number of studies have found university entrance score, previous study in mathematics and high school economics study to be among the more important determinants of first year economics performance. Demographic factors, particularly socio-economic status, however, have not been studied as extensively.

Measuring determinants that affect tertiary study in any discipline is valid, especially as the expansion of participation in higher education has further complicated and problematised the transition to university. Increasing the diversity of the student population raises questions about student readiness to undertake tertiary studies. The demographic variable of *socio-economic status* (SES) is of particular interest in view of the Federal Government's 2009/10 package of $433 million in funding to increase participation of students from low socio-economic backgrounds. The *Widening Participation Policy* (WPP) will admit many more students from low SES to meet the Federal Government's target of 20% by 2020.

The present paper investigates a slightly broader range of determinants of performance in first year economics by adding socio-economic background to the main factors already identified in the literature. It uses data collected from a survey of first year economics students in an Australian business degree program to explain student performance in the economics course. The paper proceeds by reviewing the relevant literature in the next section, then by outlining the data and methodology used in the study. Results are then reported, discussed and some conclusions drawn in the final section.

2. BACKGROUND AND PRIOR RESEARCH

As noted in the introduction, the influence of external factors on student performance in economics has been reported in studies in the USA, UK and Australia. High school entrance score (Camara & Echternacht 2000; Win & Miller 2005), previous high school study in mathematics (Mallik & Basu 2009; Mallik & Lodewijks 2010) and previous study in

economics (Durden & Ellis 1995; Birch & Williams 2009) have been reported as having an impact on grades at university. Some studies of demographic factors such as socio-economic status (Win & Miller 2005), hours of paid work (Hunt, Lincoln & Walker 2006), gender (Birch & Miller 2006) and English language background (Birch & Williams 2009; Mallik & Lodewijks 2010) have also been determined as affecting student grades, although results are somewhat inconclusive as differing measures have been used.

In their study of high school entrance scores Camara & Echternacht (2000) found a positive relationship between *overall high school performance* and subsequent performance in tertiary economics courses. Their findings are consistent with the body of Australian literature that has recently emerged. Birch & Miller (2006), Mallik & Basu (2009) and Mallik & Lodewijks (2010) presented high school performance as a proxy for innate student ability.

The precise effect of *high school economics* on tertiary economic performance was inconclusive in earlier studies (Saunders 1970; Siegfried & Round 1994). However, later studies began to place importance on prior subject knowledge and the relationship between high school economics and grades in first year. For example, a U.S. study, Durden & Ellis (1995) suggested prior knowledge results in a 3% higher grade. Lopus (1997) looked at previous study of economics in more detail and focused on U.S. students who specifically studied units of microeconomics and macroeconomics at high school and found that in general these students had a greater knowledge than students who did no economics. A Canadian study undertaken by Anderson, Benjamin & Fuss (1994), also looked at the effects of prior knowledge in more detail. Their study showed that previous study of economics only has an effect at tertiary level if the student was relatively successful at high school.

Some Australian studies have been conducted that support results of earlier studies. Mallik & Lodewijks (2010) found a positive and significant coefficient at the 1% level indicating that prior study assists tertiary grades. Birch & Williams (2009) found that previous study of economics has a higher effect on the lower end of the grade distribution so that high school economics helps the low-scoring tertiary student the most. Their findings that students who had studied economics in high school had an estimated impact of 5.3% at the 10th quantile of the grade distribution to 1.5 for students at the 90th quantile are in line with earlier

overseas studies and concluded prior knowledge of the subject studied is an important variable to be included in the estimation of the determinants of academic performance.

High school mathematics has also been seen to be predictive in university economics performance. Mallik & Basu (2009) and Mallik & Lodewijks (2010) found that students who had studied general mathematics did not perform as well as those who had studied higher levels. Their study concluded the coefficient of the 2 unit maths variable is positive and significant for all models. They conclude study of higher level mathematics at schools generates quantitative skills that in turn lead to better performance in tertiary economics. Lagerlöf & Seltzer (2009) interpret the meaning of the coefficient on mathematical performance in high school. They posit that mathematical ability is an approximate measure of both ability and motivation, and use difference-by-difference methods to separate these factors to look at the pure effect of remedial mathematics classes.

Some researchers sought to determine if *English language competence* could be identified as affecting student grades. Mallik & Lodewijks (2010) measured the impact of birth in Australia and found no significant evidence that this had any effect on performance. Their exploration of levels of English studied in high school found that those students who studied higher level English performed better than those who studied standard English. Birch & Williams (2009) measured non-English speaking background of students born overseas but did not include students born in Australia. The analysis found that students born overseas in non-English speaking countries had grades in first year tertiary economics higher than students born in Australia. They linked this higher grade to the higher premium placed on education among families from non-English speaking backgrounds (*cf.* Birrell 1987) but the result could also reflect capable international students as local NESB students were not included in the study.

Difficulties faced by low socio-economic status (SES) students entering tertiary institutions are well documented in the sociological and education literature. These include a lack of knowledge about what is expected in university study (James, Krause & Jenkins 2010) and little socio-cultural competency within a tertiary setting that 'can hinder their success and achievement at university' (Devlin 2011, p.3). Devlin cites researchers who believe that low SES students have difficulty adapting to tertiary environments because of the incongruence between

their cultural capital and the middle class culture encountered in higher education (*cf.* Bamber & Tett 2001; and Greenbank 2006). She believes this incongruence may present difficulties in understanding a range of discipline specific discourses as such students may not have the relevant cultural capital or familial experience with universities to help them decode the discourses and respond to implicit expectations within them.

Studies of *socio-economic factors* have, however, been affected by a lack of definitive measurement. Camara & Echternacht (2000) identify socio-economic factors as increasing tertiary performance in economics and use such proxies as the highest level of tertiary qualification attained by a parent to represent these factors. An Australian study, Win & Miller (2005) found no significant relationship between academic performance and home's economic resources although they suggest that parental educational level has a positive effect. This is consistent with findings by Marks *et al.* (2000) who found parents' occupational stature has a positive effect on student achievement. However, the Department of Education, Employment and Workplace Relations (2009) report *Measuring the Socio-economic Status of Higher Education Students* points out that most studies find a high correlation between family wealth measures and both educational participation and attainment (Long *et al.* 1999; Williams *et al.* 1993). The report asserts that being located in a low SES area with what Vinson (2007) calls 'a disabling social climate' can create and sustain disadvantageous impacts on educational participation and attainment.

Studies as early as Rubin (1977) found students in paid employment outside university hours tended to score lower grades with the hypothesis that their study time was more limited. More recent research by Hunt, Lincoln & Walker (2006) explored the growth in term-time employment and its impact upon academic attainment amongst students at Northumbria University finding that employment did affect academic attainment, particularly for those working longer hours. Metcalf (2003) explored the increasing inequality in higher education driven by the reliance that many students have upon working whilst studying. It was found that students must sacrifice time for employment in order to ease financial pressures (particularly for those students whose families do not provide financial support). Birch & Williams (2009) study measured impacts of studying part time at university, that is, students combining study with paid work and/or childcare. They found that the relationship between part time study and lower performance was less

pronounced than in other studies that had looked at grades in all units of study. They suggested that first year economics may be more suitable for studying on a part time basis than other subjects.

To summarise, the literature commonly identifies previous study in economics, mathematics and overall high school performance as positively affecting performance in tertiary economics. Findings about demographic variables and language background are less consistent since differing ways of measuring the relevant variables seem to affect results. The objective in this study was to see whether first year performance is affected by socio-economic background but controlling for a broad range of variables. The implementation of the WPP underpins the study as universities are increasingly faced with students being admitted through special consideration programs and bonus points. This raises questions about the ability or readiness of such students to decode tertiary discourses.

3. DATA AND METHODOLOGY

The objective of investigating whether first year performance is affected by socio-economic background was pursued in the present study using data from the first year unit in the Bachelor of Business degree at the University of Technology, Sydney (UTS) called *Economics for Business*. This compulsory unit covers seven weeks of elementary microeconomics and five weeks of macroeconomics with theoretical and applied content. It has an average enrolment of around 1,400 students. Because of privacy restrictions on the availability of student-specific data within the University, the data used in the study was collected via a voluntary student survey and cross-referenced with students' final grades. The resulting sample size was 386 students. This method of collecting data clearly implies that the study suffers from self-selection bias and we discuss the nature of this bias and ways in which it might modify the interpretation of our results later in the paper.

The survey was designed to collect data on the variables identified in the literature as important for determining first year economics performance. The survey itself is reproduced in the Appendix but it included questions on students' mathematics background, including the level of maths studied at high school. We viewed various levels of mathematics background as representing a composite of ability and motivation so that *pre-disposition* to mathematics is assumed to enhance university performance. The higher the mathematical standard attained, the better should be first year economics performance.

The survey also asked students whether they had studied economics at high school, which was assumed would have a positive influence on their first year economics performance. With respect to demographic variables, the survey asked about age and whether the student was engaged in paid work. Previous studies indicate that the first of these variables would have a positive influence on first year performance because of the greater maturity and perspective that comes with being older, while the second would be expected to have a negative effect since work of this kind would place students under greater time pressure that would compete with their studies.

Socioeconomic status (SES) was a particular focus of the study due to the university's adoption of the WPP. We decided not to ask the occupational status of parents to measure SES but to focus on residential location. There is also good data from the Australian Tax Office (ATO) that indicates differences in average incomes across residential areas in Sydney grouped by postcode into six regions. These regions and their average taxable incomes in 2010 were: West (W) $44,394; South West (SW) $38,358; City Business District (CBD) $59,440; North (N) $66,469; North West (NW) $56,183; South (S) $45,451. The overall average taxable income across these regions was thus $51,716. As a very rough indication of the impact of socio-economic background on university performance, we might expect that students from areas with average taxable incomes below the overall average might fare worse than those from areas with average taxable incomes above the overall average. Thus students from the West, South West and South might be expected not to perform as well as students from the City, North and North West regions. There are also a number of studies, including Williams *et al.* (1993), Long, Carpenter & Hayden (1999), and Vinson (2007), which show that wealth exerts an influence over and above parental occupation and education on socio-economic status. This could also be expected to show up in family choice about residential location. The survey thus asked for postcode information and allocated postcodes into one of the six ATO regions. This provided at least a rough indication of the socio-economic background of the student.

As indicated in the previous section, the fact that English language competence has an effect on tertiary performance is well documented in the educational and linguistics literature. Yet the literature overwhelmingly refers to international students. Local students may

also have a language background other than English but if they are admitted to university through high school or some alternative pathway (for example, through a Technical and Further Education (TAFE) college) this information is usually not captured. We wanted to capture the pure effect of language background on university performance and did not need to differentiate between local and international students, so the survey simply asked students if English was their first language. Due to some evidence that students entering university through alternative pathways do not perform as well as those from high school, we also included questions about completion of high school in Australia and university entry via non-standard pathways.

In New South Wales, high school achievement is measured by the university admissions index (UAI) which also serves, as its name suggests, as the criterion for standard admission to courses at all NSW universities. This index would have been a good proxy for general ability but it was not, unfortunately, available due to privacy provisions. What was available, however, was students' choice of campus. UTS offers the Bachelor of Business at two locations in Sydney, the City (or downtown) campus and the Kuring-gai (or suburban) campus. There is a 15% difference in the admission grade for these two campuses so that campus choice could be taken as a proxy for higher and lower achievement in the UAI.

Our approach thus identified seventeen potential variables that could be used to explain the determination of a student's final score in *Economics for Business* in the semester in question. Table 1 provides a summary of these variables, their short names and the influence they could be expected to have on student performance in the subject. We initially estimated the model in equation (1) below which included all of the variables in Table 1 using OLS.

$$\begin{aligned}
\text{SCORE}_i = {} & \beta_1 + \beta_2 \text{HSAU}_i + \beta_3 \text{HSAU09}_i + \beta_4 \text{HSEC}_i + \beta_5 \text{ENG}_i \\
& + \beta_6 \text{NonUAI}_i + \beta_7 \text{Over20}_i + \beta_8 \textit{HiUAI}_i + \beta_9 \text{HRSW}_i \\
& + \beta_{10} \text{CBD}_i + \beta_{11} \text{N}_i + \beta_{12} \text{NW}_i + \beta_{13} \text{W}_i + \beta_{14} \text{SW}_i \\
& + \beta_{15} \text{S}_i + \beta_{16} \text{Math2}_i + \beta_{17} \text{Math3}_i + \beta_{18} \text{Math4}_i + \varepsilon_i \qquad (1)
\end{aligned}$$

The results from this estimation naturally included a number of statistically insignificant coefficients. We identified the least statistically significant of these estimates, excluded the associated variable from a revised version and re-estimated the model. This

Table 1: Potential Variables for Use in the Study

Variable	Variable Name	Source	Expected Sign	Description
Completion of High School in Australia	$HSAU_i$	Survey	Uncertain	Whether student completed high school in Australia. Dummy variable taking value of 1 for Australian completion, 0 otherwise.
High School 2009	$HSAU09_i$	Survey	+ ve	Whether student completed high school immediately prior to first year economics. Proxy for freshness. Dummy variable taking value of 1 for completion in 2009 and 0 otherwise.
High School Economics	$HSEC_i$	Survey	+ ve	Whether student completed high school Economics. Dummy variable taking value of 1 for yes and 0 otherwise.
English First Language	ENG_i	Survey	+ ve	Whether English was student's first language or whether there was a strong background in a language other than English. Dummy variable taking value of 1 for English as first language and 0 otherwise.
Non UAI Score	$NonUAI_i$	Survey	– ve	Whether student entered UTS via alternative pathway. Dummy variable taking value of 1 for yes and 0 otherwise.
Students 20+	$Over20_i$	Survey	+ ve	Whether student was 20 years of age or more when completing first year Economics. Dummy variable taking value of 1 for age of 20+ and 0 otherwise.
High UAI Score	$HiUA_i$	Enrolment Status	+ ve	Whether student was enrolled at the City Campus requiring a high UAI score or the Kuring-gai Campus with a lower score. Dummy variable taking value of 1 for City and 0 otherwise.

Table 1: Continued

Variable	Variable Name	Source	Expected Sign	Description
Paid Employment Hours	HRSWi	Survey	– ve	No of hours in which student was engaged in paid work during completion of first year Economics. Continuous variable.
Students Residing in:				
Sydney CBD	CBD$_i$	Survey	+ ve	Whether student resided in Sydney CBD area. Dummy variable taking value of 1 for yes and 0 otherwise.
North	N$_i$	Survey	+ ve	Whether student resided in Sydney's Northern suburbs. Dummy variable taking value of 1 for yes, 0 otherwise.
North Western Sydney	NW$_i$	Survey	+ ve	Whether student resided in Sydney's North West. Dummy variable taking value of 1 for yes and 0 otherwise.
Western Sydney	W$_i$	Survey	– ve	Whether student resided in Western Sydney area. Dummy variable taking value of 1 for yes and 0 otherwise.
South Western Sydney	SW$_i$	Survey	– ve	Whether student resided in South West Sydney. Dummy variable taking value of 1 for yes and 0 otherwise.
Southern Sydney Economics	S$_i$	Survey	– ve	Whether student resided in Southern Sydney area. Dummy variable taking value of 1 for yes and 0 otherwise.
2 Unit Maths	Math2$_i$	Survey	+ ve	Whether student completed 2 unit high school maths. Dummy variable taking value of 1 for yes and 0 otherwise.

Table 1: Continued

Variable	Variable Name	Source	Expected Sign	Description
3 Unit Maths	Math3$_i$	Survey	+ ve	Whether student completed 3 unit high school maths. Dummy variable taking value of 1 for yes and 0 otherwise.
4 Unit Maths	Math4$_i$	Survey	+ ve	Whether student completed 4 unit high school maths. Dummy variable taking value of 1 for yes and 0 otherwise.

process was repeated until all of the estimated coefficients were statistically significant.

4. RESULTS

As explained above, the model in equation (1) was initially estimated using OLS. The results for this estimation procedure are shown in Table 2. The variables which had statistically significant coefficients were the completion of high school Economics (HSEC), whether English was spoken by the student as a first language (ENG), whether the student had a high university admission score (HiUA), all of the geographic socio-economic variables except whether the student resided in North Western Sydney, and all of the mathematics background variables. The least significant variable was the hours of paid employment. This variable was removed and the model was re-estimated. This stepwise cleaning process was repeated to remove the least significant variable in each re-specification in order to arrive at the most parsimonious model. The final model is shown in equation (2) and the estimation results are shown in Table 3.

$$\text{SCORE}_i = \beta_1 + \beta_4\text{HSEC}i + \beta_5\text{ENG}_i + \beta_8\,\text{HiUAI}_i + \beta_{14}\text{SW}_i$$
$$+ \beta_{16}\text{Math2}_i + \beta_{17}\text{Math3}_i + \beta_{18}\text{Math4}_i + \varepsilon_i \qquad (2)$$

The variables that were retained in the final model were the background in high school economics variable (HSEC), English as a first language (ENG), whether the student had a high UAI score (HiUA), and all of

Table 2: Results for Initial Estimation of the Full Model

Variable		Value	Standard Error	t-value	p-value	
Constant		64.27	5.569	11.542	0.000	
Completion of High School in Australia	(HSAU$_i$)	- 5.161	5.107	- 1.010	0.313	
High School 2009	(HSAU09i)	- 1.398	1.616	- 0.865	0.388	
High School Economics	(HSEC$_i$)	4.188	1.272	3.293	0.001	***
English First Language	(ENG$_i$)	3.459	1.531	2.260	0.025	**
Non UAI Score	(NonUAI$_i$)	- 3.560	2.457	-1.449	0.148	
Students 20+	(Over20i)	1.566	2.546	0.615	0.539	
High UAI Score	(HiUA$_i$)	7.426	2.014	3.688	0.000	***
Paid Employment Hours	(HRSWi)	0.024	0.064	0.380	0.704	
Students Residing in:						
Sydney CBD	(CBD$_i$)	-5.926	2.561	-2.313	0.021	**
North	(N$_i$)	-.4.412	2.373	-1.859	0.064	*
North Western Sydney	(NW$_i$)	-3.546	2.734	-1.297	0.196	
Western Sydney	(W$_i$)	-5.838	2.692	-2.168	0.031	**
South Western Sydney	(SW$_i$)	-6.635	2.379	-2.788	0.056	*
Southern Sydney	(S$_i$)	-5.236	2.325	-2.252	0.025	**
2 Unit Maths	(Math2$_i$)	5.199	1.641	3.167	0.002	***
3 Unit Maths	(Math3$_i$)	6.649	1.790	3.714	0.000	***
4 Unit Maths	(Math4$_i$)	7.096	2.822	2.514	0.013	**

Note: *** indicates significance at the 1% level; ** indicates significance at the 5% level; and * indicates significance at the 10% level.

the maths background variables (Math2, Math3, Math4). The only socio-economic background variable that was eventually significant was whether the student resided in Sydney's southwest. This model indicates that the most important factor affecting performance in first year economics was whether students had completed advanced maths at high school. Students who completed 4 unit maths scored over 8 marks out of a possible 100 better than students who did not complete advanced maths at any level. Students who completed 3 unit maths scored about 7 marks more, and students who completed 2 unit maths scored just over 5.5 marks more than students who did not complete

Table 3: Final Regression Model

Variable		Value	Standard Error	t-value	p-value	
Constant		54.41	2.076	26.20	0.000	***
High School Economics	(HSEC$_i$)	4.151	1.217	3.410	0.000	***
English First Language	(ENG$_i$)	3.468	1.432	2.421	0.011	**
High UAI Score	(HiUA$_i$)	6.479	1.882	3.443	0.001	***
Students Residing in:						
South Western Sydney	(SW$_i$)	-2.574	1.531	-1.68	0.094	*
2 Unit Maths	(Math2$_i$)	5.681	1.571	3.616	0.000	***
3 Unit Maths	(Math3$_i$)	6.977	1.736	4.018	0.000	***
4 Unit Maths	(Math4$_i$)	8.258	2.748	3.004	0.003	***

Note: *** indicates significance at the 1% level; ** indicates significance at the 5% level; and * indicates significance at the 10% level.

any form of advanced maths. The next most important factor was the proxy for general ability and whether students entered the program at the City campus which required a higher university entrance score. These students scored about 6.5 marks more than their lower UAI peers. Completing high school economics and having English as one's first language added 4 and 3.5 marks to one's final result for *Economics for Business* compared to students who had not completed economics and had a first language other than English respectively.

Students whose socio-economic background was based in Sydney's south west tended to perform marginally worse than other students, scoring just under 3 marks out of 100 *less* in their final mark for the subject. We stress, however, that this variable was only barely significant at the 10% level. We retained the variable in the final model because it may indicate an issue that warrants the kind of further investigation we recommend later in the paper's conclusion.

Thus a student who completed high school economics and 4 unit maths, achieved a high UAI score and did not reside in Sydney's southwest, could expect to score around 77 marks out of a possible 100 in *Economics for Business*. This is a *Distinction* grade, which in the Australian system is a relatively high level of performance. A student with the same characteristics but living in Sydney's southwest could expect to score about 74 out of a possible 100 marks, just missing the

cut-off of 75 marks for the *Distinction* grade. A similar student again, not living in Sydney's southwest but with a language background *other than* English could expect to score about 73 marks. This student would also miss out on a *Distinction* grade but by a slightly greater margin indicating that language background has a slightly bigger negative impact on subject performance than a poor socio-economic background according to our results. A student with none of the characteristics outlined above could still expect to pass *Economics for Business* with a grade of about 54 marks from a possible 100.

This regression had an adjusted R^2 of 0.19 and an *F-statistic* of 11.34 compared with an *F-critical* value of 3.70 at the 1% level. White's *F*-test on the original model failed to find heteroskedasticity (*p-value* = 0.3941).

5. DISCUSSION

The results reported above are consistent with those from the existing literature on determinants of student performance in tertiary economics classes discussed in Section 2. The innovative finding of the present study, however, is the negative effect of the south western socio-economic variable on performance in our first year economics subject. Strictly, the south western dummy variable indicates that a background in the south western region generates observable or unobservable student characteristics that are associated with lower academic performance, holding other characteristics fixed. It may thus be that there is a less enabling social climate in Sydney's southwest, correlated with lower average taxable incomes and lower wealth (*cf.* Vinson 2007), that makes it more difficult for students from this area to perform as well in first year economics as students from other areas. But the size of the effect is small, less than 3 marks, and it is barely statistically significant. This suggests first of all that more work is needed to explore the size and significance of the effect. Data from additional cohorts across both time and institutions is needed to examine the possible dimensions of this effect. Given the importance of the *WPP*, such a study is clearly justified. It is also worth bearing in mind that the self-selection bias noted earlier in the paper from which the present study suffers is likely to *understate* the size of this effect. It is more likely that students from lower SES backgrounds were among those absent from class and not completing the survey or choosing not to complete the survey due to sensitivities about their backgrounds in a middle class university context. Such a perspective suggests that at least a modest

amount of additional support is justified in helping students from lower SES backgrounds to overcome the small disadvantage they face in tertiary study.

The effect of English language background identified in our results also warrants further comment. Universities are currently aware of the problem of students entering institutions without the standard of English necessary to successfully complete their studies. Many have introduced English Language Policies and established means by which such students are supported. Yet these policies are, for the most part, directed at international students. There are a number of ways current universities support students who need to develop their English language and academics are usually aware of language provision services, especially in courses with high numbers of international students. Yet local students whose language background is not English often do not regard language as their problem. Language specialists report high attendance at workshops by international students but subject academics at our university report that local students, particularly those from low SES areas, do not generally seek language support services.

Although the variable of low SES has been studied in determinants of performance in tertiary economics, the correlation of English language background and low SES has not been identified by researchers. Yet South Western Sydney was identified as having the highest number of students in NSW with a language background other than English. This statistic, 65%, was published in a 2011 NSW Government Education and Communities Report. Thus, a possible non-English language background of low SES students, added to their low social and cultural capital, presents challenges to tertiary institutions with the WPP targeting and admitting many more such students to meet the Australian Federal Government's target of 20% by 2020. Tertiary institutions are aware of the problem of stigmatising such students yet it can be assumed students targeted by this policy will be challenged by tertiary study, particularly in subjects requiring mathematical calculations and use of econometric models.

6. CONCLUSION

This paper has examined the determinants of academic performance in economics for students enrolled in a first year first semester core economics subject. The paper used a regression model where the overall result of the subject was regressed against a set of variables previously

shown to have affected student performance. While results of previous study of economics, level of mathematics and high school university entrance score showed a positive effect on performance, our study has also found a small negative effect for students with an SES background from Sydney's southwest and a larger negative effect for students with a background where English is not the primary language. These latter results are important in determining academic performance but are somewhat under-researched in economics education studies.

The result for SES background is especially important, as we have previously stated, if universities are enrolling increasing numbers of low SES students. It could be suggested the purpose of giving wider access to university entrance will be defeated if the students specifically targeted are not provided with additional support services and enriched delivery mechanisms to prevent potential declines in student retention rates (Mallik & Lodewijks 2010). While this study involved a cohort of first year students at one university, with a possible self-selection bias, the findings support the notion that tertiary institutions generally need to respond to larger numbers of low SES students. Strategies to attract low SES students are currently successful resulting in expanding enrolment but providing supporting mechanisms to assure attainment may be more complex than is currently acknowledged.

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