Determining Student Satisfaction: An Analysis of the National Student Survey.

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Abstract

The National Student Survey represents a major resource, never previously used by investigators to understand how the market signal of quality in higher education works. In this study, we examine the determinants of the overall student satisfaction score across eleven subject areas for 121 UK universities between 2007 and 2010. Using a unique panel data set and random effects estimation we find large differences in NSS scores across subjects and across different groups of universities. Additionally, the staff-student ratio and student employability are strong influencers of student satisfaction; both factors which may be cultivated by a policy which places emphasis on student support, personal development and employability skills.

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I. Introduction

The annual *National Student Survey* (NSS) was introduced in the UK in 2005 and is completed by the graduating student body of all publicly funded higher education institutions. Commissioned by the Higher Education Funding Council for England (HEFCE), administered by Mori, and forming part of the quality assurance framework implemented by the Quality Assurance Agency (QAA) for higher education, the NSS has become one of the major instruments by which universities seek to compete in the market for student recruitment by sending a signal of teaching quality. Furthermore, these scores are incorporated into the major university league tables (HEFCE 2008). The administering of the survey itself, between January and April when students are in their final year, has been subject to many allegations of potential distortion including claims that students could be encouraged by their teachers to provide an excellent review (The Times Higher Education Supplement: May 2008). As noted by HEFCE, "Whether attempts to use the results to enhance quality have been successful is an unresolved issue" (HEFCE 2010 p.11). However, since the announcement of the new higher student fee schedule[1] students possess more incentive than ever to search for the best value student experience they can find and therefore the NSS is potentially a key weapon for universities to deploy in search of market share.

The economics literature has tended to focus on either the labour market outcomes of graduates or average graduate wage returns as indicators of institutional performance (Blundell *et al*., 1997; Smith *et al*., 2000; Chevalier and Conlon 2003; Bratti *et al*., 2005), or has viewed the higher education institution as a

[1] Fees for full-time higher education students were increased up to the cap of £9000 per annum at many English universities for UK residents who started their undergraduate course from September 2012.

multiproduct firm, assessing the determinants of their productivity (Johnes and Taylor 1990; Johnes *et al.,* 2005; Lenton 2008). The importance of university rankings in students' choice of university is becoming an important area of research as since the changes in funding regimes have led universities to actively seek students. Horstchraer (2012) finds that university rankings play an important role in identifying student satisfaction for students making their choice of medical school in Germany. In the UK the literature on the NSS is sparse, consisting mainly of reports by HEFCE of the descriptive statistics, trends in the scores across years, and discussions surrounding their usefulness (Cheng and Marsh 2010). In this paper, we address the gap in the economics literature by examining possible influences on the overall NSS scores for eleven subject areas within 121 UK universities between 2007 and 2010, using a unique panel dataset. In the following section we describe our data and estimation technique. In section III we discuss our results and in section IV we draw our conclusions and implications for policy.

II. Data and methodology

The NSS questionnaire consists of 22 questions across six areas of university life: teaching; assessment and feedback; academic support; organisation; resources and personal development. A final question asks students for an overall rating of their satisfaction with the quality of their course which is answered on a five point Likert scale from 'definitely agree' to 'definitely disagree':

"Overall, I am satisfied with the quality of the course"

The NSS data is provided on the 'unistats' website and available for subjects within the joint academic coding system (JACS) 4 digit code which enables us to

match in data on teaching costs, students and the destination of graduates for each subject in each UK university, which was provided by HESA. The NSS score is calculated as the percentage of students who agree or definitely agree with the statement above. As previously mentioned, there is criticism of this measure because it is claimed that it provides a limited basis for discriminating between universities; however, the ratings across universities have been found to be highly reliable and stable over time (Cheng and Marsh 2010) and remain the method by which university teaching quality is measured in many ranking systems[2]. The first survey in 2005 produced a response rate of 60% with a total of 171,290 respondents, which by 2009 had risen to a 62% response rate and 223,363 respondents.

The mean overall NSS score is quite high at 82.8 although ranges from a low score of 32 to a maximum score of 100. The descriptive statistics are provided in Table 1 below for our dependent and explanatory variables, which we now discuss in greater detail.

[TABLE1 HERE]

The proportion of graduates who are in employment or postgraduate study six months after graduation may be indicative of a good reported satisfaction score as these would have been the students who are most likely to have performed well and enjoyed their programme of study. However, students who have enjoyed their studies, and received excellent teaching in state-of-the-art lecture theatres, may still feel dissatisfied if they perceive themselves to lack the skills to secure graduate employment, or if they feel their probability of success in the labour market or in

[2] For example, the Times guide and the Guardian university rankings.

postgraduate study is below that of their contemporaries. This is a particularly important variable in our analysis in that it is a subjective measure which may be amenable to a university policy which encourages students to reflect on their progress and builds their confidence. HESA have provided us with information on the number of graduates in each subject within each institution who subsequently entered employment or postgraduate education within six months of graduation along with firstly, the number of graduates who are classified as in the labour market i.e. employed or actively searching for employment (the HESA baseline measure of graduate employment). We convert these figures into their respective percentages. The percentage of graduates who are reported as employed or in postgraduate study is fairly consistent across university types at around 84% and also consistent across most subjects apart from art and design where it is slightly lower (78%).

The percentages of students in each classification of degree, for each subject in each university, are recorded in the NSS data for universities in England, Wales and Northern Ireland only. We consider it vital to include this variable in our modelling because those students who obtain a good class of degree[3] would be more likely to report a high level of satisfaction on the NSS. We were able to obtain the relevant degree classification data, by subject within each of our Scottish universities, which was supplied by HESA[4]. The average percentage of students who obtained a first class degree is higher in the traditional universities (15.9) compared to the average for all other types of university (9.8).

Staff-student ratios are highly likely to influence student perceptions of the quality of teaching quality and their learning environment, where we would expect a

[3] An upper second class or above is the standard required by many of the major graduate employers.
[4] Scotland offers both honours and non-honours degrees, the latter of which are not classified. Therefore, Scottish degrees here are all honours degrees.

smaller staff-student ratio to provide a more positive satisfaction score. We are unable to measure the actual class size for each module within the subject but argue that a smaller staff-student ratio may imply more opportunity for staff and students to get to know one another and provide extra support, for example, more office time. This variable is calculated by dividing the number of students taking the subject by the number of academic staff in the subject. The data from which the cost and staff-student ratio measures were calculated was also provided by HESA. As previously mentioned a large concern for some time has been the effect of tuition fees on students' expectations of the value for money provided by their institution. The average staff-student ratio at around 21 students per staff member is consistent across universities but differs by subject. Typically, smaller ratios are seen for mathematics (18.1), languages (18) and history (17.5) and larger ratios for economics (26.5), management (26) and business (24.7).

Students enter university after meeting the educational requirements of their place offer and the evidence provided by the literature shows that good students are spread across subjects (Leslie 2003) so any difference in NSS score will be driven by the student experience and not influenced by higher student ability in any subject. However, we have attempted to control for student ability which could bias the estimated quality of teaching across universities, which we discuss in detail in the methodology section below, by including the average UCAS points in each subject for each university, hence capturing the quality of the student body on entrance to higher education.[5] The average UCAS points score is 302, and does differ considerably across universities to reflect the quality of the student intake, from 410 for Russell group universities to 237 for the modern, non-traditional universities.

[5] We acknowledge that the average UCAS points measure cannot capture the distribution of points within each subject across universities.

Universities differ in the proportions of undergraduate teaching, postgraduate teaching and research they provide and increasingly have sought to differentiate themselves by highlighting their research capabilities and expertise making a refinement of their standard classification as traditional (older universities), modern post 1992(which are mainly former polytechnics that gained university status in 1992), or SCOP[6] universities (newer universities that were previously colleges of higher education, many of which gained university status in the mid 2000s), necessary to capture the changing perception of universities since they have increasingly sought to emphasise their role as leaders in research and as providing benefits to the wider society by form clusters of excellence. We identify 8 distinct types of university and apply dummy variables; the Russell Group (traditional universities which represent the 20 leading UK research-intensive universities),the 1994 Group[7] (a coalition of 12 top smaller research intensive universities); the Million Plus Group[8] (a modern universities think-tank); the GuildHE Group[9] (formerly the SCOP universities); the University Alliance (post 1992 universities which are engaged in business research and knowledge transfer); traditional universities not in any group; post 1992 universities not in any group and finally, other newer universities not in any group[10].

Increases in departmental expenditure on teaching and student facilities are likely to increase student satisfaction. We include three measures of expenditure for each university at the subject level within each university; the total expenditure per

[6] SCOP refers to the Standing Conference of Principals.
[7] Founded in 1994 to defend their interests following the formation of the Russell Group.
[8] Formed in 1997 as the Campaign for Modern Universities, it changed name to Million+ in 2004.
[9] Founded as the Standing Conference of Principals in 1967, many colleges gained university status in the early 2000s and the GuildHE was registered in 2006.
[10] Research assessment exercises (RAE) were conducted in the UK in 2001 and 2008, however, the metric differed between the two exercises so that it was not possible to calculate a consistent metric of research across our data using the two measures.

student, which will capture the budget available for all student related direct and indirect expenditures; the per-student expenditure on the remuneration of academic staff and the per-student expenditure on the remuneration of administrative staff. Table 1 shows that the expenditure on academic staff accounts for 60% of the total teaching budget spent, however, this varies by university type in a couple of ways; Firstly. the traditional universities, (which include Russell group and Group94 universities) have on average larger total teaching budgets than the other universities and secondly, of the total budget a smaller proportion is spent on academic teaching staff (60% compared to 69%).

We include in our modelling dummy variables for each English region and for each country of the UK in order to explore if there are differences in NSS scores between countries with different fee regimes and additionally between regions, for example, it may be that the proximity to the city of London yields a higher likelihood of finding employment as the student studying there is more familiar with the city labour market making job search easier relative to a student elsewhere.

Our eleven subjects reflect teaching across faculties and are likely to differ in the way courses are taught and the resources required. For example, biological sciences need laboratory facilities whereas history and management among others are likely to be classroom based, and mathematical sciences, computing and economics need computing facilities. We include dummy variables for our different subjects to examine whether there are noticeable differences in the reporting of scores across subjects, even within universities, and if there are, which subjects are

likely to receive a high score, for example, do classroom taught subjects yield a difference in score compared to those which are laboratory based?[11]

Not all universities in the UK took part in the survey in the initial years: Scottish universities did not take part and some English universities, perhaps assuming that this was a transitory poll, also abstained. However, with the results incorporated in the major ranking systems as mentioned above, all universities in the UK now participate and for this reason we take our starting point for this analysis as 2007.

Whilst we have controlled for factors which we believe influences the quality of teaching there may be external factors which are difficult to capture and not directly within a university's control but never the less may influence overall satisfaction. Student safety and well-being, the ability to concentrate on one's studies is paramount to any student's sense of satisfaction with their choice of university and we include two measures in an attempt to capture this; firstly students collectively may feel more safe in an environment where all their needs are at hand so a dummy variable captures whether the university is situated on a campus rather than in buildings across a city[12]; secondly, we have been able to map into the data local police authority total crime rates[13]. Finally, we include year dummies in order to capture any increase in scores over time as universities strive to put in place improvements to the student experience.

In our analysis we focus upon eleven subjects within each university, namely; biological sciences, mathematical sciences, psychology, computer sciences,

[11] There may be differences in class sizes across and within the subjects but we are unable to capture this in our estimation.

[12] Some universities have residences on a campus but lecture theatres within the city or town. Our definition of campus here is where both residences and teaching spaces are on a campus.

[13] Local police crime rates are available from the Office for National Statistics. Here we use the figures for total crimes in the locality.

economics, sociology, business and administration, management, European languages, history and art and design. The choice of these eleven subjects was driven largely by the availability of matching data across our data sources and this provided a total sample of 3438 observations within 121 Universities across England, Scotland, Wales and Northern Ireland. The data comprises of an unbalanced panel due to missing information at the subject level from some of our data sources[14]. In the estimation that follows we use the overall NSS score for each subject in each university as our dependent variable. The distribution of NSS scores is shown in Figure1 below.

[FIGURE 1 HERE]

The model

The NSS score achieved by each department in each year is assumed to reflect overall satisfaction with teaching and the student experience. This score, given by a different cohort each year we argue reflects not only the level of teaching but other internal and external factors including the level of confidence the student has regarding their employment prospects or the probability of being accepted onto a postgraduate course. Students will have had expectations of their educational outcome when they entered university. Following human capital theory, they will have assessed the return on their investment, which at time of making their investment decision would have included the choice of which university to attend. We hypothesise that students who consider themselves as highly able and most likely to secure a graduate job or enter a postgraduate course would rate their overall satisfaction with their degree course most favourably.

[14] Not all subjects for every university are recorded in the NSS each year.

The NSS score may well also be influenced by the proportion of students gaining a first class degree or a degree of an upper second or above (the standard requirement for graduate jobs or further study) , with those departments achieving a high standard being more likely to receive a favourable quality rating from their students. We considered the possibility of collinearity in our estimations as those students who gained a good degree may be more likely to be those in employment or further study. However a simple correlation between these two variables revealed that, counter to our initial intuition, this was not a problem and there is no significant correlation between the proportion of first class degrees and employment/further study[15]; we consider this may be due to our HESA employment measure reflecting all types of employment rather than only graduate jobs, hence our employment variable represents the quantity not the quality of the jobs, hence the degree classification is not at issue here. The difference between the average quality of the student body across universities on entrance to higher education should be taken into consideration because this may impact on the perception of teaching quality, therefore we include the average UCAS points on entry for each subject within each university. The student experience, even within the same subject, may be different across different types of university, especially if students believe the quality of teaching or reputation of their university to be superior to the quality of other universities. In order to identify possible factors that influence student satisfaction of their degree programme we estimate a random effects model where the dependent variable is the overall NSS score over a four-year period within eleven subjects in 121 universities across the UK, a list of the universities in the study is provided in the appendix.

[15] The correlation coefficient between the percentage of students in employment or further study and the percentage of students who gained a first is -0.016 and insignificant (p value 0.3577).

The random effects model is then given as:

$$Y_{ijt} = f(\beta_0 + \beta_1 \text{ Percentage employed or postgraduate}_{ijt} + \beta_2 \text{ Percentage first class}_{ijt} + \beta_3 \text{ Staff-student ratio}_{ijt} + \beta_4 \text{ Subject}_{ijt} + \beta_5 \text{ University type}_{ijt} + \beta_6 \text{ Region}_{ijt} + \beta_7 \text{ Cost academic staff}_{ijt} + \beta_8 \text{ Cost administration staff}_{ijt} + \beta_9 \text{ Cost other teaching}_{ijt} + \beta_{10} \text{ Campus}_{ijt} + \beta_{11} \text{ Average UCAS points}_{ijt} + \beta_{12} \text{ Crime rate}_{ijt} + \beta_{13} \text{ Year} + e_{ijt}) \quad (1)$$

where: Y_{it} is the overall NSS score and $_{ijt}$ indexes each subject in each university in each year. e_{ijt} is the error term where we assume that:

$$e_{ijt} = u_{ij} + v_{ijt} \quad (2)$$

where u_{ij} captures group effects and in the random effects model are realisations from an underlying probability distribution and v_{ijt} is the independent and identically distributed disturbance term.

Departments, as alluded to in the introduction, are concerned to maximise their NSS score and are anxious to be cost effective in this respect. To analyse whether we can directly attribute spending to this student evaluation we include measures of total departmental spending, the expenditure on academic staff salaries and the expenditure on administrative staff salaries. The NSS score as a reflection of the student experience may be influenced by location of the university, either because of the funding regime or because of the proximity to a graduate labour market, therefore we include dummy variables for each region. This may be influenced by the staff-student ratio as mentioned above and subject departments within universities are not of uniform size.

The student experience will also be influenced by the type of university and this also may have an impact on the student's subjective probability of finding good employment or a good postgraduate opportunity. Possibly, those students from research intensive universities may see themselves as more able to find good employment than students from other institutions and this may be reflected in their NSS scores. We include dummy variables to reflect the 8 different types of university we identified within the data section[16]. External factors to teaching that are taken into account here are the crime rate in the locality and a dummy variable for whether the university is located on a campus. Finally we include dummy variables for each year.

However, we must not ignore the possibility of endogeneity within our specification whereby those students who are most likely to gain employment may be those who have a high level of motivation to search for employment. These students are likely to be those who have high ability and have achieved a degree classification of an upper second or above, the standard requirement for applications to graduate positions, if this is so our measure of the proportion gaining a first class degree may also be endogenous in the model. However, to test whether our employability variable is in fact endogenous we use an instrumental variables approach and estimate a two stage least squares model of the NSS score where our main equation:

$$Y_{ijt} = f(\beta_0 + \beta_1 \text{ Percentage employed or postgraduate}_{ijt} + \beta_2 \text{ Percentage first class}_{ijt} + \beta_3 \text{ Staff-student ratio}_{ijt} + \beta_4 \text{ Subject}_{ijt} + \beta_5 \text{ University type}_{ijt} + \beta_6 \text{ Region}_{ijt} + \beta_7 \text{ Cost academic staff}_{ijt} + \beta_8 \text{ Cost administration staff}_{ijt} + \beta_9 \text{ Cost other teaching}_{ijt} + \beta_{10} \text{ Campus}_{ijt} + \beta_{11} \text{ Crime rate}_{ijt} + \beta_{12} \text{ Year } + e_{ijt}) \quad (3)$$

[16] We also estimated a model with 2001 RAE scores in place of the dummy variables.

is instrumented as follows:

$$E_{ijt} = f(\beta_0 + \beta_1 \text{ Average UCAS points}_{ijt} + \beta_2 \text{ regional unemployment rate}_{ijt} + u_{ijt}) \quad (4)$$

where the percentage of new graduates in employment or postgraduate education is instrumented by the average UCAS points, which may pick up unobserved ability or motivation and, because the likelihood of employment will also be influenced by the state of the labour market and the demand for graduates, the regional unemployment rate.

Using this specification we are able to test for endogeneity of our employability variable and in addition, we also run the model to test for endogeneity of our variable that captures the percentage of students within each subject within each university who gained a first class degree.

III. Results

The results from our two different estimators, the random effects model and the two stage least squares model provide evidence that the random effects model is the superior. The two stage least squares estimation results[17] provide us with similar estimates to that of the random effects model and although the two stage least squares model is proved to be correctly and strongly identified with respect to the instruments, the further tests for endogeneity in the model with respect to the percentage employed or in postgraduate study variable indicates that we cannot

[17] Results of the two stage least squares estimation are not reported here for brevity but are available from the author upon request.

reject the null of exogeneity[18]. We therefore focus our discussion on the results provided by the random effects model which are presented in table 2.

The positive and significant coefficients on the year dummies reveal that NSS scores have increased since 2007 most probably due to the fact that departments and universities have increasingly realised how important these are and have actively sought to increase their scores as has been alluded to in the literature (HEFCE 2008; HEFCE 2011). We note that whilst all coefficients are positive, showing an increase of one percentage point on the NSS score from 2007 to 2008, there have been no significant increases in the scores over the following two years under study. Our interpretation of the stagnant growth in NSS scores after 2008 is that this may be due to a heightened concern with 'value for money' that pervaded the higher education system after the increase in tuition fees in England[19], that occurred in 2006 which directly affected students entering this year and whom would have been filling in their NSS in 2009.

[TABLE 2 HERE]

The estimate on our employed or in postgraduate study measure lends support to our hypothesis that students are concerned about their future employability as they prepare to confront the labour market and are more likely to report a high level of satisfaction with their degree programme if they consider themselves likely to have a positive outcome. This is evident as on average a two percentage-point increase in the students classed as in employment or postgraduate study leads to a point

[18] The endogeneity test of employability gave a test statistic of 0.193, p-value 0.6602. The two stage model was also estimated with first class degree instrumented; the endogeneity test for first class of degree also failed to reject the null of exogeneity with a test statistic of 1.650, p-value 0.189.

[19] Fees increased from £1125 up to a maximum of £3000 for UK students entering English universities in 2006.

increase in NSS score.[20] These students may well have secured their employment or their place on a postgraduate programme before completing the NSS, converting their expected high level of employability into achievement, and thus are more likely to provide a positive review of their experience as they perceive that the institution and the department helped them to secure employment or their place on a postgraduate programme. This implies that the careers service within the university, the link between employers and the department, and the ability to enhance their students' employability are of the utmost importance in the quest for high student satisfaction scores. With the increase in tuition fees applicable to the 2012 cohort of new students we may speculate that the influence of employability on NSS scores will increase significantly. Whilst our focus in this paper is on the influence of both time invariant and time varying factors on NSS scores which necessitates the use of a random effects model, a fixed effects estimator provides a remarkably similar result (reported in the appendix).

The coefficient on the percentage of students gaining a first class degree reveals that approximately a 10 percentage point increase in the percentage of students with a first class degree will lead to a one point increase in the NSS score which lends support to our argument that students' sense of self development and employability is more important as they prepare to enter the labour market.[21]

[20] We included both HESA measures of employment and further study in our modelling – the first as a percentage of graduates considered in the labour market or in further study (includes those actively seeking work) and secondly, as a percentage of all who responded to the survey (as above and those who stated they were not seeking work). Both measures produced significant positive effects.

[21] We estimated models replacing the first class dummy variable with one for an upper-second class or above which gave a smaller but significantly positive effect and all other coefficients remained the same. Results are available from the author upon request.

Evidence suggests that staff-student ratios are highly likely to influence students' perceptions of their teaching experience and our results suggest that a smaller staff-student ratio elicits a favourable response to the NSS from students.

None of our expenditure per student measures have a statistically significant influence on the overall NSS scores. Whilst the remuneration of academic staff is insignificant we believe this could be because expenditure on academic staff does not signal the quality of teaching as these costs may vary according to the grade structure of academic staff, for example, a department with many students could have a smaller expenditure on academic staff, if they have a large proportion of staff in the lecturer grade, than a department with fewer students but a larger proportion of professorial staff. Furthermore, expenditure in one year may not bring instant results in the form of increased satisfaction, for example, expenditure on new teaching software technology in one year may require time for academic staff to learn how to use the technology and incorporate it into their teaching material. Nevertheless, it is interesting to note that the amount of expenditure per student, which varies greatly across universities, does not appear to increase student satisfaction.

All subjects are significantly more likely to have higher NSS scores than art and design. The incremental effects reveal the high average scores for biology and mathematical sciences which are recognised as subjects that yield a high return in the labour market (Bratti *et al*., 2005), although history has the highest incremental effect on the NSS score even though it is not recognised as providing the highest return. We would argue that this may be because these subjects are of a more technical nature and students taking them are more likely to do so because they have a genuine interest or a natural ability in the subject, in which case they may be

more likely to be successful in their studies leading to high NSS scores. There may also be differences in the teaching across different subjects, in which case departments could learn from more successful departments. As suggested earlier, staff-student ratios may play their part in enhancing students' sense of well-being and satisfaction with their course. Whatever the reason we see large differences in NSS scores across subjects and we suggest that this is an area for further study.

Interestingly, traditional universities, whether in the Russell group or not and the universities in the 1994 Group all have higher overall NSS scores, of around 3 NSS points, than the base category of post-1992 universities that are not in any group. The universities in the Million Plus group have a 2 point penalty compared to the base category. Thus, it could be that the traditional universities provide better teaching quality or that the reputation of the these universities serve to signal a better quality student to employers, a sheepskin effect, making the students perceive themselves to more employable in the labour market and hence satisfied with their university programme quality.

The regional dummies reveal a large and statistically significant increase of over 3 NSS points for the Scottish universities considered here compared to the base category of universities in London[22]. This is an interesting finding which may reflect in part the different funding system in Scotland, where Scottish students were not faced with the fees that English students were and therefore this may have influenced their sense of satisfaction whereas students in other universities may have had higher expectations of value for their money. We consider this warrants further research. The Welsh universities also reveal a significant positive difference

[22] We estimated the model without the first class degree dummy variable in order to examine whether or not the classification system in Scotland was influencing this result. This statistically significant and positive effect was still apparent.

of up to 1.6 NSS points compared to London universities and of the English universities, those in the South, the East and the East Midlands have a significantly higher NSS score than other regions compared to the base category.

Finally, the local crime rate variable reveals a significantly negative influence on the NSS score but universities that have all facilities on a campus elicit a much more favourable NSS score, hence a sense of security which provides an opportunity to concentrate on one's studies is just as important as the teaching quality when it comes to student satisfaction.

IV. Conclusion

The NSS is a major instrument by which teaching quality in higher education is measured today with the results incorporated in many of the leading university rankings. Thus, all universities are interested in possible methods by which they may maximise their NSS scores and attract more good students. In this paper, we have examined the possible influences on the overall NSS scores in eleven subject areas within and across 121 UK universities between 2007 and 2010. This is the first econometric study of the NSS that we are aware of, thus filling a large gap in the economics literature. The analysis has been undertaken using a unique panel dataset that has been constructed from data available from several sources including, Natcen, HESA and the ONS.

Our findings show that there is a significant difference in scores across different types of university. We have created a typology of universities according to not only whether they are a traditional or a modern university but also to which research group they have placed themselves into. Our results show that the traditional

universities, regardless of research group, all elicit a more favourable score than the modern universities which we speculate may be due to better quality teaching, perhaps more research led teaching or possibly because the graduating body are aware of the reputational element of the university that is attached to their degree; the empirical literature has shown there is an advantage in the labour market to attending a traditional university (Chevalier and Conlon, 2003). The evidence from our 'employed or in postgraduate study' variable supports this latter supposition as students satisfaction scores appear to reflect their readiness and confidence to face the labour market. We note here that the percentage of first class degrees awarded has only a small positive influence on the NSS score, which supports our hypothesis that confidence building and personal support mechanisms are key. We may infer from these findings that a major task for university departments is to incorporate employability into their curriculum by giving more employability advice on possible careers, summer placements and internships. Increasing students' general employability skills and giving them a sense of being employable at a time when many are anxious about entering the world of work is key to a positive assessment of their university course and a high NSS score.

Another major and not unrelated factor is the staff-student ratio which may be picking up the need of many students for some more intensive teaching time or pastoral care where they can discuss their needs, problems or misunderstandings away from the large classroom or lecture hall environment that has been the norm since the expansion of higher education in the late 1990s. Universities have had to adapt to large increases in students over a short period of time and there is a need to ensure that all students receive personal attention and development and that their needs are met. Student expectations of their university experience are likely to be

greater since the increase in fees in English universities in 2006 implying that they expect a higher level of teaching quality which includes, more personal tuition, smaller class sizes and staff devoted to the continuing assessment of their personal development. The evidence found here that average NSS scores are higher in Scottish universities, where they do not charge home students a fee, supports the view that students expectations of teaching quality is higher where they are aware of paying fees.

There is a large difference in NSS score across subjects within universities. Why biological sciences and history should elicit such favourable scores is puzzling and we suggest this is an area for further research.

At a time of huge financial uncertainty, universities have an obvious interest in understanding the factors on which their competitive position is based. But our findings have relevance also to policy authorities and indeed all those seeking to allocate resources rationally within education, as they give us a clearer picture of what student demand is based on, and a pointer to what elements in student choice are transient and second-order and which are fundamental. On the evidence of this paper there is, sadly, a grave risk that investment in the best research, teaching, lecture rooms and state-of- the-art technology may soon be forgotten by students who are dissatisfied because they think they will not find graduate employment or be accepted onto a postgraduate programme after graduation. To confirm whether these indications are justified requires further research at the microeconomic level.

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TABLE 1:Descriptive statistics

Variable	Mean	Stddev
NSS overall score – dependent variable	82.82	9.93
Percentage of graduates employed or in further study	84.03	8.64
Percentage with a first class of degree	12.72	8.28
Percentage with an upper second or better class of degree	59.82	16.05
Staff-student ratio	21.17	4.01
Average UCAS entry points	302.10	89.19
Expenditure in subject department per student £000's	17.47	37.07
Expenditure academic staff per student £000's	11.17	22.58
Expenditure administrative staff per student £000's	2.64	5.66
Russell Group university	0.19	0.39
1994 Group university	0.16	0.37
Million Plus Group university	0.16	0.36
GuildHE Group university	0.06	0.23
University Alliance Group	0.21	0.41
Traditional university not in any group	0.13	0.33
Post 1992 university not in any group	0.06	0.23
Other university not in any group	0.04	0.20
Campus based University	0.47	0.50
Art & Design	0.09	0.29
Biological sciences	0.10	0.30
Business and Administration	0.10	0.31
Computing	0.11	0.31
Economics	0.06	0.25
European Languages	0.08	0.27
History	0.10	0.30
Management	0.08	0.26
Mathematical sciences	0.06	0.24
Psychology	0.11	0.31
Sociology	0.10	0.30
East	0.06	0.23
East Midlands	0.07	0.26
Greater London	0.14	0.35
North East	0.05	0.22
North West	0.11	0.31
South East	0.14	0.34
South West	0.10	0.29
Yorkshire and Humber	0.09	0.29
West Midlands	0.08	0.27
Northern Ireland	0.02	0.15
Scotland	0.08	0.27
Wales	0.06	0.25
Local crime rate	10.69	3.86
Year 2007	0.24	0.42
Year 2008	0.24	0.43
Year 2009	0.26	0.44
Year 2010	0.26	0.44

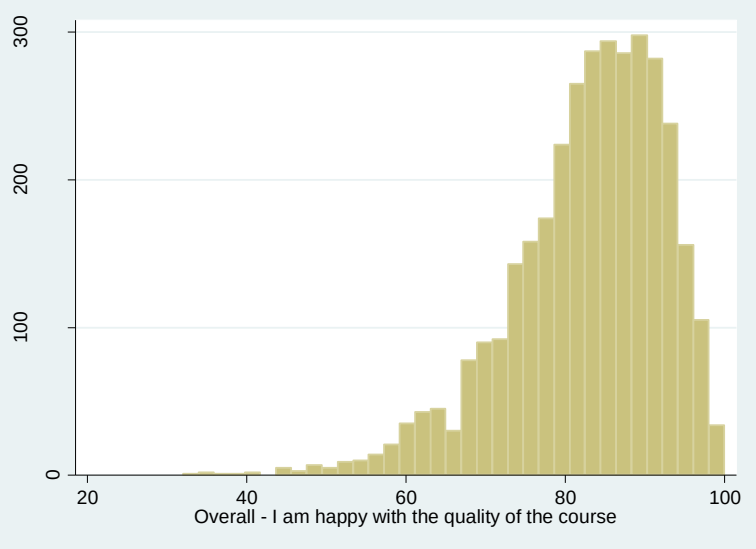
TABLE2: Random effects model of the determinants of NSS scores.

Dependent variable- NSS overall score N = 3438	Coefficient	Robust Standard errors
Percentage of graduates employed or in further study	0.469***	0.024
Percentage of students gaining a first class	0.096***	0.022
Average UCAS points on entry	-0.005	0.004
Staff-student ratio	-0.191***	0.055
Expenditure academic staff per student	-0.021	0.016
Expenditure administrative staff per student	0.070	0.062
Total expenditure per student	0.008	0.009
Russell Group University	3.115***	1.116
1994 Group University	3.085***	1.074
Million Plus Group University	-2.409**	1.108
Guild HE Group University	-1.301	1.328
University Alliance University	-0.858	1.008
Traditional University not in any group	3.589***	1.008
Other University not in any group	-1.302	1.299
Biological sciences	10.029***	0.939
Business and Administration	7.688***	0.981
Computing	5.119***	0.941
Economics	8.893***	1.061
European Languages	8.015***	1.053
History	11.791***	0.996
Management	7.228***	1.051
Mathematical sciences	9.802***	1.008
Psychology	7.753***	0.922
Sociology	8.650***	0.972
East	0.870	0.896
East Midlands	3.860***	0.852
North East	1.458	0.992
North West	1.704**	0.789
South East	2.894***	0.779
South West	2.062**	0.902
West Midlands	1.035	0.869
Yorkshire and Humber	-0.053	0.928
Northern Ireland	-0.617	1.132
Scotland	3.374***	0.798
Wales	1.643*	0.865
year 2008	1.502***	0.283
year 2009	1.008***	0.323
Year 2010	0.945***	0.366
Campus University	0.757*	0.396
Local Crime rate	-0.116**	0.053
Constant	37.657***	2.938
R-squared between = 0.5926: overall = 0.4674 Wald chi2 = 1540.60		

Notes: ***,** and * represent significance at 1%, 5% and 10% levels respectively.

Figure 1

The Distribution of NSS scores



Appendix

Table A1: Universities in the study

Anglia Ruskin University	Thames Valley/University of West London
Aston University	The Arts Institute at Bournemouth
Bath Spa University	The Manchester Metropolitan University
Birmingham City University	The Nottingham Trent University
Bournemouth University	The Queen's University of Belfast
Brunel University	The University of Aberdeen
Buckinghamshire New/ Chilterns University	The University of Bedfordshire
Canterbury Christ Church University	The University of Bristol
Cardiff University	The University of Central Lancashire
City University	The University of Chester
Courtauld Institute of Art	The University of Chichester
Coventry University	The University of Dundee
De Montfort Universtity	The University of Durham
Edge Hill University	The University of East Anglia
Glasgow Caledonian University	The University of East London
Glyndwr University/N.E Wales Institute	The University of Edinburgh
Goldsmiths College	The University of Essex
Heriot-Watt University	The University of Exeter
Imperial College of Science, Technology	The University of Glasgow
King's College London	The University of Gloucestershire
Kingston University	The University of Greenwich
Leeds Metropolitan University	The University of Huddersfield
Liverpool Hope University	The University of Hull
Liverpool John Moores University	The University of Keele
London Metropolitan University	The University of Kent
London School of Economics and Political Science	The University of Lancaster
London South Bank University	The University of Leeds
Loughborough University	The University of Leicester
Middlesex University	The University of Lincoln
Newman College of Higher Education	The University of Liverpool
Norwich University College/School of Art	The University of Manchester
Oxford Brookes University	The University of Newcastle-upon-Tyne
Ravensbourne College of Art and Design	The University of Northampton
Roehampton University	The University of Northumbria at Newcastle
Royal Agricultural College	The University of Nottingham
Royal Holloway and Bedford New College	The University of Oxford
School of Oriental and African Studies	The University of Plymouth
Sheffield Hallam University	The University of Portsmouth
Southampton Solent University	The University of Reading
St Mary's College	The University of Salford
Staffordshire University	The University of Sheffield
Swansea Metropolitan University/Institute	The University of Southampton
The University of St Andrews	University for the creative arts/Surrey Institute

The University of Stirling	University of Bath
The University of Strathclyde	University of Birmingham
The University of Sunderland	University of Bolton
The University of Surrey	University of Bradford
The University of Sussex	University of Brighton
The University of Teeside	University of Buckingham
The University of Wales, Lampeter/Trinity	University of Cambridge
The University of Wales, Newport	University of Derby
The University of Wales, Swansea	University of Glamorgan
The University of Warwick	University of Hertfordshire
The University of Westminster	University of Ulster
The University of Winchester	University of Wales Aberystwyth
The University of Wolverhampton	University of Wales Institute, Cardiff
The University of York	University of Wales, Bangor
The University of the West of England,	University of Worcester
Trinity and All Saints College-Leeds	University of the Arts, London
University College Falmouth	York St John University
University College London	

Table A2: Fixed effects model of the determinants of NSS scores.

Dependent variable- NSS overall score N = 3438	Coefficient	Standard error
Percentage of graduates employed or in further study	0.471***	0.021
Percentage of students gaining a first class	0.076***	0.029
Expenditure academic staff per student	-0.015	0.038
Expenditure administrative staff per student	0.122	0.121
Total expenditure per student	-0.009	0.021
Staff-student ratio	-0.221***	0.073
Year 2008	1.624***	0.301
Year 2009	1.205***	0.305
Year 2010	1.283***	0.310
R-squared between= 0.3501; Overall = 0.2937 F (9, 2516) = 61.94		