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Do flexible admission systems affect student enrollment? Evidence from UK universities

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ABSTRACT
We reveal the current level of flexible admission systems (FAS) at UK universities, and explore its impact on student enrollment rates. We employ quantitative analysis techniques for data collected and customized from the Higher Education Statistics Agency (HESA) in the UK, during the period 2010–2015. To understand the impact of FAS on student enrollment, six statistical tests were conducted. Based on the level of FAS adopted by universities, we identified four groups of UK universities: very low, low, medium, and high levels of FAS. No robust evidence exists to support claims that universities which apply a higher level of FAS have higher student enrollment. The study results were based only on secondary data collected from HESA, so future studies should be based on other types of data. This paper attempts to cover the missing elements of previous literature and its traditional research techniques.

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KEYWORDS
Admission systems; UK universities; student enrollment; student choice; HESA

Introduction

Market forces are increasingly influencing the Higher Education (HE) sector (Altbach & Knight, 2007) and student choice is becoming a principal factor in determining the sustainability of the sector (Briggs, 2006). Global financial constraints have forced universities to investigate different methods and modes of study in a bid to increase student enrollment. Researchers have investigated factors that could influence demand, including satisfaction, loyalty and the power of students as customers (Hemsley-Brown & Oplatka, 2015). The results of most of these studies were based on micro data collected via either questionnaires or interviews, which, at their utmost value, may benefit those marketing universities participating in the study. Moreover, most of these studies focus on the aim of advancing marketing strategies by looking at feedback from students and other stakeholders on different issues, e.g. their satisfaction.

While studying student satisfaction is crucial to understanding the quality of services and ways of improving such services, it is not always influencing the purchasing behavior of students. Hence, further studies are also important to understand which student preferences are more likely to lead to the act of purchasing. For example, despite FAS being an issue widely discussed in both international offices and academic departments at UK universities as well as in HE reports (UCAS, 2011), none of the previous studies explored the
relationship between the level of FAS and student enrollment. FAS could be used to refer to admission systems which meet the needs of a wide range of applicants. FAS could include a number of issues such as flexible selection criteria, inclusion of disadvantaged groups and others (e.g. mature students and international students), supporting pathway variation, flexible study plans, flexible study hours (e.g. part time/full time), considering recognition of prior learning and achievements and offering multiple admission/intakes.

For the purpose of this research, FAS is used to refer to multiple intakes. Some universities have more than one intake during the year. On the one hand, this practice could be very helpful for universities which do not have the capacity to admit and accommodate many students at the beginning of the academic year. On the other hand, multiple intakes might attract students who missed the September intake or who were not ready to start university in September. For example, some students fail to get their study visas on time, fail or miss their entry or language exams (i.e. IELTS, TOEFL or GMAT), or they simply do not feel prepared to start university in September for personal reasons. Accordingly, it would be assumed that a high level of application of FAS will increase student enrollment, as students could perceive FAS as allowing different admission periods to meet individual needs.

Studying student enrollment at universities and the factors that would affect enrollment are important as they reflect the real demand for HE. Furthermore, understanding overall demand requires data at the national level, which is an important input in the decision-making process at the university level. In the UK, HESA maintains databases on HE, which are under-employed by researchers in the field and could be a subject for further study, responding to the needs of both practitioners and researchers in the field of HE.

Within the current financial constraints that universities around the world are facing and the drop of university student numbers in the UK (see Figure 1), universities have

![Trend of total no. of UK universities student enrolment vs FAS student enrolment](image)

**Figure 1.** UK student enrollment trend. Source: prepared by authors, data extracted from HESA.
started to think of different methods and modes of study that may increase student enrollment, including FAS (UCAS, 2011). University policy makers propose that applying such systems may enhance the number of students enrolled each year. However, this has not yet been proved by researchers in the field. Furthermore, the core methodology used in the paper, based on employing data mining techniques in the HE sector (Rudy, 2015; Delavari, Phon-Amnuaisuk, & Beikzadeh, 2008; Sauer & O’Donnell, 2006) opens a venue for marketing managers to employ tools to support the marketing decision-making process at their universities, not only in the UK but also internationally. Taking the UK case into consideration, this paper attempts to cover the missing elements of previous literature and its traditional research techniques. The paper is designed to complement the previous studies on students’ choice and enrollment which are either of micro/institutional focus or tackle satisfaction instead of the overall demand that leads to purchase. Aiming to explore possible relationships between adopting FAS and student enrollment rates at UK universities, the study exploits data acquired from HESA, covering the years 2010–2015.

**Student choice and enrollment in HE**

Previous studies on student choice in HE can be classified into two categories: studies that investigated the internal motivator behind student choice, and studies that investigated the external motivator for student choice.

On the one hand, previous literature on the internal motivator indicates three main categories: family and social class, friends, and personal factors (Ahmad & Hussain, 2017; Engin & McKeown, 2017; Arar, Abramovitz, Bar-Yishay, & Notzer, 2017; Singh, 2016; Yang & Mutum, 2015; Al-Fattal and Ayoubi, 2013; Dunnett, Moorhouse, Walsh, & Barry, 2012; Kember, Ho, & Hong, 2010; Eder, Smith, & Pitts, 2010; Callender & Jackson, 2008; Bruce & Edgington, 2008; Cubillo, Sanchez, & Cervio, 2006; Wellington & Sikes, 2006; Chen & Zimitat, 2006; Pimpa, 2005; Mazzarol & Soutar, 2002).

Family factors and social class are major factors in determining student choice in HE. Dunnett et al. (2012) found that UK students from low social classes and from families where there is no history of attending university will experience more disutility from the higher fees. Similarly, Callender and Jackson (2008) found that financial issues constrain lower social class students’ choice of UK university far more than those from other social classes. Pimpa (2005) confirmed that Thai students from families with direct experience of study abroad are subject to higher family expectations to study abroad than students from families without direct experience. Similarly, Mazzarol and Soutar (2002) found that family, economic and social forces within the home country serve to push students abroad, and Singh (2016) found that socio-economic, environmental and personal factors played an important role in the international student’s decision-making process of choosing the country and HE institution.

The second group of studies looks at the influence of friends. In understanding the factors influencing Taiwanese students’ decision making regarding Australian international HE, Chen and Zimitat (2006) found that the influence of family and friends was the most important factor in shaping intentions to study abroad. Bruce and Edgington (2008) confirmed that word-of-mouth recommendations from friends are an important source of influence for prospective MBA students when selecting a school. Similarly,
Yang and Mutum (2015) corroborated the reliance on word-of-mouth of friends to evaluate the performance of universities, rather than conventional marketing-dominated information sources.

Personal factors are the third category of internal motivator. Eder et al. (2010) explored the factors influencing students’ decisions to study in the United States and found that personal growth was the most important motivator. Similarly, Cubillo et al. (2006) proposed a theoretical model to understand international students’ purchase intentions as dependent on personal reasons. Wellington and Sikes (2006) found that the attraction of a challenge is the main motivation behind choosing a professional doctorate by students. Kember et al. (2010) claimed individual goal setting, career and interest as major motivational influences to study at universities in Hong Kong. Arar et al. (2017) compared Arab and Jewish students’ motivations for study choice and found that the strongest motivation expressed by Arab and Jewish students is a desire for self-fulfillment. However, the motivation for social mobility and to help to empower their society is more important for Arab students.

On the other hand, previous literature on external motivators for student choice for HE also indicated three categories: distance, the image of the host country, and the university system (Ahmad & Hussain, 2017; Basha, Sweeney, & Soutar, 2016; Ayoubi and Massoud, 2012; Yen, Yang, & Cappellini, 2012; Wilkins & Huisman, 2011; Eder et al., 2010; Simoes & Soares, 2010; Gunn & Hill, 2008; Yang, Alessandri, & Kinsey, 2008; Chen, 2007; Briggs, 2006; Cubillo et al., 2006; Mazzarol & Soutar, 2002).

Distance from the home country is the key external motivator for student choice for HE. Simoes and Soares (2010) suggested that geographical proximity is the most important factor when selecting a HE institution in Portugal. Due to their geographical coverage, Wilkins and Huisman (2011) found that overseas campuses could pose a considerable alternative and threat to home campuses in the competition for international students in the future. Briggs (2006) found that the decision of Scottish students is mainly affected by distance from home and location.

The image of the country and the culture of the host institution are also important external motivators. Mazzarol and Soutar (2002) argued that the decision as to which host country students will select is dependent on a variety of cultural and institutional factors. Cubillo et al. (2006) suggested that the purchase intention of international students is mainly dependent on the effect of the image of country, city and institution. Chen and Zimitat (2006) found that the perception of Taiwanese students towards HE in the destination country is of greatest importance in shaping their intention for overseas study. Chen (2007) affirmed that the influence of institutional academic and administrative factors, the Canadian environment, the economics of Canadian education, and the ease of immigration are major motivators. Eder et al. (2010) identified physical geography, college issues, culture, and visa issues as the main factors for studying in the United States.

The third category of external motivator is institutional reputation and league tables. Gunn and Hill (2008) realized that the higher the league position, the faster the growth in applications. Yen et al. (2012) revealed that the ranking position of a university is the ultimate source of power that defines its position in the international HE network of universities and agents. Ahmad and Hussain (2017) identified institutional reputation as a key factor in determining student destination choice for HE in the UAE. However, Yang et al. (2008) argued that the concepts of relational quality and reputation can be intertwined
based on individual stakeholders’ subjective views of their experience, interactions and information.

Other external motivators are factors related to internal institutional services and academic systems which have already been studied by researchers in the field. This category of factors represents the first direct line of satisfying the needs of students. Most studies on student satisfaction that have been conducted by researchers are classified within this category (Dao & Thorpe, 2015; Migin, Falahat, Yajid, & Khatibi, 2015; Nasser, Khoury, & Abouchedd, 2008; Eagle & Brennan, 2007; Veloutsou, Paton, & Lewis, 2005; Telford & Masson, 2005; Schmidt, 2002; Emery, Kramer, & Tian, 2001; McCollough & Gremler, 1999; Sanders & Chan, 1996). Student satisfaction is a major factor in increasing student recruitment and is the primary aim of university policy and marketing managers when seeking to do this. Shah (2009) found that implementing quality programs leads to an increase in satisfaction among students and in revenue, which could enhance expenditure on marketing, increasing student recruitment in the future. Arena, Arnaboldi, and Azzone (2010) found that student perception of central administrative services in Italian universities affects their satisfaction, which then influences recruitment. Hallett (2010) studied the student experience of study support on a taught master’s program in the UK and revealed the need for a common understanding of the range of student profiles in HE.

Institutional factors are also considered a key external motivator for student choice. Pamploni (2010) found that institutional characteristics are more influential than interpersonal or informational resources used by students. Elliott and Healy (2001) suggested that student centered-ness, campus climate and instructional effectiveness all have a strong impact on how satisfied a student is with the overall educational experience. In investigating the factors determining the study abroad destination choice for Taiwanese students, Lee (2014) suggested that policy makers and institutional administrators should focus on offering various kinds of scholarships, designing multilingual websites, promoting language training programs, and designing student recruitment strategies tailored for the different study groups of international students. Ayoubi and Massoud (2012) found that research assessment and the types of certificates offered are positively associated with entry standards to UK universities. Wiers-Jenssen, Stensaker, and Grogaard (2002) realized that social climate, aesthetic aspects of the physical infrastructure and the quality of services from administrative staff are important aspects when looking to improve student satisfaction and opportunities for future recruitment in Norway. In the same context, Clemes, Gan, and Kao (2008) found a relationship between service quality and price, image, satisfaction and favorable future behavioral intentions. Dao and Thorpe (2015) referred to nine key factors influencing Vietnamese student decisions: facilities and services; program; price; offline information; opinions; online information; ways of communication; program additions; and advertising. Migin et al. (2015) highlighted five institutional dimensions in measuring a student’s choice of private universities in Malaysia: cost; reputation; location; program; and facilities.

Academic factors are also an external motivator for students when applying to a university. Douglas, Douglas, McClelland, and Davies (2015) found that motivation, reward, social inclusion, usefulness, value for money and fellow student behavior are the main determinants of quality from the perspective of UK students. Wiers-Jenssen et al. (2002) argued that the academic and pedagogic quality of teaching are crucial determinants of Norwegian student satisfaction. Ginns, Prosser, and Barrie (2007) concluded that good teaching,
clear goals and standards, appropriate assessment and workload, and an outcome scale measuring generic skills development are key factors for student satisfaction and creating future demand for courses at Sydney University. Belanger and Longden (2009) found that the personality of teachers, classroom environment and teaching style characteristics are key factors that would satisfy European students. Palmer, Koenig-Lewis, and Asaad (2016) discovered that universities which focus on offering great academic experiences to their students will be more effective in developing strong brand identification over time, which in turn leads to greater brand loyalty and brand support. Magi, Jaakson, Aidla, Kirss, and Reino (2012) revealed three areas in which Estonian university education does not correspond to student expectation: content of study provided at the university, the study process, and university requirements.

Academic systems and mode of study are considered by students when choosing a destination for study. Hagel and Shaw (2010) confirmed two main effects of study mode on university choice. According to their study, the most preferred study modes for undergraduates and postgraduates were face-to-face study and print-based study, as they affect student experience of learning and socializing at university, and their flexibility in choosing the time and place. Chen (2008) showed that twinning or in-country programs have a strong influence on an undergraduate student’s decision to come to Canada. Trying to understand students’ choice of electives at a public university in Malaysia, Ting and Lee (2012) suggested that students are most concerned about the perceived difficulty of the electives and tend to avoid enrolling in them. In a study on the factors that encouraged or discouraged highly successful Advanced level students from applying to Cambridge University, Whitehead, Raffan, and Deaney (2006) revealed that the nature of the courses, the prestige of the university and anxiety about the application process combined with fear of failure are the main dimensions associated with the decision to apply to Cambridge. Basha et al. (2016) found that online distance learning was the least preferred option, while offshore campuses were more acceptable to Malaysian students compared to Chinese students. Malaysian students preferred to study in the UK, while Chinese students favored Australia. Malaysian students are more cost sensitive compared to Chinese students, while the latter were more motivated by job prospects offered by an institution. Arar et al. (2017) found that flexible entrance standards and employment prospects while studying determined college choice for Jews and Arabs more than college reputation and teaching quality.

The above studies are summarized in Table 1.

Most previous studies investigated either the external or the internal motivators of student choice in HE. However, none of these studies investigated the direct link between motivators and student demand, which leads to future student enrollment. Additionally, despite being an important issue of discussion in university international offices and academic departments in the UK, very little attention was paid to FAS by researchers in the field of HE and very few studies have explored the impact of FAS on student satisfaction, demand and future enrollment. Although some of the academic studies reported no clear impact of FAS (Morris, 2000; Klos & Trenton, 1969), there are a small number of studies which show that students are positively affected by FAS, compared to the closed system, as it could enhance their learning experience and overall performance (Khattak et al., 2015; Yousaf & Hashim, 2012).

Nevertheless, with the financial constraints that UK universities are currently facing, universities have started to think of different methods and modes of study that may increase
student enrollment, including FAS as a type of dynamic admission system for enrolling students. University policy makers propose that applying such systems may enhance the number of students enrolled each year. However, this has not yet been proven by researchers in the field. By mining the data that has been collected and customized from HESA during the period 2010-2015, this paper aims to explore whether any relationship exists between applying FAS and the enrollment rates of students at UK universities. More comprehensively, the study aims to answer the following two questions:

RQ1. What is the recent trend of FAS at UK universities?

RQ2. Does adopting FAS help to increase student enrolment or attract more international students?

Table 1. Summary of internal and external motivators of student choice.

<table>
<thead>
<tr>
<th>Internal motivators</th>
<th>Family and social class</th>
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<tbody>
<tr>
<td>Dunnett et al. (2012)</td>
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<td>Callender and Jackson (2008)</td>
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<td>Pimpa (2005)</td>
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<td>Mazzarol and Soutar (2002)</td>
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<td>Yang and Mutum (2015)</td>
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<td>Bruce and Edgington (2008)</td>
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<td>Chen and Zimitat (2006)</td>
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<td>Arar et al. (2017)</td>
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<td>Singh (2016)</td>
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<td>Kember et al. (2010)</td>
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<td>Eder et al. (2010)</td>
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<td>Cubillo et al. (2006)</td>
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<td>Wellington and Sikes (2006)</td>
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<tr>
<th>External motivators</th>
<th>Distance</th>
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<td>Wilkins and Huisman (2011)</td>
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<td>Simoes and Soares (2010)</td>
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<td>Briggs (2006)</td>
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<td>Eder et al. (2010)</td>
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<td>Mazzarol and Soutar (2002)</td>
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<td>Ahmad and Hussain (2017)</td>
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<td>Yen et al. (2012)</td>
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<td>Yang et al. (2008)</td>
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<td>Gunn and Hill (2008)</td>
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<td>Chen (2007)</td>
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<td>Cubillo et al. (2006)</td>
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<td>Mazzarol and Soutar (2002)</td>
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<td>Dao and Thorpe (2015)</td>
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<td>Migin et al. (2015)</td>
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<td>Lee (2014)</td>
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<td>Ayoubi and Massoud (2012)</td>
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<td>Pampaloni (2010)</td>
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<td>Clemes et al. (2008)</td>
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<td>Wiers-Jenssen et al. (2002)</td>
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<td>Elliott and Healy (2001)</td>
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<td>Palmer et al. (2016)</td>
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<td>Douglas et al. (2015)</td>
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<td>Basha et al. (2016)</td>
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<td>Ting and Lee (2012)</td>
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<td>Hagel and Shaw (2010)</td>
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<td>Chen (2008)</td>
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<td>Whitehead et al. (2006)</td>
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Methods and data

In 2016–17, there were 162 HE institutions in the UK in receipt of public funding via one of the UK funding councils that returned data to HESA, the central agency responsible for maintaining statistics of the HE sector in the UK (Universities UK, 2017). A centralized admissions service for undergraduate admissions to HE called UCAS (Universities Central Admission System) was evolved in 1993 to help universities effectively manage multiple applications from students (UCAS, 2018).

In responding to the first research question, and in communication with HESA and UCAS, the authors found that both agencies do not keep data that clearly categorizes UK universities according to the nature of their admission systems. However, HESA offered information regarding new student commencement months and suggested this as an indicator of the level of FAS that UK universities apply. Accordingly, the authors categorized UK universities into five groups depending on the number of students starting their study after November (indicating the application of FAS). Based on data of the academic year 2011/2012, the percentage of students who commenced their study between December and July compared to the total number of students who commenced in the same year was calculated for all universities. The maximum percentage was 62.69%, while the minimum was 0%, with an average of 12.55%. The range between the minimum and maximum values (percentages) was divided into five equal ranges ($62.69/12.55 = 4.995 \approx 5$) and the universities were categorized accordingly. These groups of FAS are: the very low group, the low group, the medium group, the high group and the very high group. To assure the classification of the five groups identified above, cross referencing was conducted for accuracy by contacting the registry departments of selected universities of the five groups. The authors found that the classification they proposed is close to the real practice.

A closer look into the trend of UK students’ enrollment versus FAS students’ enrollment in Figure 1 reveals the following: the number of enrolled students witnessed a decline from 2011/2012 onwards, and the number of FAS students’ enrollments shows a similar decline influenced by the decline in FAS home students. The contribution of FAS enrollment to total enrollment declined from 16.8% in 2010/2011 to 12% in 2014/2015. The numbers of EU and Non-EU FAS enrollments show better stability compared to the above figures and their contribution to total FAS enrollment increased over the period ranging between 19% in 2010/2011 and 24.74% in 2013/2014, peaking when the total number of enrollments and home students’ FAS enrollments was declining. This demonstrates how different segments of enrollment could work as a safety valve if well employed during periods of undesirable circumstances.

To answer the second research question of whether FAS help to increase students’ enrollment at UK universities, the authors relied on current data available from HESA for the academic years between 2011 and 2015. Data mining was employed through statistical techniques and data preparation for further analysis. According to Taniar and Rahayu (2002), data mining is a process of non-trivial extraction of implicit previously unknown and potentially useful information from data in a database. Luan (2002) proposed data mining as a process of discovering hidden messages, patterns and knowledge within large amounts of data and of making predictions for outcomes or behavior. The goal of data mining is to reduce large data into useful knowledge (Baritchi, 2004). The application
of data mining in the HE sector is an emerging trend to support HE as a global competitive business (Maqsood, 2013).

Responding to the second research question, the following variables have been identified to be employed in further analysis:

- The level of FAS is a variable that reveals four groups of universities (as explained earlier).
- The total number of new enrolled students between academic years 2010/2011 and 2014/2015 (5 variables).
- The growth of the number of new students between academic years 2010/2011 and 2014/2015 (compared to previous year) (4 variables).
- The total number of international students (including new students) between academic years 2010/2011 and 2014/2015 (5 variables).
- The growth in the number of international students between academic years 2010/2011 and 2014/2015 (compared to previous year) (4 variables).

A number of independent one-way ANOVA tests were carried out to examine the impact of FAS on international and overall student enrollment at UK universities investigating whether universities with higher levels of FAS enjoy significant statistical differences in student recruitment.

Results

**RQ1: trend of FAS at UK universities**

In response to the first study question on the current trend of FAS at UK universities, the authors distinguished five groups: the very low group, the low group, the medium group, the high group and the very high group (see Appendix).

The first group, ‘very low FAS group’, includes all institutions with a very low number of students commencing the academic year between December and July (between 0% and 12.53%). This is the largest group, with 91 universities. The second group, ‘low FAS group’, includes all institutions with a low number of students commencing the academic year between December and July (between 12.53% and 25.06%). The universities in this group are thought to partly apply FAS for some courses. This group is the second largest group and includes 51 universities. The third group, ‘medium FAS group’, includes all the institutions with a medium number of students commencing the academic year between December and July (between 25.06% and 37.59%). The universities in this group are thought to apply FAS in more courses compared to the second group. This group includes 12 universities. The fourth and fifth groups, ‘high FAS’ and ‘very high FAS’, include all institutions with a high and very high number of students commencing the academic year between December and July (between 37.59% and 50.12%, and between 50.12% and 62.69%, respectively). The universities in the last two groups are
thought to apply FAS in more courses compared to the previous groups. The fourth group includes four universities, while the fifth group is made up of only one university. The last two groups have been merged together for the analysis.

**RQ2: FAS and student enrollment at UK universities**

In order to study the diversified impact of FAS on student enrollment, and based on the collected secondary data, the authors developed the following tests:

Test 1: to investigate whether there is no significant difference between the mean of the numbers of new students of all groups of universities between 2010 and 2015.

Test 2: to investigate whether there is no significant difference between the mean of the growth of the numbers of new students of all groups of universities between 2010 and 2015 (compared to the previous year).

Test 3: to investigate whether there is no significant difference between the means of the growth (year 2010/2011 as a base year) of the numbers of new students of all groups of universities between 2010 and 2015.

Test 4: to investigate whether there is no significant difference between the means of the numbers of international students of all groups of universities between 2010 and 2015.

Test 5: to investigate whether there is no significant difference between the means of the growth (compared to the previous year) of the numbers of international students of all groups of universities between 2010 and 2015.

Test 6: to investigate whether there is no significant difference between the means of the growth (year 2010/2011 as a base year) of the numbers of international students of all groups of universities between 2010 and 2015.

Table 2 shows the output of the ANOVA analysis for the six tests listed above, the values of (F), and their significance. The results appear in the second column and show the results of the first test. The level of significance for all values of the first test (p) is below 0.01, except for the last year (P > 0.05). Therefore, there is a statistically significant difference between the mean number of new students amongst the four groups of universities in the years 2010/2011, 2011/2012, 2012/2013 and 2013/2014. However, the difference is not significant for the year 2014/2015. Considering the descriptive statistics (the group means), this suggests that the mean number of new students at universities which apply higher levels of FAS is significantly higher than their counterpart universities which apply lower levels of FAS. In other words, it could be said that universities with higher levels of FAS enjoy a higher enrollment of students (measured by the number of new students).

**Table 2.** One Way ANOVA results (values of F and their significance).

<table>
<thead>
<tr>
<th>Academic year</th>
<th>Test 1</th>
<th>Test 2</th>
<th>Test 3</th>
<th>Test 4</th>
<th>Test 5</th>
<th>Test 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010/2011</td>
<td>9.647**</td>
<td>.834</td>
<td>.834</td>
<td>1.814</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2011/2012</td>
<td>7.373**</td>
<td>2.528</td>
<td>2.815*</td>
<td>2.043</td>
<td>1.294</td>
<td>2.614</td>
</tr>
<tr>
<td>2013/2014</td>
<td>3.934**</td>
<td>2.410</td>
<td>.280</td>
<td>.679*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2014/2015</td>
<td>2.558</td>
<td>4.706**</td>
<td></td>
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</tbody>
</table>

*Significant at the 0.05 level.
**Significant at the 0.01 level.
Column 3 shows that there are no significant statistical differences between the four groups, where (p) is more than 0.05 for the years 2011/2012 and 2012/2013. In contrast, the results for the academic years 2013/2014 and 2014/2015 show significant statistical differences between the four groups, where (p) is less than 0.05. The interpretation of the One-Way ANOVA suggests that, while there is no difference between the mean of the growth in the number of new students (growth measured by comparison with previous years) between the four groups of universities for the first two years, the mean of the growth in the number of new students at universities applying higher levels of FAS is significantly lower than counterpart universities applying lower levels of FAS for the last two years. In other words, it could be said that universities with higher levels of FAS suffered low levels of new student growth during 2013/2014 and 2014/2015.

Column 4 does not support the results of the previous sections. The output of the ANOVA analysis shows no significant statistical differences between the four groups, where (p) is more than 0.05 for the years 2011/2012, 2013/2014 and 2014/2015. In contrast, the results for the academic years 2012/2013 show significant statistical differences between the four groups, where (p) is less than 0.05. Therefore, it could be said that during 2012/2013, universities with higher levels of FAS suffered low levels of new student growth (measured by the percentage of change in the number of new students compared to 2010/2011).

Columns 5, 6, and 7 show the output of the ANOVA analysis for international student enrollment to examine whether there is a significant statistical difference between the four groups regarding these variables. Column 5 shows that the significance level for all (p) values is above 0.05. Therefore, there is no statistically significant difference in the mean of the number of international students between the four groups of universities in all years of study. The results in columns 6 and 7 are consistent with the above and suggest no significant difference between the mean of the growth of the numbers of international students from all groups of universities between 2010 and 2015 (P > 0.01).

**Discussion**

This study advances the understanding of the factors affecting student enrollment by firstly providing a review of previous literature on internal and external motivators of student choice in HE, and secondly by examining one important under-investigated system factor, FAS, in relation to actual demand measured by enrollment and student number growth. The literature review showed that most prior studies focused on students’ choices and/or satisfaction and were mainly based on questionnaires. It indicated that family, social class, friends and personal inspiration are key internal motivators and that distance, image of the host country, institutional reputation, general institutional factors, general academic factors such as the mode of study, and the academic system are key external motivators for student choice in HE. However, it reveals that scholars in the field of HE have paid little attention to the relationship between university admission systems and student enrollment.

The general analysis of the UK HE sector in this study exhibits an overall decrease in the number of students but also reveals how different FAS student segments behaved differently during the study period, suggesting them as safety valves during periods of undesirable circumstances. Nevertheless, a closer look into the levels of applying FAS systems
shows a weak trend towards adopting FAS in the UK. Based on the level of FAS adoption, the study identifies four groups of UK universities, with the majority falling into the ‘low’ and ‘very low’ categories. This could be explained by the risk of change and costs associated with the adoption of FAS, which contradicts the traditional conservative hierarchy of university management systems. Although the statistical tests provide evidence that the higher the level of FAS applied at a UK university, the higher the number of new students enrolled at the university, no strong evidence was found to support other relationships between the levels of adopting FAS on the one hand and growth in student enrollment, international enrollment, and international student numbers on the other. The above results suggest that, although the groups of universities who adopt higher levels of FAS enjoyed higher means of enrolled students and managed to mitigate the negative effects of the decline in home students’ numbers during the study period (due to the stability of the number of students in some FAS segments), universities in these groups failed to employ their FAS to achieve better levels of overall growth in student numbers compared to universities in the other groups during the study period (no significant difference between the means of the growth of student numbers was found in the four groups).

The study results also reinforce the traditional classification of UK universities as either Russell Group UK Universities or Post 1992 UK Universities. On the one hand, almost all UK Russell Group Universities are located within the very low group of FAS. These universities are characterized by higher levels of research activity, greater wealth and capacity, academic success and socioeconomically advantaged student intakes, but with similar levels of teaching quality compared to new Post 1992 institutions (Boliver, 2015). On the other hand, most Post 1992 UK universities are located in the medium to high level of FAS groups. This highlights the fact that factors other than research distinguish the two traditional groups of UK universities.

The adoption of FAS by Post 1992 UK universities could be explained by the perception that Post 1992 UK universities are focused more towards teaching than research, with teaching considered to be more related to FAS. Another explanation is that FAS is believed by these universities to play a crucial role in increasing student recruitment for them, as they are considered financially less stable than Russell Group universities, a claim that is to an extent supported by the study results. In addition, adopting FAS might be looked at as an opportunity to solve capacity constraints, enhance recruitment and grow without having to bear the painful costs of expansion. Finally, a possible explanation is that while Russell Group universities apply strict and rigid admission systems, which are sometimes thought to be unfair (Boliver, 2016, 2013; Hemsley-Brown, 2015), Post 1992 universities choose to apply more flexible and dynamic admission systems that could explain why they are more flexible in accepting students than Russell Group universities.

Three key implications emerge from the above discussion. First, FAS seems to be more popular in modern universities which do not enjoy the competitive advantages most well established universities have (e.g. diversified teaching research activities, historic reputation and success, capacity and wealth). Second, although adopting FAS is not proved to support enrollment growth during the period of high competition, this practice helped to ease the adverse effects during periods of low demand. Better marketing for FAS could result in better enrollment figures during periods of low competition if the right student segments are well targeted. Third, accordingly, marketing managers are invited to pay attention to the different segments of enrolled students when analyzing
national and international demand. This is crucial for the decision-making process as it provides information on competitors’ behavior in the sector as well as on the variation of student segments’ behavior which could help managers identify the unsettled segments and the possible survival supporting segments which should be better targeted during periods of undesirable circumstances. HESA is an important source of data for universities in the UK, but is still under-used by practitioners and researchers in the field. Such databases provide comprehensive variables on national and international student demand for UK courses and current UK HE providers. Data mining would be a valuable tool that should be further utilized by managers in the sector.

Nevertheless, the study is limited by the method employed by the authors to measure FAS. FAS is not only measured by the flexible admission timing or multiple intakes currently used by some universities, but it also refers to various other factors relating to the needs of a wide range of applicants (as explained earlier in this paper). The study opens the venue for future research to study the various aspects of FAS motivations, objectives, current structure, obstacles, challenges and outcomes other than increasing enrollment and the relationship between FAS adoption and many other variables such as retention, capacity constraints, and strategic intent which would help in advancing our understanding of these systems and their application at universities. In addition, a comprehensive model of student satisfaction/choice should accommodate students’ needs and opinions about FAS.

More advanced studies that investigate the chain of student purchasing behavior would be supportive. Additionally, the competitiveness of HE has been under-investigated by researchers in the field. However, the traditional models used when studying competition in the business sector can still play an important role in advancing study in the HE sector.

**Disclosure statement**

No potential conflict of interest was reported by the authors.

**References**


**Appendix**

**Recent trend of FAS at UK universities**

<table>
<thead>
<tr>
<th>Very low FAS</th>
<th>Low FAS</th>
<th>Medium FAS</th>
<th>High/Very high FAS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bishop Grosseteste University</td>
<td>Cranfield University</td>
<td>Buckinghamshire New University</td>
<td>The Open University</td>
</tr>
<tr>
<td>The Royal Central School of Speech and Drama</td>
<td>Royal College of Art</td>
<td>University of St Mark and St John</td>
<td>Edge Hill University</td>
</tr>
<tr>
<td>Falmouth University</td>
<td>University of Chester</td>
<td>University of Cumbria</td>
<td>Harper Adams University</td>
</tr>
<tr>
<td>Liverpool Hope University</td>
<td>Canterbury Christ Church University</td>
<td>Anglia Ruskin University</td>
<td>University of Wales</td>
</tr>
<tr>
<td>University of the Arts, London</td>
<td>York St John University</td>
<td>Coventry University</td>
<td>Trinity Saint David</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>The University of Buckingham</td>
</tr>
</tbody>
</table>
Newman University  The University of Winchester  University of Derby
Ravensbourne  University of Bedfordshire  Staffordshire University
Roehampton University  The University of Northampton  Teesside University
Rose Bruford College  University of Worcester  The University of West London
Royal Academy of Music  The University of Bolton  Glyndwr University
Royal College of Music  Bournemouth University  Cardiff Metropolitan University
Royal Northern College of Music  Birmingham City University  The Institute of Cancer Research
Southampton Solent University  The University of East London
St Mary's University, Twickenham  University of Hertfordshire
Leeds Trinity University  Liverpool John Moores University
Trinity Laban Conservatoire of Music and Dance  Middlesex University
Bath Spa University  University of Northumbria at Newcastle
The University of Brighton  Oxford Brookes University
The University of Central Lancashire  Sheffield Hallam University
University of Gloucestershire  London South Bank University
The University of Greenwich  The University of Sunderland
The University of Huddersfield  The University of Westminster
The University of Lincoln  The University of Wolverhampton
Kingston University  University of South Wales
Leeds Beckett University  Queen Margaret University, Edinburgh
The Manchester Metropolitan University  The Robert Gordon University
De Montfort University  The University of the West of Scotland
The Nottingham Trent University  Glasgow Caledonian University
University of Plymouth  Edinburgh Napier University
The University of Portsmouth  The University of Bradford
University of the West of England, Bristol  The University of East Anglia
The University of Chichester  The University of Hull
University of Abertay Dundee  Institute of Education
Glasgow School of Art  King’s College London
Royal Conservatoire of Scotland  London Business School
Aston University  London School of Hygiene and Tropical Medicine
The University of Bath  The Royal Veterinary College
The University of Birmingham  St George’s Hospital Medical School
The University of Bristol  The University of Hull
Brunel University London  Institute of Education
The University of Cambridge  King’s College London
The City University  London Business School
University of Durham  London School of Hygiene and Tropical Medicine
The University of Essex  The Royal Veterinary College
The University of Exeter  St George’s Hospital Medical School
The University of Keele  University of Wolverhampton
The University of Kent  The University of Leeds
The University of Lancaster  The University of Manchester
The University of Liverpool  University of Manchester
Birkbeck College  University of Manchester
Goldsmiths College  University of Manchester
Imperial College of Science, Technology and Medicine
London School of Economics and Political Science
Queen Mary University of London
Royal Holloway and Bedford New College
The School of Oriental and African Studies
University College London
University of London (Institutes and activities)
Loughborough University
University of Newcastle-upon-Tyne
University of Nottingham
The University of Reading
The University of Salford
The University of Sheffield
The University of Southampton
The University of Sussex
The University of York
The University of Edinburgh
The University of Glasgow
The University of Strathclyde
The University of St Andrews
SRUC
Aberystwyth University
Bangor University
Cardiff University
The Queen’s University of Belfast
Writtle College
Norwich University of the Arts
Stranmillis University College
St Mary’s University College
Royal Agricultural University
The Arts University Bournemouth
Conservatoire for Dance and Drama
Courtauld Institute of Art
The University of Manchester
Heythrop College
University for the Creative Arts
Guildhall School of Music and Drama
The Liverpool Institute for Performing Arts