MBA Program Application Levels: A Predictive Framework utilizing Traditional and Current marketing theory

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Title

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Introduction

There is clear evidence that MBA applications at business schools are declining in the US. This trend has been continuing for some years. Indeed, the median applications for a two-year US MBA in 2014 and 2019 were 307 and 225 students, respectively. Median class sizes have fallen between 2014 and 2019 from 75 to 50 students. Between 2018 and 2019, Full-time MBA, Professional MBA, and Executive MBA programs all showed a decline in applications. In 2014, the median acceptance rate of applicants was 45%; by 2019, this had reached 80%. The data presents a challenging environment for business schools during a time when US economic growth is robust and unemployment is low. If such an environment were to reverse, the consequences for the financial viability of many programs could be dire. Moreover, this trend has been reasonably constant for ten years. Given the trend and the probability of a cyclical economic change in the coming years, it is critical to discern the keys drivers to predict graduate applications. (GMAC, 2019)

Given the data illustrating deteriorating annual MBA applications and the importance of the MBA program as the financial backbone of most business schools, an acute awareness of the drivers of graduate applications are critical for business school administrators. This study is important in that it links the key traditional and more current marketing models into a framework to act as a predictor of graduate MBA applications. It isolates the specific Independent Variables that are robust in an empirical model and may verify the survey data and the extent to which the surveys (when combined in a framework) are predictive of applications.

Business schools offering MBA programs all utilize websites to provide information regarding their programs. Indeed, in a 2019 survey of prospective MBA students, some 89% regarded websites as an essential tool for assessing the MBA program at a given business school. Furthermore, the next highest selection method (69% of students) indicated that current students formed the basis of their decision. (AIGAC, 2019). Contrary to traditional approaches and existing preconceptions, the business schools' admissions officer, faculty and team were relevant for less than 50% of students, marginally higher than MBA fairs and school blogs. This is a material change over the last five years.

Firstly, the researcher will undertake a content analysis of school websites given the importance of websites in the graduate application decision-making process. Specifically, the researcher will use the engagement factors founded on the prospective MBA survey results. (GMAC, 2019)

Second, the researcher will examine the traditional marketing-mix theory (the 4-P's) to create a scoring framework to then combine with the relationship marketing model, mentioned below.

Third, the researcher will use Kotler and Armstrong's (1996) five-level relationship marketing model (Klassen, 2002). In addition, the relationship factors (Current Students, Alumni Referrals, Faculty and Admissions) utilized by AIGAC will are used to assess the program relationship marketing (AIGAC, 2019). The researcher will collect data based on these criteria to determine application predictability.

The researcher will thus generate the independent variables that are robust in determining application levels based on current trends in graduate decision-making. This will assist graduate schools in the efficient allocation of scarce internal resources to enhance MBA student enrollment.

Thus, the primary research questions are:

(a) What are the study-defined marketing characteristics of the programs in the sample?
(b) What are the marketing relationship levels on the websites?
(c) Combining the marketing-mix and the marketing relationship variables, is there a correlation among the sample programs?

(d) To what extent do the Independent Variables predict admission levels?
(e) To what extent is the relationship marketing model the overriding category determining applications (as denoted in prospective MBA student surveys)?

Regarding the concepts discussed and in addition to the above discussion about the traditional marketing-mix factors and relationship marketing, as part of the Theoretical Framework, the researcher will introduce the supporting commitment-trust theory of marketing as part of the overall research framework (Morgan & Hunt, 1994). The key components missing in the traditional and relationship theories of marketing are commitment and trust. These components are regarded as key components of firm success and thus should be included in the context of this paper. They are also regarded as an extension of Kotler and Armstrong's relationship theory.

Six cross-sectional regression analyses are undertaken. The first five regressions are to test the hypotheses and the validity of the data. The final regression is undertaken with certain variables weighted in line with the GMAC research, which reported that prospective students rank the following as the most important attributes in the application decision-making process: quality of the Product, the admissions staff, and the current student. This is detailed in the section on Method.

Literature Review

When attracting potential full-time MBA students, graduate schools use a range of approaches to achieve acceptable and increasing application levels. Similarly, potential applicants consider a range of criteria in the process, including school reputation, tuition costs, career implications post-MBA completion, and the materials produced by the school in the application process. These criteria and the approach taken by the schools are generally consistent with the Traditional Marketing Mix theory. Furthermore, relationships established with current students, alumni and both faculty and admissions staff are offered to attract

prospective students (Mahoney, 2006). These relationships are considered to be the basis of Relationship Marketing Theory (Klassen, 2002).

This section reviews the underlying theoretical foundations of the paper. First, the author considers the literature on the underlying nature of the choices made by potential applicants. Second, a brief theoretical review of the Traditional Marketing Mix is presented. Third, the researcher summarizes the theoretical underpinnings of Relationship Marketing with a particular focus on Commitment-Trust Theory and Kotler and Armstrong's five-level model. Finally, the more modern aspects of Relationship Marketing are considered with a particular focus on e-relationships, for example, videoconferencing and accessibility through social media mediums.

Regarding the nature of the school choices of the potential applicants, research has been undertaken by GMAC and AIGAC to ascertain these criteria (AIGAC, 2019; GMAC, 2019). From the surveys, it appears that over 85% of students utilize websites to acquire information on which to base decision-making. The research from these sources also indicates that school websites are the most important determinant for the applicant. Also, the research showed that applicants regarded students on the current program and admissions staff as the most important of the four school relationships. Concerning the most critical aspect of their set of factors, applicants indicated that 'reputation' and 'quality' were the most important factors. The paper also provides granularity on the reputation and quality factors: accreditation, faculty and course quality, and the post-graduation success of previous students (GMAC, 2019).

Regarding the Traditional Marketing Mix Theory, it is well documented that this framework of decision-making by consumers is grounded by substance. The 4Ps have been articulated and executed in various formats by both practitioners and scholars alike since the introduction of the concept by McCarthy (Anderson & Taylor, 1995). There is also a strong

underpinning of this theory in the field of education. Academic institutions have used the Traditional Marketing Mix in their strategic processes for decades through the development of a product, communications with prospective students, catalogs and determination of fees (Kotler, 1979). Not only has the theory been actively used, but it has also been noted as being effective at the organization level (Constantinides, 2006).

While the Traditional Marketing Mix has spanned decades back to the 1960s, Relationship Marketing was introduced as a formal concept by Berry in the mid-1980s. Interestingly, Magrath extended the above and suggested that 'personnel' be included as a fifth P in the Traditional Marketing Mix (Magrath, 1986). Constantinides asserted that the Traditional Market Mix did not capture the critical elements of client interaction and relationship dynamics (Constantinides, 2006).

A key underpinning of Relationship Marketing theory is the Commitment-Trust theory. As noted above, regarding the importance of interaction and relationship dynamics in Relationship Marketing, the additional sub-factors of commitment and trust are crucial elements. Morgan and Hunt referred to 'mutual commitment' as the core of a relationship, and trust as the reliability and integrity that gives credibility to the mutual commitment (Morgan & Hunt, 1994). Bowden extends the above by suggesting that commitment-trust dynamic leads to loyalty and thus long-term commitment which is a competitive advantage in applications and student retention (Bowden, 2011).

A framework for assessing Relationship Marketing was forwarded by Kotler and Armstrong (Zineldin, 2007). In summary, the five distinct levels in the model are as follows:

- *Basic:* the website information required to inform and allow for communication for potential applicants is non-existent. That is, information is generally available, but not the means to communicate. As a general trend in the service industry, this situation is uncommon (Bai, Hu, & Jang, 2007).

- *Reactive:* the website offers minimal information with minimal effort to communicate and foster trust with applicants. Contact details and personnel background information are generally provided.
- *Proactive*: the website moves beyond mere information and presents access to other communication and relationship opportunities, including audio-visual media and social networking mediums.
- *Partnership*: the website contains a material level of interaction with the applicant via advanced technology techniques, including webinars and videoconferencing. This level offers the highest level of contact and intimacy and thus the highest level of commitment-trust.

The five-level model does contain theoretical justification in education, given that it has been utilized as a framework in the research of both Kittle and Ciba, and Klassen (Kittle & Ciba, 2001; Klassen, 2002).

Finally, with the growth of the internet and a significant increase in the number of software programs for web-based communication and customer service, e-marketing has also been adopted in education. Theoretical justification is supported for the proposition that web-based communication is more effective for Relationship Marketing than traditional direct marketing approaches. The interaction and immediate 2-way communication have become the most effective means of organization-customer relationship building. (Rose, Hair, & Clark, 2011). More specifically, video conferencing remains at the core of the customer relationship-building goal. The cost-effectiveness of videoconferencing and the wide accessibility of the internet is complementary to the students' desire to spend less time on school campuses during the decision-making process (GMAC, 2019).

Theoretical Framework

This paper has studied the gap in the literature, described above, by utilizing insights from the Traditional Marketing Mix and Relationship Marketing theories to create a conceptual framework for empirical verification, that examines the combined and interacting effects of these two concepts on MBA admissions at business colleges. The paper analyzes the correlations and causation of various marketing aspects on full-time MBA applications for lesser ranked colleges as a proxy for unranked colleges.

The underlying theoretical framework rests upon the two marketing pillars of the Traditional Marketing Mix and Relationship Marketing. The Traditional Marketing Mix comprises an assessment and characterization of 'Price,' 'Product,' 'Promotion' and 'Place.' Relationship Marketing approaches consider the assessment of the role and interaction of 'People' in the marketing process. The author presents the statistically significant determinants of MBA applications for each pillar separately, and after that, combines the statistically substantial variables into a single consolidated formula.

In the early 1960s, Jerome McCarthy, an academic by profession and applying mathematics and statistics to modeling marketing strategy, presented the concept of the '4Ps Marketing Mix' (Anderson & Taylor, 1995). For much of the subsequent five decades, the '4Ps' have become synonymous in marketing in both academia and commerce (Constantinides, 2006; Klassen, 2002; Krachenberg, 1972).

The body of research also suggests that the Relationship Marketing concept introduced 'People' into the marketing impact discussion. This momentum was particularly noted during the 1980s as the global economy became more open (Berry, 2002; Cravens, 2006; Jang, Hu, & Bai, 2006; Magrath, 1986; Vargo & Lusch, 2004). While the author has selected 'People' as the additional marketing weapon, Berry noted that relationship marketing also includes Physical Facilities and Process Management into the MIX, resulting in 7Ps. The

author, in this paper, has condensed both Physical Facilities and Process Management into the 'Place' component.

As a research framework, the author argues that the Traditional Marketing Mix is essential in the customer acquisition process and long term retention, however, the Relationship Marketing aspect is vital in the acquisition-retention dynamic in that it includes customer 'Trust,' especially in the acquisition process (Bowden, 2011; Magrath, 1986; Mahoney, 2006). The characterization of trust in the relationship marketing process requires the introduction of the Commitment-Trust theory into the research mix (Morgan & Hunt, 1994). The Commitment-Trust Theory proposes that both commitment and trust are crucial elements in a relationship and, thus, critical features of a successful relationship marketing outcome.

In this paper, the relationship marketing strategies of the sample of universities is analyzed through the lens of college websites. This introduces the concepts of E-relationship Marketing and Content Analysis. E-relationship Marketing has received substantial scholarly attention in recent decades, but little has been undertaken in the field of education (Constantinides, Lorenzo, & Alarcón-del-Amo, 2013; George, 2000; Kittle & Ciba, 2001). Similarly, significant research has been undertaken on website content analysis and the importance thereof in relationship marketing and customer attention (Blake & Neuendorf, 2004).

This paper proposes the following hypotheses and concept relationships in analyzing the research question:

Hypothesis 1 (H_1): There is a positive correlation between traditional and relationship marketing theories and prospective MBA graduate applications.

While there is a scarcity of research on the implications for the interactions of the two marketing theories on university applications generally, there is evidence in the body of

literature that supports the use of these theories more generally, as noted above. Furthermore, by introducing the 'People' component to the Traditional Mix, the relationship to applications should be strengthened while not possessing strong correlations with the other independent variables.

Hypothesis 2 (H_2): There is a positive correlation between the relationship marketing characteristics contained in program websites and prospective MBA graduate applications.

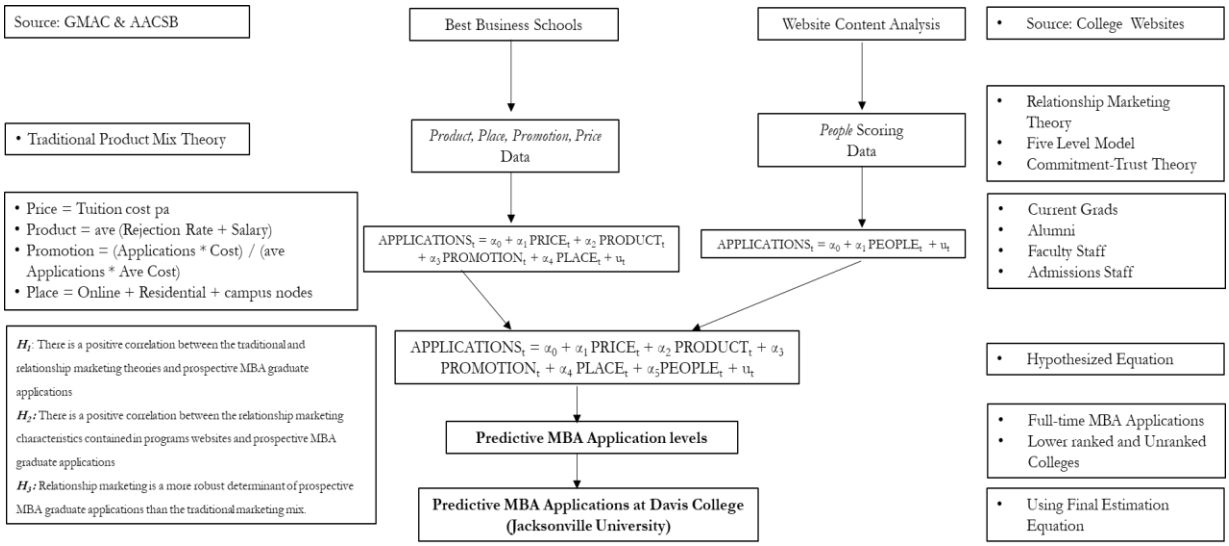
The extant literature outside of education does the present scholarly foundation for the contribution of Relationship Marketing to firm success both in the service industry and manufacturing (Vargo & Lusch, 2004). Thus, it follows that Relationship Marketing should have a positive relationship with MBA applications. This is especially the case given the age profile of the range of typical applicants for the full-time MBA. That is, there is support for the proposition that relationship marketing through websites, in particular, has an age bias towards the younger generation and those in the services sector (Bowden, 2011).

Hypothesis 3 (H_3): Relationship marketing is a more robust determinant of prospective MBA graduate applications than the traditional marketing mix.

While there is strong scholarly support for the two marketing theories, there is no previous study that has analyzed the proposition that the internet age and commoditization of services has brought about a strong emphasis on relationship marketing, rather than the traditional marketing mix. The underlying rationale for the above hypotheses is that marketing models, both traditional and modern, have an impact on MBA applications. Moreover, there is a stronger relationship between applications and relationship characteristics. A simple approach to MBA applications that implies 'what works last year will work this year' may not be successful.

The relationships may not hold in a sample that includes business schools that are not accredited by the AACSB. Similarly, the relationships may not hold in a sample of both ranked and unranked non-AACSB colleges.

In summary, the paper will follow the analytical framework presented diagrammatically below:



Method

The paper focusses on full-time MBA applications at lesser ranked business schools, as a proxy for unranked schools facing a deteriorating business school environment. Thus, to test the above hypotheses and to present an appropriate frame of reference, it is proposed that the analysis includes a sample of colleges based in the US, and defined as colleges ranked 50 or worse by the US News Best Business Schools survey. The population for the study is 75 colleges, from which a random sample of 30 colleges was selected.

From a research design perspective, the author uses quantitative content analysis to assess the specific five-levels of relationship marketing extracted from the program websites. This follows the methodology of Kotler and Armstrong's five-level marketing model based on relationships (Armstrong, Adam, Denize, & Kotler, 2014; Zineldin, 2007). The paper

analyzes the potential relationship features of the website as they pertain to current students, alumni, faculty staff and admissions staff. These are deemed to be the key areas cited by students as important in their decision-making process (Kittle & Ciba, 2001). The relationship marketing variables are based on the five-level marketing model: (1) Basic, (2) Reactive, (3) Accountable, (4) Proactive, and (5) Partnership. The unweighted average of the criteria is represented as the variable 'People.' The website content analysis approach is an adaptation of Armstrong and Kotler's analysis. Other scholars have utilized the approach for an internet-based service sector to analyze the extent to which an entities website reflects a basic level (very little communication with the customer and thus little trust-based relationship) through to a partnership level characterized by a strong communication delivering a sense of trust through a partnership-type relationship (Bai et al., 2007; Han, Hu, Bai, & Jang, 2005). Such an approach has been used in education previously (Klassen, 2002). The five levels are outlined further in the literature review section. The website content scoring is shown in Appendix 1.

The Traditional Marketing Mix variables were formed from data collected from the AACSB and US News rankings (AACSB, 2019; USNews, 2020). The traditional marketing constructs are:

- Price: Cost of tuition (AACSB Survey, 2019);
- Product: simple average based on the importance prospective graduate placed on the variables (student-faculty ratio; employment rate; rejection rate; rankings) from GAMC, 2019);
- Place: number of MBA locations offered by a faculty, and online programs (AACSB Survey,2019); and

- Promotion: (MBA Enrollment * Tuition cost pa) / (Average sample MBA Enrollment * Average sample Tuition cost pa) (AACSB Survey, 2019)(USNews, 2020).

The additional aspects of the research design are as follows:

- The unit of analysis: Number of applications
- Type of research design: Multiple Regression
- Field setting: Secondary data

Regarding population and sample, the universe of AACSB accredited schools in the United States comprises 470 schools (AACSB, 2019). The researcher created a population of 75 lesser ranked schools and then sampled 30 school websites using a random sampling method. No further rankings are used with AACSB accreditation being the constant quality construct.

The Independent Variables are categorized as traditional and relationship.

Sample size and data collection methods: Many sources, as noted above, and a sample of 30 programs from lesser ranked schools (ranked at 50 or worse). N = 30.

Data Collection:

- Traditional Marketing Mix: (AACSB, 2019; USNews, 2020)
- Relationship Marketing: College websites (noted in Appendix 1)

Also, a level of compliance was undertaken regarding the website data. Website content was checked for consistency and material changes over time on *webarchive.org*. Websites were checked over random periods for the last year during the sample period.

Significant results are presented as a strong relationship between the combined marketing framework and application levels.

The dependent variable in this study is *full-time MBA applications*. The independent variables are People, Product, Promotion, Place, and Price.

Six cross-sectional regression analyses were undertaken. The first five regressions are to test the hypotheses and the validity of the data. The final regression was undertaken with certain variables weighted in line with the GMAC research, which reported that prospective students rank the following as the most important attributes in the application decision-making process: quality of the Product, the admissions staff, and the current student. Quality can be ascertained from ranking, accreditation, and rejection rate. The ranking is not important in this study since we are observing lesser ranked schools as a proxy for unranked schools. Accreditation is a pre-condition of the population in the study and is thus of no relative value in the regression. The rejection rate will be increased to an 80% weight (increased from a simple average equal weight in the other regressions) in the Product determination. In the Relationship Marketing model ('People'), Admissions staff and current students will be increased in weight to 40% each, and Alumni and Faculty staff will be decreased pro-rata.

Data Analysis and Results:

All data was collected and collated in Microsoft Excel and exported to IBM SPSS software, which was used for the statistical analysis. Descriptive statistics were observed to determine normality, homogeneity, and linearity. Pearson correlation analysis was performed to determine if the independent variables were unacceptably correlated at both the individual marketing theory level, and at the consolidated regression level. The above was undertaken before the regression analysis. Both the descriptive statistics and the correlations provided some insight into the relationship with the independent variable prior to observing the regression results. That is higher correlations with the independent variable suggest that an independent variable will likely have a stronger co-efficient, if statistically significant.

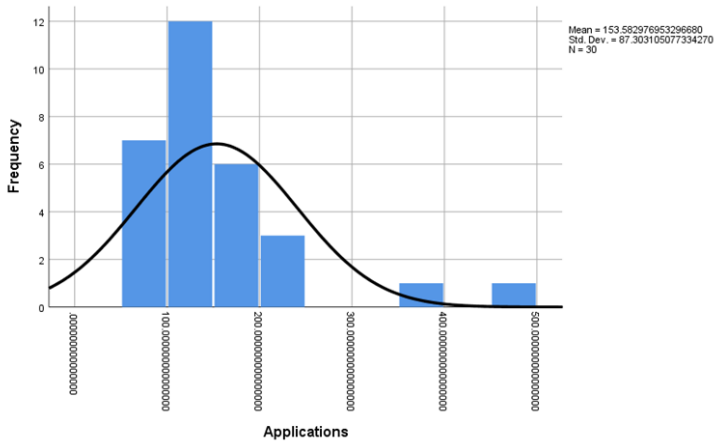
A cross-section multiple regression was undertaken to ascertain the predictive determinants of MBA applications based on the data collected for the two marketing theories, as adjusted in this paper. The SPSS output is presented in Appendix 2.

A regression was undertaken on the four-factor Traditional Marketing Mix model. No missing values or material outliers were observed. The descriptive statistics suggest that the data is reasonably spread around the respective means, and skewness and kurtosis are both at acceptable levels. The dependent variable is somewhat elevated, but further investigation below suggests normalcy.

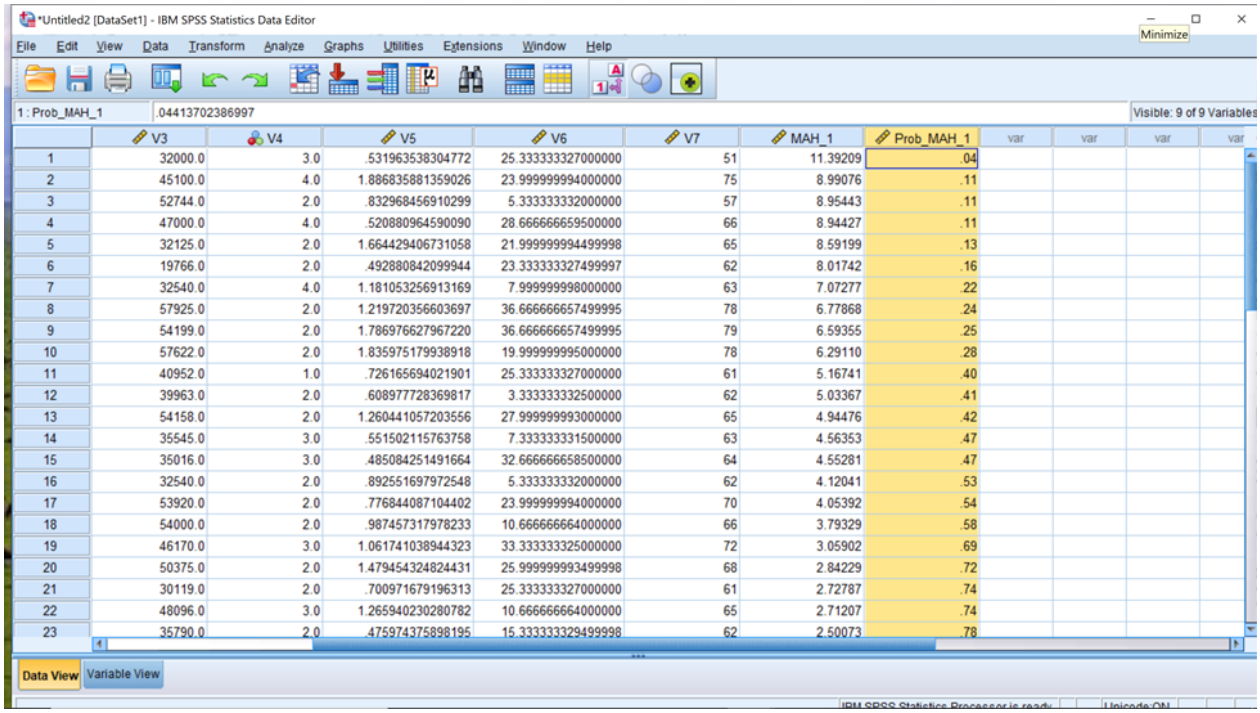
Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
Applications	30	64.69002695	464.6153846	153.5829770	87.30310508	2.170	.427	5.533	.833
Price	30	19766.0	57925.0	42213.683	9824.8247	-.108	.427	-.784	.833
Place	30	1.0	4.0	2.467	.7303	.692	.427	.055	.833
Promotion	30	.4759743759	1.886835881	.9932488401	.4268168372	.671	.427	-.473	.833
Product	30	3.333333332	36.66666666	20.33333333	9.566464411	-.147	.427	-.934	.833
People	30	51	79	65.40	6.129	.588	.427	1.048	.833
Valid N (listwise)	30								

The Histogram presents a positive skew, and this is a result of a few graduate schools having outsized applications. Considering the analysis concerns the determinants of the applications and that these schools have historically significant facilities for a higher number of students, the skewness is ignored.

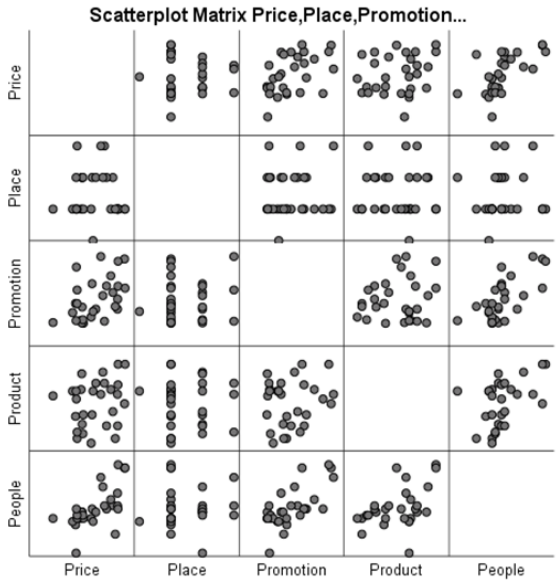


The researcher considered the possibility of outliers in the dataset, and a Mahalanobis Distance analysis was conducted and presented below. A Chi-squared transformation was undertaken to check the probability of outliers, and no outliers are identified. That is, all colleges presented above the 0.001 significance level and the probability of outliers is very low.

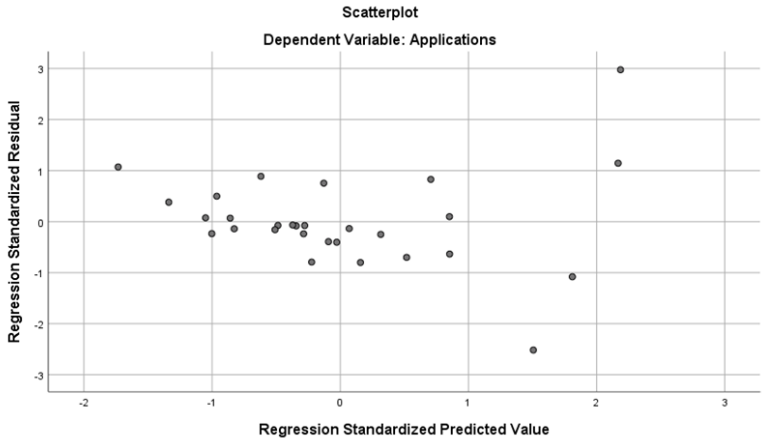


	V3	V4	V5	V6	V7	MAH_1	Prob_MAH_1	var	var	var	var
1	32000.0	3.0	.531963538304772	25.333333327000000	51	11.39209	.04				
2	45100.0	4.0	1.886835881359026	23.999999994000000	75	8.99076	.11				
3	52744.0	2.0	.832968456910299	5.333333332000000	57	8.95443	.11				
4	47000.0	4.0	.520880964590090	28.666666659500000	66	8.94427	.11				
5	32125.0	2.0	1.664429406731058	21.999999994499998	65	8.59199	.13				
6	19766.0	2.0	.492880842099944	23.333333327499997	62	8.01742	.16				
7	32540.0	4.0	1.181053256913169	7.999999998000000	63	7.07277	.22				
8	57925.0	2.0	1.219720356603697	36.666666657499995	78	6.77868	.24				
9	54199.0	2.0	1.786976627967220	36.666666657499995	79	6.59355	.25				
10	57622.0	2.0	1.835975179938918	19.999999995000000	78	6.29110	.28				
11	40952.0	1.0	.726165694021901	25.333333327000000	61	5.16741	.40				
12	39963.0	2.0	.608977728369817	3.333333332500000	62	5.03367	.41				
13	54158.0	2.0	1.260441057203556	27.999999993000000	65	4.94476	.42				
14	35545.0	3.0	.551502115763758	7.333333331500000	63	4.56353	.47				
15	35016.0	3.0	.485084251491664	32.666666658500000	64	4.55281	.47				
16	32540.0	2.0	.892551697972548	5.333333332000000	62	4.12041	.53				
17	53920.0	2.0	.776844087104402	23.999999994000000	70	4.05392	.54				
18	54000.0	2.0	.987457317978233	10.666666664000000	66	3.79329	.58				
19	46170.0	3.0	1.061741038944323	33.333333325000000	72	3.05902	.69				
20	50375.0	2.0	1.479454324824431	25.999999993499998	68	2.84229	.72				
21	30119.0	2.0	.700971679196313	25.333333327000000	61	2.72787	.74				
22	48096.0	3.0	1.265940230280782	10.666666664000000	65	2.71207	.74				
23	35790.0	2.0	.475974375898195	15.333333329499998	62	2.50073	.78				

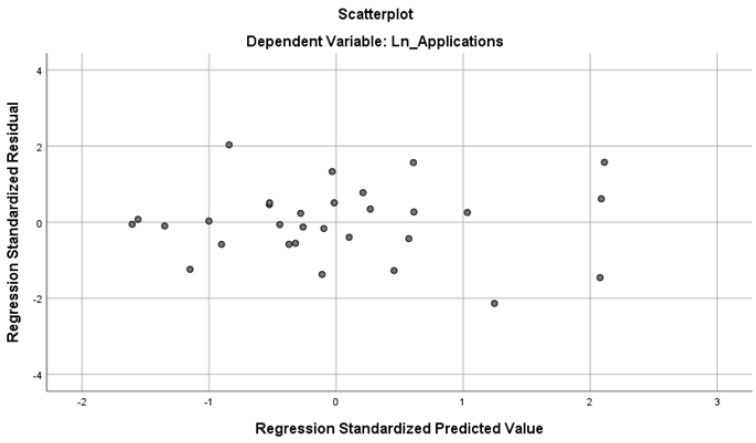
A check for linearity, homogeneity, and normality was undertaken and presented in the scatter matrix below. Generally, the scatter plot distributions appear to be elliptically shaped. However, there is concern over the shape of the independent variable ‘Place.’ While the data points are evenly spread, they do not conform to an elliptical or linear form. The analysis further below ultimately excludes ‘Place’ as a variable in the study.



The Scatterplot below suggests very little heteroskedasticity. The pattern of plots is not evenly spread around the zero level, and the spread of data is not circular in nature with a funnel shape developing as the residuals increase. This suggests the presence of heteroskedasticity in the dataset.



By performing a log transformation of the dependent variable, homogeneity is achieved, and this can be observed from the scatterplot below.



Regression 1: A stepwise regression analysis is undertaken on the Traditional Marketing Mix variables, excluding 'Place.' The following output is generated and presented below and more comprehensively in Appendix 2. The remaining three independent variables produce a statistically significant model while adhering to all linear regression assumptions. The collinearity statistics also suggest no multicollinearity. The model is statistically significant with an F-statistic of 36.871. The model explains some 79% of the variability of applications.

Model Summary[d]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.756[a]	.571	.556	.31039
2	.835[b]	.697	.675	.26578
3	.900[c]	.810	.788	.21465

a. Predictors: (Constant), Promotion
b. Predictors: (Constant), Promotion, Product
c. Predictors: (Constant), Promotion, Product, Price
d. Dependent Variable: Ln_Applications

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	3.597	1	3.597	37.331	.000[b]
	Residual	2.698	28	.096		
	Total	6.294	29			
2	Regression	4.387	2	2.193	31.053	.000[c]
	Residual	1.907	27	.071		
	Total	6.294	29			
3	Regression	5.096	3	1.699	36.871	.000[d]
	Residual	1.198	26	.046		
	Total	6.294	29			

a. Dependent Variable: Ln_Applications
b. Predictors: (Constant), Promotion
c. Predictors: (Constant), Promotion, Product
d. Predictors: (Constant), Promotion, Product, Price

Excluded Variables[a]

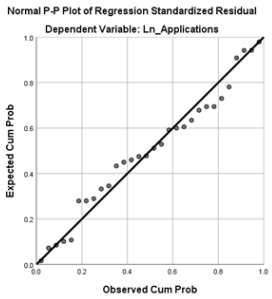
Model		Beta In	t	Sig.	Partial Correlation	Collinearity Statistics: Tolerance	Collinearity Statistics: VIF	Collinearity Statistics: Minimum Tolerance
1	Price	-.316[b]	-2.394	.024	-.418	.752	1.329	.752
	Product	.359[b]	3.345	.002	.541	.976	1.025	.976
	People	.197[b]	1.161	.256	.218	.524	1.907	.524
2	Price	-.392[c]	-3.924	.001	-.610	.733	1.365	.733
	People	-.044[c]	-.260	.797	-.051	.407	2.456	.407
3	People	.225[d]	1.556	.132	.297	.331	3.018	.331

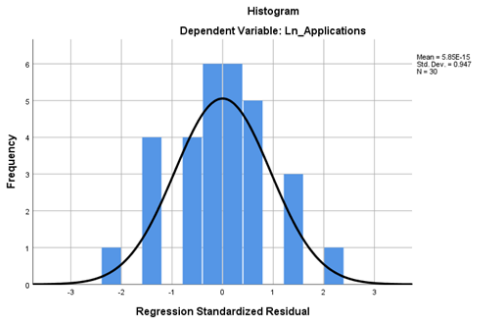
a. Dependent Variable: Ln_Applications

b. Predictors in the Model: (Constant), Promotion

c. Predictors in the Model: (Constant), Promotion, Product

d. Predictors in the Model: (Constant), Promotion, Product, Price





Coefficients[a]

Model		Unstandardized Coefficients: B	Unstandardized Coefficients: Std. Error	Standardized Coefficients: Beta	t	Sig.	Collinearity Statistics: Tolerance	Collinearity Statistics: VIF
1	(Constant)	4.099	.146		28.148	.000		
	Promotion	.825	.135	.756	6.110	.000	1.000	1.000
2	(Constant)	3.804	.153		24.910	.000		
	Promotion	.764	.117	.700	6.531	.000	.976	1.025
	Product	.017	.005	.359	3.345	.002	.976	1.025
3	(Constant)	4.331	.182		23.738	.000		
	Promotion	.968	.108	.887	8.977	.000	.750	1.333
	Product	.020	.004	.414	4.722	.000	.950	1.052
	Price	-1.860E-5	.000	-.392	-3.924	.001	.733	1.365

a. Dependent Variable: Ln_Applications

The Traditional Marketing Mix estimation equation produced by the model is:

Y = 4.331 + 0.968(Promotion) + 0.020(Product) – 0.000(Price), where Y = Ln_Applications

Thus, Promotion is a very material determinant of full-time MBA applications for lessor ranked colleges. Adjusting for the log transformation, for every US$1 increase in Promotion, applications would be expected to increase by 0.00968%. Tuition cost has a negative

correlation with applications, but this is not material in the estimation. Similarly, Product is positively correlated to applications, but not meaningful.

Regression 2: A regression analysis is undertaken on the Relationship Marketing mix variables. The following output is generated and presented below and more comprehensively in Appendix 2. This output suggests a statistically significant model while adhering to all linear regression assumptions. The collinearity statistics also suggest no multicollinearity. The simple regression model is statistically significant, with an F-statistic of 17.922. The 'People' variable explains some 37% of the variability of applications, ceteris paribus.

Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	People[b]	.	Enter

a. Dependent Variable: Ln_Applications

b. All requested variables entered.

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.625[a]	.390	.368	.37022

a. Predictors: (Constant), People

b. Dependent Variable: Ln_Applications

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2.456	1	2.456	17.922	.000[b]
	Residual	3.838	28	.137		
	Total	6.294	29			

a. Dependent Variable: Ln_Applications

b. Predictors: (Constant), People

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	1.812	.737		2.460	.020		
	People	.047	.011	.625	4.233	.000	1.000	1.000

a. Dependent Variable: Ln_Applications

The Relationship Marketing estimation equation produced by the model is:

Y = 1.812 + 0.047(People), where Y = Ln_Applications

Thus, People are not a material determinant of full-time MBA applications for lessor ranked colleges, ceteris paribus. Adjusting for the log transformation, for every 1 unit increase in the relationship marketing score, applications would be expected to increase by 0.00047%. While statistically significant, this is not a strong determinant of full-time MBA applications.

Regression 3: A regression analysis is undertaken on all the combined variables for the Traditional Marketing Mix and Relationship Marketing strategies, excluding 'Place.' The following output is generated and presented below and more comprehensively in Appendix 2. The independent variables produce a statistically significant model while adhering to all linear regression assumptions. The collinearity statistics also suggest no multicollinearity. The model is statistically significant with an F-statistic of 29.768. The model explains some 80% of the variability of applications.

Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	People, Product, Price, Promotion[b]	.	Enter

a. Dependent Variable: Ln_Applications

b. All requested variables entered.

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.909[a]	.826	.799	.20901

a. Predictors: (Constant), People, Product, Price, Promotion

b. Dependent Variable: Ln_Applications

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	5.202	4	1.300	29.768	.000[b]
	Residual	1.092	25	.044		
	Total	6.294	29			

a. Dependent Variable: Ln_Applications

b. Predictors: (Constant), People, Product, Price, Promotion

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Tolerance	VIF
1	(Constant)	3.542	.538		6.588	.000		
	Price	-2.203E-5	.000	-.465	-4.306	.000	.596	1.677
	Promotion	.849	.130	.778	6.543	.000	.491	2.037
	Product	.017	.005	.347	3.615	.001	.755	1.325
	People	.017	.011	.225	1.556	.132	.331	3.018

a. Dependent Variable: Ln_Applications

The Combined estimation equation incorporating all variables produced by the model is:

Y = 3.542 - 0.000(Price) + 0.849(Promotion) + 0.017(Product) + 0.017(People), where Y = Ln_Applications. Promotion remains a robust determinant, while People is not statistically significant when combined with other independent variables.

Regression 4: A stepwise regression is undertaken to produce the optimum set of independent variables to formulate a predictive framework for full-time MBA applications at lesser ranked business schools. The following output is generated and presented below and more comprehensively in Appendix 2. Observing *Model 3*, the independent variables produce a statistically significant model while adhering to all linear regression assumptions. The collinearity statistics also suggest no multicollinearity. The model is statistically significant, with an F-statistic of 36.871. The model explains some 79% of the variability of applications.

Model Summary[d]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.756[a]	.571	.556	.31039
2	.835[b]	.697	.675	.26578
3	.900[c]	.810	.788	.21465

a. Predictors: (Constant), Promotion

b. Predictors: (Constant), Promotion, Product

c. Predictors: (Constant), Promotion, Product, Price

d. Dependent Variable: Ln_Applications

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	3.597	1	3.597	37.331	.000[b]
	Residual	2.698	28	.096		
	Total	6.294	29			
2	Regression	4.387	2	2.193	31.053	.000[c]
	Residual	1.907	27	.071		
	Total	6.294	29			
3	Regression	5.096	3	1.699	36.871	.000[d]
	Residual	1.198	26	.046		
	Total	6.294	29			

a. Dependent Variable: Ln_Applications

b. Predictors: (Constant), Promotion

c. Predictors: (Constant), Promotion, Product

d. Predictors: (Constant), Promotion, Product, Price

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Tolerance	VIF
1	(Constant)	4.099	.146		28.148	.000		
	Promotion	.825	.135	.756	6.110	.000	1.000	1.000
2	(Constant)	3.804	.153		24.910	.000		
	Promotion	.764	.117	.700	6.531	.000	.976	1.025
	Product	.017	.005	.359	3.345	.002	.976	1.025
3	(Constant)	4.331	.182		23.738	.000		
	Promotion	.968	.108	.887	8.977	.000	.750	1.333
	Product	.020	.004	.414	4.722	.000	.950	1.052
	Price	-1.860E-5	.000	-.392	-3.924	.001	.733	1.365

a. Dependent Variable: Ln_Applications

The Combined estimation equation incorporating the statistically significant variables produced by the model is: Y = 4.331 + 0.968(Promotion) + 0.020(Product) - 0.000(Price), where Y = Ln_Applications.

Promotion remains a robust determinant, while People is not statistically significant when combined with other independent variables and is thus excluded in the stepwise iteration. This result suggests that Promotion is consistently the most material determinant of applications. While the correlations of the remaining variables are statistically significant and have the anticipated relationship with the dependent variable, they are not material. The

People variable is only statistically significant in a single independent variable model and is not material under such conditions.

Regression 5: Based on a change in the weights for 'Product' by increasing the weight of the rejection rate in the variable and changing the weights for current Students and Admissions staff in the 'People' variable, a stepwise regression is undertaken to produce the optimum set of independent variables to formulate a predictive framework for full-time MBA applications at lesser ranked business schools. These weights were increased as a result of the survey conclusions undertaken by GMAC (GMAC, 2019). The following output is generated and presented below and more comprehensively in Appendix 2. Observing *Model 3*, the independent variables produce a statistically significant model while adhering to all linear regression assumptions. The collinearity statistics also suggest no multicollinearity. The model is statistically significant and explains some 91% of the variability of applications.

Model Summary[d]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.756[a]	.571	.556	.31039	.571	37.331	1	28	.000
2	.886[b]	.785	.769	.22396	.213	26.781	1	27	.000
3	.960[c]	.922	.913	.13724	.137	45.906	1	26	.000

a. Predictors: (Constant), Promotion

b. Predictors: (Constant), Promotion, Product

c. Predictors: (Constant), Promotion, Product, Price

d. Dependent Variable: Ln_Applications

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	4.099	.146		28.148	.000		
	Promotion	.825	.135	.756	6.110	.000	1.000	1.000
2	(Constant)	3.722	.128		29.131	.000		
	Promotion	.774	.098	.709	7.903	.000	.990	1.010
	Product	.021	.004	.464	5.175	.000	.990	1.010
3	(Constant)	4.299	.116		37.159	.000		
	Promotion	1.002	.069	.918	14.563	.000	.752	1.329
	Product	.024	.003	.538	9.599	.000	.953	1.050
	Price	-2.065E-5	.000	-.436	-6.775	.000	.724	1.381

a. Dependent Variable: Ln_Applications

Excluded Variables[a]

Model		Beta In	t	Sig.	Partial Correlation	Collinearity Statistics: Tolerance	VIF	Minimum Tolerance
1	Price	-.316[b]	-2.394	.024	-.418	.752	1.329	.752
	Product	.464[b]	5.175	.000	.706	.990	1.010	.990
	People	.216[b]	1.281	.211	.239	.528	1.894	.528
2	Price	-.436[c]	-6.775	.000	-.799	.724	1.381	.724
	People	-.202[c]	-1.387	.177	-.263	.364	2.751	.364
3	People	.053[d]	.531	.600	.106	.305	3.279	.305

a. Dependent Variable: Ln_Applications

b. Predictors in the Model: (Constant), Promotion

c. Predictors in the Model: (Constant), Promotion, Product

d. Predictors in the Model: (Constant), Promotion, Product, Price

The 'People' variable remains excluded from the model. This is the optimum estimation equation for determining application.

The estimation equation incorporating the statistically significant variables produced by the model is: Y = 4.299 + 1.002(Promotion) + 0.024(Product) - 0.000(Price), where Y = Ln_Applications.

Regression 6: A regression was performed to determine whether an increase in the weights for Current Students and Admissions Staff based on the prospective student survey presented by GMAC (GMAC, 2019).

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics: R Square Change	F Change	df1	df2	Sig. F Change
1	.633[a]	.401	.380	.36695	.401	18.744	1	28	.000

a. Predictors: (Constant), People

b. Dependent Variable: Ln_Applications

Coefficients[a]

Model		Unstandardized Coefficients: B	Unstandardized Coefficients: Std. Error	Standardized Coefficients: Beta	t	Sig.	Collinearity Statistics: Tolerance	VIF
1	(Constant)	1.875	.706		2.656	.013		
	People	.018	.004	.633	4.329	.000	1.000	1.000

a. Dependent Variable: Ln_Applications

The Relationship Marketing estimation equation based on weighted variables produced by the model is:

Y = 1.875 + 0.018(People), where Y = Ln_Applications

The ‘People’ variable explains some 38% of the variability of applications, ceteris paribus. This is very similar to the unweighted variable regression (Regression 2) for Relationship Marketing. Interestingly, by weighting the variables, prospective students deem more important had an impact on the ‘Product’ variable in Regression 5 but had minimal impact on the ‘People’ variable. Relationship Marketing remains unimportant despite the findings of the research by GMAC.

Revisiting the three hypotheses, one can summarize the regression results as follows:

Hypothesis 1 (H_1): There is a positive correlation between traditional and relationship marketing theories and prospective MBA graduate applications. The results from Regression 3 reject this hypothesis. Indeed, only three variables of the original five variables for which data were collected were found to be statistically significant (Promotion, Product and Price). The People variable which represents Relationship Marketing, was not statistically significant when included with other variables.

Hypothesis 2 (H_2): There is a positive correlation between the relationship marketing characteristics contained in program websites and prospective MBA graduate applications. The results from Regression 3 support this hypothesis. When People is included in a single independent variable model, Relationship Marketing explains some 37% of the variability of MBA applications and is statistically significant.

Hypothesis 3 (H_3): Relationship marketing is a more robust determinant of prospective MBA graduate applications than the traditional marketing mix. The results from Regression 3 reject this hypothesis. The People variable, which represents Relationship Marketing, was not statistically significant when included with other variables from the Traditional Marketing Mix. This is further supported by the results of Regression 1 (Traditional

Marketing Mix variables) which explained some 79% of the variability of Applications. Furthermore, the output from Regression 2 indicates that Relationship Marketing only explains some 37% of the variability of MBA Applications. Thus, there is no condition under which Relationship Marketing is more robust that elements of the Traditional Marketing Mix.

Contribution and Limitations

The paper contributes to the body of literature in several ways. First, in designing a predictive framework for a research model grounded in multiple theories to ascertain the determinants of the backbone and most profitable area of business schools – full-time MBA. Second, by focusing on the lesser ranked schools and the secondary data available for said schools, a potential proxy for unranked and vulnerable schools is created. Third, the paper contributes to the extant literature by providing a basis for business school administrators to allocate resources in a manner that bears a more predictive application outcome. Fourth, the research design and framework incorporate both the traditional Marketing Mix and the more modern Relationship Marketing aspect which includes web-based relationships.

The primary limitations of the study concern, firstly the generalizability of the results to unranked schools. It is assumed that lesser ranked schools are a proxy for unranked schools. While this seems imminently reasonable, it may not be valid. Second, the data selected to construct the independent variables were based on data availability, rather than data best reflecting the variable. This limitation is mitigated by the fact that applications are also based on perception rather than unavailable data.

Future Research

A further study using the method developed here should include independent variables that contain more data. A survey and a school specific data collection process would likely need to be undertaken. Such data collection should include unranked schools.

Furthermore, the research could include schools within peer groups in collaboration with the AACSB. Producing peer groups and analyzing correlations and causality within those groups may provide deeper applicant determinant insights.

Conclusion

This research paper undertakes to design and test a predictive framework for full-time MBA applications to assist business school administrators and faculty members in allocating resources in a deteriorating environment for business schools in the US. The implications arising from the results suggest that 'Promotion' is the single biggest determinant of applications in lesser ranked schools. A further implication is that the data underlying that variable is based on the formula: (Tuition cost * Enrollment) / (Average sample tuition cost * Average sample Enrollment). This is a proxy for the revenue produced by full-time MBA enrollment at a school, relative to the sample average. That is, the greater the relative revenue, the greater the level of applications. The formula is based on the proposition that at least some of the relative surplus revenue per student (relative to other schools per-student revenues) can be potentially allocated towards promoting the business school MBA program. This is a competitive advantage in the applications process and increases the positive perception of the business school concerning potential school ranking in the future, course sustainability, and validation that the school offering is perceived to be of a certain standard, relative to other choices available.

This is somewhat circular and typical of a competitive market segment where the larger actors in the sector tend to remain large in an increasingly commoditized area. Tuition fee revenues cannot, ceteris paribus, fall below the fixed cost of the school, and enrollment is a function of applications. In this scenario, without enrollment increases, applications will not increase. This renders organic growth within the full-time MBA area

almost impossible for these schools and thus, inorganic growth should be urgently considered. Such growth would potentially include the following strategies: offshore expansion into new markets, differentiating the MBA program to include other accreditations (for example, SEC Series 7 exams).

A further noteworthy observation us that Relationship Marketing has a minimal impact on applications. The notion that resource allocation towards website design and maintenance, and the pursuit of current student, alumni, faculty and admissions staff accessibility will have a positive impact on applications, is false. This is in contrast to other industries such as tourism and hospitality (Bai et al., 2007; Han et al., 2005).

While many schools are pursuing the on-line course route, this offering is becoming increasingly commoditized and will ultimately be subject to the same financial pressures and the pursuit of applications. Similarly, many business schools are increasing the offering of specialty courses, for example, relating to executive and leadership-based MBA's. The sustainability of such courses in the context of potential salaries of the graduate and employer demand remains a concern.

More research needs to be undertaken in this crucial area of applied graduate education, especially considering the time-sensitive nature of the threats to this segment of the industry.

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Appendix 1:

Website Content Scoring and Data Sheets

WEBSITE ANALYSIS SCORING SHEET		BUSINESS SCHOOL:					DATE ASSESSED:		
CHARACTERISTIC LEVEL		CURRENT GRAD PROFILES		ADMISSION STAFF		FACULTY STAFF		ALUMNI		TOTAL
Basic	1	Biography		Admission Information		Biography		Biography		0
Reactive	2	Contact information		Multiple Contact Information		Contact information		Contact information		0
Accountable	3	Social Media availability		Biographies of Staff		Social Media availability		Social Media availability		0
Proactive	4	Available for Contact		Social Media access		Available for Contact		Available for Contact		0
Partnership	5	Year of Study		Video-conferencing		Video-conferencing		Scholarly Interest		0
		TOTAL	0	TOTAL	0	TOTAL	0	TOTAL	0	0

Unweighted Data:

University	Applications	Price	Place	Promotion	Product	People
Babson College	146	57622	2.00	1.84	20.00	78
Baylor University	176	42842	2.00	1.10	20.00	66
Cape Western Reserve	97	42450	3.00	0.78	28.67	64
Clarkson Uni	72	52744	2.00	0.83	5.33	57
Clemson Uni	121	32540	2.00	0.89	5.33	62
Florida State	76	35545	3.00	0.55	7.33	63
Fordham Uni	223	50375	2.00	1.48	26.00	68
Howard Uni	119	35016	3.00	0.49	32.67	64
Louisiana State	122	35200	3.00	0.82	11.33	64
Northeastern Uni	465	45100	4.00	1.89	24.00	75
Pepperdine Uni	165	32540	4.00	1.18	8.00	63
Purdue Uni	152	19766	2.00	0.49	23.33	62
Rutgers	127	48096	3.00	1.27	10.67	65
Temple Uni	112	34623.5	2.00	0.54	26.00	62
Texas Christian University	247	46170	3.00	1.06	33.33	72
Texas Tech Uni	180	31710	2.00	0.90	14.67	60
Tulane University	126	54158	2.00	1.26	28.00	65
Uni California - Irvine	374	54199	2.00	1.79	36.67	79
Uni California Riverside	128	51459	3.00	1.13	16.67	66
Uni California San Diego	187	57925	2.00	1.22	36.67	78
Uni Colorado Boulder	239	32125	2.00	1.66	22.00	65
Uni Denver - Daniels	83	47000	4.00	0.52	28.67	66
Uni Houston	106	40952	1.00	0.73	25.33	61
Uni Kentucky	69	39963	2.00	0.61	3.33	62
Uni Louisville	103	32000	3.00	0.53	25.33	51
Uni Mississippi	149	53920	2.00	0.78	24.00	70
Uni Missouri	131	30119	2.00	0.70	25.33	61
Uni Oklahoma	90	54000	2.00	0.99	10.67	66
Uni Oregon	158	40461	3.00	1.31	15.33	65
Uni South Carolina	65	35790	2.00	0.48	15.33	62

Weighted Data:

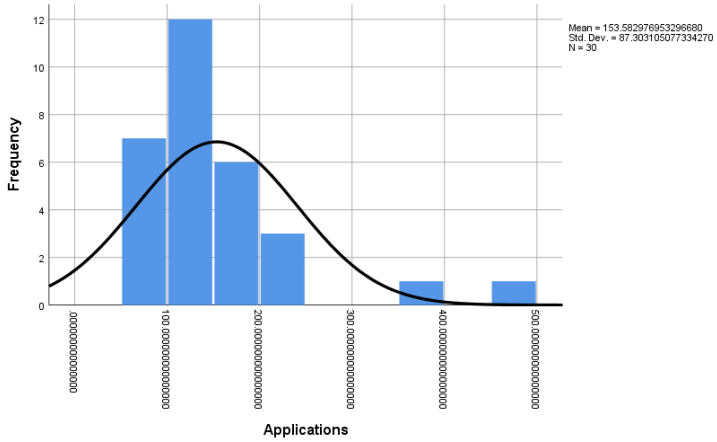
University	Applications	Price	Place	Promotion	Product	People
Babson College	146	57,622	2.00	1.84	11.20	198
Baylor University	176	42,842	2.00	1.10	24.80	168
Cape Western Reserve	97	42,450	3.00	0.78	21.87	166
Clarkson Uni	72	52,744	2.00	0.83	5.33	141
Clemson Uni	121	32,540	2.00	0.89	2.93	158
Florida State	76	35,545	3.00	0.55	10.93	165
Fordham Uni	223	50,375	2.00	1.48	29.60	173
Howard Uni	119	35,016	3.00	0.49	33.07	163
Louisiana State	122	35,200	3.00	0.82	14.13	160
Northeastern Uni	465	45,100	4.00	1.89	32.80	189
Pepperdine Uni	165	32,540	4.00	1.18	5.60	162
Purdue Uni	152	19,766	2.00	0.49	23.73	158
Rutgers	127	48,096	3.00	1.27	9.87	164
Temple Uni	112	34,624	2.00	0.54	28.00	164
Texas Christian University	247	46,170	3.00	1.06	35.73	183
Texas Tech Uni	180	31,710	2.00	0.90	21.87	150
Tulane University	126	54,158	2.00	1.26	22.40	170
Uni California - Irvine	374	54,199	2.00	1.79	38.67	205
Uni California Riverside	128	51,459	3.00	1.13	19.47	171
Uni California San Diego	187	57,925	2.00	1.22	35.47	201
Uni Colorado Boulder	239	32,125	2.00	1.66	13.60	170
Uni Denver - Daniels	83	47,000	4.00	0.52	29.87	168
Uni Houston	106	40,952	1.00	0.73	23.73	160
Uni Kentucky	69	39,963	2.00	0.61	2.93	155
Uni Louisville	103	32,000	3.00	0.53	25.33	132
Uni Mississippi	149	53,920	2.00	0.78	31.20	181
Uni Missouri	131	30,119	2.00	0.70	22.13	154
Uni Oklahoma	90	54,000	2.00	0.99	13.07	168
Uni Oregon	158	40,461	3.00	1.31	13.33	170
Uni South Carolina	65	35,790	2.00	0.48	12.53	152

APPENDIX 2

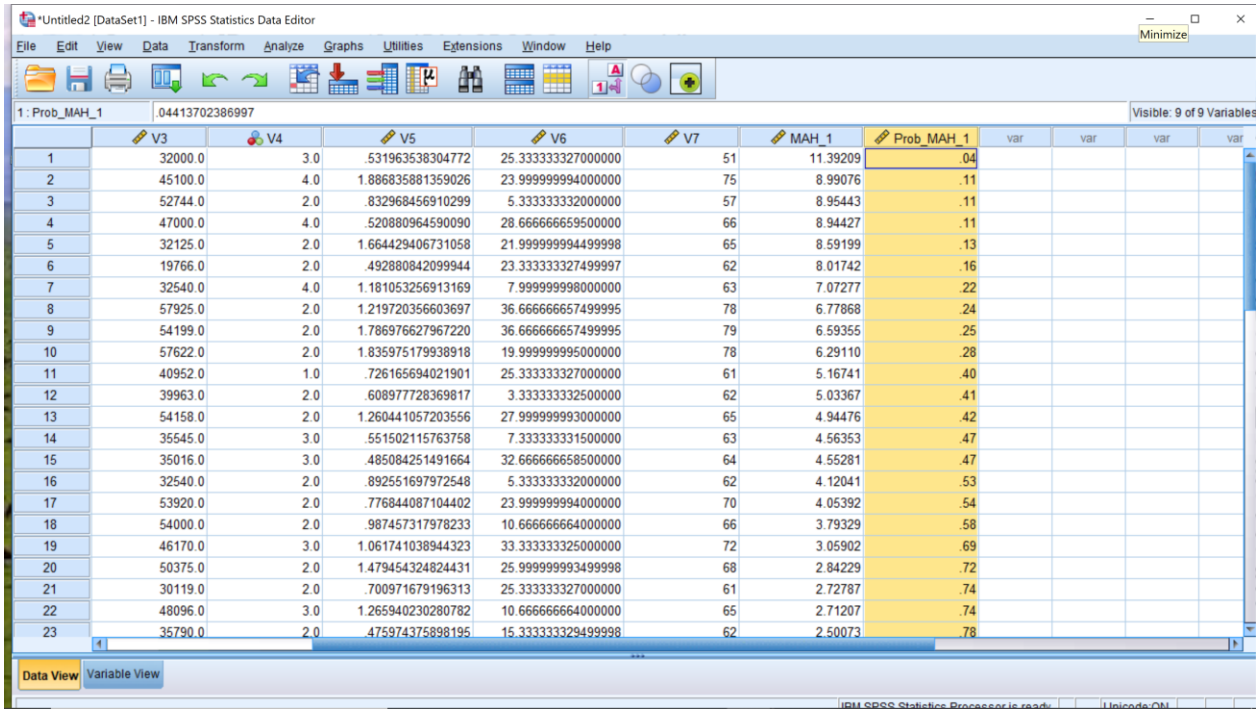
Initial Descriptive Statistics: Traditional Marketing Mix and Relationship Marketing Combined

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
Applications	30	64.69002695	464.6153846	153.5829770	87.30310508	2.170	.427	5.533	.833
Price	30	19766.0	57925.0	42213.683	9824.8247	-.108	.427	-.784	.833
Place	30	1.0	4.0	2.467	.7303	.692	.427	.055	.833
Promotion	30	.4759743759	1.886835881	.9932488401	.4268168372	.671	.427	-.473	.833
Product	30	3.333333332	36.66666666	20.33333333	9.566464411	-.147	.427	-.934	.833
People	30	51	79	65.40	6.129	.588	.427	1.048	.833
Valid N (listwise)	30								

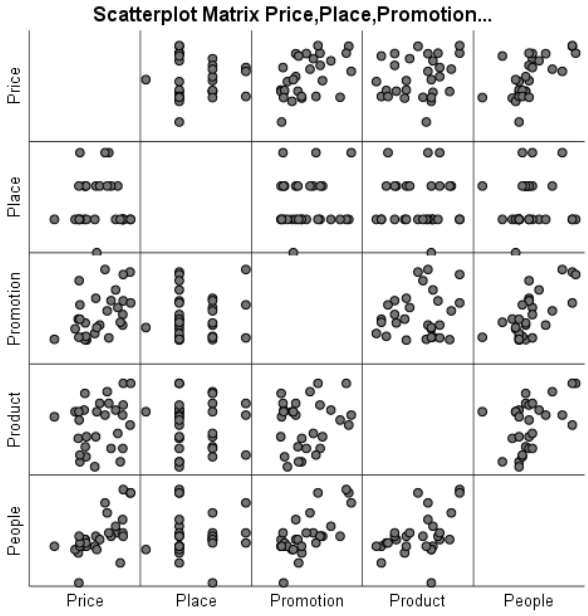


Outlier Analysis:



	V3	V4	V5	V6	V7	MAH_1	Prob_MAH_1	var	var	var	var
1	32000.0	3.0	.531963538304772	25.333333327000000	51	11.39209	.04				
2	45100.0	4.0	1.886835881359026	23.999999994000000	75	8.99076	.11				
3	52744.0	2.0	.832968456910299	5.333333332000000	57	8.95443	.11				
4	47000.0	4.0	.520880964590090	28.666666659500000	66	8.94427	.11				
5	32125.0	2.0	1.664429406731058	21.999999994499998	65	8.59199	.13				
6	19766.0	2.0	.492880842099944	23.333333327499997	62	8.01742	.16				
7	32540.0	4.0	1.181053256913169	7.999999998000000	63	7.07277	.22				
8	57925.0	2.0	1.219720356603697	36.666666657499995	78	6.77868	.24				
9	54199.0	2.0	1.786976627967220	36.666666657499995	79	6.59355	.25				
10	57622.0	2.0	1.835975179938918	19.999999995000000	78	6.29110	.28				
11	40952.0	1.0	.726165694021901	25.333333327000000	61	5.16741	.40				
12	39963.0	2.0	.608977728369817	3.333333332500000	62	5.03367	.41				
13	54158.0	2.0	1.260441057203556	27.999999993000000	65	4.94476	.42				
14	35545.0	3.0	.551502115763758	7.333333331500000	63	4.56353	.47				
15	35016.0	3.0	.485084251491664	32.666666658500000	64	4.55281	.47				
16	32540.0	2.0	.892551697972548	5.333333332000000	62	4.12041	.53				
17	53920.0	2.0	.776844087104402	23.999999994000000	70	4.05392	.54				
18	54000.0	2.0	.987457317978233	10.666666664000000	66	3.79329	.58				
19	46170.0	3.0	1.061741038944323	33.333333325000000	72	3.05902	.69				
20	50375.0	2.0	1.479454324824431	25.999999993499998	68	2.84229	.72				
21	30119.0	2.0	.700971679196313	25.333333327000000	61	2.72787	.74				
22	48096.0	3.0	1.265940230280782	10.666666664000000	65	2.71207	.74				
23	35790.0	2.0	.475974375898195	15.333333329499998	62	2.50073	.78				

Linear Regression Assumption analysis:



Multicollinearity Assessment:

Correlations

		Applications	Price	Place	Promotion	Product	People
Applications	Pearson Correlation	1	.168	.187	.739**	.413*	.628**
	Sig. (2-tailed)		.375	.322	.000	.023	.000
	N	30	30	30	30	30	30
Price	Pearson Correlation	.168	1	-.078	.498**	.216	.627**
	Sig. (2-tailed)	.375		.681	.005	.252	.000
	N	30	30	30	30	30	30
Place	Pearson Correlation	.187	-.078	1	.053	-.036	.042
	Sig. (2-tailed)	.322	.681		.782	.849	.827
	N	30	30	30	30	30	30
Promotion	Pearson Correlation	.739**	.498**	.053	1	.155	.690**
	Sig. (2-tailed)	.000	.005	.782		.413	.000
	N	30	30	30	30	30	30
Product	Pearson Correlation	.413*	.216	-.036	.155	1	.445*
	Sig. (2-tailed)	.023	.252	.849	.413		.014
	N	30	30	30	30	30	30
People	Pearson Correlation	.628**	.627**	.042	.690**	.445*	1
	Sig. (2-tailed)	.000	.000	.827	.000	.014	
	N	30	30	30	30	30	30

**. Correlation is significant at the 0.01 level (2-tailed).

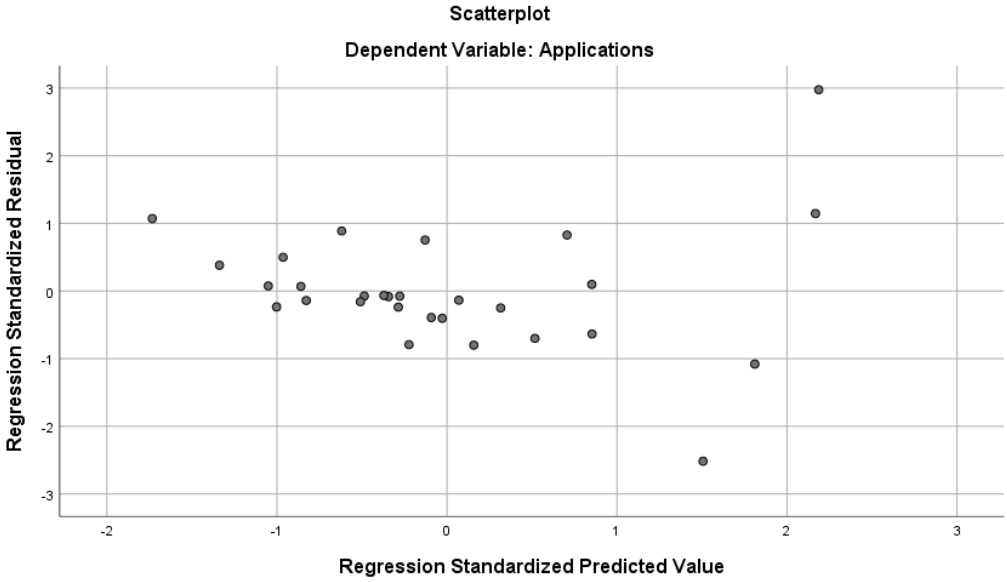
*. Correlation is significant at the 0.05 level (2-tailed).

Collinearity Diagnostics[a]

Model	Dimension	Eigenvalue	Condition Index	Variance Proportions (Constant)	Promotion	Product	Price
1	1	1.921	1.000	.04	.04		
	2	.079	4.936	.96	.96		
2	1	2.794	1.000	.01	.02	.02	
	2	.139	4.476	.01	.46	.69	
	3	.067	6.463	.98	.52	.29	
3	1	3.756	1.000	.00	.01	.01	.00
	2	.144	5.108	.00	.24	.77	.01
	3	.077	7.003	.21	.63	.22	.06
	4	.023	12.799	.79	.12	.00	.93

a. Dependent Variable: Applications

Homoscedasticity analysis:



Log Transformation:

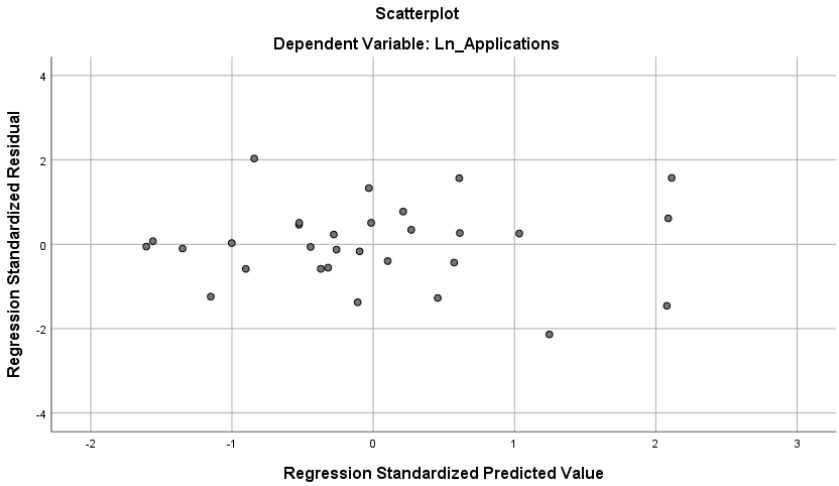
Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	People, Product, Price, Promotion[b]	.	Enter

a. Dependent Variable: Ln_Applications

b. All requested variables entered.

***Post* transformation homoscedasticity analysis:**



Regression 1: Traditional Marketing Mix Regression output:

Model Summary[d]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.756[a]	.571	.556	.31039
2	.835[b]	.697	.675	.26578
3	.900[c]	.810	.788	.21465

a. Predictors: (Constant), Promotion

b. Predictors: (Constant), Promotion, Product

c. Predictors: (Constant), Promotion, Product, Price

d. Dependent Variable: Ln_Applications

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	3.597	1	3.597	37.331	.000[b]
	Residual	2.698	28	.096		
	Total	6.294	29			
2	Regression	4.387	2	2.193	31.053	.000[c]
	Residual	1.907	27	.071		
	Total	6.294	29			
3	Regression	5.096	3	1.699	36.871	.000[d]
	Residual	1.198	26	.046		
	Total	6.294	29			

a. Dependent Variable: Ln_Applications

b. Predictors: (Constant), Promotion

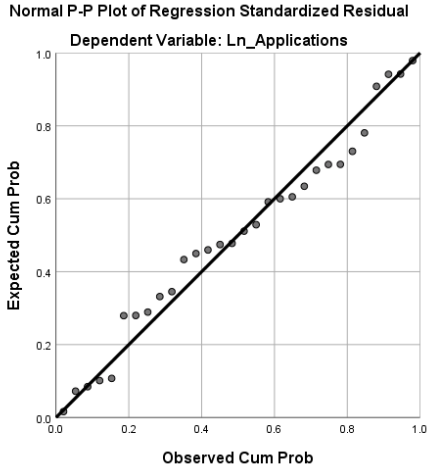
c. Predictors: (Constant), Promotion, Product

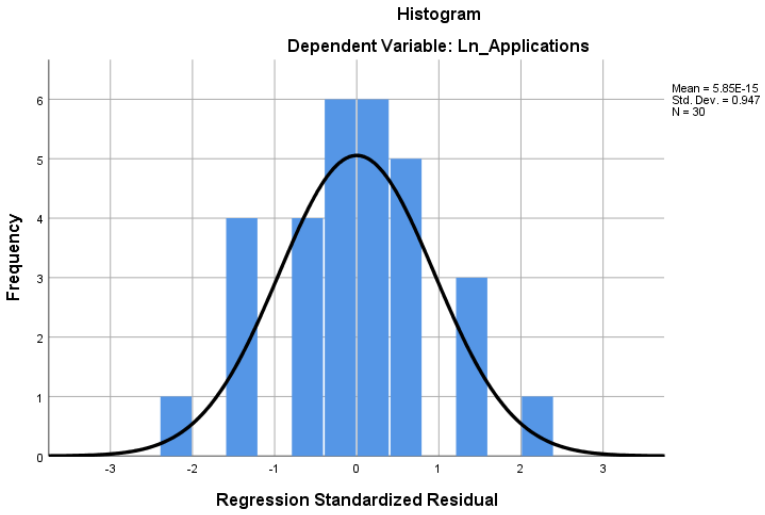
d. Predictors: (Constant), Promotion, Product, Price

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Tolerance	VIF
1	(Constant)	4.099	.146		28.148	.000		
	Promotion	.825	.135	.756	6.110	.000	1.000	1.000
2	(Constant)	3.804	.153		24.910	.000		
	Promotion	.764	.117	.700	6.531	.000	.976	1.025
	Product	.017	.005	.359	3.345	.002	.976	1.025
3	(Constant)	4.331	.182		23.738	.000		
	Promotion	.968	.108	.887	8.977	.000	.750	1.333
	Product	.020	.004	.414	4.722	.000	.950	1.052
	Price	-1.860E-5	.000	-.392	-3.924	.001	.733	1.365

a. Dependent Variable: Ln_Applications





Regression 2: Relationship Marketing Regression output:

Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	People[b]	.	Enter

a. Dependent Variable: Ln_Applications

b. All requested variables entered.

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.625[a]	.390	.368	.37022

a. Predictors: (Constant), People

b. Dependent Variable: Ln_Applications

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Tolerance	VIF
1	(Constant)	1.812	.737		2.460	.020		
	People	.047	.011	.625	4.233	.000	1.000	1.000

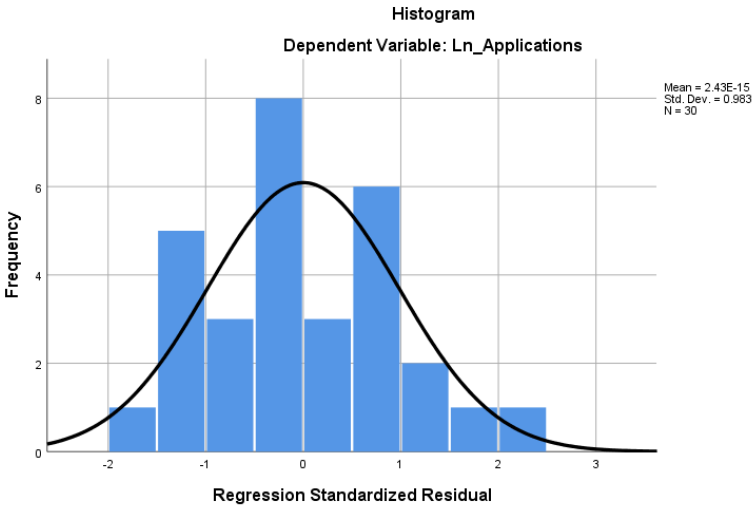
a. Dependent Variable: Ln_Applications

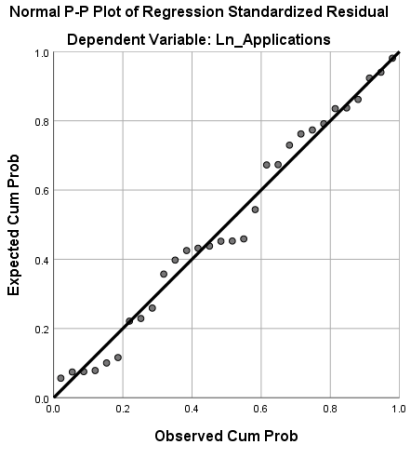
ANOVA[a]

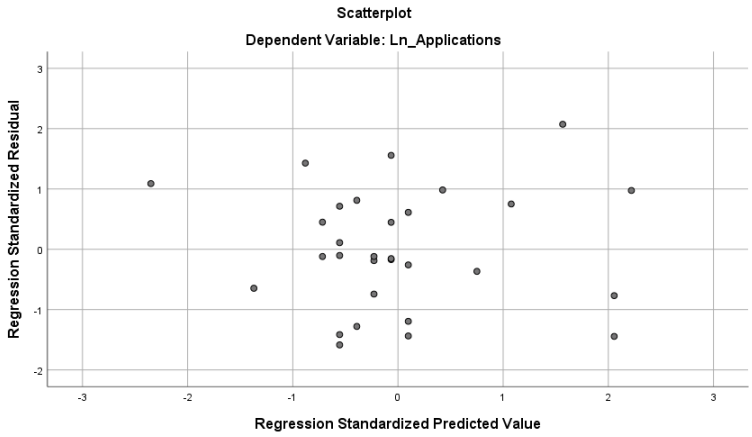
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2.456	1	2.456	17.922	.000[b]
	Residual	3.838	28	.137		
	Total	6.294	29			

a. Dependent Variable: Ln_Applications

b. Predictors: (Constant), People


Histogram
Dependent Variable: Ln_Applications
Mean = 2.43E-15
Std. Dev. = 0.983
N = 30
Frequency
Regression Standardized Residual


Normal P-P Plot of Regression Standardized Residual
Dependent Variable: Ln_Applications
Expected Cum Prob
Observed Cum Prob


Scatterplot
Dependent Variable: Ln_Applications
Regression Standardized Residual
Regression Standardized Predicted Value

Regression 3: Marketing Mix and Relationship Marketing Combined Regression output: *(Enter)*

Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	People, Product, Price, Promotion[b]	.	Enter

a. Dependent Variable: Ln_Applications

b. All requested variables entered.

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.909[a]	.826	.799	.20901

a. Predictors: (Constant), People, Product, Price, Promotion

b. Dependent Variable: Ln_Applications

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	5.202	4	1.300	29.768	.000[b]
	Residual	1.092	25	.044		
	Total	6.294	29			

a. Dependent Variable: Ln_Applications

b. Predictors: (Constant), People, Product, Price, Promotion

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Tolerance	VIF
1	(Constant)	3.542	.538		6.588	.000		
	Price	-2.203E-5	.000	-.465	-4.306	.000	.596	1.677
	Promotion	.849	.130	.778	6.543	.000	.491	2.037
	Product	.017	.005	.347	3.615	.001	.755	1.325
	People	.017	.011	.225	1.556	.132	.331	3.018

a. Dependent Variable: Ln_Applications

Regression 4: Marketing Mix and Relationship Marketing Combined Regression output: *(Stepwise)*

Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	Product, Promotion, Price[b]	.	Enter

a. Dependent Variable: Ln_Applications

b. All requested variables entered.

Model Summary[d]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.756[a]	.571	.556	.31039
2	.835[b]	.697	.675	.26578
3	.900[c]	.810	.788	.21465

a. Predictors: (Constant), Promotion

b. Predictors: (Constant), Promotion, Product

c. Predictors: (Constant), Promotion, Product, Price

d. Dependent Variable: Ln_Applications

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	3.597	1	3.597	37.331	.000[b]
	Residual	2.698	28	.096		
	Total	6.294	29			
2	Regression	4.387	2	2.193	31.053	.000[c]
	Residual	1.907	27	.071		
	Total	6.294	29			
3	Regression	5.096	3	1.699	36.871	.000[d]
	Residual	1.198	26	.046		
	Total	6.294	29			

a. Dependent Variable: Ln_Applications

b. Predictors: (Constant), Promotion

c. Predictors: (Constant), Promotion, Product

d. Predictors: (Constant), Promotion, Product, Price

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Tolerance	VIF
1	(Constant)	4.099	.146		28.148	.000		
	Promotion	.825	.135	.756	6.110	.000	1.000	1.000
2	(Constant)	3.804	.153		24.910	.000		
	Promotion	.764	.117	.700	6.531	.000	.976	1.025
	Product	.017	.005	.359	3.345	.002	.976	1.025
3	(Constant)	4.331	.182		23.738	.000		
	Promotion	.968	.108	.887	8.977	.000	.750	1.333
	Product	.020	.004	.414	4.722	.000	.950	1.052
	Price	-1.860E-5	.000	-.392	-3.924	.001	.733	1.365

a. Dependent Variable: Ln_Applications

Excluded Variables[a]

Model		Beta In	t	Sig.	Partial Correlation	Collinearity Statistics		
						Tolerance	VIF	Minimum Tolerance
1	Price	-.316[b]	-2.394	.024	-.418	.752	1.329	.752
	Product	.359[b]	3.345	.002	.541	.976	1.025	.976
	People	.197[b]	1.161	.256	.218	.524	1.907	.524
2	Price	-.392[c]	-3.924	.001	-.610	.733	1.365	.733
	People	-.044[c]	-.260	.797	-.051	.407	2.456	.407
3	People	.225[d]	1.556	.132	.297	.331	3.018	.331

a. Dependent Variable: Ln_Applications

b. Predictors in the Model: (Constant), Promotion

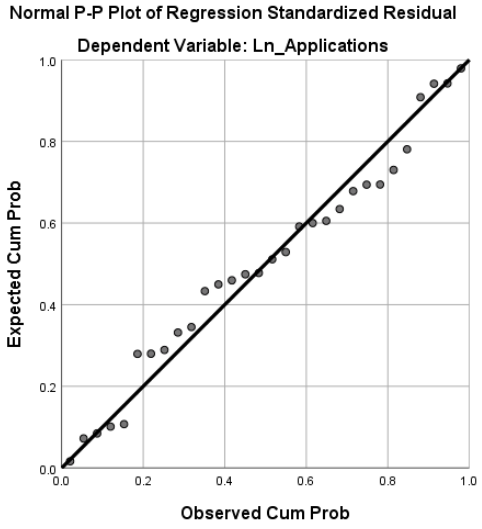
c. Predictors in the Model: (Constant), Promotion, Product

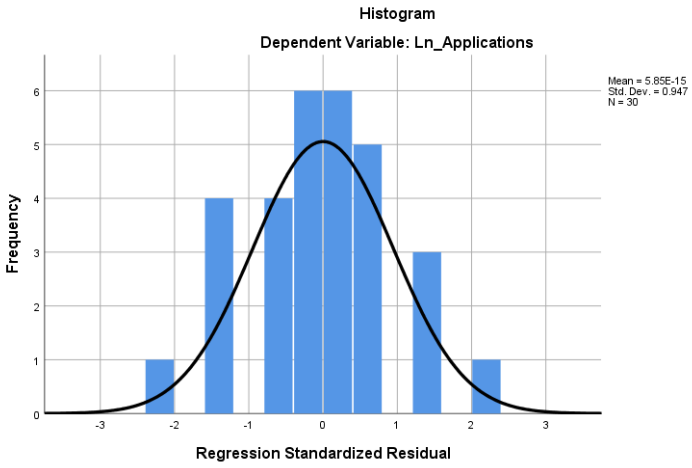
d. Predictors in the Model: (Constant), Promotion, Product, Price

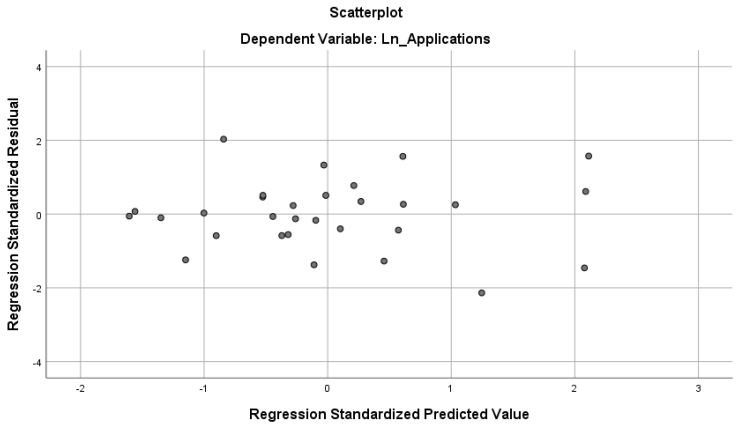
Collinearity Diagnostics[a]

Model	Dimension	Eigenvalue	Condition Index	Variance Proportions			
				(Constant)	Promotion	Product	Price
1	1	1.921	1.000	.04	.04		
	2	.079	4.936	.96	.96		
2	1	2.794	1.000	.01	.02	.02	
	2	.139	4.476	.01	.46	.69	
	3	.067	6.463	.98	.52	.29	
3	1	3.756	1.000	.00	.01	.01	.00
	2	.144	5.108	.00	.24	.77	.01
	3	.077	7.003	.21	.63	.22	.06
	4	.023	12.799	.79	.12	.00	.93

a. Dependent Variable: Ln_Applications


Normal P-P Plot of Regression Standardized Residual
Dependent Variable: Ln_Applications
Expected Cum Prob
Observed Cum Prob
0.0
0.2
0.4
0.6
0.8
1.0


Histogram
Dependent Variable: Ln_Applications
Mean = 5.85E-15
Std. Dev. = 0.947
N = 30
Frequency
Regression Standardized Residual


Scatterplot
Dependent Variable: Ln_Applications
Regression Standardized Residual
Regression Standardized Predicted Value

Regression 5: Marketing Mix and Relationship Marketing Combined Regression output: *(Stepwise)*

(Weights increased for Product, Admissions staff and Current Students)

Model Summary[d]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.756[a]	.571	.556	.31039	.571	37.331	1	28	.000
2	.886[b]	.785	.769	.22396	.213	26.781	1	27	.000
3	.960[c]	.922	.913	.13724	.137	45.906	1	26	.000

a. Predictors: (Constant), Promotion

b. Predictors: (Constant), Promotion, Product

c. Predictors: (Constant), Promotion, Product, Price

d. Dependent Variable: Ln_Applications

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	4.099	.146		28.148	.000		
	Promotion	.825	.135	.756	6.110	.000	1.000	1.000
2	(Constant)	3.722	.128		29.131	.000		
	Promotion	.774	.098	.709	7.903	.000	.990	1.010
	Product	.021	.004	.464	5.175	.000	.990	1.010
3	(Constant)	4.299	.116		37.159	.000		
	Promotion	1.002	.069	.918	14.563	.000	.752	1.329
	Product	.024	.003	.538	9.599	.000	.953	1.050
	Price	-2.065E-5	.000	-.436	-6.775	.000	.724	1.381

a. Dependent Variable: Ln_Applications

Excluded Variables[a]

Model		Beta In	t	Sig.	Partial Correlation	Collinearity Statistics		
						Tolerance	VIF	Minimum Tolerance
1	Price	-.316[b]	-2.394	.024	-.418	.752	1.329	.752
	Product	.464[b]	5.175	.000	.706	.990	1.010	.990
	People	.216[b]	1.281	.211	.239	.528	1.894	.528
2	Price	-.436[c]	-6.775	.000	-.799	.724	1.381	.724
	People	-.202[c]	-1.387	.177	-.263	.364	2.751	.364
3	People	.053[d]	.531	.600	.106	.305	3.279	.305

a. Dependent Variable: Ln_Applications

b. Predictors in the Model: (Constant), Promotion

c. Predictors in the Model: (Constant), Promotion, Product

d. Predictors in the Model: (Constant), Promotion, Product, Price

Regression 6: Relationship Marketing Regression output (Weighted Variables):

(Weights increased for Admissions staff and Current Students)

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.633[a]	.401	.380	.36695	.401	18.744	1	28	.000

a. Predictors: (Constant), People

b. Dependent Variable: Ln_Applications

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	1.875	.706		2.656	.013		
	People	.018	.004	.633	4.329	.000	1.000	1.000

a. Dependent Variable: Ln_Applications