

THE DETERMINANTS OF RESEARCH PRODUCTIVITY IN PUBLIC VERSUS PRIVATE SAUDI UNIVERSITIES

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Abstract

Historically, with the exception of King Saud University which was established in 1957, Saudi Arabia had been facing different deficiencies in the higher education system. However, since the last two decades, the nation has evolved as one of the major educational hubs by attracting both national and international students and has tremendously increased the number of public Universities. Indeed, the demand for higher education because of the young population growth imposed itself. On the other hand, sending mass students to foreign universities which used to be an optimal alternative is no longer sustainable and presents a real challenge for the female students given the Saudi Culture. The public universities were not able to meet the demand. The authorities have progressively allowed the establishment of private higher education institutions. Currently, there are 27 public sector universities in Saudi Arabia and more than 36 private colleges and 9 private universities. The aim of this research is to investigate the role played by the private universities in research by comparison to the public universities for at least two reasons: public universities are larger in size and benefit from governmental grants whereas the private universities suffer the access to external funding from governmental agencies and foundations. Both categories of universities are developing and training Citizens. The present research addresses the productivity efficiency of private university to produce research of quality that would be integrated in teaching, hence, producing good Citizens as the Saudi Arabia public Universities. Our results show that the Kingdom of Saudi Arabia has the highest number of publications in the GCC countries including Egypt, Turkey, and Iran. However, our statistics have exhibited that public universities produce higher number of published papers compared with the number of publications in the private universities. Furthermore, the data analyzed shows that public universities possess a higher number of full professors and active researchers. Moreover, Public schools receive governmental funds and tend to attract better opportunities from the industry. Government budgets and research fund approvals for the private universities can be considered as some of the prime reasons behind the shortfall of research in private universities leading to the assumption that public universities produce better Citizens than private universities unless the trend in funding research changes.

Keywords: Research Productivity, Public Universities, Private Universities, KSA

1. Introduction

Although historically, Saudi Arabia lacks in major evidences of educational development being in deficiency of Universities, since the recent decade the nation has evolved as one of the major educational hubs for both national and international students. In the current day context, there are several universities and colleges established which attracts domestic as well as international students. The historical need of educational development in Saudi Arabia is therefore evident from the first university of the nation, i.e. King Saud University, which was established in 1957 (King Saud University, 2015). This suggests that prior to 1957 there was almost no opportunity for higher education within the nation. Nevertheless, in the current day scenario, there are several private and public universities and colleges established in the nation. Moreover, the fact that these universities and colleges are

associated with delivering several research papers should be emphasized, as it holds high level of prominence in enhancing its popularity.

It is important to note that in the initial phase of educational development in Saudi Arabia, primarily public or government universities and colleges were established (Ministry of Education, 2015). These universities have been considered highly effective in providing quality education to their students. This quality education in public universities and colleges in Saudi Arabia has attracted a considerable number of students comprising both international and domestic pupils. Owing to such educational developments, several private entities in the last few decades have established some of the universities and colleges. However, quality education delivered by the private universities in the nation is still facing considerable uncertainty (Ministry of Education, 2015). The objective of the current study is to determine the research productiveness of private universities in Saudi Arabia in comparison to the public universities. Correspondingly, the study aims at gaining insightful knowledge and understanding of the facts pertaining to research publications and further intends to analyze the reasons as to why public universities were able to deliver a higher number of research papers in relation to private universities in the nation.

2. Research Objective and Question

This research was concentrated to the objective of gaining sufficient understanding, as to whether private universities are equally productive in research, contrary to the public universities in Saudi Arabia. This research study has been conducted with the aim of addressing the research question as outlined below:

Are private universities equally productive in research, as opposed to public universities in the Kingdom of Saudi Arabia (KSA)?

3. Research Methodology

The research study on 'Are private universities equally productive in research, as opposed to public universities in the Kingdom of Saudi Arabia (KSA)?' has been conducted with the help of a qualitative research study, wherein data has been gathered from secondary sources encompassing scholarly articles and Saudi Arabian University websites. Furthermore, the data has been analyzed with the help of trend charts, highlighting the comparison of public and private universities based on the number of research papers.

4. Analysis and Discussion

4.1. Public Sector Universities in Saudi Arabia

Observably, in the current day context, there are 27 public sector universities in Saudi Arabia; including the Saudi Electronic University. King Saud University, previously known as the Riyadh University, is a public university, considered as the leading education institute in Saudi Arabia. This university is the oldest in the nation, founded on 1957. This university has nearly 5,000 administrative staff members and over 51,000 enrolled students, which signifies its vastness. Through its journey, the university has developed its vision of "Global leadership and excellence in building a knowledge society". The university comprises of 12 deanships, encompassing 24 colleges. Moreover, the university has published 9,746 papers as of 2012 and further holds 75+ patents. The university has 4,952 professors and the ratio of student to professor stands at 10.33:1, representing a positive situation (King Saud University, 2015).

Another prominent public university located in Saudi Arabia is the Islamic University of Medina, which was established in the year 1961. The university operates with the prime aim of accomplishing its future vision of becoming a leader beacon that can be distinguished

from others, in terms, of its techniques used for imparting Islamic knowledge. Moreover, the university envisions promotion of Islam as a language by providing of training, education and teachings to lawyers, educationists and others operating within the nation and under its judicial mechanisms. The university houses 11 deanships and 15 colleges, wherein, professors and students, owing to their quality knowledge and competencies, have published 10 articles and books until 2012. To facilitate quality learning, the university has employed 785 professors, wherein, the composition of students to university professors stands at 21.8:1(Islamic University, 2014).

Another top university of the nation is the King Abdulaziz University. This is also a public university, which is located in the city of Makkah. The success of the university is evident from its significant number of doctoral students, which is above 900. The university also has over 40,000 undergraduate and 2,000 postgraduate students. In this regard, it must be noted that the university is distinguished by eight deanships that encompass 18 colleges. Besides this, the university has over 2,300 administrative staff members (King Abdulaziz University, 2014). The productivity in research in the university is evident from the several academic awards that it has received. This includes the appreciation from Commission for Academic Accreditation of Engineering and Technology, Vocational Education Council Commission, Geological Society, United Nations Development Programme, European Organization for Dental Education, and US Commission for the Blood Bank, among several other organizations. The university has made major contributions in enriching research practices. This includes the departments of Water Research Center, Medical Research Center, Osteoporosis Research, Center of Excellence in Genomic Medicine Research, and Islamic Economics Institute, among several others. As of 2015, the number of professors associated with the university stands at 7,228, wherein, the ratio of student to professors is 7.25:1. It can be interpreted from the ratio that there exists a balance between the professors and students, the validity of which can be retrieved from the fact that the university has published 14 articles and 4 books till date (King Abdulaziz University, 2014; Ministry of Education, 2015).

King Fahd University of Petroleum & Minerals is another public sector university, which is also considered among the top educational institutes in Saudi Arabia. The university was established in 1963. However, during that period it was known as College of Petroleum and Minerals. It was further renamed in 1975 as University of Petroleum and Minerals, which eventually changed to its current name in the year 1986. In the current day context, this public sector university has over 800 staff members for more than 7,000 undergraduate and 500 postgraduate students (King Fahd University of Petroleum and Minerals, n.d.). The university encompasses 10 colleges under 8 deanships, wherein, the number of professors as of 2015 is 1,045, showcasing a ratio of students to professor as 7.25:1. Since 2012, the university has engaged itself in publishing 4,037 papers and has established itself as a prominent university attaining 392 patents. This university provides productive research in several subjects related to basic science, engineering and applied engineering, environmental design and community development among others. Moreover, in order to conduct effective research studies, the university has franchised several research institutes. These include the Centre for Communications & Information Technology Research, Centre for Environment & Water, Center for Petroleum & Minerals, among others. The university also conducts excellence in research in Petroleum Refining and Petrochemicals, Nanotechnology, Corrosion, and renewable energy (Ministry of Education, 2015; King Fahd University of Petroleum and Minerals, n.d.).

King Faisal University is another important public university located in Hofuf, Saudi Arabia. The university was established in the year 1975, and since its existence, the university has established 12 deanships and 18 colleges. Moreover, King Faisal University has developed itself as one of the prominent institutes that has been able to publish 1,154 publications since

2012. The university has been able to incorporate 20 patents with its name, owing to the fact that the university has 1,387 quality professors and 21,856 students, thereby having a student professor ratio of 15.75:1 (King Faisal University, 2015).

King Abdullah University of Science and Technology is another example of a leading educational institute in Saudi Arabia, which is also a public sector university. The university was established in 2009 and has over 1,200 postgraduate students. However, it does not host any graduate program at the current scenario (King Abdullah University of Science and Technology, 2015). The university is comprised of five deanships, which encompass 18 colleges. Moreover, the university has published 1,409 papers as of 2012, as well as 38 patents. Although the university is a comparatively newly established, it has made major contributions in research. These include the research centers for Advanced Membranes and Porous Materials, Desert Agriculture, Solar and Photovoltaics Engineering, Water Desalination and Reuse, and Computational Bioscience, among several others. In order to gain excellence in its research process, the university has obtained the support from Office of Competitive Research Funds (OCRF), Office of Competitive Research Funds (OCRF), and Postdoctoral Support and many more (King Abdullah University of Science and Technology, 2015; Ministry of Education, 2015).

Taibah University, located in the holy city of Medina in Saudi Arabia, is another prominent university that provides quality education to students. The university excels in the field of continuous quality improvements and establishments of an integrated structure that supports quality education. The university imparts education with the help of 13 deanships and 28 colleges. Additionally, the university encompasses a student base of 45,787 postgraduate and undergraduate students, wherein the number of professors associated with the university stands at 1,633, thereby representing the student to professor ratio of 28.03:1. The university also supports application of quality research and development in the field of biological science and industrial departments (Taibah University, 2014).

King Khalid University is a public state university in Saudi Arabia, which is also among the top universities in the nation. The university was established in 1998 and is located in the Asir Province of the nation. The university has more than 1,500 postgraduate students and over 72,000 undergraduate students (King Khalid University, 2015). Additionally, King Khalid University serves eight deanships in 52 colleges. As of 2012, the university had published 788 papers and had three patents in its name. The university has 2,329 teaching professionals and the ratio of student is to professors is 17.87:1. Although the university conducts limited research, the quality of the research is high. The university conducts researches on scientific, social, and linguistic studies (King Khalid University, 2015).

Another major public sector university in Saudi Arabia is the Umm al-Qura University. The university was established in 1949 and is located in Mecca Province of the nation (Umm Al-Qura University, 2015). The university includes nine deanships, which further encompass 26 colleges. The university has emerged as one of the largest public universities in Saudi Arabia in terms of number of professors. The university has 3867 professors, wherein, the ratio of students and professors is competitively higher, i.e., 15.87:1. As of 2012, the university had published 539 papers and had 2 patents in its name. This University has witnessed quality research on several subjects, which includes Medicine, Nursing, Dentistry, Social Sciences, Engineering and Islamic Architecture, Pharmacy, and others. The university also conducts research on other subjects such as Shari`ah and Islamic Studies and Arabic Language, (Ministry of Education, 2015; Umm Al-Qura University, 2015).

Jazan University located in Jazan is yet another public university in Saudi Arabia, known for its use of contemporary teaching materials with the aim of imparting quality education to its student. Jazan University is a recently established institute that aims at serving the community by providing quality education and excellence in various fields, in addition to

preparing quality leaders in the fields of business, health, education and governmental services (Jazan University, 2015). Jazan University's goal is to introduce itself as a gateway to future that is known across the globe for its academic excellence and service capable of delivering higher level of societal improvements through teaching quality graduates. As of 2015, the university encompasses 7 deanships, comprising of 17 colleges. Owing to its academic excellence and high level of investments in the field of research and development, the university has been able to publish 228 papers, as per the data collected until 2012. Moreover, the university offers quality education to its student base of 44,225 students, with the help of its professor base of 1,713 professors. The university incorporates a large base of professors, the validity of which can be observed from the student to professor ratio of 25.81:1, which shows that there exists a single professor for every 26 students. The university intends to grow and establish its name towards ensuring success of the forthcoming educational dimensions in Saudi Arabia.

An assessment of the findings pertaining to number of research papers published by the public universities in Saudi Arabia, suggest that public universities were involved in publishing several research papers, wherein, King Saud University published the highest number of research papers.

4.2. Private Sector Universities in Saudi Arabia

Among the private universities in Saudi Arabia, Alfaisal University is considered to be at the top and leading. The university was established in 2002 and currently, it has enrolled domestic and international students of over 1,500. It is considered as the single private university, which is ranked among the top universities in Saudi Arabia (Alfaisal University, 2015). Alfaisal University has gained popularity amongst other universities owing to its ability to deliver excellent education and infrastructural facilities across 5 deanships that encompass 5 colleges. Moreover, Alfaisal University follows a unique structure that is incorporated with university objectives aimed towards attaining higher benchmarks and use of learning with the help of evidence-based approaches. The university provides quality researches in several departments of higher education including business, engineering, medicine, science, and general studies. In business, the university has made major contributions to researches on Accounting, Finance, Marketing, Human Resource, and others. In engineering, the university has contributed on Architectural studies, Electrical Engineering, Mechanical Engineering, Industrial Engineering, and Software Engineering among several others.

The university also has major contributions in medicine, which is evident from the vast research outcomes in Anatomy & Genetics, Physiological Sciences, Pathology, Biochemistry & Molecular Medicine, Biostatistics & Epidemiology, and Surgery, Obstetrics & Radiology among several others (Alfaisal University, 2015; Ministry of Education, 2015).

Effat University is another significant private university in Saudi Arabia. The university was established in 1999 in Jeddah. This university has over 220 staff members providing services to over 1000 current graduate students (Effat University, 2015). It is worth mentioning that although the quality of education in this university is considerable, accordingly; it is arguable that the research quality of the university is not as impressive. The university herein deals with several subjects, which include business, science and humanities, engineering as well as architecture and design. The university has 2 deanships, which facilitate quality learning through its 4 colleges (Effat University, 2015).

Another private university in Saudi Arabia is the Fahd bin Sultan University. This university was established in the year 2003. Although the university has produced quality students, its quality and quantity of research outputs are limited and hence, not highly appreciated as

compared to other universities (Fahad Bin Sultan University, 2015). The university has three deanships and four colleges, which altogether aim at fostering quality education and achieve excellence. The university provides educational facilities on business and management, computing, engineering, science and humanities. The university also has the vision of enriching its research output and dealing with more subjects. However, in the current day context, the performance of this university is not as satisfying as it needs to be to compete equally with other institutes of a similar status (Fahad Bin Sultan University, 2015; Ministry of Education, 2015).

Another private university of Saudi Arabia is the University of Business and Technology (UBT). Although the university was previously a college and was commonly known as College of Business Administration (CBA), the incredible performance of the college through providing quality educational outputs has upgraded it to a university. The university was established in the 2000 and is located in Jeddah and Dahaban in Saudi Arabia. It is worth mentioning that the university solely focuses on business sector education or professional learning. The university has not been competitively effective in contributing quality research outputs, due to its new promotion to a university, but it has the vision of providing quality research output in applied studies and Research and Development studies. The university also has the motto of providing job opportunities to the students through quality education. This has significantly attracted students to enroll in the university (Ministry of Education, 2015; University of Business and Technology, n.d.).

Arab Open University is yet another prominent private university located in Dammam, Saudi Arabia that specializes in imparting quality education to students and strengthens its core vision of establishing itself as a benchmark in providing quality education to its students. Owing to intensive research in the field of research and development, the university has been able to establish itself as a pioneer in developing several innovations, publishing 37 journals in its name by 2012. Moreover, the university specializes in providing educational guidance to professors as well, thereby enhancing the chances of future success and development in the field of education. The university has of 54 deanships incorporating five colleges (Arab Open University, 2015).

Prince Mohammad bin Fahd University (PMU) has drawn its own history since establishment as one of the top private university in the country and the best in the eastern province and surrounding region. PMU offers chance to students to explore genuine paths to learn and innovate when being groomed for their future roles as hardcore professionals. Currently, the university offers degree courses in four disciplines (engineering, information technology, business administration and arts and sciences). It worth to note that TIEC (Texas International Education Consortium), as Educational Consultant of PMU, involved experts from 32 American universities for PMU academic structuring. PMU is now at a position to promise and impart excellent education to nourish the future leaders in their areas of study.

Al-Yamamah Private University is also a major university that houses one deanship and has been segregated into 5 colleges and functions with 652 professionals. The university provides quality education to students at low costs in the field of bioscience, engineering, medical science, business management, amongst several others. The university aspires towards establishing itself as a prominent Saudi Arabic institution, which is known worldwide for its quality and specialized education, apart from effective preparation of professionals targeted towards attainment of higher goals, thereby ensuring improvement and consistency in teaching (Al-Yamamah Private University, 2015).

5. Comparative Analysis and Discussion

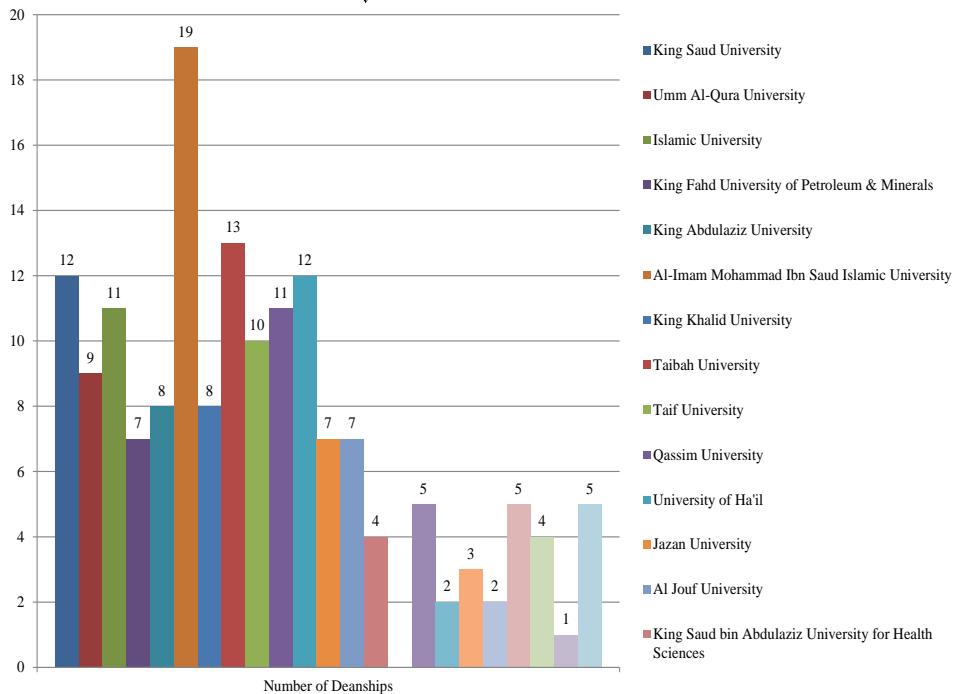
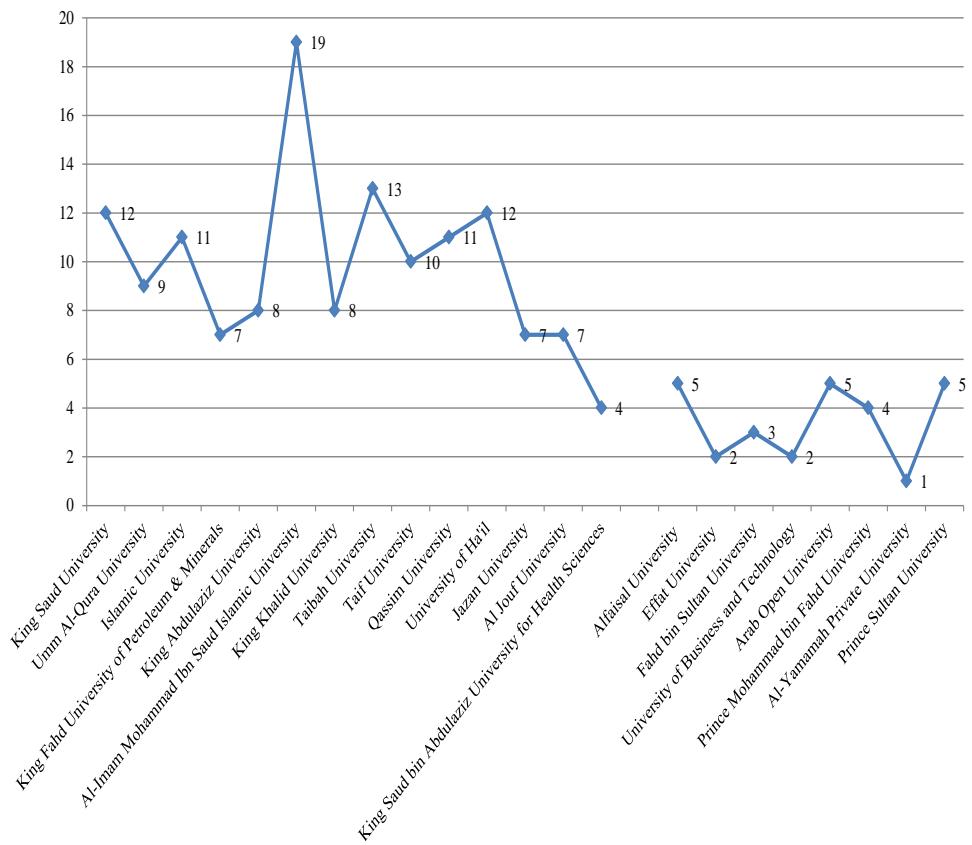
From the data collected in the current study, it is evident that the majority of the private universities in Saudi Arabia were established during the last two decades. On the other hand, the public universities of the nation were mostly established since 1957 (King Saud University, 2015). Thus, private universities have had comparatively less time to establish themselves as reputed organizations that produce quality research outputs. Owing to the fact that public universities in Saudi Arabia have existed for a longer period, they have produced a higher number of research outputs. Thus, public sector universities in Saudi Arabia have been more productive in producing researches in comparison to the private universities (Ministry of Education, 2015). It is also evident from the current study that majority of the public universities in Saudi Arabia are among the list of top ranked educational institutes. On the other hand, among the private universities in the nation, none of them has been able to attain the reputation of top 5 universities. Alfaisal University is the only private institution that ranks within the list of top 10 universities in the nation in terms of producing overall quality education. Besides Alfaisal University, the other private universities have extremely poor rankings. This signifies that the private universities in Saudi Arabia are not equally productive in producing quality education in comparison to the public or government universities of the nation (Ministry of Education, 2015).

The current study also demonstrates that the public universities in Saudi Arabia have contributed in several fields of education producing research outputs in a wide variety of subjects. However, private universities in Saudi Arabia have been able to produce research in very limited subjects and topics in comparison to the public ones. Moreover, it is arguable from the data collected that private universities in Saudi Arabia are not effective in producing quality research outputs, especially when compared to the public universities of the nation (Ministry of Education, 2015). On the other hand, it is eminent that the research outputs of the public universities are mostly quality enriched and hence, the research outputs are highly appreciated. Thus, it is also eminent that the research outputs of the private universities in Saudi Arabia are not equally effective in producing quality research outputs in comparison to the public universities. Furthermore, it is also eminent that the quality research outputs produced by public sector universities have also led those entities to attain several academic awards and credentials. However, the number of credentials and awards received by private universities in the nation is comparatively less to that of the public universities in the nation (Ministry of Education, 2015).

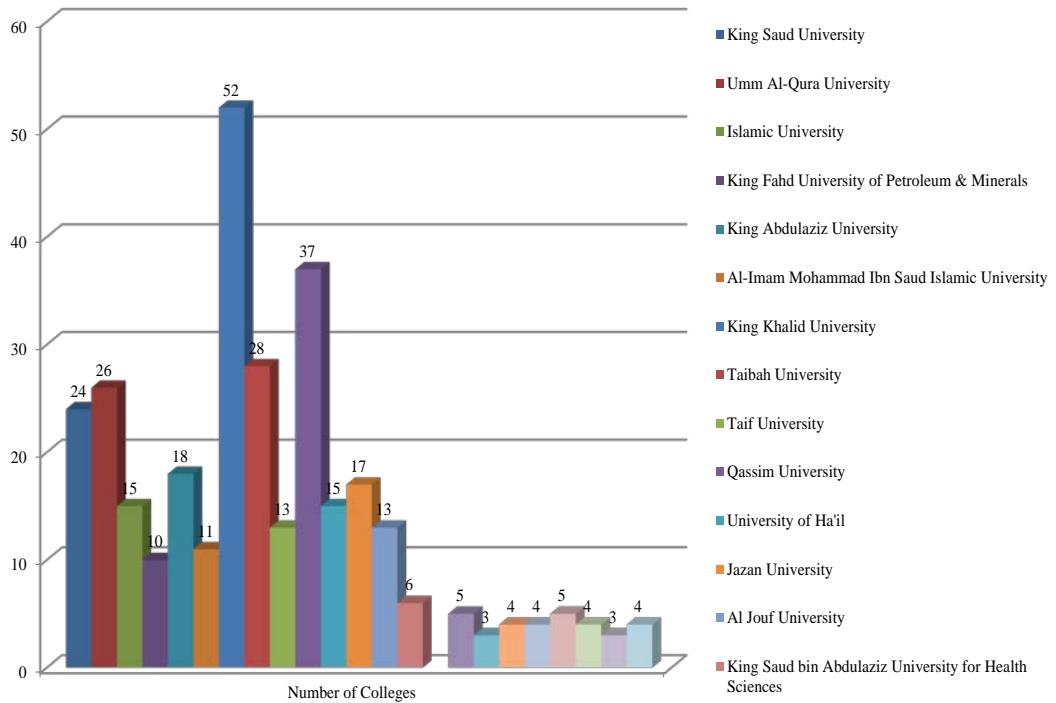
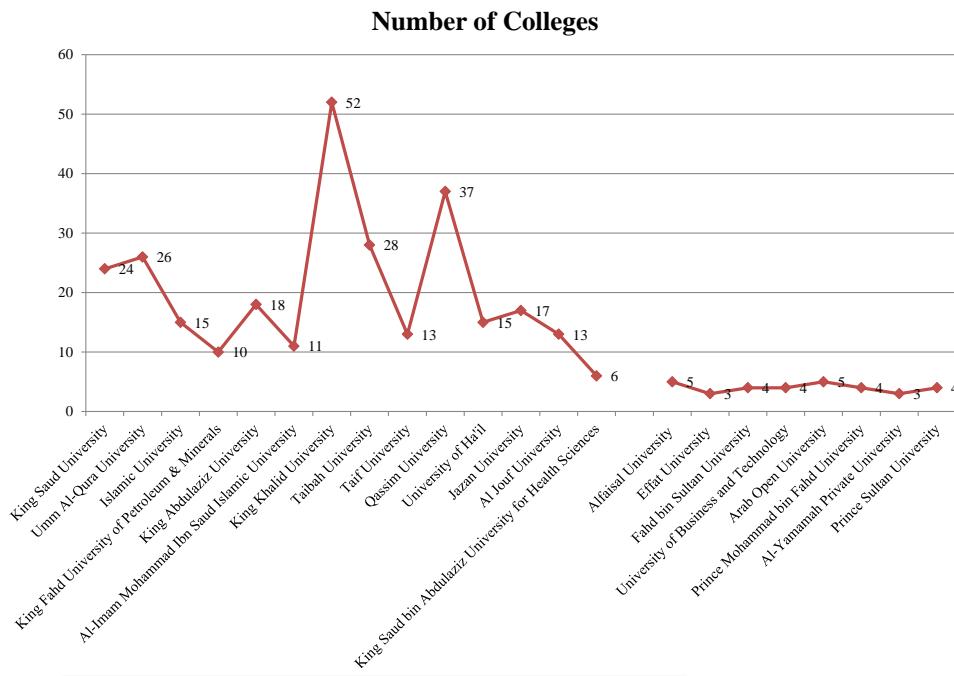
As can be inferred from the findings not reported here, it can be observed that a majority of the universities holding the top-most rankings in Saudi Arabia as of 2014 are public universities. In this regard, it is worth mentioning that the rankings have been derived based on the independent variables of variable/s incorporating Quality of Education, Alumni Employment, Quality of Faculty, Publications, Influence, Citations, Broad Impact and number of Patents.

With respect to the aforementioned factors, a number of trend charts have been diagrammatized below, which reveals that the public universities are ahead of private universities in every scenario. Trend Chart displaying comparison of Public and Private Universities in Saudi Arabia in terms of number of deanships:

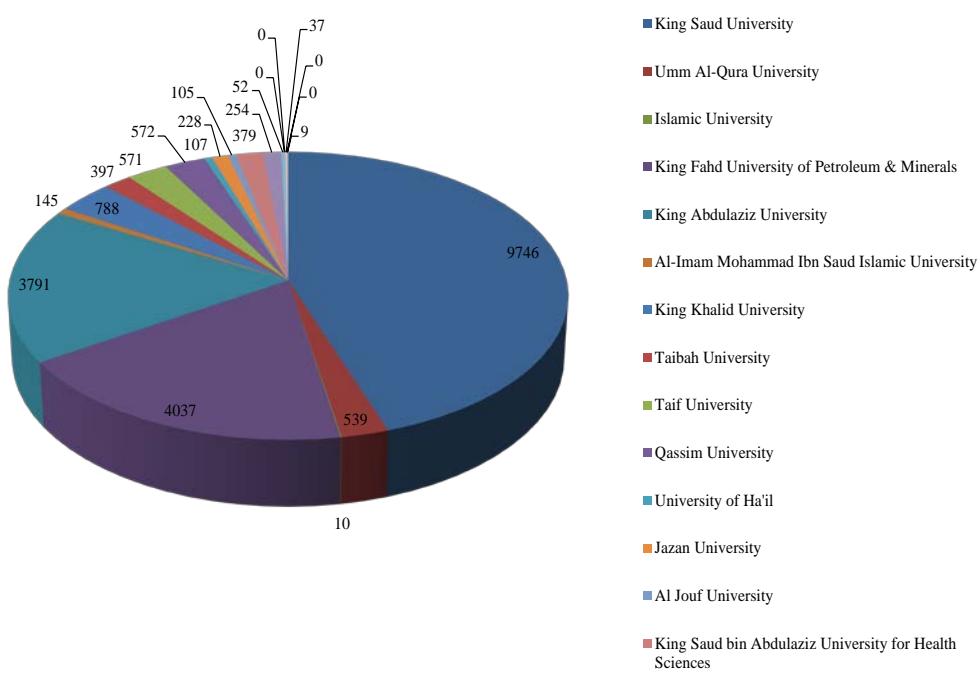
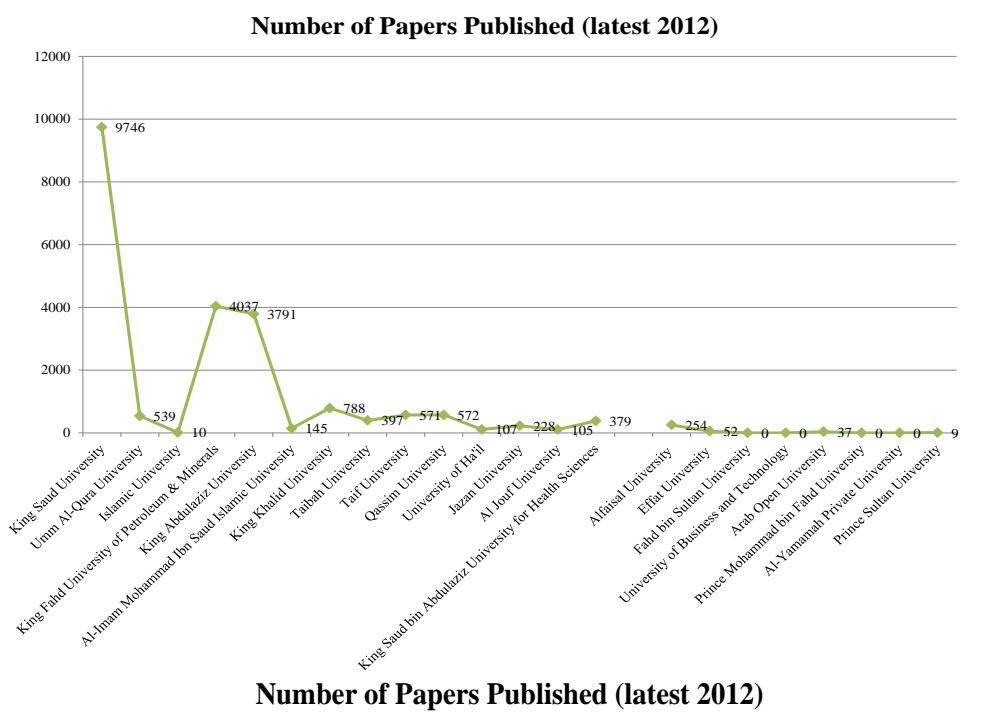
Number of Deanships



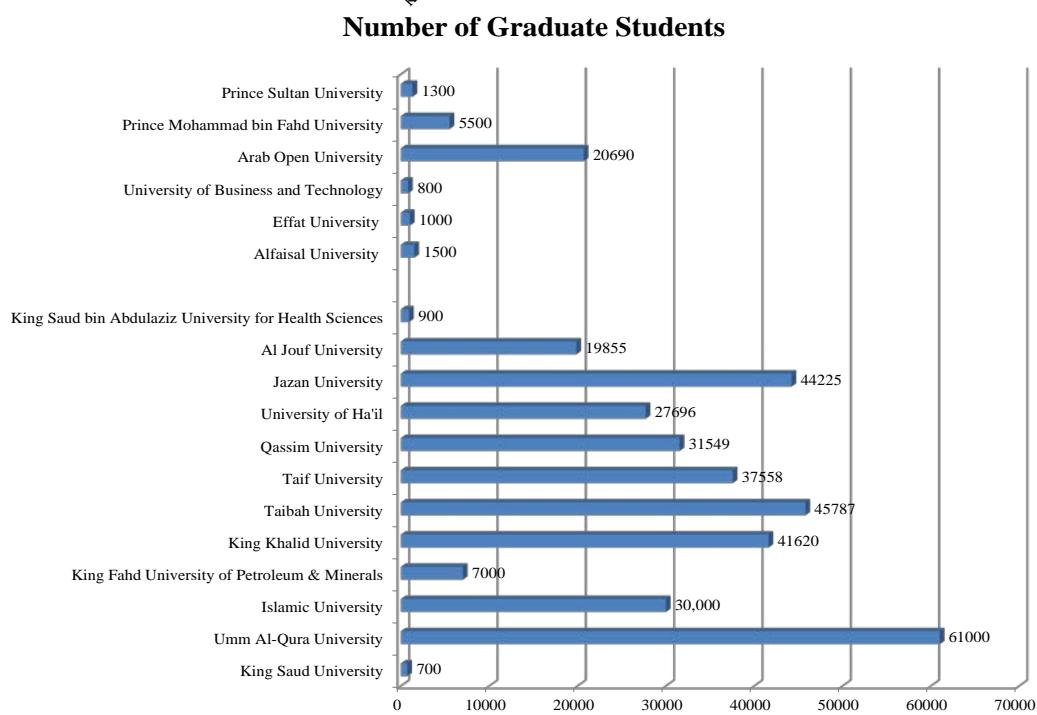
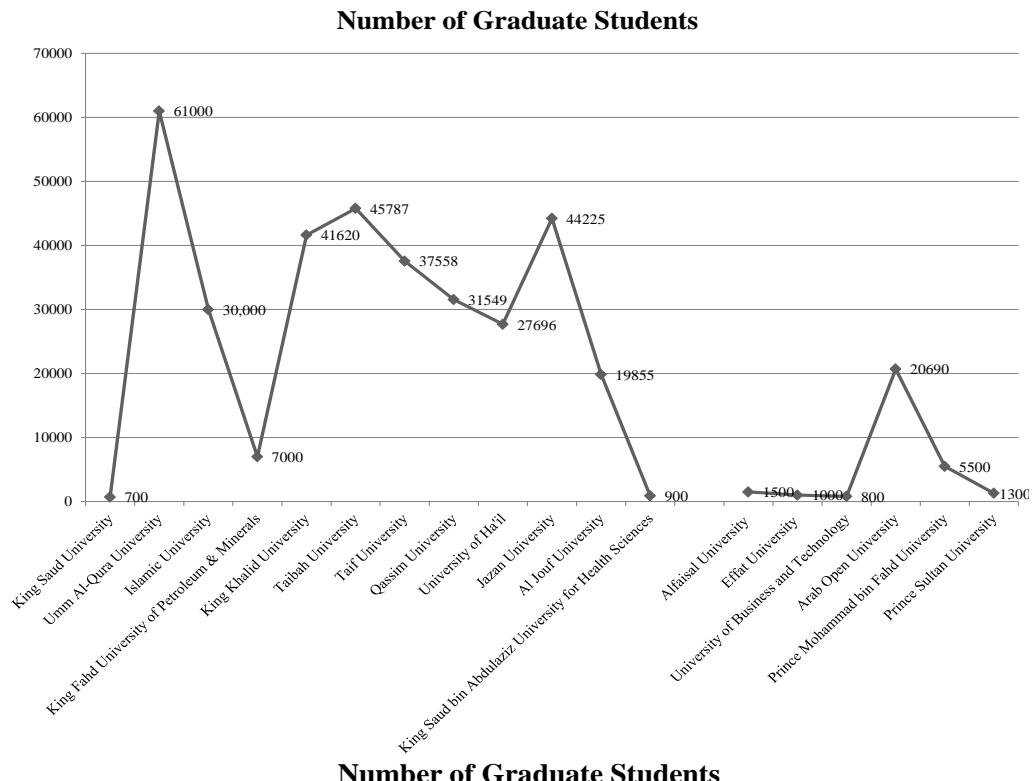
Trend Chart highlighting comparison of Public and Private Universities in Saudi Arabia in terms of number of Colleges:



Trend Chart highlighting comparison of Public and Private Universities in Saudi Arabia in terms of number of papers:



Trend Chart showcasing comparison of Public and Private Universities in Saudi Arabia in terms of number of graduate students:



Analysis of the aforementioned figures provide a comprehensive understanding of the various facts pertaining to the number of research papers published by the public as well as private universities located in Saudi Arabia. Based on the analyzed outcomes, it is worth mentioning that the public universities in Saudi Arabia have published a higher number of research papers in comparison with the private universities. Concerning the aforementioned outcome, it is worth mentioning that the public universities excel in the number of research papers published since they possess a higher number of professors and students in comparison to the number of professors and students in private universities. Moreover, early establishment, apart from higher number of deanships and colleges can be considered as

another significant factor behind higher number of papers delivered by public universities in comparison with private universities.

In addition to the above analysis, a number of findings further reveal the differences and provides a logical justification as to why private universities are lagging behind public universities of Saudi Arabia in terms of productivity. The diagram below represents the rankings of some of the top public as well as private universities listed as the leading ones of Saudi Arabia's education system.

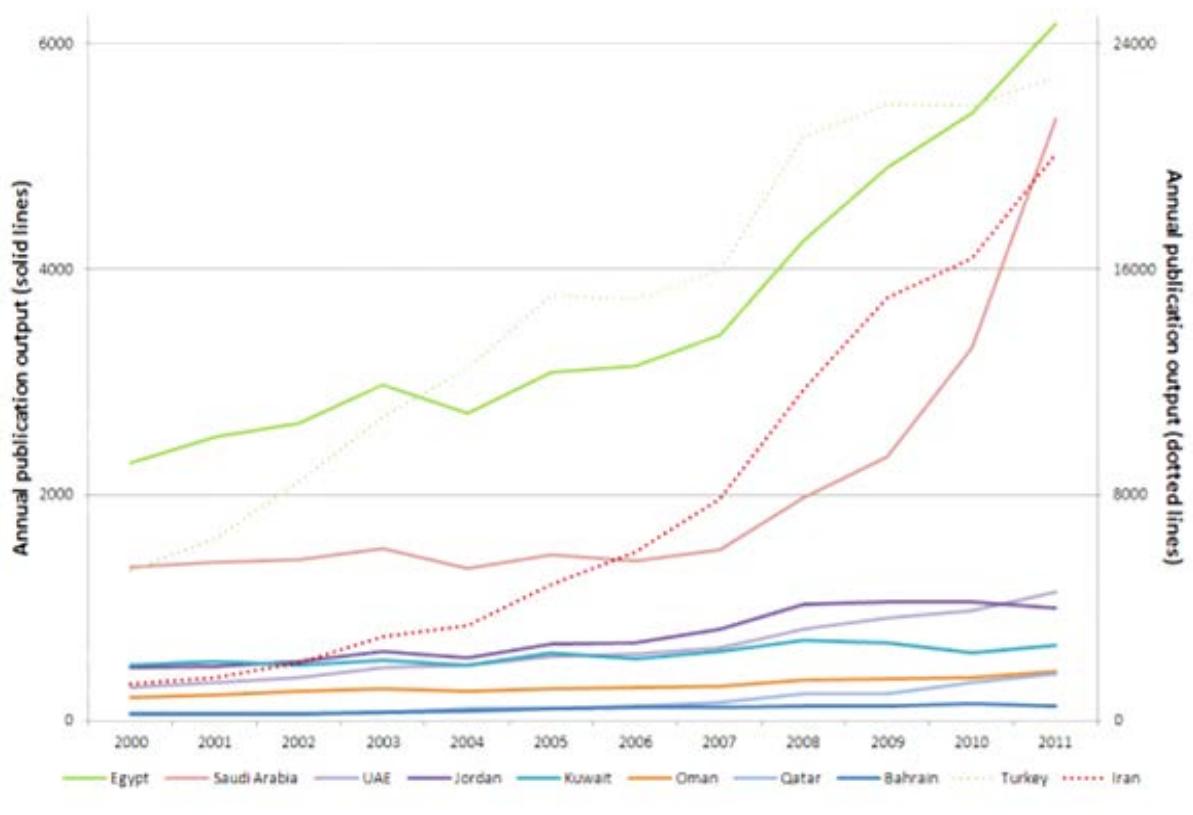
World Rank	Institution	Country/Region	National Rank	Quality of Education	Alumni Employment	Quality of Faculty	Publications	Influence	Citations	Broad Impact	Patents	Score
589	King Saud University	Saudi Arabia	1	387+	182	218+	560	539	645	837	232	44.59
704	King Abdullah University of Science and Technology	Saudi Arabia	2	387+	587+	128	691	529	812+	946	182	44.38
847	King Fahd University of Petroleum and Minerals	Saudi Arabia	3	387+	234	218+	934	950	812+	984	871+	44.19
995	King Abdulaziz University	Saudi Arabia	4	387+	449	218+	595	430	645	994	839	44.03
1001+	Alfaisal University	Saudi Arabia	5	387+	587+	218+	6 (Natl)	4 (Natl)	812+	5 (Natl)	871+	withheld
1001+	King Khalid University	Saudi Arabia	6	387+	587+	218+	9 (Natl)	10+ (Natl)	812+	5 (Natl)	871+	withheld
1001+	Najran University	Saudi Arabia	7	387+	587+	218+	14 (Natl)	7 (Natl)	812+	5 (Natl)	871+	withheld
1001+	Taif University	Saudi Arabia	8	387+	587+	218+	8 (Natl)	10+ (Natl)	812+	8 (Natl)	871+	withheld
1001+	Taibah University	Saudi Arabia	9	387+	587+	218+	7 (Natl)	10+ (Natl)	812+	9 (Natl)	871+	withheld
1001+	King Faisal University	Saudi Arabia	10	387+	587+	218+	10 (Natl)	7 (Natl)	812+	9 (Natl)	871+	withheld
1001+	University of Dammam	Saudi Arabia	11	387+	587+	218+	11 (Natl)	10+ (Natl)	812+	11 (Natl)	871+	withheld
1001+	Umm Al-Qura University	Saudi Arabia	12	387+	587+	218+	5 (Natl)	7 (Natl)	812+	12 (Natl)	871+	withheld
1001+	King Saud bin Abdulaziz University for Health Sciences	Saudi Arabia	13	387+	587+	218+	12 (Natl)	6 (Natl)	812+	12 (Natl)	871+	withheld
1001+	Jazan University	Saudi Arabia	14	387+	587+	218+	15 (Natl)	10+ (Natl)	812+	14 (Natl)	871+	withheld
1001+	Qassim University	Saudi Arabia	15	387+	587+	218+	13 (Natl)	10+ (Natl)	812+	15 (Natl)	871+	withheld
1001+	Al-Jouf University	Saudi Arabia	16	387+	587+	218+	20 (Natl)	10+ (Natl)	812+	16 (Natl)	871+	withheld
1001+	Prince Sultan University	Saudi Arabia	17	387+	587+	218+	23 (Natl)	10+ (Natl)	812+	17 (Natl)	871+	withheld
1001+	Al-Imam Muhammad Ibn Saud Islamic University	Saudi Arabia	18	387+	587+	218+	17 (Natl)	10+ (Natl)	812+	18 (Natl)	871+	withheld
1001+	University of Tabuk	Saudi Arabia	19	387+	587+	218+	16 (Natl)	10+ (Natl)	812+	19 (Natl)	871+	withheld
1001+	Salman bin Abdulaziz University	Saudi Arabia	20	387+	587+	218+	18 (Natl)	10+ (Natl)	812+	20 (Natl)	871+	withheld
1001+	University of Ha'il	Saudi Arabia	21	387+	587+	218+	19 (Natl)	10+ (Natl)	812+	21 (Natl)	871+	withheld
1001+	Al-Baha University	Saudi Arabia	22	387+	587+	218+	22 (Natl)	10+ (Natl)	812+	21 (Natl)	871+	withheld
1001+	Al-Majmaah University	Saudi Arabia	23	387+	587+	218+	21 (Natl)	10+ (Natl)	812+	23 (Natl)	871+	withheld
1001+	Prince Mohammad bin Fahd University	Saudi Arabia	24	387+	587+	218+	25 (Natl)	10+ (Natl)	812+	23 (Natl)	871+	withheld
1001+	Fahad Bin Sultan University	Saudi Arabia	25	387+	587+	218+	24 (Natl)	10+ (Natl)	812+	25 (Natl)	871+	withheld

(Source: Center for World University Rankings, 2015)

Based on the above-depicted diagram, it can be understood that in comparison to the private universities, public universities in Saudi Arabia are associated with publishing a larger number of publications. Additionally, the number of influences, as well as citations by public universities has been higher in comparison to the private universities of Saudi Arabia. It can further be interpreted from the above diagram that although the Alumni employment is lower in King Saud University, the quality of faculty differentiates the same from the private universities.

Correspondingly, in terms of its impact, Saudi Arabian public universities are ahead of the private universities, thereby revealing the fact that private universities are not equally productive in research.

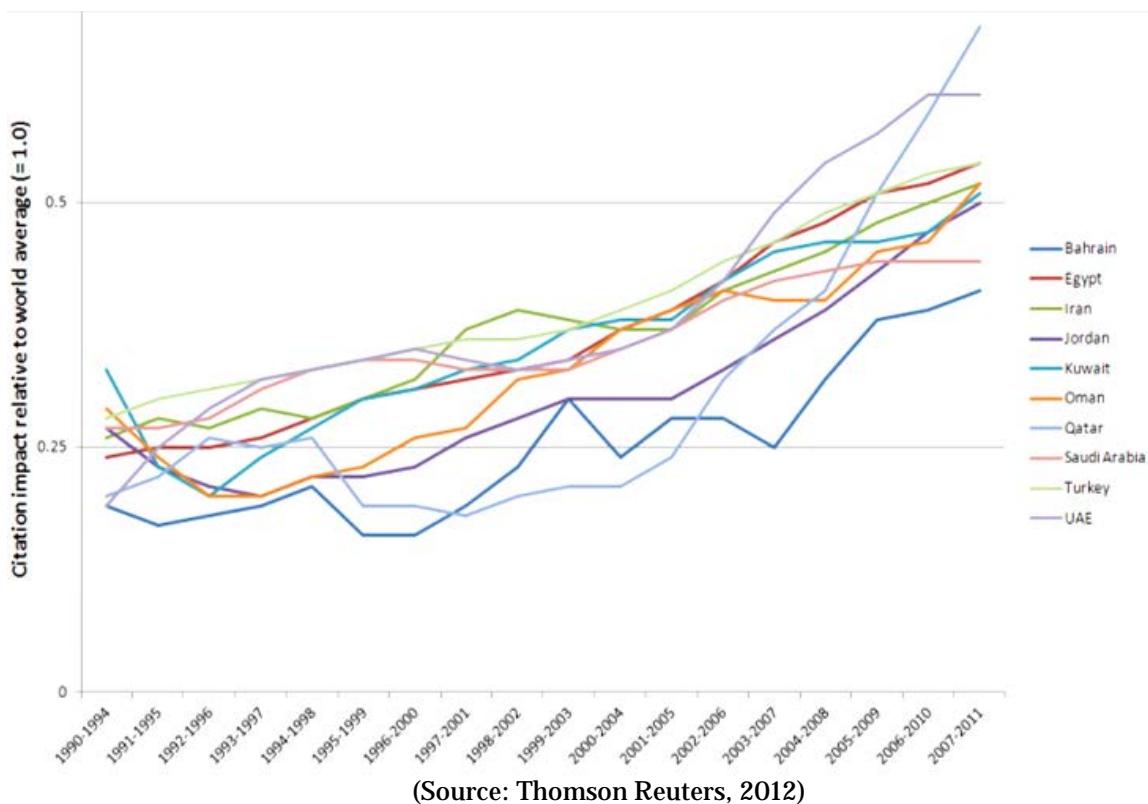
When comparing annual publications made by Saudi Arabian universities with other nations, such as Egypt, UAE, Jordan, Kuwait, Oman, Qatar, Bahrain, Turkey and Iran, it is also evident that Saudi Arabia has the highest growth rate in terms of research publications, as can be inferred from the diagram depicted below.



(Source: Thomson Reuters, 2012)

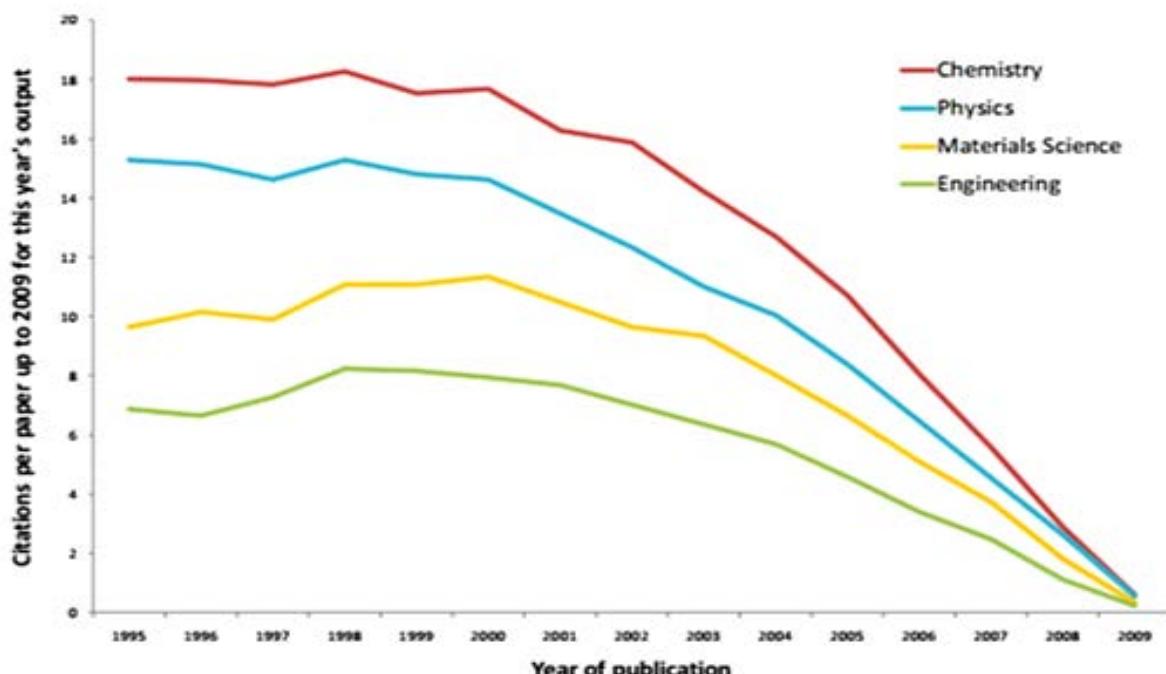
It can be interpreted from the above diagram that Saudi Arabia has the highest growth rate, in terms of research publications, which surpassed Iran in the year 2011. Although Egypt is involved in publishing a higher number of research papers, it is worth mentioning that Saudi Arabia can surpass Egypt in the forthcoming years.

Considering the average annual citations made by the Islamic nations of Saudi Arabia, Egypt, UAE, Jordan, Kuwait, Oman, Qatar, Bahrain, Turkey and Iran, the diagram below represents the average number of citations made by the nations.



(Source: Thomson Reuters, 2012)

Citation counts further play an important role in highlighting the publications made in a given year. Considering the increasing number of publications made by universities in Saudi Arabia, it is worth mentioning that there has been a significant increase in the citation counts made by the nation's universities, as can be interpreted from the diagram illustrated below.



(Source: Thomson Reuters, 2012)

Considering the aforementioned diagram, it can be understood that there has been an increasing number of publications and citations made by the universities of Saudi Arabia in various fields such as Chemistry, Physics, Material Science and Engineering. This reveals the

ability of Saudi Arabian universities in terms of productivity and highlights their competitive levels apparently.

In addition to an increased number of research publications conducted within Saudi Arabia, there is a need to lay strong emphasis on the fact that Saudi Arabian universities have played a considerable role in enhancing the number of publications made throughout middle east, as can be understood from the below diagram.



(Source: Thomson Reuters, 2012)

It can be understood from the above diagram that when compared on a global scale, Middle East, encompassing the Saudi Arabian universities, have overtaken other nations in the Asia-Pacific, European Union, USA and Latin American region.

Considering the average publications made by the top public, as well as private universities in Saudi Arabia, it is noteworthy that public universities have produced higher number of research papers in comparison to private universities of the country. The diagram below accordingly represents the number of papers, publications and the degree of average impact with respect to citations for some of the public, as well as private universities of Saudi Arabia.

Average impact	2002-2006			Institution	2007-2011		
	Papers	Publ'ns			Publ'ns	Papers	Average impact
0.49	1,674	1,878		King Saud University	5,198	4,789	0.79
0.68	1,536	1,575	King Fahd University of Petroleum and Minerals		2,166	2,099	0.79
0.61	483	522	King Abdulaziz University		1,745	1,639	0.84
0.65	960	1,336	King Faisal Specialist Hospital and Research Centre		1,338	864	0.80
-	-	-	King Abdullah University of Science and Technology		681	651	1.46
0.52	293	334	King Faisal University		619	562	0.48
0.59	209	222	King Khalid University		404	382	0.45
-	3	3	Taif University		358	347	0.73
0.40	111	111	Umm Al-Qura University		283	263	0.44
0.28	84	87	Qassim University		283	260	0.47
0.57	126	129	King Abdulaziz City for Science & Technology		264	255	0.83
1.12	19	20	Taibah University		239	226	0.85
-	4	4	King Saud bin Abdulaziz University for Health Sciences		209	162	1.12
-	-	-	Alfaial University		124	105	1.03
-	-	-	Jazan University		111	101	0.37
-	-	-	Najran University		82	80	1.54
7	7	7	Al-Imam Mohammad Ibn Saud Islamic University		85	78	0.31
-	-	-	University of Dammam		92	75	0.31
1	1	1	Al Jouf University		63	61	0.50
-	-	-	University of Ha'il		58	56	0.52
-	-	-	Salman bin Abdulaziz University		52	49	0.35
-	-	-	University of Tabuk		45	44	0.39
9	9	9	Prince Sultan University		36	36	0.98
3	3	3	Al Bahri University		26	25	0.50
-	-	-	Princess Nora bint Abdulrahman University		22	20	0.34
-	-	-	Shagra University		14	14	0.09
-	-	-	Northern Borders University		9	9	
-	-	-	Almajmaah University		8	8	
-	-	-	Islamic University		2	2	
-	1	1	Naif Arab University for Security Sciences		-	-	
Average impact	Papers	Publ'ns			Publ'ns	Papers	Average impact

(Source: Thomson Reuters, 2012)

It can be interpreted from the above diagram that the public universities located in Saudi Arabia have been ahead of the private universities of the nation in terms of publications, number of papers and average impact of citations, between the years 2002-06 and 2007-11. This reveals the fact that private universities were incompetent in publishing higher number of research papers and publications in comparison to public universities of Saudi Arabia.

The diagram below herewith represents the summary for the average impact of citations in the various fields of research.

(Papers in Web of Science (2007-2011							(Normalised citation impact (2007-2011					
MED	BIO	PMS	ENG	SOC	A&H		MED	BIO	PMS	ENG	SOC	A&H
1,549	1,842	1,685	1,046	61	6	King Saud University	0.79	0.78	0.74	0.98	0.93	
24	176	1,238	1,184	52	5	King Fahd University of Petroleum and Minerals	0.52	1.08	0.90	0.70	0.64	
289	318	1,093	396	17		King Abdulaziz University	0.48	0.44	0.96	1.02	0.45	
697	517	34	13	10		King Faisal Specialist Hospital and Research Centre	0.74	0.75	0.70	0.06	0.31	
10	172	404	253	1		King Abdullah University of Science and Technology	0.14	1.62	1.51	1.38		
227	190	179	80	13	1	King Faisal University	0.50	0.32	0.54	0.75	0.33	
108	78	208	76	7		King Khalid University	0.31	0.31	0.51	0.64		
25	87	213	101	1		Taif University	0.42	0.40	0.46	1.43		
47	99	102	87	5	1	Qassim University	0.42	0.36	0.60	0.50		
49	49	150	69	4	1	Umm Al-Qura University	0.32	0.36	0.43	0.65		
2	48	174	91	1		King Abdulaziz City for Science & Technology		0.34	0.94	0.76		
47	43	147	46	5	2	Taibah University	1.18	0.71	0.73	0.90		

(Papers in Web of Science (2007-2011)							(Normalised citation impact (2007-2011)					
MED	BIO	PMS	ENG	SOC	A&H		MED	BIO	PMS	ENG	SOC	A&H
145	38	8	3	4		King Saud bin Abdulaziz University for Health Sciences	1.17	0.36				
30	31	49	30			Jazan University	0.14	0.29	0.51	0.20		
49	61	8	11	7	1	Alfaisal University	1.00	1.21		0.28		
1	9	61	46	1	1	Najran University			1.70	1.80		
6	7	47	32	7		Al-Imam Mohammad Ibn Saud Islamic University			0.25	0.32		
45	18	20	10	3		University of Dammam	0.47	0.16	0.05			
11	18	38	17			Al Jouf University	0.47	0.39	0.45	1.19		
8	12	37	18	1		University of Ha'il		0.17	0.42	0.90		
14	15	27	13			Salman bin Abdulaziz University	0.73	0.24	0.22	0.12		
2	35	19				University of Tabuk			0.39	0.05		
2	3	19	14	5		Prince Sultan University			1.73	0.68		
2	12	10	7	1		Al Baha University		0.36	0.06			
2	5	12	6			Princess Nora bint Abdulrahman University			0.56			
(Papers in Web of Science (2007-2011)							(Normalised citation impact (2007-2011)					
MED	BIO	PMS	ENG	SOC	A&H		MED	BIO	PMS	ENG	SOC	A&H
2	2	8	3			Shagra University						
1	1	7	2			Northern Borders University						
		7	3			Almajmaah University						
		2				Islamic University						

(Source: Thomson Reuters, 2012)

In addition to the aforementioned statistical figures, it is worth mentioning that the public universities have dominated the universities' publication and number of research papers produced in every field of the study. In this regard, the diagram below represents the number of research papers produced and published by the public and private universities of Saudi Arabia, for clinical, medical and health sciences.

2002-2006		2007-2011		
Average Impact	Papers	Institution	Papers	Average Impact
0.47	818	King Saud University	1549	0.79
0.55	724	King Faisal Specialist Hospital and Research Centre	697	0.74
0.55	147	King Abdulaziz University	289	0.48
0.39	161	King Faisal University	227	0.50
0.79	4	King Saud bin Abdulaziz University for Health Sciences	145	1.17
0.32	69	King Khalid University	108	0.31
0.00	0	Alfaisal University	49	1.00
0.34	27	Umm Al-Qura University	49	0.32
0.37	11	Qassim University	47	0.42
1.83	9	Taibah University	47	1.18
0.00	0	University of Dammam	45	0.47
0.00	0	Jazan University	30	0.14
0.00	0	Taif University	25	0.42
0.67	24	King Fahd University of Petroleum and Minerals	24	0.52
	0	Salman bin Abdulaziz University	14	0.73
	0	Al Jouf University	11	0.47
0		King Abdullah University of Science and Technology	10	0.14
	0	University of Ha'il	8	
0		Al-Imam Mohammad Ibn Saud Islamic University	6	
0		Al Baha University	2	
4		King Abdulaziz City for Science & Technology	2	
0		Prince Sultan University	2	
0		Princess Nora bint Abdulrahman University	2	
0		Shagra University	2	
0		Najran University	1	
0		Northern Borders University	1	

(Source: Thomson Reuters, 2012)

Correspondingly, the diagram below represents the scenario for research papers published in biological sciences:

2002-2006			2007-2011		
Average Impact	Papers	Institution	Papers	Average Impact	
0.51	489	King Saud University	1,842	0.78	
0.71	477	King Faisal Specialist Hospital and Research Centre	517	0.75	
0.50	76	King Abdulaziz University	318	0.44	
0.53	82	King Faisal University	190	0.32	
0.55	85	King Fahd University of Petroleum and Minerals	176	1.08	
0	0	King Abdullah University of Science and Technology	172	1.62	
0.23	14	Qassim University	99	0.36	
2	2	Taif University	87	0.40	
0.57	28	King Khalid University	78	0.31	
0	0	Alfaisal University	61	1.21	
0.51	15	Umm Al-Qura University	49	0.36	
0.43	30	King Abdulaziz City for Science & Technology	48	0.34	
0.81	4	Taibah University	43	0.71	
0.06	1	King Saud bin Abdulaziz University for Health Sciences	38	0.36	
0	0	Jazan University	31	0.29	
0	0	Al Jouf University	18	0.39	
0	0	University of Dammam	18	0.16	
0	0	Salman bin Abdulaziz University	15	0.24	
0	0	Al Baha University	12	0.36	
0	0	University of Ha'il	12	0.17	
0	0	Najran University	9		
0	0	Al-Imam Mohammad Ibn Saud Islamic University	7		
0	0	Princess Nora bint Abdulrahman University	5		
0	0	Prince Sultan University	3		
0	0	Shagra University	2		
0	0	University of Tabuk	2		
0	0	Northern Borders University	1		

(Source: Thomson Reuters, 2012)

The diagram below represents the scenario for research papers published in physical science and mathematics:

2002-2006			2007-2011	
Average Impact	Papers	Institution	Papers	Average Impact
0.50	516	King Saud University	1685	0.74
0.65	809	King Fahd University of Petroleum and Minerals	1238	0.90
0.67	255	King Abdulaziz University	1093	0.96
0	0	King Abdullah University of Science and Technology	404	1.51
	1	Taif University	213	0.46
0.75	113	King Khalid University	208	0.51
0.76	76	King Faisal University	179	0.54
0.61	77	King Abdulaziz City for Science & Technology	174	0.94
0.38	72	Umm Al-Qura University	150	0.43
	8	Taibah University	147	0.73
0.29	44	Qassim University	102	0.60
	0	Najran University	61	1.70
	0	Jazan University	49	0.51
	3	Al-Imam Mohammad Ibn Saud Islamic University	47	0.25
	1	Al Jouf University	38	0.45
	0	University of Ha'il	37	0.42
	0	University of Tabuk	35	0.39
0.68	184	King Faisal Specialist Hospital and Research Centre	34	0.70
	0	Salman bin Abdulaziz University	27	0.22
	0	University of Dammam	20	0.05
	5	Prince Sultan University	19	1.73
	0	Princess Nora bint Abdulrahman University	12	0.56
	2	Al Baha University	10	
	0	Alfaisal University	8	
	0	King Saud bin Abdulaziz University for Health Sciences	8	
	0	Shagra University	8	
	0	Almajmaah University	7	
	0	Northern Borders University	7	
	0	Islamic University	2	

(Source: Thomson Reuters, 2012)

The diagram below represents the scenario for research papers published in engineering & technology:

2002-2006			2007-2011	
Average Impact	Papers	Institution	Papers	Average Impact
0.71	966	King Fahd University of Petroleum and Minerals	1,184	0.70
0.63	313	King Saud University	1,046	0.98
0.59	109	King Abdulaziz University	396	1.02
	0	King Abdullah University of Science and Technology	253	1.38
	0	Taif University	101	1.43
0.68	54	King Abdulaziz City for Science & Technology	91	0.76
0.34	34	Qassim University	87	0.50
0.79	21	King Faisal University	80	0.75
0.66	30	King Khalid University	76	0.64
0.51	26	Umm Al-Qura University	69	0.65
	0	Najran University	46	1.80
	2	Taibah University	46	0.90
	4	Al-Imam Mohammad Ibn Saud Islamic University	32	0.32
	0	Jazan University	30	0.20
	0	University of Tabuk	19	0.05
	0	University of Ha'il	18	0.90
	0	Al Jouf University	17	1.19
	4	Prince Sultan University	14	0.68
0.57	42	King Faisal Specialist Hospital and Research Centre	13	0.06
	0	Salman bin Abdulaziz University	13	0.12
	0	Alfaisal University	11	0.28
	0	University of Dammam	10	0.00
	0	Al Baha University	7	
	0	Princess Nora bint Abdulrahman University	6	
	0	Almajmaah University	3	
	0	King Saud bin Abdulaziz University for Health Sciences	3	
	0	Shagra University	3	
	0	Northern Borders University	2	

(Source: Thomson Reuters, 2012)

The diagram below represents the scenario for research papers published in Social Sciences:

2002-2006			2007-2011		
Average Impact	Papers	Institution	Papers	Average Impact	
0.69	33	King Saud University	61	0.93	
1.24	24	King Fahd University of Petroleum and Minerals	52	0.64	
	2	King Abdulaziz University	17	0.45	
	5	King Faisal University	13	0.33	
	5	King Faisal Specialist Hospital and Research Centre	10	0.31	
	0	Alfaisal University	7		
	1	Al-Imam Mohammad Ibn Saud Islamic University	7		
	2	King Khalid University	7		
	0	Prince Sultan University	5		
	0	Qassim University	5		
	0	Taibah University	5		
	0	King Saud bin Abdulaziz University for Health Sciences	4		
	0	Umm Al-Qura University	4		
	0	University of Dammam	3		
	0	Al Baha University	1		
	2	King Abdulaziz City for Science & Technology	1		
	0	King Abdullah University of Science and Technology	1		
	0	Najran University	1		
	0	Taif University	1		
	0	University of Ha'il	1		

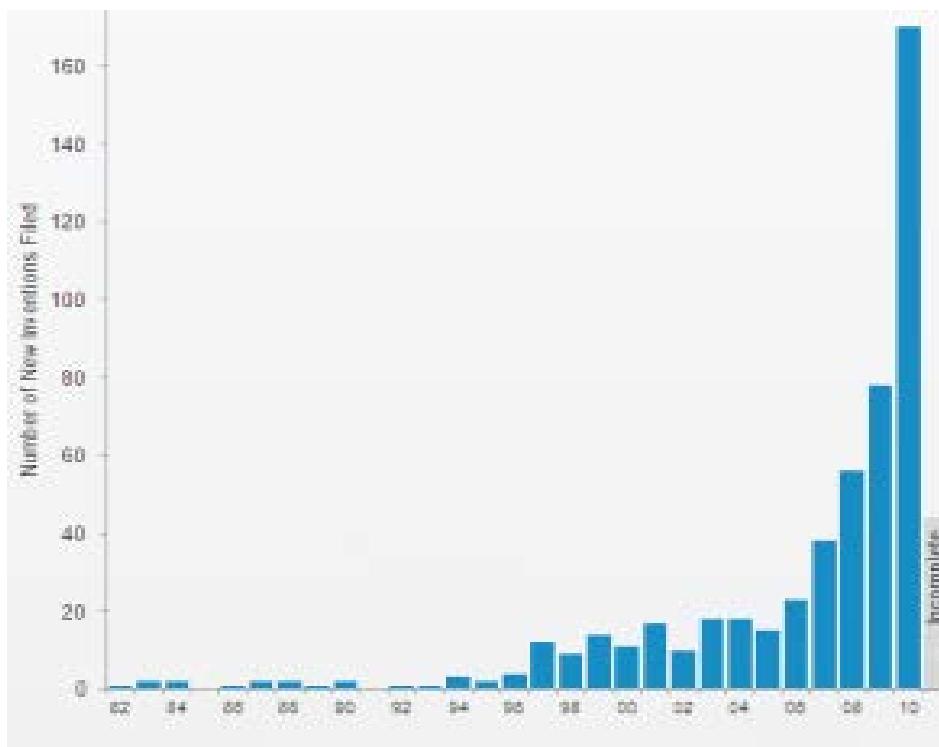
(Source: Thomson Reuters, 2012)

The diagram below represents the scenario for research papers published in arts and humanities:

2002-2006		2007-2011	
Average Impact	Papers	Institution	Papers
5	King Saud University	6	
3	King Fahd University of Petroleum and Minerals	5	
0	Taibah University	2	
0	Alfaisal University	1	
0	King Faisal University	1	
0	Najran University	1	
0	Qassim University	1	
0	Umm Al-Qura University	1	
1	Al Baha University	0	

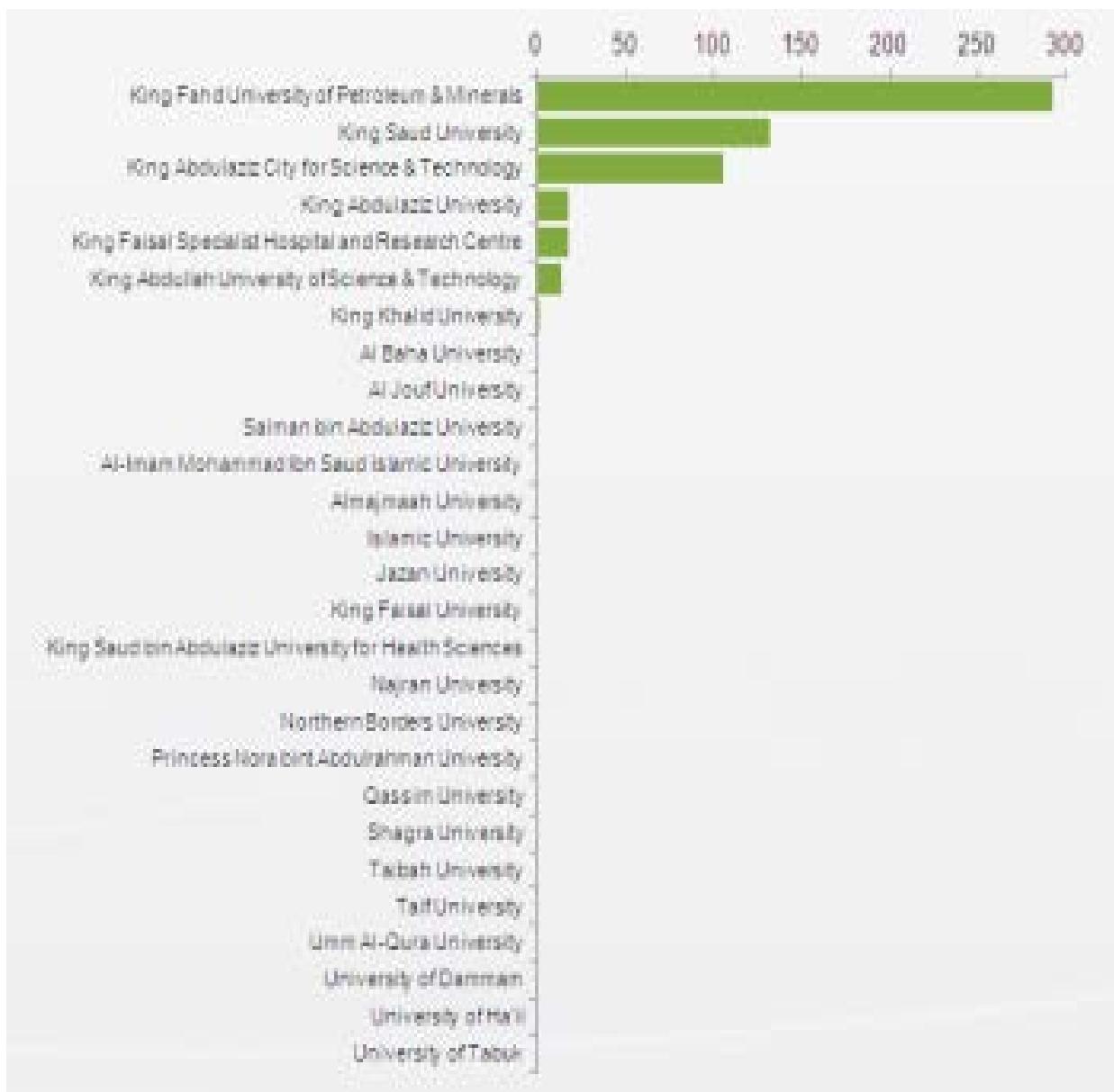
(Source: Thomson Reuters, 2012)

In terms of number of patents made by the universities of Saudi Arabia, there has been a significant rise in the number of patent filings, as can be understood from the diagram below.



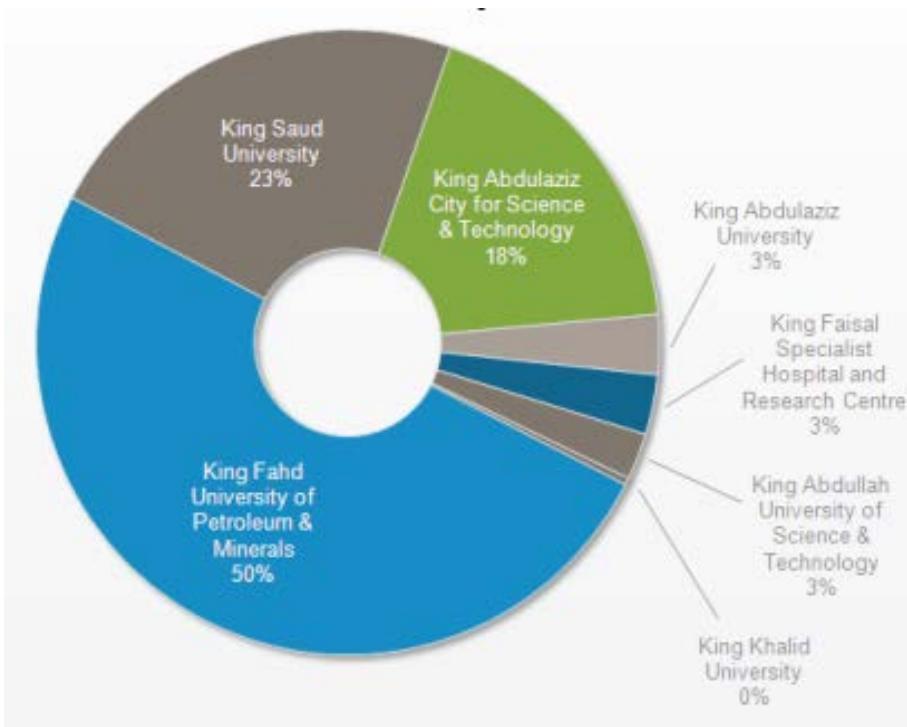
(Source: Thomson Reuters, 2012)

Considering the university's distribution, in terms of the number of patents filled, the trend chart shown below provides an understanding and comparison of public and private universities of Saudi Arabia.



(Source: Thomson Reuters, 2012)

It can be understood from the above diagram that the public universities in Saudi Arabia have filed a greater number of patents in comparison to the private universities within the nation. Additionally, in terms of proportion of collection, public universities have a higher proportion in comparison to private universities.



(Source: Thomson Reuters, 2012)

In addition to the number of publications, research papers, average impact of citations and patents, the public universities of Saudi Arabia have also excelled in terms of the number of inventions as well as funding, as can be observed from the diagram below.

Institution	Total Inventions	Total Funding 2006-2012	Funding per Patent (2006-12)	Top Technical Category
King Fahd University of Petroleum & Minerals	292	SAR 336,365,674	SAR 1,742,827	IT
King Saud University	132	SAR 927,995,878	SAR 9,372,695	Medical & Health
King Abdulaziz City for Science & Technology	106	SAR 833,462,284	SAR 7,937,736	Materials
King Abdulaziz University	18	SAR 265,918,990	SAR 29,546,544	Materials
King Faisal Specialist Hospital & Research Centre	18	SAR 151,227,294	SAR 15,122,729	Medical & Health
King Abdullah University of Science & Technology	14	SAR 3,829,825	SAR 273,558	Electronics & Comms
King Khalid University	2	SAR 24,273,955	SAR 24,273,955	Medical & Health
Al Baha University		SAR 995,000		
Al Faisal University		SAR 39,690,489		
Al Jouf University		SAR 0		
Salman bin Abdulaziz University		SAR 0		
Al-Imam Mohammad Ibn Saud Islamic University		SAR 38,706,864		
Almajmaah University		SAR 0		
Islamic University		SAR 0		
Jazan University		SAR 4,194,000		
King Faisal University		SAR 106,432,655		
King Saud bin Abdulaziz University for Health Sciences		SAR 1,719,294		
Naif Arab University for Security Sciences		SAR 0		
Najran University		SAR 0		
Northern Borders University		SAR 0		
Princess Nora bint Abdulrahman University		SAR 3,033,754		
Prince Sultan University		SAR 0		
Qassim University		SAR 54,256,572		
Shagra University		SAR 0		
Taibah University		SAR 46,903,214		
Taif University		SAR 10,036,103		
Umm Al-Qura University		SAR 81,674,077		
University of Dammam		SAR 34,572,205		
Universith of Ha'il		SAR 1,620,000		
University of Tabuk		SAR 0		

(Source: Thomson Reuters, 2012)

In relation to the above presented diagram, the diagram below provides an understanding to the impact assessment of universities of Saudi Arabia.

Institution	Total Inventions	% Filed Internationally	% with EP grant	% with US Grant	Times Cited	Citations per Family
King Fahd University of Petroleum & Minerals	292	9%	7%	54%	1140	3.9
King Saud University	132	5%	8%	32%	371	2.8
King Abdulaziz City for Science & Technology	106	7%	4%	23%	5	0.0
King Abdulaziz University	18	6%	-	56%	22	1.2
King Faisal Specialist Hospital and Research Centre	18	-	22%	11%	16	0.9
King Abdullah University of Science & Technology	14	7%	-	7%	1	0.1
King Khalid University	2	50%	-	100%	64	32.0
Al-Baha University	-	-	-	-	-	-
Al-Jouf University	-	-	-	-	-	-
Salman bin Abdulaziz University	-	-	-	-	-	-
Al-Imam Mohammad Ibn Saud Islamic University	-	-	-	-	-	-
Almajmaah University	-	-	-	-	-	-
Islamic University	-	-	-	-	-	-
Jazan University	-	-	-	-	-	-
King Faisal University	-	-	-	-	-	-
King Saud bin Abdulaziz University for Health Sciences	-	-	-	-	-	-
Najran University	-	-	-	-	-	-
Northern Borders University	-	-	-	-	-	-
Princess Noura bint Abdulrahman University	-	-	-	-	-	-
Qassim University	-	-	-	-	-	-
Shagra University	-	-	-	-	-	-
Taibah University	-	-	-	-	-	-
Tail University	-	-	-	-	-	-
Umm Al-Qura University	-	-	-	-	-	-
University of Dammam	-	-	-	-	-	-
University of Ha'il	-	-	-	-	-	-
University of Tabuk	-	-	-	-	-	-

(Source: Thomson Reuters, 2012)

In a gist, the diagram below represents the publications, inventions, total funding, as well as faculty distribution of some of the public, as well as private universities of Saudi Arabia.

Research Institutions	Publications '02-'11	Publications '01-'10	Inventions up to '10	Inventions up to '09	Total Funding '10 - '08/12 SAR	Faculty
Al Baha University	29	13	0	0	0	836
Al Jouf University	64	37	0	0	0	810
Salman bin Abdulaziz Uni-versity	52	8	0	0	0	807
Alfaisal University	124	64	0	0	16,751,125	
Al-Imam Mohammad ibn Saud	95	15	0	0	21,477,264	2614
Almajmaah University	8	1	0	0	0	487
Islamic University	2	1	0	0	0	785
Jazan University	111	39	0	0	4,095,000	1713
KACST	393	211	106	14	6,615,600	1412
King Abdulaziz University	2267	1550	18	13	138,636,627	7228
KAUST	681	237	14	2	3,644,825	
KFUPM	3741	3406	292	196	135,837,675	1045
King Faisal Specialist Hospital & Research Centre	2674	2457	18	17	65,716,029	
King Faisal University	953	868	0	0	53,472,919	1387
King Khalid University	626	533	2	1	5,246,770	2329
King Saud bin Abdulaziz Uni-versity for Health Sciences	213	107	0	0	0	351
King Saud University	7076	5056	132	74	468,357,381	4952
Naif Arab University for Security Sciences	1	1	0	0	0	
Najran University	82	38	0	0	0	690
Northern Borders University	9	6	0	0	0	356
Prince Sultan University	45	32	0	0	0	
Princess Nora bint Abdulrah-man University	22	5	0	0	1,411,000	1074
Qassim University	370	152	0	0	28,778,037	2053
Shagra University	14	0	0	0	0	761
Tabuk University	45	11	0	0	0	881
Talibah University	259	158	0	0	5,080,880	1633
Talf University	361	158	0	0	2,385,700	1715
Umm Al-Qura University	394	260	0	0	57,932,007	3867
University Dammam	92	16	0	0	23,208,520	2383
Ha'il University	58	27	0	0	0	1458

(Source: Thomson Reuters, 2012)

University budgets can be considered as another important factor highlighting the dominance of public universities of Saudi Arabia over the private universities, as can be understood from the diagram below.

University	1998 budget	2009 budget
King Saud University	2,082,145,000	5,423,782,000
King Abdul Aziz University	1,249,672,000	2,906,650,000
King Fahd Petroleum and Mineral University	411,957,000	921,060,000
Imam Mohammed Bin Saud Islamic University	1,074,154,000	2,192,698,000
Islamic University at Al-Madina Al-Munawwara	230,690,000	493,908,000
King Faisal University	554,135,000	2,741,146,000
Umm Al-Qura University	658,221,000	1,693,515,000
Total	6,240,974,000	16,372,759,000

(Source: Ministry of Higher Education, 2011)

Approval of funds from the government further plays an important role in highlighting the differences underlying public and private universities of Saudi Arabia. The diagram below represents the fund amount.

University	Government funds approved
King Saud	7,843,4
King Abdul Aziz	3,916,1
King Fahd Petroleum and Minerals	1,124,3
Imam Mohammad Bin Saud	2,723,3
Islamic University	655,8
King Faisal	1,601
Umm Al-Qura	1,919,7
King Khalid	2,697,2
Taibah	1,420
Qaseem	1,707,5
Taif	1,266,2
Jazan	1,083
Al-Jouf	899,9
Hail	882,9
Tabook	793,1
Al-Baha	626,8
Najran	630,1
Northern Border	549
Princess Nora Bint Abdul Rahman	834,7
Dammam	2,008,6
Al-Kharj	624,7
Al-Majmaah	359
Shaqra	575,6

(Source: Ministry of Higher Education, 2011)

It is evident from the above diagram that public universities have been receiving a higher number of fund approvals from the government, when compared to private universities, which justifies the reason as to why private universities lack productiveness.

Recommendations

In order to improve the research quality and productivity of the private universities in Saudi Arabia, it is important to draw particular recommendations. In this regard, it can be recommended that private universities must recruit highly skilled faculty members. This

would significantly support research development in private universities. It is also recommended that in instances where there is unavailability of skilled faculty members, the private universities should recruit from foreign nations. The private universities in Saudi Arabia also have opportunities for recruiting members as a visiting or guest faculty. In this regard, the private universities could recruit some of the highly skilled public university faculty members on their days off. This presence of the skilled faculty members would certainly improve the quality of research studies produced by the private universities.

It is also recommendable that the private sector universities should include a few more subjects in its research studies. Private universities in Saudi Arabia have incorporated a comparatively lesser number of educational subjects, which has in turn largely discouraged students to enroll in those private universities. Thus, increasing the number of subjects in private universities would certainly encourage both domestic and international students and thereafter, enhance the quality performances of these educational institutions. This will lead to the overall development of private universities in the nation. Hence, there would be hardly any difference in research productivity between private and public universities in Saudi Arabia. Furthermore, recommendations can be made pertaining to higher amount of fund approvals by the government leading towards the advancement of private universities of Saudi Arabia, which would enable the private universities to become equally competent and productive when compared with public universities. Effective training of the faculty staff can also lead to quality education, which would further enable private universities to foster competition and productiveness amid themselves.

Conclusion

From the course of the study, it is evident that educational development in Saudi Arabia started late, but gradually it has made significant leaps towards betterment within the sector. This is largely because of the effective research outputs obtained from public universities of the nation. The last two decades have also witnessed significant introduction of private universities within Saudi Arabia. However, it is notable from the study that the private universities have not been as productive in producing quality research outputs. The number of research outputs of private universities is comparatively less than those produced by public universities. In this regard, it is worth mentioning that King Saud University has established itself as a prominent public university in Saudi Arabia, which has published 9,746 papers until 2012, and thus, it is apparently higher in comparison to any other private university. Besides, it is also eminent from the study that private universities are mostly ranked in bottom among the universities in Saudi Arabia. This also signifies the ineffectiveness of private universities in producing research outputs. However, in order to promote private universities in the nation, it is recommendable to such universities to recruit high skilled faculty members. Moreover, the universities should also introduce a wide number of subjects that would considerably encourage students. Eventually, it would establish equal productiveness of private universities in Saudi Arabia as opposed to public universities in the nation.

As can be interpreted from the analysis of the public and private universities based in Saudi Arabia, it is worth mentioning that public universities are much involved in developing research papers and conducting research in comparison with the private universities. Due consideration must be placed towards ensuring equality of research opportunities between the private, as well as public universities of Saudi Arabia. Hence, there is a need to lay stress on encouraging students and professors engaged in private universities to take up research projects. Additionally, the private universities need to open up a higher number of deanships and colleges for the students, thereby ensuring that they are capable of selecting and conducting the best suitable research. Additionally, firms and educational ministries located in Saudi Arabia must take steps towards funding the research projects undertaken by professors and students in private universities, thereby ensuring that they are provided

maximum opportunities pertaining to conducting research studies and publishing higher number of research papers. Furthermore, there is need to consider the fact that universities located in the U.S. have been able to generate higher number of papers in comparison with the Saudi Arabian universities. This is because of most of the universities in Saudi Arabia had been recently launched or else have gained acceptance as university.

Moreover, there is lack of adequate resources for ensuring publications of higher number of papers in Saudi Arabia when compared with U.S., which is another constraint in lower number of research publications. Therefore, the Ministry of Education in Saudi Arabia must take pertinent steps towards ensuring that the public as well as private colleges established in Saudi Arabia are provided equal opportunities of publishing research papers, thereby ensuring continuous growth and development of the nation's education system as a whole. Hence, with due consideration to the research topic, it can be asserted that as of the present scenario, public universities have dominated in terms of research papers, quality of faculty, teaching, patents and inventions, among several others. Furthermore, government budgets and fund approvals can be considered as some of the prime reasons behind the growth of public universities. Hence, based on the analysis and comparison between private and public universities, a number of recommendations have been made that would play a key role in enhancing the productivity of private universities of Saudi Arabia.

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