

Innovation First and Foremost: The Case of Oman's Ranking in the Global Innovation Index

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ABSTRACT

Global Innovation Index is one of the most significant reports that measure the country's level of innovation. Oman's performance has been outstanding since 2013, with specialists expecting to rise to the top 40 countries in the index. However, over the last two years, Oman's ranking has dramatically declined to 80 by 2019 and continued to decline after it was 57 in the year 2018. The purpose of this research is to identify the factors that contributed to the Sultanate's decline in this report, evaluate the role of government institutions in this decline in terms of policy modification or improvement, and investigate the effect of this decline on society. Due to a lack of information on the topic, this descriptive research has adopted a combined method for collecting the data, including interviews with three participants, distributing 204 questionnaires, and document review. Some reports and other documents were analyzed, with central themes as described. Respondents for interviews and questionnaires were selected based on the study's themes to accomplish consistency and relevance. Thus, this study offers a clear picture of the factors contributing to a decrease in the GII indicators relative to previous years. Furthermore, it provides a blueprint for key stakeholders to implement significant changes needed to improve performance in crucial innovation metrics. In addition, it will help to raise awareness about policy instrumentation in Oman among professionals and organizations. Finally, this research will suggest opportunities for potential studies on this subject and government policies that will improve some of the report's indicators despite the decline of Oman's ranking.

Keywords: Global Innovation Index, Innovation Index, Oman Ranking, Key Innovation , metrics, National Innovation System

Introduction

According to Oxford Business Group (2017), it mentioned that Oman has a rich and diverse background, as well as a heritage of international discovery. Since 1970, Oman has undergone solid economic growth and exceptional domestic stability. Profits from the oil and gas industry have primarily fueled economic development, which drives the economic system. However, there is risk in the direction of growth; in the short term, the economic system is not creating sufficient employment for Omanis, whereas in the long-term, oil reserves will decline, and exploitation expenses will rise against a backdrop of volatile oil prices (Wahaibi 2017). Many countries faced economic recession because of fluctuations in oil prices since they depend on an unsustainable, rentier economy. The instability of oil prices has a significant effect on people's social and economic well-being. On the other hand, other countries depend directly on innovation, research, and development to create a competitive economy. This economy is knowledge-based, and its susceptibility to global economic crises is minimal. In these countries, innovation is the financial fuel of the future (Sira et al. 2020). Since 2011, the Omani government has altered the country's growth trajectory through economic diversification, small and medium-sized businesses, and foreign investments. The Omanisation program was the most effective policy for creating job prospects, and its outcomes were promising in the short term (Mansour n.d.). However, the most long-term and sustainable alternative to Oman's sustainability issue is the drives to promote transformational and diverse progress by solid national science, technology, and innovation system and strategy.

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Developing an effective national innovation system will contribute to a more diversified, prosperous, and sustainable economy with higher-quality and more appealing employment (UNCTAD 2014). Hence, Oman started to introduce an integrated and effective national science and technology system in keeping pace with the requirements of sustainable development. This system aimed to achieve and expand sustainable socio-economic well-being to ensure subsequent generations' future, which is reflected by increasing productivity, providing sustainable employment opportunities, and diversification (TRC 2019). In this context, the role of a knowledge-based economy relies on research and innovation to ensure a bright future for Oman today and for future generations and sustain Omani culture through successive generations.

Research Problem

The unexpected decline in Oman's ranking in the GII has various causes and ramifications for Oman and its reputation. The problems addressed in this study are the factors contributing to the two-year decline in the index and the consequences on policies adopted by Oman institutions. Also, the actions are taken to enhance Oman's efficiency and policy modification and the effect of the decrease on public perception and confidence in innovation performance. Finally, based on the findings, the report presents policy recommendations to stakeholders and practitioners.

Research Aim and Objectives

Oman's inclusion in the Global Innovation Index is one of the aspects that some experts in this area are aware of. Furthermore, there are few local reports on Oman's status in GII. Therefore, the research aims to understand the GII point's calculation to link it with the factors that led to the sudden decline and identify any complex issue behind it. The influence of that report on the policies of Omani institutions will be analyzed to ascertain if those institutions take action. The overall objectives of this research are:

- To evaluate the possible factors that contribute to Oman's decline in GII.
- To investigate whether if there are any complex issues behind that decline.
- To analyze the consequences of this decline on policies implemented by Omani institutions linked to the indicators and the action taken in response to the sudden decline.
- To identify and evaluate the impact of this decline on public perception and their confidence level on innovation performance.
- To offer policy recommendations that target both the practitioners in charge of reporting indicators and the stakeholders who carry on the innovation practices.

Literature Review

Global Innovation Index

According to Samir et al. (2017), The report critically evaluated innovation characteristics in Arab countries. It also went into great length on the GII and the aspects of innovation in the Arab countries. Furthermore, the performance of Arab countries in the Global Innovation Index is analyzed by reviewing the GII pillars. The report mentioned that there are several initiatives available for evaluating the components of the national innovation system. For instance, STIP Review by UNCTAD, GII by WIPO, and the Organization for Economic Cooperation and Development have created models to foster national innovation. However, these systems vary in the primary driver of the innovation mechanism is dependent on either the productive industries or the government. Between the above programs and indexes, the GII stands out from the others in recognition of how it represents the essence of the components of innovative intangible properties, as WIPO is a member (WIPO 2013). Because of this aspect, the index is a pioneering guide for innovative intellectual asset-related innovation for academics, corporate leaders, and stakeholders. The Global Innovation Index (GII), which is published annually, has become a significant resource in innovation indices and a valuable measuring instrument for governments, business leaders, and other stakeholders interested in understanding the status of innovation around the world. The Index is a report jointly published by Coronel University, the European Institute of Business Administration (INSEAD), and the World Intellectual Property Organization (WIPO). Innovation is a crucial engine of economic development and competitiveness. The index aims to increase the measurement and understanding of innovation. It acknowledges the need for mature and developing economies to apply a strong viewpoint on innovation. As such, it provides metrics that go beyond conventional indices of innovation, such as the extent of research and growth. As a result, the Global Innovation Index has become a powerful

benchmark instrument that promotes dialogue among the public and private sectors and allows governments, industry leaders, and other stakeholders to measure success continuously over the past few years (Farhan 2017; AL-Maliki and Abdul-Aziz 2016; Cui et al. 2020). The GII currently used the information envelopment approach to evaluate national innovative capability rates, including specific input and output steps. However, the possible structural relations between the inputs and outputs were overlooked. According to several reports, the degree of national innovation capability is more complicated than the GII model proposed, and structural relations between the elements of national innovation capability may exist (TRC 2020). It can be concluded that Cui et al. (2020) acknowledged that the global Innovation Index report is a systematic review and appraisal of a country's innovation performance in several areas. However, the country evolves and develops quickly because of societal trends and technological growth, making data gathering for GII report a challenging task. Each year, there are several missed values in the survey, which affects the score. AL-Maliki study (2016) is viewed as good; however, it is limited to the Gulf countries, and the researchers' analysis was not highly critical. It should be emphasized that the researchers did not collect primary data and did not utilize any of the research instruments (questionnaires or interviews). The report of Samir et al. (2017) was more comprehensive and had many drawings; however, one of the report's weaknesses was that the critical analysis was brief, even though it contained all seven pillars of the GII. Farhan (2017) provided research that discussed the GII for Gulf countries, although it focused more on economic analysis.

GII Input and Output

According to the GII framework, innovation has multiple facets, uses, or skills encountered with various input factors and output results. The GII has two broad categories: inputs and outputs, which assess the ability of innovation and the outcomes. It is necessary to calculate the critical metrics of a country's innovation system to examine it. These metrics have two groups: input and output indicators. The input indicators are R&D personnel, research and development, education, R&D expenses, science publications, technology exchange, and patents. The performance metrics are scientific publications, technology trade, and patents. R&D spending is one of the essential input metrics for assessing and evaluating the achievements of research and technology in various nations and regions. Second, R&D measures innovation capability and competitiveness. Besides that, human capital plays an integral part in technological and innovative research endeavors. Output indices, on the other hand, are divided into various groups. The percentage of hi-tech exports continues as a practical means of appraisal in overall export statistics. The learning experience is a primary benefit mentioned by engineers and scientists, and it is represented by participation in R&D practices. To measure a nation's accumulated expertise, the stock of hi-tech knowledge must be listed. Patents and patent applications are the most often used metrics in this respect (Usman and Liu 2015). The GII (Global Innovation Index) measures the success of a country in terms of scientific, technological, and innovative development. Three studies examined the relationship between the GII and the input and output of innovation in different countries. The researchers found that attempts made to increase innovation feedback are compensated with enhanced innovation outcomes. However, the direct result may not be immediate.

Methodology

Research Design

According to Grey (2014), the research design is the overall approach for linking research problems with relevant and attainable scientific investigations. Also, research design describes as three types: exploratory, descriptive, and explanatory. His designation is based on the study area's intent since each architecture has a particular ultimate objective. For example, the descriptive research design describes a circumstance, person, or occurrence or demonstrates how they are connected and generally happen. On the other hand, descriptive research cannot clarify why an incident occurred and are best suited for a comparatively recent or undiscovered research field. As a result, alternative study designs, including explanatory or exploratory approaches, are recommended where descriptive data are abundant. Exploratory research is carried out with little knowledge about a phenomenon or a topic that has not been well identified. The research's key objective is to investigate and explain the fall of Oman's ranking in GII. To do this, it draws statistical, quantitative findings and attempts to provide explanations for the existing association with qualitative research. As a result, the relevant research design is explanatory-descriptive, responding to the how and why aspects of the fundamental research problem, questions, and objectives.

Research Instruments (Interview)

Individual, face-to-face, and group interviews are all are types of interviewing, however owing to the spread of the Coronavirus, the discussion was facilitated via MS Teams (through video call). As planned, the researcher conducted online interviews with five knowledgeable specialists about Oman's decline in the GII ranking. The interview was straightforward and organized. This online interview has benefits over other data gathering techniques on cost and time saving because there is no need to drive and meet the interviewee face-to-face, and the requirement to plan appointment timings is easy and quick.

Research Instruments (Questionnaire)

The study's sample size is 204 respondents, based on a total population of 430. The survey was created with Google Forms and sent using WhatsApp and e-mails. It consists of 17 questions. The questionnaire includes questions regarding demographic profiles. In addition, there are Yes/No questions, multiple-choice questions, a Likert scale, and one open-ended question. The respondents were chosen based on judgmental technique, and they were from the public, private, and academic sectors, including those who attended the Oman National Innovation Strategy workshop. Also, public sector employees are assigned to the National Competitiveness office. The questions are related to the research's objectives one and four. The first question is about the demographic profile of the respondents. Furthermore, the remaining questions covered the GII's seven pillars and the level of confidence in Oman's performance. Finally, the questionnaire concludes with a series of open-ended questions concerning the factors contributing to the decline. The benefits of using a survey questionnaire are that this requires no money to float to respondents and would bring significant participation. Besides, with fast and flexible answers, participants' responses are saved immediately, and analysis and findings are generated automatically.

Data Analysis

To acquire primary data, the researcher used both qualitative and quantitative methods. According to the demographic profile of the questionnaire, male replies outnumbered female responses. However, the results were close regarding educational level, with most participants holding a master's degree. Furthermore, most respondents worked in the academic sector, with the public sector coming in second. This research has four objectives, and the researcher received numerous responses relevant to these objectives. The following are the main findings of the study:

- The research reveals that several factors affect Oman's GII ranking as per the interviews with the expert. The fundamental factors are aligned to the report's seven pillars. In several ways, the results from the interviews and the questionnaire were similar. The respondents in the interviews thought that the economy of Oman, which is dependent on oil prices and Covid-19, was one of the most critical factors contributing to the decrease. Furthermore, additional factors had contributed to this reduction, such as lack of data and the existence of obsolete data. The government also decreased funding on education and R&D, and many government institutions either failed to implement or just postponed new legislation. Furthermore, the research discovered through the questionnaire results that the respondents believed that many additional factors are connected to the decrease, such as the country's reliance on a rentier economy and the economy's constant influence by the global crisis and fluctuations in oil prices. Additionally, the market has not changed significantly, resulting in a lack of economic power, support for talented people and innovations, and insufficient government and foreign investments.
- WIPO's reports revealed weaknesses in several areas and identified concerns that were overlooked. The research found numerous complex issues that need to be investigated and solved after analyzing these reports, which experts confirmed in the interviews. Additionally, the study found that there are complex issues with collecting and updating data and applying new rules and policies. In terms of data, nine sub-indicators data were not provided to the WIPO, which affected the drop. Furthermore, the Sultanate has not updated the data of seven sub-indicators, confirming what one of the interviewees stated: they have a significant challenge in collecting information from government institutions due to lack of this data or being outdated.
- According to the study, this decline impacts government institutions, the Sultanate's performance, and investor and societal confidence. Some government institutions have launched initiatives to improve the Sultanate's performance ranking in the report. TRC organized workshops to promote awareness and assess the Sultanate's current situation, and they included decision-makers and the community as supporters of these initiatives. To centralize data collection for the center, the government delegated data collection through the NCSI, with the cooperation of several specialists from government institutions. Additionally, Riyada has made excellent facilities for small and medium-sized businesses such as deferring loans, reducing loans and some exemptions, and the Ministry of Commerce modify

internal and external investment policies. The study also discovered that more than 95 percent of respondents agree that government institutions have improved their policies as a result of the decline, and more than 93 percent agree that the Sultanate has succeeded in raising the Sultanate's level in the report, which is what has been observed in some sub-indicators. However, several factors are the major causes of the drop, including the spread of the Coronavirus, delays in adopting policies, and data availability.

- As per the study, 98 percent of respondents believe that the decrease influences public perception, and the majority (48.7 percent) have high confidence in the innovative performance of Omani institutions. It was shown that all interviewees also feel there is a significant impact on public perception. The study also discovered that the impact might be both positive and negative. If the results are negative or positive, the public will be affected. The public is engaged in the data collection, so they act as a promoter and marketer for the Sultanate both domestically and internationally and help to increase several sub-indicators in the report.

Conclusion

This study considered four objectives and questions into account. Furthermore, it linked to the GII report from many perspectives to investigate the influence of such reports on government institutions, society, and the country's overall performance. To conduct the investigation, the researcher interviewed five specialists from TRC, SQU, and National Competitiveness Office. In addition, a questionnaire was distributed to 204 respondents to address the research objectives and questions. Here, the researcher will report the outcomes that have been obtained for each objective.

Research Objective #1: To evaluate the possible factors that contributed to Oman's decline in GII.

The study concluded that the interviewees offered similar answers and linked the drop to various factors, including oil prices, Covid-19, R&D expenditure, data updating, data unavailability, and delayed legislation enforcement. There are also challenges with providing correct data, and not updating it is a critical contributor to the drop. In addition, government spending on education, research, development, innovation, and educational and industrial sector engagement has a detrimental effect on the decrease. The questionnaire responses were similar to the answers from the interviews; however, they highlighted that the country relies on a rentier economy and has not transformed its economy into a knowledge-based economy which affects by the crisis quickly and, the market has not evolved substantially and that there is weakness in economic power. Support for talented individuals and innovations and the inadequacy of government and foreign investments are also declining factors. Some have noted that the ICT sector's costs are high, which plays a role in societal engagement in this sector. According to WIPO (2019 and 2020) and TRC 2020, each pillar includes numerous factors (indicators) that can enhance or reduce a country's total score in GII. In the case of Oman, the most significant factors associated with the drop include company R&D spending, ease of getting credit, ICT services import, growth rate, high tech export, knowledge impact, and printing and other media manufacture. Furthermore, there are some missing and outdated data.

Research Objective #2: To investigate whether if there are any complex issues behind the decline.

The researcher received a response to the query only during the interview. The research concluded that the respondents believed that after releasing GII reports in 2019 and 2020, numerous complex issues appeared, including the lack of implementation of laws and police; and lack of appropriate marketing of the Sultanate both internally and externally, which stems from a lack of awareness of the significance of marketing to develop the country. Moreover, government policies have not been amended or updated, and the rest of the countries are developing their policies and laws to be adequately assessed in these reports. The most complex issue, according to the participants, is the availability and updating of data. The issue was not visible from 2013 to 2018; however, its consequences were revealed in two WIPO reports. The specialists encountered several challenges with the rest of the government institutions, including data delays, a lack of awareness of the needed data, incorrect data, and outdated data.

Research Objective #3: To analyze the consequences of this decline on policies implemented by Omani institutions and linked to the indicators and the action taken in response to the sudden decline.

As per the study, it is concluded that this decline has consequences on various government institutions. For example, TRC has launched several initiatives to raise public awareness, such as holding workshops to analyze the rapid drop in ranking. Furthermore, as one of the initiatives to improve innovative outputs in the report, TRC adopted the law of scientific and other specialized areas. Moreover, TRC, in collaboration with the National Competitiveness Office, visited several government organizations and decision-makers to encourage specialists to provide data and follow up on its updating. In addition, the government has made several efforts to improve Oman's ranking, including

centralizing data collection to the National Competitiveness Office, adopting a unified methodology for monitoring the performance and efficiency of various state institutions. Moreover, the methodology uses standardized performance indicators linked to five-year plans. It obliges the relevant institutions to provide valid and reliable data to the Center On-time to demonstrate the actual reality of the Sultanate's position in international reports and improve its position in international competitiveness and innovation reports.

Research Objective #4: To identify and evaluate the impact of this decline on public perception and their confidence level on innovation performance.

The study concluded that worldwide reports positively or negatively influence the country's performance and outcomes on society and perception. According to the survey findings, participants felt that these reports have a significant influence on society. If it is negative, the community will complain; if it is positive, the community will be optimistic. Therefore, according to experts, society plays an essential part in the report on GII. As the data collectors, they include the community in the surveys required by the organization. As a result, they play an essential role in raising the country's ranking and serving as community promoters of this report, expanding social awareness.

When many challenges must be addressed simultaneously, priorities must be established since public resources are limited. The researcher would like to offer suggestions about critical aspects relating to national engagement, high-level collaboration, and a transformational strategy.

- National engagement: The relevant authorities must develop a specific compact for innovation to fulfill Oman's 2040 vision. This compact applied within two years, and all government sectors must participate in developing it; encourages the presentation of new ideas and interest in these ideas, which will aid in developing national human resources in the field of innovation. In addition, this charter will help secure databases used to support innovation policies and research, the security of tools and information, and the provision of an appropriate environment for practicing innovative thinking, all of which will increase the number of patents and intellectual property. Furthermore, this charter would assist small and medium-sized businesses in implementing new technologies and will improve public and private sector services by using the latest technologies. Finally, it contains a list of metrics that the government undertakes to implement with the practical help of the people and stakeholders, such as the company and academics, and their implementation should be evaluated, as it will have a significant impact on the GII measures. Thus, the innovation compact will quickly remove barriers to innovative efforts, resulting in a more dynamic environment, although it does not result in the quick launch of new goods, services, and processes to produce appropriate turnover and revenues. Furthermore, eliminating or reducing barriers to innovation necessitates deliberate efforts and appropriate tools.
- High-level collaboration: It is essential to ensure good top-level coordination government to implement practical Science, Technology, and Innovation policies to increase Oman's economic growth and performance. As seen by the research's findings, there is a challenge in providing data. The researcher believes that a centralized electronic system should be developed within the last quarter of 2021 and the formation of a high-level committee to evaluate the challenges that those in charge of administering the system would confront. The committee establishes by the NCO and reports to the Minister's Cabinet on the progress of the committee's work and the level of involvement of specialists in government institutions in providing the needed data regularly.
- Transformational Strategy: The researcher suggests developing a multi-stage comprehensive, transformative approach that lasts for the third quarter of 2022. The Minister Cabinet must make an effort to apply this strategy. The first stage begins with identifying minor policies and initiatives that are worthwhile to pursue and will contribute to developing favorable attitudes toward change, especially among policymakers. The second stage will be further policy change influenced by bottom-up transformation, which will prepare the way for the third stage of policy reform. At this stage, the government is combining a short-term strategy focused on quick wins with a longer-term plan focused on fundamental transformation. The third stage will see the adoption of more sweeping changes. The GII is directly affected by these measures. All legislation relating to the GII and the remaining indicators will undergo fundamental revisions with long-term implications.
- Encourage innovation and entrepreneurship: Since innovation is the primary driver of the GII, one of the challenges is a lack of entrepreneurs with creative ideas who are ready to take risks. To encourage entrepreneurial creativity among students and entrepreneurs, the Ministry of Higher Education, Research, and Innovation, in collaboration with the Ministry of Education and Riyada, should implement several initiatives, such as training and support. For example, proliferating fab labs (small-scale workshops providing automated manufacturing) around the regions enables students and entrepreneurs to improve creative ideas and products. These labs must be built before 2024. Fab labs enable society to make their ideas to reality. They can build and maintain nearly anything using the available tools and a variety

of devices. It promotes the flow of new companies while teaching current entrepreneurs and students about the Lab's ability to produce innovative products and services.

Limitations

1. Lack of previous research on this topic, which has allowed for additional revision and analysis. The researcher discovered that studies on this topic do not exist, except for certain government records, which will challenge the researcher to obtain more information.
2. Respondents for statistical implication. The concern is that respondents cannot express their views, thinking they will be sharing is confidential.
3. Respondent can be biased, which affects the findings. For example, the respondent may likely be persuaded by one of the ideas, resulting in a more emotional response than realistic.
4. Time constraints can lead to inefficient work. Several factors, including the Coronavirus and lockdown and the months of Ramadan and Eid, have caused some delays in the study.

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