



INNOVATION PROGRAMME DRIVEN DEVELOPMENT IN THE ECONOMY: QUANTITATIVE APPROACHES

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ABSTRACT

Purpose: The purpose of this paper is to discuss and identify the similarities and differences between innovation programmes in developed and developing countries.

Methodology/approach: The research methodology uses a quantitative approach (survey).

Findings: The findings of this study indicate several similarities and differences in the successful implementation of innovation programmes worldwide.

Originality/value: This study makes a contribution towards knowledge about innovation programmes best practice in developed and developing countries, and adds value to practitioners such as government, funded organisations, institutions, and policymakers.

Paper type: Research paper

Keywords: Innovation, economic development, entrepreneurship, knowledge economy.

INTRODUCTION

International experience of developed and developing countries has shown the importance of innovation. Innovation is the heart of creating economies, increasing productivity and economic growth (Zuniga, 2016). Al-Mubarak et al. (2015a) indicated that innovation is a vital tool for economic development and job creation. A study by Bruni and Verona (2009), and García-Morales et al. (2008) showed that innovation can be considered as the key driver of the long-term success of the firm, and another study by the Organisation for Economic Co-operation and Development (OECD, 2005) focussed on innovation outcomes as long-term outputs to innovate products, services, and processes. The International Monetary Fund (IMF, 2016) demonstrated that innovation-driven economic diversification can obtain new processes, new products, high-tech sectors, and new organisations.

The objective of this paper is to discuss and identify the similarities and differences between innovation programmes. The structure of this paper is as follows: Section 2 provides a literature review of innovation. Section 3 provides the research methodology using an international survey as a quantitative approach. In Section 4, the authors briefly discuss the study findings of 86 innovation programmes based in developed and developing countries. Section 5 presents the study's conclusions.

LITERATURE REVIEW

In 2016, the OCED defined four types of innovation:

- 1) a product innovation presented a new or improved good or service;
- 2) process innovation presented new or significantly improved production or delivery methods;
- 3) a marketing innovation presented a new marketing method involving significant changes; and
- 4) an organisational innovation presented a new organisational method in business.

Another definition of innovation by Drucker (1985) defines innovation as the tool used by entrepreneurs to introduce something new to the existing realm and order of things.

Some literature focusses on how innovation is a powerful driver of our future growth (White House, 2010; EURP, 2010; EBN, 2010; EC, 2010; Eshun, 2009). The European Business and Innovation Network (EBN, 2016) demonstrated innovation into three groups: first, technological innovation (50%); second, non-technological innovation (30%); and third, non-innovation (20%).

Many studies have discussed that the innovation concept could be a driver of productivity through innovation (Bertrand and Schoar, 2003, Geroski, 1989; Geroski et



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al., 2009; Syverson, 2011). The study by Mohnen and Hall (2013) indicated the significant and positive link between innovation and productivity, and other studies show significant evidence from developed countries through fostering innovation (Hall and Sena, 2014; Raymond et al., 2015; Crespi and Zuniga, 2011, Masso and Vahter, 2008; European Commission, 2014; EBRD, 2014).

In addition, the evidence from developed and developing countries presented that management increased the level of productivity (Bloom and Van Reenen, 2007; Bloom et al., 2013a, 2013b). In addition, Mackey (2008) indicated the impact of managers on profitability and innovation (Galasso and Simcoe, 2011).

Innovation also presented a new market to improve the innovation performance through the survival of SMEs and growth (Hadjimanolis and Dickson, 2000; Blackburn et al., 2008). Furthermore, SMEs can identify job creation, which leads to economic growth (Birch, 1987; Acs and Armington, 2004; Audretsch and Keilbach, 2004). However, another study (Parker, 2001) suggested that SMEs can promote economic development and Huggins and Johnston (2009) indicated that innovation can provide knowledge networking, which leads to the growth of businesses. Rosenbusch et al. (2011) demonstrated the link between innovation and SME performance, and Freel and Robson (2004) show a positive link between innovation and growth.

The US report on the Global Innovation Index (Cornell University et al., 2015) provided an active tool for decision makers on innovation. The ranking of 141 countries used many innovation pillars to monitor innovation impact and policies. Table 1 shows the ranking of the top 20 developed countries and top five Gulf Countries Council (GCC) countries.

Five additional studies have suggested the positive impact of innovation programmes: first, the study by Al-Mubarak and Busler (2012a) demonstrated that innovation programmes are developed to accelerate successful entrepreneurial companies through a set of services and business support resources; second, a study by Al-Mubarak and Busler (2012b) has clearly demonstrated that innovation programmes provide support for innovation, entrepreneurship and technology commercialisation (IET) towards 21st century growth; third, a study by Al-Mubarak et al. (2013) presented that innovation is a long-term investment that establishes self-sustaining technology. It does this by speeding up successful innovation outcomes and technology commercialisation through the development of R&D to foster high-quality products; fourth, a study by Al-Mubarak et al. (2014) concluded that innovation indicators presented high ratings for all categories, such as culture, policy, economy and industry, averaging 90%, 90%, 90%, and 100%, respectively; the faith study by Al-Mubarak et al. (2015b) summarised that innovation programmes are vital tools for economic growth, knowledge, and technology transfer based on multiple indicators. These include six indicators: 1) creativity, 2) entrepreneurship, 3) survival rate, 4) job creation, 5) start-up companies, and 6) number of patents.



Table 1: Ranking of top 20 developed countries and top 5 GCC countries for Global Innovation Index in 2015

<i>Country</i>	<i>Ranking</i>
Switzerland	1
United Kingdom	2
Sweden	3
Netherlands	4
United States of America	5
Finland	6
Singapore	7
Ireland	8
Luxembourg	9
Denmark	10
Hong Kong (China)	11
Germany	12
Iceland	13
Republic of Korea	14
New Zealand	15
Canada	16
Australia	17
Austria	18
Japan	19
Norway	20
<i>GCC Countries</i>	
Saudi Arabia	43
United Arab Emirates	47
Qatar	50
Bahrain	59
Oman	69
Kuwait	77

RESEARCH METHODOLOGY

The research methodology used in this research paper is a quantitative approach in the form of a survey: a survey questionnaire is an appropriate tool for collecting quantitative data (Bryman and Bell, 2007). The investigation and analysis of literature is an accepted form of desk-based research that compares the works of different authors (Hart, 1998).

The survey consists of 16 questions; each question was developed through refining the relevant questions to reach the study objectives, and was then subjected to a descriptive analysis. SurveyMonkey, an online survey website was used as an Internet-based survey of innovation programmes, and was conducted with members of the National Business

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Incubation Association (NBIA), United Kingdom Business Incubation (UKBI), and the United Kingdom Science Park Association (UKSPA). Figure 1 presents the research design.

Among the sample of survey invitations, 101 innovation programmes were emailed to NBIA, UKBI, and UKSPA members through the SurveyMonkey website. Of the total, 15 were returned as undeliverable, leaving a sample frame of 86. The total number of survey responses was 86 - representing a response rate (RR) of approximately 85%.

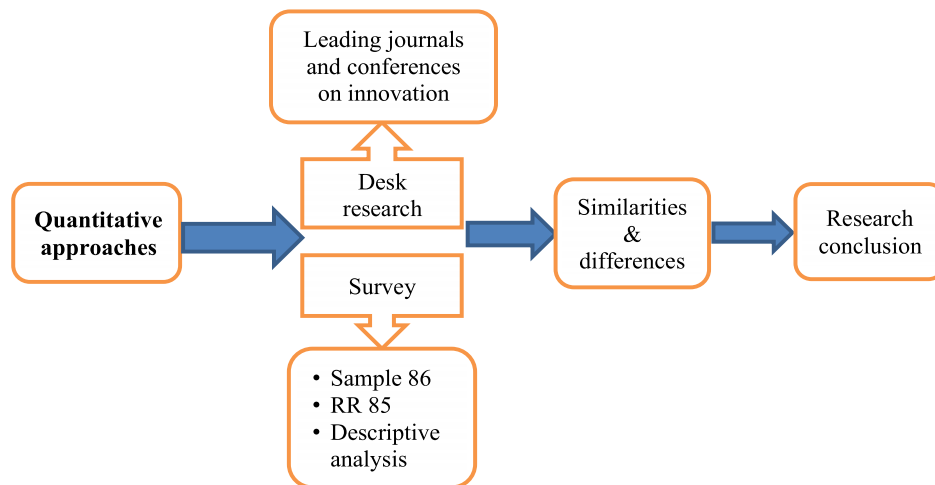


Figure 1: Research methodology

Source: DeVised by authors

FINDINGS AND DISCUSSIONS

A total of 101 survey invitations were emailed to NBIA, UKBI, and UKSPA members via the SurveyMonkey website. The total number of survey responses was 86, representing a response rate of about 85%. SPSS was used for statistical analysis, and each question was also used in a descriptive analysis.

Table 2 provides the highest response of 86 innovation programmes in the survey sample that are based on developed and developing countries. More than half (50%) of developed and developing countries' innovation programmes presented several characteristics: first, innovation strongly agrees in creating an entrepreneurial climate (65%). Second, it was agreed that innovation added creativity, and leads to inclusive growth and smart growth (55%). Third, it was strongly agreed that innovation helps sustainability growth and innovation, and allows the conversion of the global idea to markets (52%). Fourth, innovation leads to new services and long-term investments (51%). Fifth, the rate of fostering entrepreneurship presented as the market rate (70%). Sixth, innovation leads to new sectors (56%).

Many characteristics presented in fewer than half (50%) of innovation programmes in developed and developing countries; this indicated a low rate of licensed intellectual property (47%), a low rate of patents and innovation leading to technology transfer (44%), a poor rate of science parks (40%), innovation leads to new products (47%), and an active role of cooperation of R&D (33%).

Table 2: Highest response of survey for innovation programmes

No.	Question	Answer option	Response %
1	The rate of patents	Low rate	44%
2	The rate of licensed intellectual property	Low rate	47%
3	The innovation added creativity	Strongly agree	55%
4	The innovation helped sustainability growth	Strongly agree	52%
5	The innovation created an entrepreneurial climate	Strongly agree	65%
6	The innovation converted the global idea to market	Agree	52%
7	The innovation supported inclusive growth	Agree	55%
8	The innovation led to smart growth networking	Agree	56%
9	The innovation led to new products	Agree	47%
10	The innovation led to new services	Agree	51%
11	The role of science parks	Poor	40%
12	The innovation led to technology transfer	Modest	44%
13	The rate of fostering entrepreneurship	At market rate	70%
14	The innovation created new sectors	Agree	55%
15	The role of cooperation of R&D	Active	33%
16	The innovation is a long term investment	Agree	51%

Source: Devised by authors

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Table 3 provides the lowest response of 86 innovation programmes based on developed and developing countries. The majority of developed and developing countries' indicated a disagreement that innovation added creativity (1%), innovation converts the global idea to market (9%), innovation supports inclusive growth (3%), innovation leads to smart growth and networking (4%), innovation is a long-term investment (10%) and innovation creates new sectors (19%). Most innovation programmes presented strongly disagreed that innovation leads to new products and new services (12%). Innovation led technology transfer was indicated as poor (25%), there was a low rate of fostering entrepreneurship (12%), a high rate of patents (19%), and a high rate of licensed intellectual property (18%), active role of a Science Park (14%), and role of cooperation of R&D (22%). It was agreed that innovation helps sustainability growth (48%).

Table 3: Lowest response of survey for innovation programmes

<i>No.</i>	<i>Question</i>	<i>Answer option</i>	<i>Response %</i>
1	The rate of patents	High rate	19%
2	The rate of licensed intellectual property	High rate	18%
3	The innovation added creativity	Disagree	1%
4	The innovation helped sustainability growth	Agree	48%
5	The innovation created an entrepreneurial climate	Disagree	2%
6	The innovation converted the global idea to market	Disagree	9%
7	The innovation supported inclusive growth	Disagree	3%
8	The innovation led to smart growth networking	Disagree	4%
9	The innovation lead to the new product	Strongly Disagree	1%
10	The innovation led to new services	Strongly Disagree	1%
11	The role of science parks	Active	14%
12	The innovation led to technology transfer	Poor	25%
13	The rate of fostering entrepreneurship	Low rate	12%
14	The innovation created new sectors	Disagree	19%
15	The role of cooperation of R&D	Present	22%
16	The innovation is a long term investments	Disagree	10%

Source: Devised by authors

Table 4: Modest response of survey for innovation programmes

<i>No.</i>	<i>Question</i>	<i>Answer option</i>	<i>Response %</i>
1	The rate of patents	Medium rate	37%
2	The rate of licensed intellectual property	Medium rate	35%
3	The innovation added creativity	Agree	43%
4	The incubator helped sustainability growth	Agree	48%
5	The innovation created an entrepreneurial climate	Agree	33%
6	The innovation converted a global idea to market	Strongly agree	39%
7	The innovation supported Inclusive growth	Strongly agree	44%
8	The innovation led to smart growth networking	Strongly agree	41%
9	The innovation led to new product	Strongly agree	46%
10	The innovation led to new services	Strongly agree	43%
11	The role of science parks	Present	24%
12	The innovation led to technology transfer	Strong	32%
13	The rate of fostering entrepreneurship	Below market rate	18%
14	The innovation created new sectors	Strongly agree	26%
15	The role of cooperation of R&D	Very active	25%
16	The innovation is a long term investment	Strongly agree	40%

Source: Devised by authors

Table 4 shows that less than half (50%) provided a modest response of developed and developing countries' innovation programmes which presented strongly agree that:

- 1) innovation supported inclusive growth and new services (41%);
- 2) innovation converted global ideas to market (39%);
- 3) innovation led smart growth (43%);
- 4) innovation led new products (46%);
- 5) innovation led technology transfer (32%);
- 6) innovation created new sectors (26%); and
- 7) innovation is a long term investment (40%).

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Three characteristics of innovation programmes demonstrated agree responses; these included innovation added creativity (43%), innovation helped sustainability growth (48%) and created an entrepreneurial climate (33%). However, the rate of fostering entrepreneurship was below market rate (18%), the medium rate of patents (37%) and medium rate of licensed intellectual property (35%), very active role of science park (24%), and role of cooperation of R&D (25%).

Based on an in-depth analysis of the survey results, the identification of similarities and differences in innovation programmes in developed and developing countries can be presented as follows:

- 1) innovation creates an entrepreneurial climate, and fostering entrepreneurship is similar in developed and developing country programmes where entrepreneurship is one of the key factors of economic diversification, employment creation and sustainable growth. In addition, the results of the survey indicates more than half entrepreneurial climate (65%) and fostering entrepreneurship (70%);
- 2) the similarity of innovation programmes created new services, new sectors, new products and added creativity towards economic development in both developed and developing countries. Furthermore, the results of the survey indicated more than half of (50%) innovation programmes in developed and developing countries created new services, new sectors, added creativity and new products; and
- 3) most of the innovation led to smart growth (56%), inclusive growth (55%) and sustainable growth (52%) (see Table 5).

In addition, there are three differences in innovation in developed and developing countries. First, the role of cooperation of R&D differs from developed countries to other developing countries. However, the results of the survey show most developed and developing countries are above a third (33%). Second, the role of science parks is present in several countries, of which the results of the survey show most developed and developing countries presented a highest response (40%). Third, there is a low rate of patents in developed and developing countries where the results of survey indicated below half (44%) (see Table 5).



Table 5: Similarities and differences of innovation programmes in developed and developing countries

<i>Developed and developing countries</i>	
<i>Similarities</i>	<i>Differences</i>
1) Innovation creates an entrepreneurial climate and high rate of fostering entrepreneurship	1) The role of cooperation of R&D
2) The innovation created new sectors, new services, new products and added creativity	2) The role of science parks
3) Innovation leads to smart, inclusive and sustainable growth	3) Rate of patents

Source: Deviced by authors

CONCLUSIONS

Innovation is a vital factor for economic diversification. Also, it is well known that innovation is the success driver of our future growth, economic growth, and job creation. The authors in this paper have highlighted the importance of the similarities and differences between the innovation programmes in developed and developing countries. This paper is based on a quantitative approach using an international descriptive survey, with a sample of 86 and RR of 85%. Also, the authors have identified the 16 key indicators that were used through the international survey, as mentioned in Section 4.

The research findings indicated three similarities:

- (1) innovation creates an entrepreneurial climate and fosters the entrepreneurship; the results of the survey present more than half for the entrepreneurial climate (65%) and fostering the entrepreneurship (70%).
- (2) the similarity of innovation programmes created new services, new sectors, new products and added creativity towards the economic development; the survey indicated more than half (50%) of innovation programmes in developed and developing countries created new services, new sectors, added creativity and new products.
- (3) Most of the innovation leads to smart growth (56%), inclusive growth (55%), and sustainable growth (52%).

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Moreover, the research findings indicated three differences:

- 1) the role of cooperation of R&D differs from developed countries to other developing countries; the results of the survey show that most developed and developing countries are above a third (33%);
- 2) the role of science parks is present in several countries; the results of the survey show most developed and developing countries presented highest response (40%);
- 3) a low rate of patents, where the results of survey indicated below half (44%).

In conclusion, this study has clearly stated that innovation programmes act as a powerful tool for economic development, which leads practitioners, such as policy makers and governments, towards successful implementation.

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BIOGRAPHIES

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