

The factors driving and accelerating the adoption of innovation: highlighting China's experience in tackling the spread of the Coronavirus COVID19

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Abstract:

The purpose of this paper is to present the factors driving and accelerating the adoption of innovation by highlighting China's experience in tackling the spread of the Coronavirus COVID-19. A literature review of types, degrees and drivers for innovations was conducted. We adopt descriptive research by using a specific method for the review, the authors selected a set of papers from various scientific databases as a study sample, which covers the knowledge domain object of this study. The findings show that there are several factors driving and accelerating innovation according to the sector and field of activity. The result shows that there are other factors specific to the country of China that promote innovation, which called "3+6+7" reform agenda

Keywords: Innovation; Drivers; Accelerators; COVID-19 Pandemic; China.

Jel Classification Codes : O30; O31; O33; O36; O39; O53; H12.

الملخص:

الهدف من هذه الورقة هو تقديم العوامل التي تدفع وتسرع تبني الابتكار من خلال تسليط الضوء على تجربة الصين في معالجة انتشار فيروس كورونا COVID-19. تم إجراء مراجعة الأدبيات لأنواع ودرجات ودوافع الابتكارات. اعتمدنا الدراسة الوصفية باستخدام طريقة محددة للمراجعة، وقد اختار المؤلفون مجموعة من الأوراق من قواعد بيانات علمية مختلفة كعينة دراسة تغطي موضوع مجال المعرفة في هذه الدراسة، ووجدنا أن هناك عدة عوامل تدفع وتسرع الابتكار حسب القطاع ومجال النشاط. أظهرت النتيجة أن هناك عوامل أخرى خاصة بدولة الصين تعزز الابتكار، والتي تسمى أجندة الإصلاح "3 + 6 + 7"

الكلمات المفتاح: ابتكار؛ الدوافع، مسرعات، جائحة كوفيد -19، الصين.

تصنيف JEL: O30; O31; O33; O36; O39; O53; H12.

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1. Introduction

On December 31, 2019, Chinese governments announced to the World Health Organization (WHO) the first case of the coronavirus COVID-19. After a month, it became a Public Health Emergency of International Concern (WHO, 2020). Due to COVID-19, all of the health care organizations, industry partners, and government agencies worldwide have quickly come together to propose solutions to the pandemic challenges and especially in the case of social distancing. During this period, several innovations were introduced and adopted in China to reduce the spread of the COVID-19 pandemic: digital health care solutions (Li et al., 2020) (Chesbrough, 2020), Construction solutions (China constructed a 1000-bed hospital in 10 days) (Sophia Ankel, 2020) e-commerce (Yonggui Wang et al., 2020), tracing the patient (Cohen et al., 2020), and others. Innovation has become the core of the world's attention. Prior research shows that innovations could help firms (Fang et al., 2020) to survival (Hivner et al., 2003) to competing in a product market (Bento, 2020), and contributing value to the sustainable development (Dogaru, 2020). Beyond all these developments related to innovation, there are factors driving and accelerating the innovation and adopting it as a future policy to find quick solutions to current or future problems and crises. The literature on drivers and accelerators of innovation, which attempts to understand different factors of adopting innovation: policy support, proaction to challenges, cooperation and capacity of technology (Nevzorova & Karakaya, 2020), organisational structure (Hivner et al., 2003) . The Cross-Sector collaboration between the private and public sector (Cankar & Petkovšek, 2013). These factors vary by domain and sector: in mining (Gruenhagen & Parker, 2020), sustainable development (Dogaru, 2020) and marketing field (Yonggui Wang et al., 2020).

Based on the various previous factors that drive and accelerate the innovation process, all kinds of innovations, and an increase over the overall innovations that the world witnessed during the Covid-19 pandemic, the experience of China through the presented innovations is the pioneer in trapping the pandemic. To find out the secret of the success of the Chinese experiment, the following question can be asked: ***what are the major success factors that drive and accelerate the adoption of innovation in China and especially when the types of innovation gave very satisfactory results in contributing to tackling the spread of the pandemic Covid-19?***

In this paper and following the introduction, we present in the second section the theoretical background of innovation. In the third section, the data and methods of the empirical study are presented, followed by the empirical analysis and results in the fourth section. The final section draws conclusions about the results and future research avenues.

2. Theoretical and conceptual framework

Back to the 1950s, J.A.Schumpeter, who is the founder of the economic theory of innovation, understood innovation very widely as a product-related, procedural and organisational changes that need not ensue from new scientific findings but may come as a new mixture of already existing technologies or their application in a new context In addition to technical and technological changes and improvements (Ondrej, 2014) (Lemanowicz, 2015).

The Austrian economist "Schumpeter" comprehends innovations as:

- The introduction of a new product or a new quality of a product.
- Opening a new market, regardless of whether that market already exists.
- Introducing a new method of production.
- The implementation of a new organization of industry, such as the creation or destruction of a market monopoly.
- Discovering a new source of supply of primary inputs such as a raw materials and intermediate inputs (Ondrej, 2014).

In 1960, the term innovation is related to manufacturing in developed countries, as it was based on the technological field, implicated prior research and development department and incubated by large corporation (Edwards-Schachter, 2018). Through this, innovation is a source that achieves organizational competitive advantage and is found important for organizational survival (Reiter-Palmon, 2016). In addition to this definition, the innovation cope with modern societal challenges, such as environment, food security, healthcare (University of Cornell et al., 2019).

Reviewing the literature and according to innovation system theory, innovation is the outcome of a complex combination of relationships between the ecosystems actors that includes companies, universities, and research institutes (Böhmer & Lindemann, 2015).

According to Oslo Manual, an innovation is the application of a new or modified product, or process, a new marketing method or a new organisational method in business practices, external relations or workplace organisation (Fred Gault, 2018).

2.1. Benefits of innovation for business

In the literature review, the innovation offered a various benefits to business in order to maintain productivity, growth and profitability in a competitive business environment (Moroni et al., 2015) with a change in market behavior. The benefits of innovation are given below:

-Increase sales and customer relationship: If the organization invests in innovation, customers will notice and appreciate the additional value that the organization provides them and which translates into more sales.

-Reduce waste and costs: Innovation can support the organization to reduce waste in business that can create a plenty of benefits such as lower costs, better profits margins, improved customers service and competitiveness (BDC.ca, 2016)

-Increasing Market Share: Innovation is one method by which an organization can increase market share. When a company introduces to the market a new technology that its competitors have not yet introduced, consumers who want to own the technology buy it from a company, even if they had previously worked with a competitor (Kramer, 2019).

-Improve employee relations: An innovative workplace is inspiring for staffs in the same organization. To be an industry leader should reduce workplace turnover and boost productivity (BDC.ca, 2016).

2.2. Types of innovation.

Discussing the definition of innovation above, Gault presented four types of innovation (Fred Gault, 2018) (Fred Gault, 2015)(F Gault, 2014) according to the classification of “Oslo Manual” in the field of measurement and evaluation of innovation activities from OECD member states (Eurostat, 2005).

A **product innovation** is a new or improved product, with respect to its characteristics or proposed uses, made accessible to eventual consumers (Fred Gault, 2018). Different studies proposed the product innovation process (Xie et al., 2019) (Yufang Wang et al., 2019)(Najafi-Tavani et al., 2018) (Mergel et al., 2018) and especially in sustainability-oriented ventures (Keskin et al., 2020). Keskin, Wevers and Brezt conceptualized a three constructs of the product innovation process in sustainability-oriented ventures: value propositions, design experiments and stakeholder interactions.

An **organisational innovation** is the implementation of an original or significantly changed organisational method in the business practice, workplace organization or external relations of the institutional unit (Fred Gault, 2018). The process of organisational innovation rely on different determinants such as leadership, organizational culture, internal organizational properties, external environmental pressures, and organizations' general characteristics for instance the size or the age (Laurett & Ferreira, 2018)(Jaskyte, 2018)(Ibrahimov, 2018)(Shin & Choi, 2019)

A **process innovation** is the application of a new or meaningfully delivery process or improved production. This contains several significant changes in inputs as well as the infrastructure within the organisational unit and techniques.(Fred Gault, 2018). the process innovation includes the new or significantly improved equipment, software in additional support activities, such as accounting , computing and maintenance (Ondrej, 2014).

A **marketing innovation** defined as the improvements in product design (such as packaging food, beverages and detergents), placement, promotion or pricing methods (Naidoo, 2010). Also the marketing innovation is the process to involving new or significantly improved marketing methods in the goal of creating superior customer value by using their resources to meet customer's demands

(Yonggui Wang et al., 2020). a marketing innovation is the method of promoting products of the organisational unit.(Fred Gault, 2018).

In addition to the above and due to literature review, each of the Martin, Gustafsson and al introduced a special element to the types of innovation, which is "**service innovations**" who is related to reorganization the service, distinguishing the service from competitors, unlimited customer assistance or contributing to the experience (Martin et al., 2016). Consumer experiences are associated with innovative service because the consumer is considered as a service innovation co-creators (Vakulenko et al., 2019).

2.3. Degree of innovation.

Another different element is the degree of innovation. Schumpeter emphasized in his definition of innovation that the relevant sector must be modernized, so that radical innovations play a fundamental role in economic development according to the Schumpeter's theory. This opinion relates to the classification of innovations according to the degree of modernity into the followings point.

A **radical innovation** which represent the introduction of revolutionary new technologies, but also considerable uncertainty for the business model and the whole firm (Ondrej, 2014). Additionally, radical innovation is the creation of innovative behaviour that involves continuous development, and this allows to achieve unprecedented adjustments or performance features (Leifer et al., 2000). In the era of the knowledge economy, radical innovation has become the most strategically desired method of innovation for organizations or innovators (Zhao et al., 2020).

An **incremental innovation** refers to relatively minor modifications to existing products on the market for example small changes in the design or new appearance of the product, technology used, launch of a new product line, and extensions of new company lines but not new to the market (Lennerts et al., 2020a). Several studies concerned with the performance of radical innovation and incremental innovation (Lennerts et al., 2020b)(Johansson et al., 2019)(Ringberg et al., 2019)(Guisado-González et al., 2016)(Hernandez-Espallardo et al., 2012)(Arnold et al., 2011)(Un, 2010) (Yalcinkaya et al., 2007)(Corso & Pellegrini, 2007)(Atuahene-Gima, 2005).

A **rationalisation innovation** is the primary factor for regional development, which is a realistic problem that discusses sustainable innovation in the system of rational innovation (YANG Jian et al., 2010). Rational innovation includes the prevention and elimination of production losses though using present business elements optimally (Ondrej, 2014).

Disruptive innovation theory was firstly proposed by Christensen in his famous book *The Innovator's Dilemma*. He initially described a concept of disruptive technology (Christensen, 1997).(Christensen, 2013). He explored how modern technologies outperform those in the market. In his seminal book titled *Disrupt You!: Master Personal Transformation, Seize Opportunity, and Thrive in the Era of Endless Innovation*, (Jay, 2015) describes the unique method and techniques he has used to create new markets and expand established businesses. According to Markides (2006), Christensen stressed that disruptive innovation can be technological and also in business models and in product innovations (Markides, 2006).

In *The Innovator's Solution: Creating and Sustaining Successful Growth*, both of Christensen and Raynor enlarge the idea of disruption, explaining how companies can and should become disruptors themselves.(Clayton M.Christensen & Raynor, 2013). The above book listed pieces of advice on the business decisions decisive to reaching disruptive growth and recommended procedures for developing disruptive growth engine.

2.4. The factors driving the adoption of innovation

"Everyone knows that innovation is a central business necessity and companies that don't innovate, die"(Sivam et al., 2019). Its means that innovation is essential to survive in competitive environment, but innovation management depends from creating and managing interfaces according to Caraça and al (2007), such as: technological cooperation, technological awareness, new users, intellectual property, innovation friendly governance, monitoring and forecasting, weak signal analysis, knowledge management and organisational capabilities.(Sivam et al., 2019). It is important for the quality and innovation potential of a firm that it achieves a high level of

innovation in the following areas of its management: Business and marketing level, technical and technological level including R&D, logistics level, Human resources, external resources, economic level including financial resources, Management.

A number of studies in different school of thoughts have worked to determine which factors driving, facilitating and accelerating the adoption and the diffusion of innovation. All of these variables take innovation forward. This indicates that drivers of innovation might be at variance through organizations (Size, Field) and sectors (Private and public). To achieving this explication, the following paragraphs describe the variables of innovation according to the nature of the institution as well as the nature of the field in which it is active.

The process of acceptance of an innovation eventually among members of a social system is called the *diffusion of innovation*. The firms intend to develop innovations that can be used at a higher rate, in order to ensure greater market shares and high gains. The reason is due to the spread of technologies faster and the shortening of product life cycles compared to the past. (Jahanmir & Cavadas, 2018)

Mische (2001) emphasized the importance of facilitating the innovation diffusion process that's also supported in the relevant literature. He observed that high performance firms share five characteristics that specify their undertaking to facilitating the diffusion of innovation.

- Firms have adopted innovation as a way of life.
- They have leaderships that promote innovation and develop a creative and collaborative learning ecosystem.
- Firms hire, support, and desire innovative employees.
- They appreciate and compensate creativity.
- They let answers and results evolve toward a general goal, without prejudice to prior answers. (Hivner et al., 2003)

Akenroye (2012) through *the Innovation Journal: The Public Sector Innovation Journal*, classified the factors driving innovation to factors specific to the public sector and other factors specific to the private sector. These factors are summarized in table 1, including the notes of (Clausen et al., 2020; Daglio et al., 2014) and (Agolla & Lill, 2014)

Table 1. Factors driving innovation in the public and private sector

Factors driving innovation in the public sector	Factors driving innovation in the Private sector
- Increasing demand on public services. - Recession driving to tightening of public finance. - Long term and pressing challenges. - The accumulation of persistent problems without known pathways to solution. - Organization size. - External knowledge. - Organization capacities (sourcing, exploiting, sharing). - Implementing political and legislative actions. - Human Resource Management (a specially Pay systems).	- Changes in consumer needs. - Technological changes. - Change in operating environment - Changing nature of competition. - Collaboration, partnerships and networking.

Source: Adapted from Demircioglu and al (2019), *Intensity of Innovation in Public Sector Organizations:*

The Role of Push and Pull Factors, Public Administration, page: 03-07. Daglio and al (2015), *building organisational capacity for public sector innovation, background paper prepared for the OECD Conference "Innovating the Public Sector: from Ideas to Impact"*, page: 05-17. (Agolla & Lill, 2014). Akenroye (2012), *Factors influencing innovation in healthcare: a conceptual synthesis, The Innovation Journal: The Public Sector Innovation Journal*, page: 06.

In addition to the previous segmentation of the factors driving innovation in both the public and private sectors, researchers have also suggested as drivers for innovation a firms, universities,

research institutions and regulators (Agolla & Lill, 2014). Among the significant drivers for innovation, the *project Publin* (Program in the Nordic Public Sector) outlined a particular concern to:

- *Problem-oriented drivers*: In order to find solutions to specific problems, individuals resort to innovation.
- *Non-problem oriented drivers*: In the absence of problems, individuals can suggest innovative solutions to a better situation.
- *Political push*: Change requires strong political will.
- *Enlargement of a culture of revision*: the evaluation of practices may stimulate innovation.
- *The implementation of the policy measures* aimed at funding and fostering innovation by the authorities in goal to Support mechanisms for innovation.
- *Capacity for innovation*: Sometimes public officials have high levels of professional expertise and creativity in problem-solving.
- *Competitive drivers*: Performance targets support the adoption of innovative approaches.
- *NGOs and private companies*: The public institutions can adopt the models developed by NGOs and private companies.

To achieve these above factors, the government need to address four sections who are suggested by the OECD¹ Observatory of Public Sector Innovation:

- *People matter*: Invest in human as the catalysts of innovation. This includes developing the cultural, motivations and measures to facilitate new ways of working.
- *Working together*: providing the information and resources available for innovation, sharing risks in order to promote new organisational structures and partnerships.
- *Knowledge is energy*: facilitate the free flow of information, data and knowledge across the public sector and use it to respond creatively to new challenges and opportunities
- *Rules and processes to support*: Create a balance between both internal rules and processes on the one hand, and risk alleviation capabilities on the other, with the need to protect resources and enable innovation (OECD Observatory of Public Sector Innovation, 2017).

All previous studies focused on factors that driving the innovation in the public and the private sectors, provided that there is coordination between them (Cross-Sector collaboration) in order to respond quickly to the needs of society in several fields (Cankar & Petkovšek, 2013).

The innovation has progressively been applied to industry, agricultural, international development, education system, and public health. Supporting the notes of Mische (2001), in the UK as an example, the adoption and diffusion of innovation in the healthcare field is facilitated by the following institutions (Akenroye, 2012):

- National Institute for Health and Clinical Excellence (NICE).
- Social Care Institute of Excellence (SCIE).
- NHS Technology Adoption Centre.
- NHS Institute for Innovation and Improvement.
- Commissioning for Quality and Innovation (CQUIN).

In other countries, governments who support innovation can create institutions that drive the public sector to adopt innovation (OECD Observatory of Public Sector Innovation, 2017), for example: Innovation Lab (In Chile, France and Denmark), Performance Hub (New Zealand), and Open Government team (Germany).

After reviewing a number of factors that encourage innovation, mentioned above, and in light of COVID-19 crises, the next sections will discuss the following question: Are there other factors that driving the spread of innovation during the crisis of COVID-19, especially in China?

3. Methodology

A broad review was conducted of publishing articles relating to the drivers and accelerators of innovation through China's experience in tackling the spread of the COVID-19. The aim was to select and analyse relevant papers were sourced by searching databases such as Science Direct,

¹ OECD : The Organization for Economic Co-operation and Development.

Emerald Insight, Google Scholar and Wiley Online Library. The key words used for the literature search were Innovation, innovation drivers, innovation accelerators, innovation adoption, innovation & Coronavirus COVID19, innovation & China, and innovation & China & COVID-19. The data was conducted from January 2020 to Jun 2020.

More than 382845 articles were collected from various scientific databases as a study sample. The country of China was chosen as a case study for a number of reasons, the most important of which is the beginning of the emergence of the Covid-19 pandemic, and how China has succeeded in proposing innovative solutions to limit the spread of the pandemic.

The methodology of this paper is structured as follows. Firstly, we diagnostic a number of statistics for the articles published in the various scientific databases using the keywords mentioned earlier. Secondly, we present a different examples of innovation developed in China and we discuss our findings with particular emphasis on drivers, accelerator of innovation in China during Covid-19 pandemic. Finally, we outline some suggestions for future research.

4. Results and discussion.

4.1. Research topic exploration: through scientific databases

Through this study, we provide a description and an evaluation of the current obtained articles. As highlighted in Figures 1-2-3-4-5-6-7, the literature review shows to be quite dispersed in several publications, so that the articles are the top in terms of number of publications compared to scientific books and other publications, some of which contain interdisciplinary topics.

Figure 1.

The number of articles according to scientific databases and the nature of the work published: Research word "innovation"

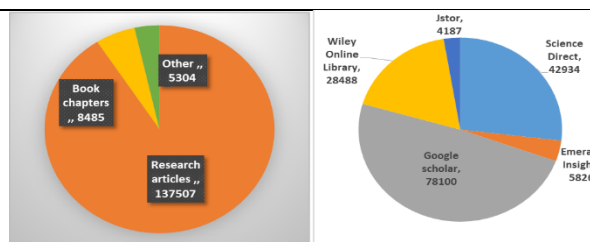


Figure 2.

The number of articles according to scientific databases and the nature of the work published: Research word "innovation & Drivers "

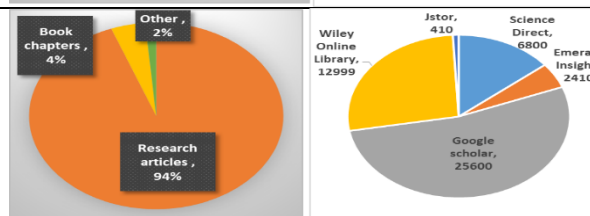


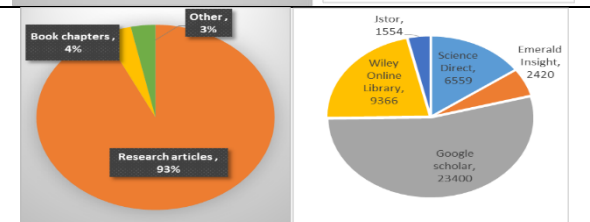
Figure 3.

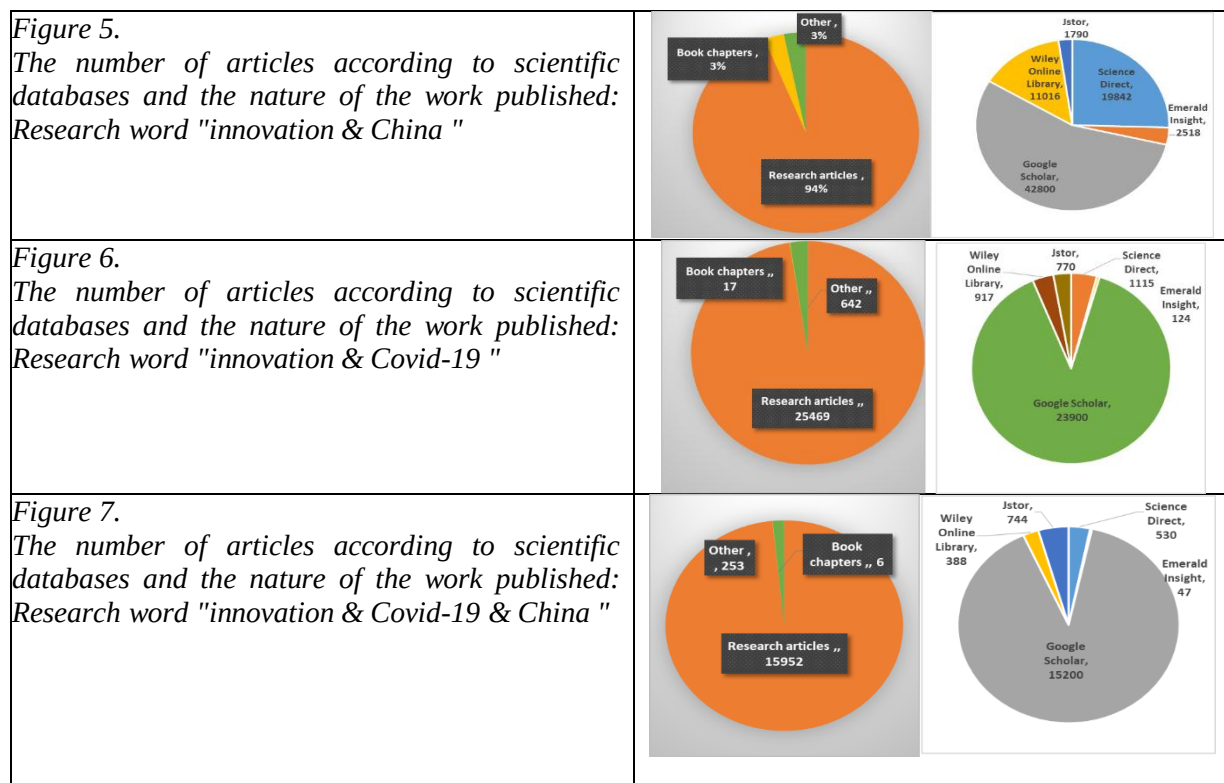
The number of articles according to scientific databases and the nature of the work published: Research word "innovation & Accelerators "



Figure 4.

The number of articles according to scientific databases and the nature of the work published: Research word "innovation & Adoption"





Source: Own analysis. Adapting from: www.sciencedirect.com, <https://www.emerald.com/insight>, <https://scholar.google.com>, <https://onlinelibrary.wiley.com>, www.jstor.org, consulted between May 2020 to Jun 2020.

As highlighted in Figure 1, the term “Innovation” was used in more than 159535 studies, estimated at 91% scientific articles, 6% books and 1% others publication. As for mixing the two terms “Innovation and Drivers”, the results showed that 53% of publications is in Google Scholar, 27% in Wiley Online Library, 15% in Science Direct, 5% in Emerald and 1% in Jstor database. These results showed in Figure.2, indicated the continuous interest of researchers in the factors that driving innovation. When we examine the Fig.3, we can see that Wiley Online Library ranked first in the based research string “Innovation” and “Accelerators” with 55% followed by Google Scholar, Science Direct and Emerald Insight. Through these results we supposed that researchers gave fewer interests to the factors of accelerating the innovation than the factors of driving innovation. Otherwise, the results of the combination of “innovation” and “adoption” were close to the results of the combination of “innovation” and “Drivers” presented in Figure4.

The case study in this paper is China. In figure 5, the results presented more than 77966 publications during 2020, 94% was in research articles, 3% in book chapters and 3% in other publications.

There are a huge numbers of publication in matching the terms “Innovation” and “Covid-19” as pandemic. We found 26826 scientific publication including 89% publications in Google Scholar, 4% publications in Science Direct and the rest between 3% in Wiley Online Library, and Jstor. Finally, as the last combined terms “Innovation” and “China” and “Covid-19”, we recorded 16909 scientific publications including 94% as a research articles and 06 books and 253 as others publications. These results are shown in Figure 07.

The diagnostic results in scientific database engines showed a set of points, the most important are: Academics' interest in the term innovation during the year 2020, and this is a record period (06 months since January 2020). Through the provided statistical survey, this paper explained the importance of this study.

4.2. A review of some Chinese innovations under the Corona Covid-19 pandemic crisis.

In 2019, China ranked 14th in the global innovation index (54.82 as a score) comparing the last year that It rose by three degrees(University of Cornell et al., 2019). The second step is to extract the

innovations in various fields developed in China during the Covid-19 pandemic. We can cite the following points:

- With the support of artificial intelligence, the “SenseTime” and “Megvii” firm developed a system capable of performing facial recognition, analyzing body temperature and detecting the fever within 0.3 C exactness, checking that a mask is being worn and that it is worn properly, in goals to diminish the spread of the coronavirus Covid-19. This system was installed in streets, building and grocery (Yasheng Huang et al., 2020).
- Local governments created the algorithms behind the rating on apps hosted by China’s largest tech companies: “Alibaba Group”, “Tencent Holdings”, and “Baidu Inc”. The app generate a QR code including a basic information like name, national identity card phone number. According to the available data, the program issues 3 colors, depending on the circumstances. Green indicates freedom of movement without conditions, while yellow indicates a quarantine procedure for 7 days, and the last color, which is red, indicates that its owner remains in quarantine for 14 days (Naomi Xu & Clay, 2020).
- “JD.com” company developed semi-autonomous robots to shipment of medical equipment to hospitals and people in quarantine. In Wuhan, the company was able to fill 70% of its orders by robot and declared a 10% increase in sales between January and March 2020 (Adrien, 2020).
- Implantation of marketing innovation tools is relatively quickly and specially can be adapted to require the new and changing of consumers’ psychology and behaviors during home isolation (Yonggui Wang et al., 2020).
- In medicine, and during the Covid-19 pandemic, the only orthopedic robot “TEANA” can accomplish spinal full-segment, pelvic and limb fracture surgery, the robot has performed more than 8000 operations across China (Teller Report, 2020).

4.3. Promoting innovation in China: new drivers of growth through the “3+6+7” reform agenda.

Before discussing the new drivers of innovation in China, we take a part in highlighting the seven advantages that allow China to innovate and make it the engine of economic growth:

- First is the scale and wide-ranging abilities of its industrial sector which are leading the point where products can be reverse-engineered and new product lines brought into large scale production. The co-location of R&D and manufacturing in China’s leading industrial centres that provide the basics of a robust innovation system.
- Second is the increasing attention to the quality education system in at all levels. This attentiveness can boost to innovativeness and productivity.
- The third: Venture funds and China’s private and state owned banks are supporting innovative firms, but a gap in funding it is also remains.
- A fourth advantage originate from China’s successful and penetration of the global market, the formation of clusters and agglomerations and acquiring the scale economies.
- Fifth is the pro-business, entrepreneurial culture in several of China’s provinces that is supporting the small firms and startups.
- The sixth advantage lies in the potential in the Chinese service sector, which is not yet saturated and immature, and therefore the technological and productive gaps in the services sector are large, which gives great opportunities for innovation.
- The seventh and final point is the Chinese community’s awareness of the necessity of adopting an urban development strategy, which aims to build effective, green and innovative cities, to create enormous opportunities for innovation in urban planning, metro transportation systems and green technologies. (World Bank, n.d.)

In addition to previous studies (Agolla & Lill, 2014; Akenroye, 2012; Cankar & Petkovšek, 2013; Clausen et al., 2020; Daglio et al., 2014), and in the purpose of promoting new drivers of growth, China will need to address its major productivity challenges with supporting innovation. The report suggests the “3+6+7” reform agenda to address China’s productivity challenges and achieve long-term sustained growth. The explanation is below:

- **Numbers “3”** refers to the three D’s that are the keys to promoting productivity-driven growth: removing distortions, accelerating diffusion, and fostering discovery.
- **Number “6”** refers to the six strategic choices (furthering productivity and innovation) for promoting the three D’s: 1) Striking the right balance between the three drivers of growth. 2) Reshaping industrial policies. 3) Adjusting the balance between the state and markets. 4) Attaining mutually beneficial international trade and investment relations with global partners. 5) Balancing supply-side reforms with demand-side reforms. 6) Preparing for the future impact of technological changes.
- **Number “7”** refers to the seven critical areas of structural, governance and institutional reform in China: 1) Remodeling industrial policies and supporting market competition. 2) Encouraging innovation and the digital economy. 3) Building human capital. 4) Allocating resources efficiently. 5) Leveraging regional development and integration. 6) Promoting international competitiveness and economic globalization. 7) Governing the next transformation (The World Bank, 2020).

At the end, and according to Chesbrough (2020), the open innovation can help speed things up and respond a solution sooner through the Covid-19 pandemic. In the past, the factor costs is important to promote the innovation, but now, the factor time is so precious and crucial to discover the vaccine and saving lives (Chesbrough, 2020).

5. Conclusion and future research.

Our systematic review of the literature demonstrates that research on the factors driving and accelerating the diffusion of innovation is in growth, especially during the covid-19 pandemic crisis.

This suggests a growing interest in and attention to the topic, and likewise extensive occasions exist for future research to boost our knowledge of diffusion and adoption of innovation processes in different areas.

Conclusion, there are various factors that drive innovation like government policies, collaboration between the public and private sector, the technology used, funding sources and other variables. However, open innovation contributes significantly to accelerating innovation in enterprises. The open innovation helps in creating more experiences and generates more knowledge as well as effective ways to respond to global crises in the future.

However, these factors that drive innovation can differ from one country to another, and may also differ according to the sector in which enterprises are active. These elements may be the start of future research.

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