

The Role of Foreign Direct Investment in Supporting the Transition to a Knowledge Economy: Case of China

Guedri Salah Eddine¹, Djabi Amina Hana², Boukeltoum Mohamed³

¹ University Center of Tipaza, (Algeria)

² University Center of Tipaza, (Algeria)

³ Entrepreneurship and Tourism Development Laboratory, University Center of Tipaza, (Algeria)

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Abstract:

The trend in world economy is towards knowledge-based economy. Knowledge is becoming more and more a major factor in the economy of the 21st century. technology is the type of knowledge most related to economic and social development. Technology market has been undergoing several changes during the last two decades; Technology is perceived as an intangible asset and is traded internationally either in embodied or disembodied form. Technology generation is concentrated in few developed countries and is protected more and more by intellectual property rights.

Developing countries wanted to close the technology gap by attracting FDI because they saw it as a magical solution to transfer technology. But experience s showed that they were wrong and that needs a national system of invention and innovation based on training and teaching technological task force and research and development.

Keywords: Knowledge Economic; Foreign Direct Investment (FDI); Transfer of Technology; Absorptive Capacity China.

Jel Classification Codes : F21 ; O1-11 ; O3.

1. Introduction :

The tracker of economic events during the last decades of the twentieth century and the beginning of the third millennium recognizing the extent of accelerated economic and financial developments that have had multiplier effects on various aspects of the world economy, As these developments become more frequent and wider, new mechanisms, forms and concepts are emerging on the stage of economic policy.

From the liberalization of international trade to the free movement of private capital and foreign investment, Towards the Information and Communication Technologies revolution that has contributed to the liberalization and deepening of globalization and its spread and the twenty-first century began with significant radical changes that presented many challenges and opportunities, as well as the growing importance of knowledge in the economy until the 21st century's economy is characterized by knowledge-based economy knowledge, creativity, intelligence and information.

In this context, we find China as a country that was able to emerge during the beginning of the 21st century as a major economic power globally. This is mainly due to the adoption of advanced strategic plans, based on high technology and digital knowledge to transform its inert economy into a focus of activity that has spread trade enthusiasm around the world, Foreign Direct Investment (FDI) has made an effective contribution to this shift and has been one of the most significant features of the country's economic reform and opening up to the outside world (Chen, 2007), China has transformed itself from a poor nation almost completely cut off from the global economy to one of the world's most important suppliers of labor-intensive manufactures (G. Branstetter & C. Feenstra, 2002), and interest in FDI has increased rapidly (Sun, Tong, & Qiao, 2002).

We therefore ask the following question: ***How has Foreign Direct Investment (FDI) supported China's transition to a knowledge economy?***

As an advance answer to the key question, we provide the following hypothesis: ***"FDI has contributed to supporting China's knowledge economy by contributing to the transfer of part of this knowledge to it and supporting its national innovation system, as multinational companies is the main controlling global technological and knowledge accumulation and is the main drivers of various research and development activities"***.

2. Research Methodology

The historical descriptive method was adopted when addressing the theoretical, historical and related aspects of the study of FDI, as well as technology, while the analytical curriculum in the analysis of China's economic data and technological situation was adopted as a successful experiment in this area; This work was done by drawing on a range of references in Arabic and foreign languages through the use of books, journals, Internet sites, reports from various international bodies and organizations such as UNCTAD's Global Investment Reports, as well as working papers and scientific studies.

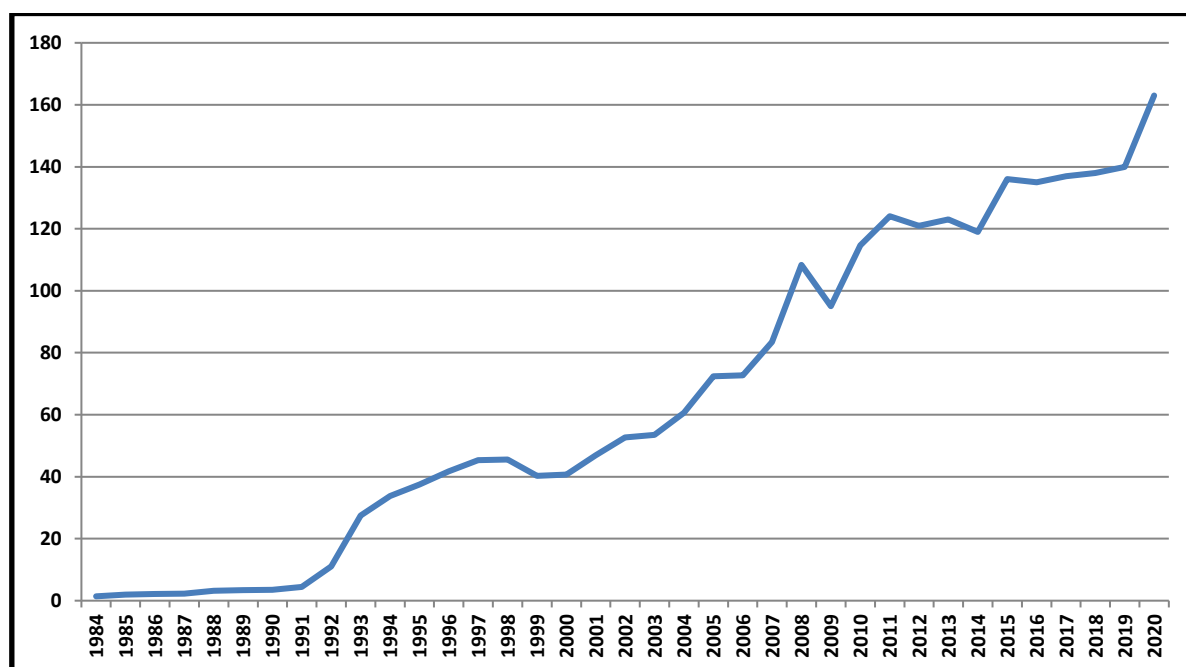
3. Results and Discussions

China's economy is the second largest in the world, with the world's highest growth rate in 2020 at about 7%, although it was about 12% and 13% before the coronavirus pandemic and also has the world's largest foreign exchange reserves, estimated at 12,23 trillion dollars in 2020, representing an estimated 15.12% of the world's gross domestic product (GDP) for the same year. China also has the world's largest foreign exchange reserves, estimated at 3373 billion dollars in September 2021 and China's economy is 80% export-oriented, the main industries are: mining, service processing, iron and steel, cement, chemicals and fertilizers, as well as consumer products including electronics (1pp. 117-118).

3.1 The role of Foreign Direct Investment (FDI) in the transfer of technology and knowledge to China

Since 1979, China has pursued an open policy towards FDI with the aim of acquiring advanced technology ; The promotion of FDI was one of the main pillars of China's policy of change and openness, China developed because it increasingly opened its market to foreign investment (Carvalho & Nogueira, 2023), and foreign direct investment (FDI) has brought huge amounts of capital and advanced technology to China and he has brought huge amounts of capital and advanced technology to China (Deyun, Luyao, Lijia, Wang, & Wei, 2023) (Guedri, Bendehiba, Khouni, & Djabi, 2017), the following figure shows the development of FDI to China during the period 1984-2020.

Figure (1): Flow of Foreign Direct Investment (FDI) to China: 1984-2020 (Billion Dollar)



The Source: - (Ministry of Commerce of the People's Republic of China, 2015)

- (World Investment repor UNCTAD, 2020)

Noting through the bellow figure that FDI to China has been on the rise, particularly since 1992, and since 1999 the Chinese Government's attention has been drawn to attracting foreign research and development centres when it announced tax exemptions for investors directing equipment and technology imported into domestic research laboratories rather than to production. In addition to the income tax exemption for incomes derived from technology transfer and development, As well as granting tax concessions of up to 50% for companies that raise their investment in research and development in China by 10% compared to the previous year (Guoqiang, 2005, pp. 329-330) . This is in addition to China's low costs, as it constitutes a preferred base for foreign companies wishing to reduce production costs (DREIC, 2011, p. 125) and one interpretation of the increase in FDI and interest is that China provides a unique business environment, not only due to its size and domestic market growth (Fetscherin, Voss, & Gugler, 2020).

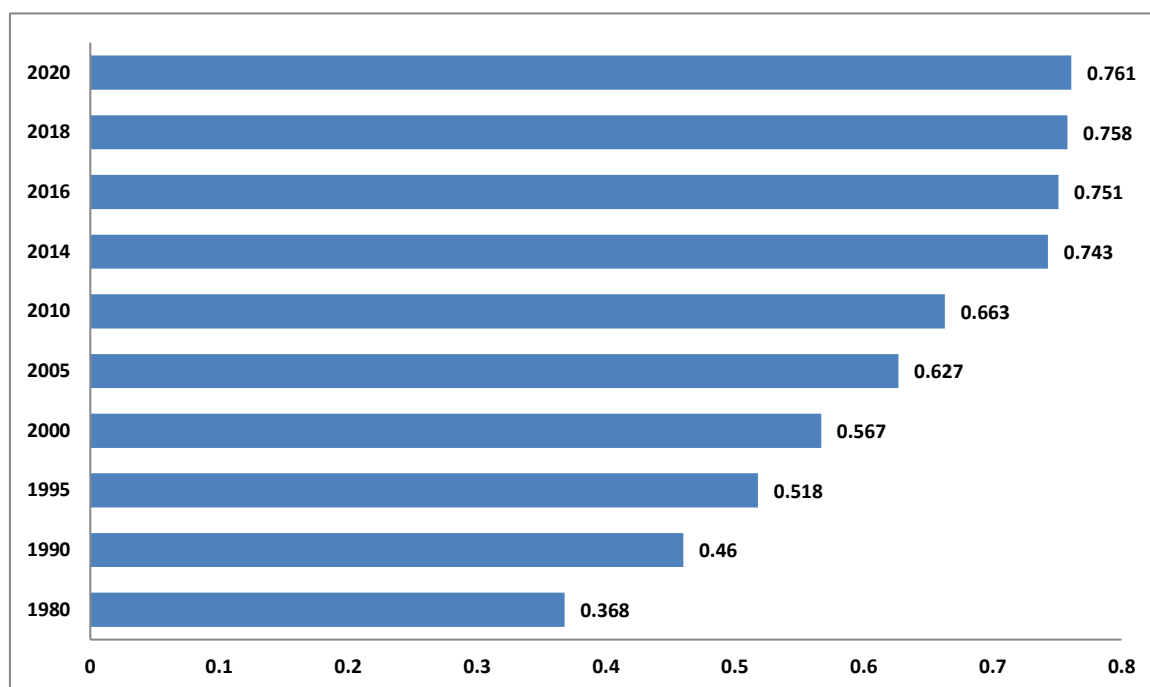
3.2 China's knowledge economy indicators and the impact of Foreign Direct Investment (FDI) on them

China has pursued a range of programmes and policies to leverage this transfer of foreign technology to support the transition towards a knowledge economy through the development of the national innovation system as a critical first step.

3.2.1 Human capital in China

Human resources are of great importance to the functioning, development and development of economic activities, especially in the context of the knowledge economy and its advanced techniques. Given the significant role played by human capital in the transition to a knowledge economy and attracting foreign investment, China has recorded strong performance in human development rates. The following figure shows the development of China's human development index.

Figure (2): Evolution of China's Human Development Index (1980-2020)



The Source: - (United Nations Development Programme, 2010, p. 153)

- (United Nations Development Programme, 2020, p. 31)

We note from the figure above that China's human development index is increasing steadily from 0.368 in 1980 to 0.761 in 2020. This is among the efforts to upgrade the intellectual factor, and China is classified by Human Development Report (HDR) 2020 with countries with high human development. Successive Chinese governments have emphasized the role of education, scientific research and the promotion of a culture of innovation and creativity in human development.

3.2.2 Information and communication technologies index in China

The Information and communication technologies (ICT) deployment index is particularly important with the synchronization of facts, where the knowledge-based economy met with an appropriate technological base the flourishing of intensive activities in knowledge, production and dissemination of new technology has reinforced the latter's three effects on the economy:

- Allow special productive profits in processing, storage and information exchange;
- New information and communication technologies promotes the emergence and prosperity of new industries such as: multimedia, e-commerce, e-tablets, etc...;
- It urges the adoption of original organizational models with a view to making better use of new possibilities for the distribution and dissemination of information.

3.2.3 Research and Development in China

Research and development data constitute the basic indicators of the knowledge economy, and until 1995 there was no clear policy and strategy for the promotion of research and development. The Chinese Government announced its intention to increase in China, but during the Ninth Five-Year Plan (1996-2000) its gradual contribution to the development of science and culture through a range of important actions (Abd El Fakil, 2000, pp. 149-150) :

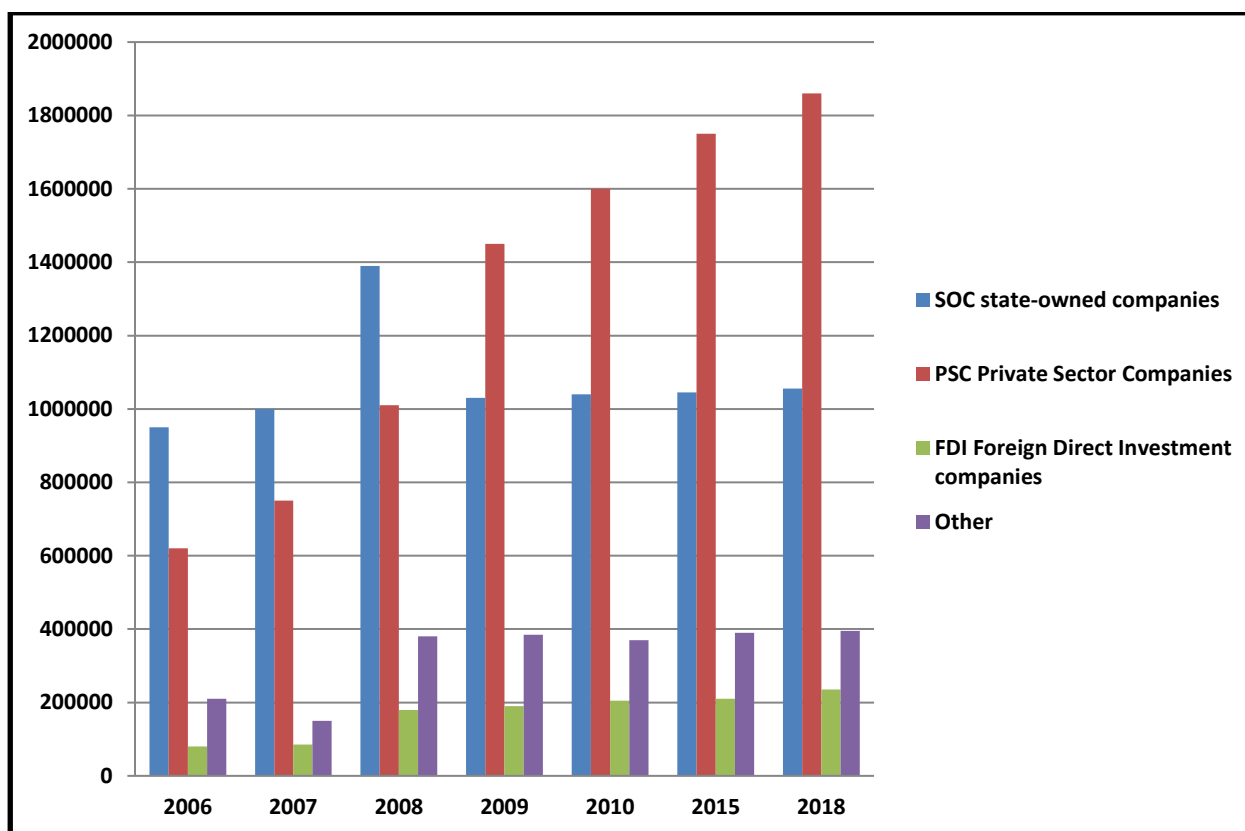
- Increase the proportion of loans granted for scientific and cultural research, as well as banks' provision of special loans to implement the results of cultural research; in addition to expanding the use of modern cultural means by companies (public, special and common);
- The Government's departments of science and culture provide financial support to research institutes implementing structural reform programmes, so that they can achieve a world record;
- Within this plan, the Government has selected 800 research institutes belonging to the various ministries to implement the Science and Culture Development System, where close links of state-owned institutes and companies are woven in order to upgrade the efficiency of Chinese industries and raise the quality of products in order to increase the competitiveness of Chinese products in domestic and global markets.

After becoming a member of the International Intellectual Property Organization, China National Research and Development Programmes , the Ministry of Science and Technology decided at its tenth meeting to initiate 973 national research and development programmes and, once implemented, to bring China into the international competition fold in terms of innovation and creativity, The Ministry also identified mechanisms for launching its implementation process based on the preparation of human resources and the collection of qualified and competent scientific teams in addition to securing funding for research (Hong, Edler, & Massini, 2022, p. 348).

3.2 The role Foreign Direct Investment (FDI) in supporting China's knowledge economy

The following figure shows the contribution of Foreign Direct Investment to the transfer of knowledge to China.

Figure (3): The role of FDI in supporting China's knowledge economy-building process during the 2006-2018 period (unit: billion yuan)



The Source: Personal realization based on: (Xiangdon, Xiaol, & Jizhen, 2010);
(Karen, Xiaoyan, Junsheng, & Ying, 2020)

Licenses are considered «The license agreement stipulates that the licensee pays a fee in order to obtain the patent and know-how received from licensors, since in most international licensing agreements the royalty rate is a percentage of sales of licensed products over the contract period, which is the case with most American companies (Saadi, 2010, pp. 154-155)»; one of the most common ways of transferring knowledge-based research to industries, the Chinese University, in this framework, had an enormous amount of patents, which encouraged such kind of cooperation between the university and industry.

The above format shows that cooperation between the University and industry in China has increased with the private sector and foreign companies in the framework of FDI, demonstrating China's reliance on foreign technology to strengthen its national system of innovation and shift towards a knowledge economy, as illustrated by many studies (Saadi, 2010, pp. 154-155) (Guoqiang, 2005, pp. 327-330) (Zhang, Lawrence, & Chung, 2003, p. 23).

But the technology used by the foreign investor in China was not developed during the period 1984-1995, with a 1995 study by **Chen and others** proving that technology transfer to China was relatively weak and most FDI projects in the industrial sector use underdeveloped technology, at

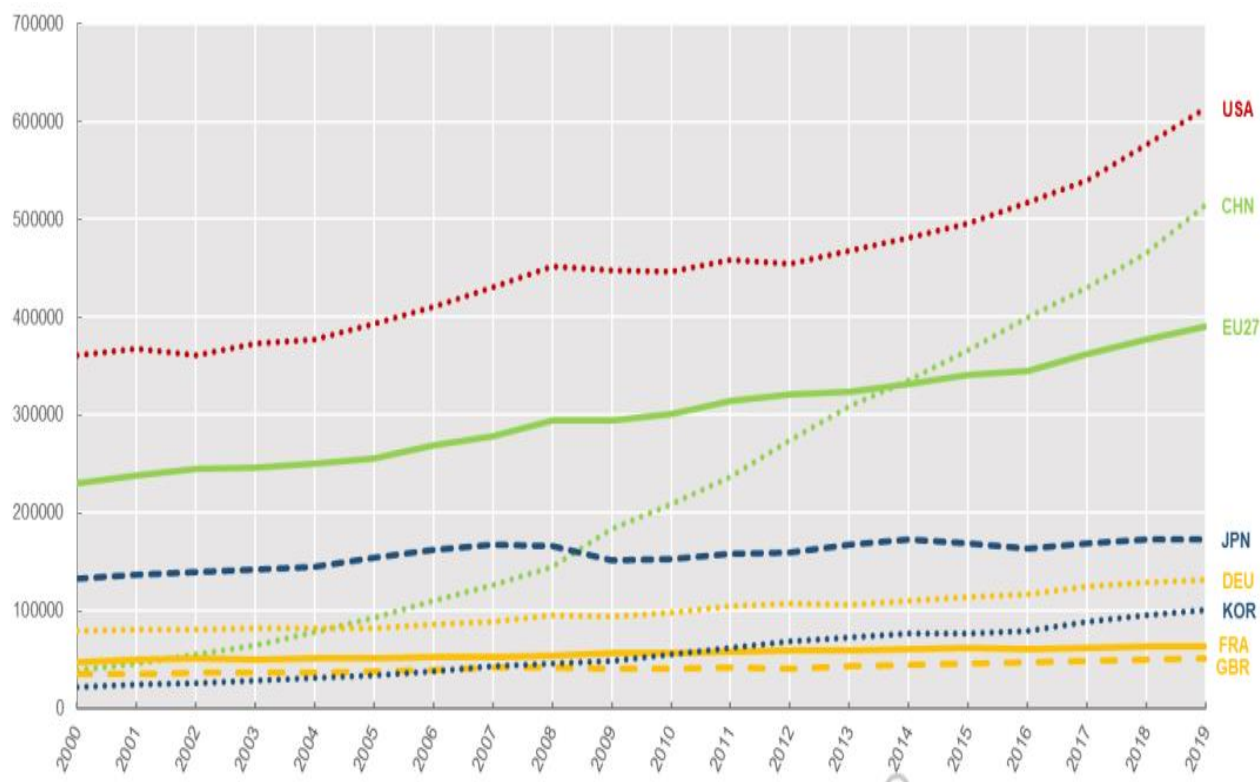
best medium or low technology (Zhang, Lawrence, & Chung, 2003, p. 23), thanks to the improved intellectual property rights conditions in China, multinational companies have changed their investment strategy from labour-dependent enterprises to those that rely on intensity in research ,development, technology and capital intensity, in addition to increasing the flow of foreign investment at high rates from 2000, most of the researchers studies on the transfer of such investment to China have been shown.

In this framework, most of the researchers' studies on the transfer of these investments to China have shown that multinational companies have transferred China's advanced technology and the study by Jiang Xiaojuan on 127 foreign companies in China has demonstrated. In 2002, 65% of the sample provided technology that relatively reduced China's technology gap, while the remaining 35% used locally developed technology:

- When comparing the level of technology used between 1997-2002 It was found that 60% of the sample used relatively sophisticated technology from two to three years of origin, and this situation differed from that in 1997, where the proportion was 54%, while the remaining 33% used ineffective technology in the parent company (Guoqiang, 2005, pp. 327-330).

In addition, multinational companies contributed to the strengthening of China's national scientific and technological capabilities through their research and development activities in China. American companies based in China carried out research and development activities in the amount of 1141 million dollar in 2007 from 319 million dollar in 1999 and 5 million dollar in 1993, and Japanese companies also spent 314 million dollar on research and development in China in 2007 after being from 60.3 million dollar and 1.9 million dollar in 1999, 1993, respectively (UNCTAD, 2010, p. 13).

Figure (4): Total domestic research and development expenditure in China during the period (2000-2019)



The Source: (OECD Main Science and Technology Indicators Database, 2021)

China is the world's second largest research and development spender, accounting for 80% of total R&D spending in the United States in China, and an estimated 500% increase over 2005. National research and development programmes in global technology have also been developed aimed at promoting and increasing innovation and invention rates in high-tech sectors, and the production of goods and competing devices for goods and devices in global markets, where the following factors have been highlighted (Hong, Edler, & Massini, 2022, pp. 349-350):

- * Identification of research priorities, coordination mechanisms and key and priority projects in implementation, development of management system and organization of research and development processes.

- * Develop a research project management system, which includes how the project is being implemented, securing funding and the marketing and manufacturing process; Conducting the measurements, experiments and tests required to put a project under implementation.

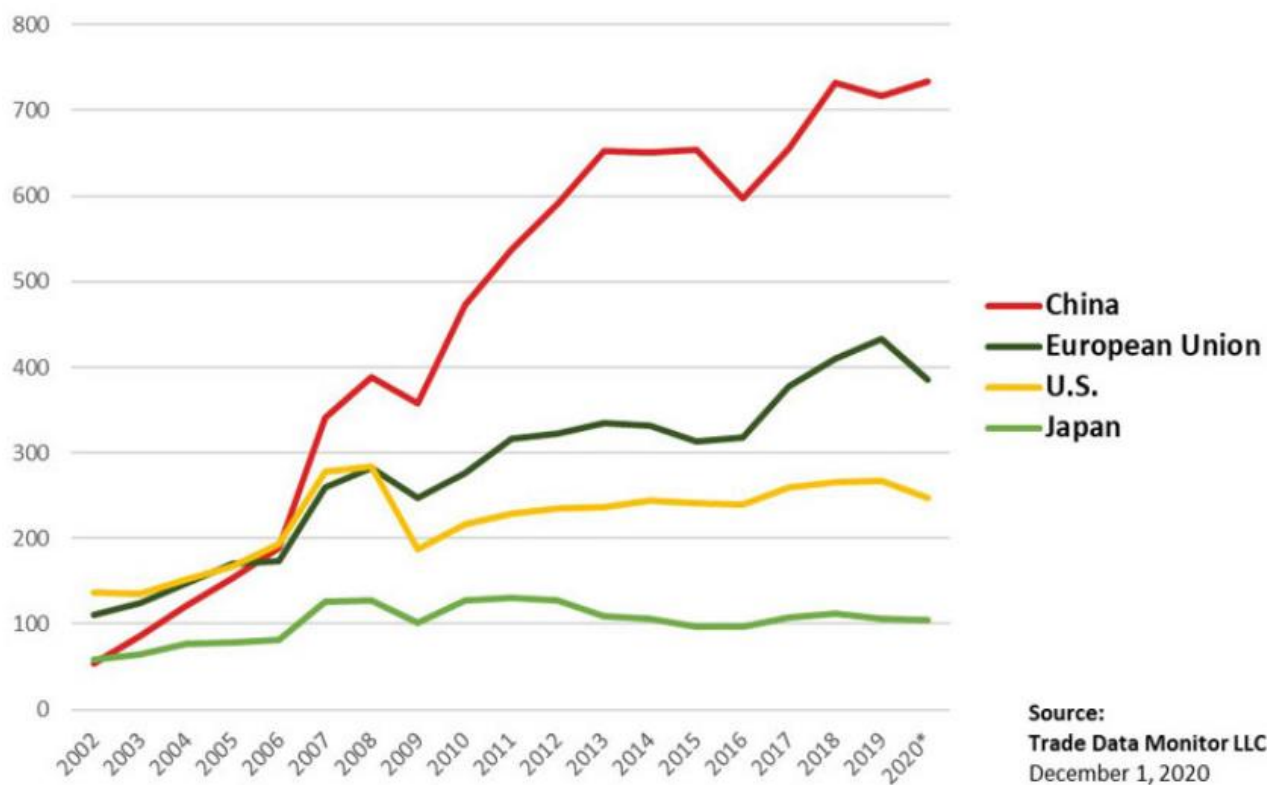
- * Strengthening procedures for protecting research results and managing their production and marketing processes; integrating research programmers with local development needs; as well as the development of key technologies to build and develop China's technological infrastructure and promote invention and innovation.

Technology incubators in China have played an important role as a focal point for modern technical development of the entire Chinese economy and society, with 465 incubators set up until

October 2002 mostly technological incubators, bringing China to the second place in the world in the number of incubators after the United States of America, and the number of companies set up in these technological parks to 20796 companies producing high-tech products; The next figure shows the development of China's advanced technology exports for the period 1992-2014.

Figure (5): Development of China's technology exports during the period "2002 - 2020"

Unit: Billion US Dollar



The Source: - (J.Holmes & al, 2011)
- (Trade Data Monitor LLC, 2020).

We note through the format that the proportion of Chinese exports of advanced technology is constantly rising, as it exceeds the proportion of exports of the United States and the European Union. This confirms the success of China's experience in benefiting from foreign investments that are promising as a tool to support its national innovation system and build a knowledge society and economy.

4. Conclusion:

The steady increase in Foreign Direct Investment (FDI) volumes around the world has demonstrated how important it is. The proportion of exporting countries and their multinational companies is the most important means of strengthening the status of their economies and ensuring their growth and prosperity. For officials of importing countries, it has become the most important means of achieving their countries' development and supporting the roaming of a knowledge-based economy, it is regarded as the best means of transferring technological and performance knowledge, the latter of which is of great importance in a world that, more than ever, is moving towards a knowledge-based economy, in which technology is one of the most relevant elements of knowledge for economic and technological development; Experience, like that of China, has shown that FDI is an effective tool to support States' transition to a knowledge economy if accompanied by a genuine strategy to advance their national innovation system, as well as research and development centers that contribute to strengthening the national innovation and innovation system. China's accession to the International Intellectual Property Organization as a full-fledged member has improved its intellectual property conditions, as well as attracting foreign investments using advanced technology, has also preserved inventors' rights and encouraged them to give more.

Results: Through this study:

- ✓ China's government policy and strong political will have maximized the use of knowledge and technology acquired by cognitive and technological breeding countries, through the development of a national strategy for the development of the country through science, through which the University was introduced as a locomotive to enter the technology market;
- ✓ There are no absolute models for utilizing the knowledge and technology of Foreign Direct Investment (FDI) in the world, as this depends primarily on the characteristics of each country's national innovation system.
- ✓ The transfer of technology and knowledge between foreign investors and recipient countries cannot be talked about without an efficient intellectual property system, which provides incentives to facilitate the effective transfer of technology and knowledge.
- ✓ The process of building a shift towards a knowledge-building economy is directly linked to economic development, which gives national scientific research the opportunity to exercise its task of solving problems and developing innovations. China is the best evidence of this as a leading experience in this field.
- ✓ Building independent technology that contributes to industrial development does not imply isolation from global scientific progress, but utilization of it is one of the channels through which private technology is adopted; The presence of a foreign investor in the host State is also an important factor in the localization of technology and support for its national

innovation system, as this leads to the acquisition by local research centers of the latest technology and research techniques by global companies.

Recommendations: we propose in order to reach these results:

- ✓ Developing countries must formulate a well-defined scientific and technological policy that goes hand in hand with development plans; In addition to encouraging researchers to create and innovate through material and moral stimuli, and to work towards linking research centers with the industrial sector according to each State's characteristics.
- ✓ Establish and strengthen national centers for the generation, development and linkage of technology to productive sectors to enable them to meet actual needs, as well as link them to existing educational institutions to enable them to formulate a scientific policy consistent with the State's technical policy and overall development plans.
- ✓ Linking the University with industrial institutions in a manner conducive to the manufacture of the University's objectives, formulating its scientific and technical policy and contributing to facilitating its implementation and linking its activities more closely with the needs of those institutions, resulting in the graduation of engineering and technical frameworks with scientific qualification capable of entering effectively into the productive process;
- ✓ Strengthening foreign partnerships that promote exchanges of expertise and techniques with universities on the one hand, leading to control of the latest findings of these foreign companies, allowing control of the project after the foreign partner's withdrawal;
- ✓ Attention to cultural awareness and sensitization of society on the importance of science and knowledge, using written, audiovisual means, translating science and technology into each country's mother tongue to facilitate its understanding of the general public and the working class, and preparing books and magazines for various works.

.5. Referrals and references:

1. Abd El Fadil, M. (2000). *Arabs and Asian Experience - Lessons Learned-* p.p149-150. Beirut: Centre for Arab Unity Studies, first edition.
2. Carvalho, P., & Nogueira, I. (2023, January-March). The role of the State on foreign direct investment regulation in China. *Brazilian Journal of Political Economy* , pp. 256-274.
3. Chen, C. (2007). Foreign direct investment in China Trends and characteristics after WTO accession. *ANU Epress and Asia pacific press* , pp. 197-224.
4. Deyun, X., Luyao, G., Lijia, X., Wang, Z., & Wei, W. (2023). Revisiting the Green Growth Effect of Foreign Direct Investment from the Perspective of Environmental Regulation: Evidence from China. *International Journal of Environmental Reaserch and Public Health* , pp. 1-20.
5. DREIC. (2011). *World investment prospects, foreign direct investment and the challenge of political risk* , p 125. Columbia: publication of Dominican Republic export and investment centre,.
6. Fetscherin, M., Voss, H., & Gugler, P. (2020). 30 Years of foreign direct investment to China: An interdisciplinary literature review. *Rollins Scholarship Online* , pp. 1-36.
7. G. Branstetter, L., & C. Feenstra, R. (2002, December). Trade and foreign direct investment in China: a political economy approach. *Journal of International Economics* , pp. 335-358.
8. Guedri, S. E., Bendehiba, M., Khouni, R., & Djabi, A. H. (2017). The Problem of Taking Advantage of Foreign Direct Investment Technology in Developing Countries: The Case of China. (P. b. Development, Éd.) *Journal of Economics and Development Studies* , 5 (1), 29-39.
9. Guoqiang, L. (2005). Does Foreign direct investment promote development? *Publication of institute of international Economics, Washington, USA* , pp. 327-330.
10. Hong, J., Edler, J., & Massini, S. (2022). Evolution of the Chinese Intellectual Property Rights System: IPR Law Revisions and Enforcement. *Management and Organization Review* , 18 (04), 755-787.
11. J. Holmes, T., & al, e. (2011, November). Technology Capital Transfer. *Working paper No.687*, p33 . Federal Reserve Bank of Minneapolis.
12. Ministry of Commerce of the People's Republic of China. (2015). *Flow of Foreign Direct Investment (FDI) to China: 1984-2020 (Billion Dollar)*.
13. OECD Main Science and Technology Indicators Database. (2021, OECD Main Science and Technology Indicators Database). Retrieved from <http://oe.cd/msti>
14. Saadi, M. (2010). Essays on Foreign direct investment, Technology Transfer and International Trade. *PhD thesis in Economic Sciences* p.p 154-155 . France: university of Pâris Est.

15. Sun, Q., Tong, W., & Qiao, Y. (2002). Determinants of foreign direct investment across China. *Journal of International Money and Finance* , pp. 79–113.
16. Trade Data Monitor LLC. (2020, december). Trade Data Monitor LLC.
17. UNCTAD. (2010, december 08). Foreign direct investment, the transfer and diffusion of technology, and sustainable development. *publication of United Nations Conference on Trade and Development p13* . United Nations.
18. United Nations Development Programme. (2020). *Human Development Report p31*. United Nations.
19. United Nations Development Programme. (2010). *Human Development Report, Real Wealth of Nations, p. 153*.
20. World Investment repor UNCTAD. (2020). *Flow of Foreign Direct Investment (FDI) to China: 1984-2020 (Billion Dollar)*.
21. Xiangdon, C., Xiaol, F., & Jizhen, L. (2010). *Xiaolan Fu and Jizhen Li , The Dual Role of Universities in Industrial Innovation in Emerging Economies: A Comparative Study of China and the UK* (Vol. TMD Working Paper Series N 45). UK: University of Oxford.
22. Zhang, Y., Lawrence, C., & Chung, C. (2003). The role of foreign direct investment in China's fast- 1978 economic development. *Working Paper No-002* . Management School, United Kingdom: Lancaster University.