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BRI is a chance or a trap? Examining FDI between China to MENA countries on economic growth

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List of Acronyms

MENA	Middle East and North Africa
FDI	Foreign Direct Investment
IMF	International Monetary Fund
UNCTAD	United Nations Conference on Trade and Development
MoU	Memorandum of understanding
BRI	The Belt and Road Initiative
SEZ	Special Economic Zone
MSRI	The Maritime Silk Road Initiative
SREB	The Silk Road Economic Belt
MOFCOM	China's Ministry of Commerce
SEP	Shanghai Electric Power Company
CNOOC	China National Offshore Oil Corporation
CRCC	China Railway Construction Corporation
CCOEC	China National Corporation for Overseas Economic Cooperation
UAE	United Arab Emirates
JOCIC	Jiangsu Provincial Overseas Cooperation and Investment Comany
ADNOC	Abu Dhabi National Oil Company
GNA	Government of National Accord

Abstract

This paper will focus on the MENA countries who joined the BRI after 2013. The purpose is to analyse the relations between China's outwards investment during 2011-2019 and the economic growth in MENA countries. There are some reviews about the positive effects of FDI on developing countries' economic growth, which brings potential risk assessment as well. Under the theoretical guidance, I first collect and write the introduction for each country, the background of FDI and BRI, then bring my own research questions and use certain quantitative research methods to explore some empirical evidence.

Keywords

BRI, MENA, FDI, China, GDP, Panel Data

Chapter 1 Introduction to FDI and BRI

1.1 Introduction

Foreign direct investment (FDI) is defined as an investment involving a long-term relationship and reflecting a continuing interest and control by a resident entity in one economy (foreign direct investor or parent enterprise) in an enterprise resident in an economy other than that of the foreign direct investor (UNCTAD, 2014).

FDI is often connected with the GDP per capita and other indicators that can conclude the economic growth. It is believed to bring positive effects on developing economies, which includes the transfer of knowledge/technologies bringing about the improvement of the quality of the labor force and the development of science, also the increase of employment rate and the cultivation of domestic industries.

In a paper of Henrik Hansen and John Rand(2006), they analyzed the Granger causal relationships between foreign direct investment (FDI) and GDP within a sample of 31 developing countries covering 31 years. Their conclusion is that FDI has a significant long-run impact on GDP averagely, which is irrelevant to the impact of level of development.

In an analysis on India and China, Agrawal and Aamir Khan (2011) used regression models that included GDP, Human Capital, Labor Force, FDI, and found that between 1993 and 2009, the impact of FDI on China's development was slightly greater than that of India, But notable in both countries. The researchers attribute it to the "bigger market size, offers easy accessibility to export market, government incentives, developed infrastructure, cost-effectiveness, and macro-economic climate". This report may ignore some endogenous factors, but it also provides some insights for China's rapid development after reform and opening up, and it has become the world's leading developing economy today. The FDI inflows play an important role in this progress.

I chose MENA[1] countries as my research object, first because of China's growing investment trend in this region, and second, because of my previous studies and more contacts with the Middle East. I also look forward to using some economic models to prove some relevant conjectures.

From the successful story in developing countries, it seems that FDI should be a booster for MENA countries as well. And the FDI is also supposed to have a spill-over effect: bringing the upgrading of knowledge and technology to local enterprises and the improvement of the quality of labor force.

From the numbers of OFDI and foreign contracted projects done during 2015-2019(MOFCOM, 2019), we could point out that the proportion of countries along the Belt and Road in China's foreign investment and infrastructure projects is gradually

1 Unless otherwise mentioned, the definition of MENA followed in this paper includes: Algeria, Bahrain , Djibouti, Egypt, Iran, Iraq, Kuwait, Lebanon, Libya, Malta, Morocco, Oman, Qatar, Saudi Arabia, Tunisia, United Arab Emirates, and Yemen, in total 17 countries.

increasing, and this trend will last for a period.

	OFDI			Foreign contracted projects (new contract)		
Year	Amount(100 million dollars)	Increase(%)	Percentage(%)	Amount(100 million dollars)	Increase(%)	Percentage(%)
2015	148.2	18.2	-	926.4	7.4	44.1
2016	145.3	-2	8.5	1260.3	36	51.6
2017	143.6	-12	12	1443.2	14.5	54.4
2018	156.4	8.9	13	1257.8	-12.8	52
2019	150.4	-3.8	13.6	1548.9	23.1	59.5

Table 1. China's foreign direct investment and foreign contracted projects in the 'Belt and Road' countries, source: MOFCOM, collected by author.

When I lived in Egypt for the first six months and saw the local people praise the benefits of Chinese factories and infrastructure, I was convinced that BRI can really help Middle Eastern countries out of the economic downturn brought about by the political turmoil of the Arab Spring. This is not unrelated to China's FDI. Perhaps BRI is a viable path to development, especially since China is playing the role of an influencer in investment sectors.

This paper focuses on China's outflow FDI to MENA countries and the signal of economic growth(GDP Annual). My purpose is to check the relations between FDI and economic growth among the MENA countries who join in the Initiative. Hopefully this will be a proof to explain the effect of BRI in these countries, as the enthusiasm of countries in this region to participate is high.

In sector 1, I mainly introduce the background of the studies around FDI and economic growth, the MENA countries and the related literature. In sector 2, I will explain few points: The research questions, the methodology and hypothesis, the model and the explanation for data source and measurement error. The sector 3 is for empirical evidence with Stata and secondary data collected from World Bank Indicator and China's MOFCOM. The conclusion is placed at sector 4, while some further implications are given.

1.2 Background

1.2.1 The history of investment in MENA countries

Since the 1990s, the reform and opening-up policies implemented by the Chinese government have successfully attracted the attention of foreign-funded enterprises. At almost the same time, China began to write about its economic prosperity. It was the largest FDI inflow host economy among developing economies in 1993, until 2018, it is the third largest FDI outflow country and second largest FDI inflow economy[2]. What we should pay attention to is the increase of China's FDI outflows. In past studies, researchers often emphasized "China's outward FDI is too small, compared with its FDI inflows", but this situation has changed in the past 20 years.[3] The FDI stock show us that the outflow

[2] According to UNCTAD's World Investment Report 2019(Chapter I, Figure I.3 & Figure I.6), in 2017 China's FDI inflows was US$134 billion, which was US$139 billion in 2018. In 2017 China's FDI outflows was US$158 billion, which was US$130 billion in 2018.

[3] According to UNCTAD's World Investment Report 2019(Annex table 2, pp.217), the amount of FDI outward stock

of FDI stock from China in 2018 was 69 times that of 2000 and 6 times that of 2010. At the same time, in 2018, China's FDI outward stock exceeded its inward stock. While we look back to the FDI flows, we observe that the FDI outflow is as much as the inflow, we could say that China's investment is also going abroad fast.[4]

Judging from the '2019 Statistical Bulletin of China's Outward Foreign Direct Investment' issued by the Ministry of Commerce in 2019, the flow and stock of China's foreign investment have always been among the top ten in the world between 2009 and 2018, and the stock has gradually caught up in the past five years to the forefront of the world.[5] China's ambitions for foreign investment are indeed increasing. Another reason is because, at the level of enterprise, outward FDI has evidence that has positive feedback on the business performance of Chinese enterprises. Cozza et al.(2015) argued that they detect a positive correlation between outward FDI and several measures of performance for Chinese firms.

Looking beyond China, we can turn our glare to the Middle East and North Africa region (officially known as West Asia and North Africa in China), I will abbreviate it as MENA. The MENA countries have accounted for an increasing proportion of the Chinese government's overseas strategic development in the past ten years. This conclusion can be drawn from two aspects.

Firstly, the number and scale of China's outward FDI in developing countries have continued to grow: according to statistics from the Ministry of Commerce of China, investment in developing economies accounted for total foreign investment in 2019 87.3% of the total, US$146.22 billion; this figure was 85.1% in 2013, US$91.73 billion. (MOFCOM, 2019) Among them, the total investment in countries along the Belt and Road reached 179.47 billion US dollars, which is 8.2% of FDI outwards stock.

Secondly，When the Beijing government launched the "Belt and Road Initiative" (hereinafter referred to as BRI), it was not long after the Arab Spring, and Sino-US relations were already deteriorating: the Beijing government hoped to avoid Washington's control by going west, and also to avoid "Malacca Dilemma", which endowed BRI's strategy great significance.

From the data of MOFCOM, in 2018, MENA countries became the world's second largest recipient of Chinese investment and construction projects after Europe. China's investment in new projects of MENA countries reached 28.21 billion U.S. dollars, surpassing East Asia and Sub-Saharan Africa and other traditional initiative involved countries.(MOFCOM, 2019)

Although there is a big gap between China's investment stock in MENA countries and

in 2000 was US$27,768 million, in 2010 it was US$317,211 million, in 2018 it was US$1,938,870 million. The amount of FDI inward stock in 2018 was US$1,627,719 million. All these numbers are excluded Hong Kong, Macau and Taiwan Province.

[4] According to UNCTAD's World Investment Report 2019(Annex table 1, pp.213), In 2013, China's FDI inflows was US$123,911 million, while its FDI outflows was US$107,844 million. During 2015-2017, each year's FDI outflows was larger than FDI inflows. In 2018, China's FDI inflows and outflows are close, separately US$139,043 million and US$129,830 million.

[5] According to MOFCOM's 2019 Statistical Bulletin of China's Outward Foreign Direct Investment '2019 年度中国对外直接投资统计公报', Figures from 2002 to 2005 only includes non-financial outward foreign direct investment, while numbers after 2006 has all industries included.

other developed countries, for example, the EU's investment in this area is far bigger than that of China[6]. From the Figure 1, in terms of trends, the investment stock has increased year by year. Considering China's outwards investment had a shrink after 2017, the sector of Investment in MENA countries did not follow this trend, which could explain the confidence of China in these countries.

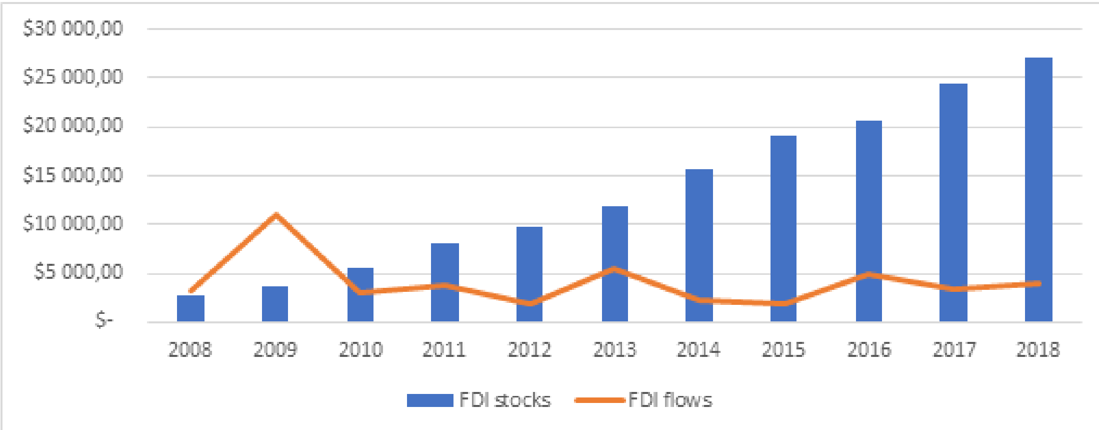

Figure 1. Chinese FDI to MENA region (USD million)

Source: Data from the AEI (FDI flows) and MOFCOM

1.2.2 The history of BRI

In 2013, while China's President Xi Jinping visited Kazakhstan, he introduced the Belt and Road Initiative (BRI) for the first time. It refers to 'Silk Road Economic Belt' and '21st Century Maritime Silk Road'. Based on China's history of shipping goods to the Middle East and even Europe through the Silk Road, this initiative has attracted the attention of various countries. As of January 2021, 140 countries have signed cooperation documents for the joint construction of the BRI.

China's BRI is comprised of two components: Silk Road Economic Belt (SREB) and the 21st century Maritime Silk Road Initiative (MSRI). The former links Beijing with Central Asia, the Middle East, and Europe on land, while the latter unites the major maritime trade routes of Africa, Europe, and Oceania as well as South and Southeast Asia (Xinhua, 2017).

1.2.3 MENA countries in BRI

MENA countries are undoubtedly important among the countries along the BRI, no matter in terms of investment volume or strategic policies. I will make a brief analysis of each investment recipient country in the following part.

- **Egypt**

  Egypt was the first country in Africa to develop diplomatic relations with the People's Republic of China, in 1956. It is also one of five countries in the Africa that have been chosen to develop a special economic zone (SEZ). The political and economic partnership between the two countries is strong, and Egypt is also a fruitful

[6] As of the end of 2017, the EU's direct investment stock was worth over 100-times more than that of China, USD 285 billion and USD 24.37 billion respectively.

example of China's South-South cooperation. Egypt joined the BRI in 2016.

From the perspective of Egypt, due to its geographical location close to the three continents of Europe, Asia and Africa. Considering the strategic influence of Suez Canal, a key logistic point for China, Egypt has convenient trading conditions. And the voice from scholars shows that Egypt may pay more attention to the newer market and investors, like Asia and Africa:

Nassar (1980) argued that, besides its traditional export destinations, 'Egypt has to explore and open new markets for its exports. ' Seddiq and Salah (2002) analyzed the EU-Egypt Partnership Agreement and suggested that Egypt should focus on more trade cooperation with other economic blocs, such as the African or Asian ones while this behavior may give Egypt better bargaining chips in the negotiations with the European side.

This is not groundless. The instruction was accepted by Egypt, as the relations between Egypt and China was developed rapidly. China pays a lot of attention to Egypt's domestic business since 20th century: According to the Egyptian bureau, until 2016, 1,066 Chinese companies have invested in Egypt, with a primarily registered capital of $320 million, and paid-in capital of $285 million.(Gadallah, 2016)

The special zone brought bigger effect on attracting investment. In 2008, China established the China-Egypt Economic Zone in Suez. It was extended in 2016. The Tianjin Economic and Technological Development Zone (TEDA) Industrial Zone is built in the Suez Canal Economic Zone (TIMEP, 2019). China's group investment projects focus on infrastructure sections(power stations, railway systems and port construction).

- **Algeria**

The historical relationship between New China and Algeria has many important points. The bilateral relationship of two countries could date back to the Afro-Asian Bandung Conference in 1955. China was the first non-Arab country to recognize the Algerian provisional government in 1958.Algeria joined the BRI in 2018.

According to the China Global Investment Tracker (CGIT), until January 2021, China's documented combined construction and investment activities in Algeria during the period 2005-2020 were heavily concentrated in the transport and real estate sectors and totaled $23.85 billion.

Algeria has the world's 10th- and 16th reservation of gas and oil, respectively, it also has the 3rd-biggest recoverable shale gas reserves.7 The non-oil resource, like gold, uranium, zinc and iron ore is also abundant.

In Algeria, China's infrastructure projects make big efforts on the East-West Highway and the Grand Mosque of Algiers, also the El Hamdania port and the new Algiers airport in 2019. (Hamaizia, 2020)

Calabrese (2021) commented that Beijing government has realized the Maghreb

7 See U.S. Congressional Research Service, "Algeria," July 6, 2021, https://crsreports.congress.gov/product/pdf/IF/IF11116.

countries are not only cheap sources of natural resources but the attractive markets for Chinese companies and investors, as to the valuable strategic assets given their location at the crossroads of the Arab world, Africa and the Mediterranean. From the history of bilateral corporations, Algeria has become an important partner of China in the Maghreb region with its political influence, geographical convenience and abundant raw materials for industrial production.

- **Djibouti**

Although it has the smallest territory in Africa, Djibouti is still an important country for China. Mordechai Chaziza (2021) discussed the importance of Djibouti to China in his research paper.

Firstly, the location for cargo transportation and maritime logistics is convenient. Djibouti controls the shipping routes of the Red Sea and the Indian Ocean, connecting Europe, Asia-Pacific, the Horn of Africa and the Persian Gulf. At the same time, the Chinese military based in Djibouti can guarantee the safety of shipping. 40% of China's total oil imports pass through the Indian Ocean, and China has 4% of its natural gas imports and 3% of its crude oil passes through the Mande Strait.

Secondly, the infrastructure built by China can help Djibouti provide better energy and strengthen the capability of transportation. China's major infrastructure projects In Djibouti are worth 14.4 billion U.S. dollars. Some important projects, such as the transformation of the Djibouti port, the Ethiopia-Djibouti railway, natural gas pipelines, and submarine optical cables contracted by Huawei.

Djibouti established a strategic partnership with China in 2017 and joined BRI afterwards.

- **Kuwait**

Kuwait was the first Gulf Arab country to establish diplomatic relations with China in 1971.(Xinhua, 2021) The earliest economic activities can trace back to 1955. In 2018, Kuwait joined the BRI in 2018.

According to the research paper of Mordechai Chaziza (2020), Kuwait's 'KV2035' project is the cornerstone of the whole cooperation. It meets the basic needs of the Initiative and it is the model student among the Gulf countries, which means the official attitude and gestures to the ambitious Initiative is positive.

Large-scale projects that China has involved include the projects of Silk City, the Kuwaiti Five Islands development and Mubarak al-Kabeer Port. The Silk City (Al-Hareer), a big complex, which is planned to finish in 25 years and will create 450,000 new jobs. Also, Chinese companies are interested in building up to five uninhabited islands on Kuwait's eastern coast and it is part of the Silk City plan.(WBV, 2019)

The investment from China concentrates on the energy, transport and real estate, in total US$ 6.1billion (China Global Investment Tracker, 2019).

- **Lebanon**

The economic exchanges between China and Lebanon can be traced back to the second half of the 1950s. At that time, the People's Republic of China had very little contact with Western countries. The first Chinese delegation came to Lebanon in 1955, and a commercial office was established in 1956. (Taleb, 2020) Lebanon joins the BRI in 2017(Xinhua, 2021). It is of significance on the trade over the Mediterranean Sea: Beirut and Tripoli ports can become central locations for potential export and import between China and the other MENA countries, even Europe.

One of the progressive projects is the reconstruction of Tripoli. It is a famous port which leads to the Mediterranean Sea. It is also very close to the other countries in Levant area: Tripoli is less than 30 kilometers from the closest border of Syria, therefore its strategic position is of importance for seeking access to the war-damaged cities in Syria. Tripoli is also close to Libya, which has a good relation with Beijing government.

Recently Lebanon is facing a severe domestic crisis, and the President of Lebanon shows a friendly attitude to China's investment projects, which are not only the huge manufacture ones, also including the language centers, musical college and the grocery sectors of introducing Lebanon's goods into China (International Financial Law Review, 2018)

- **Tunisia**

Tunisia joined the Initiative in early September 2018. Tunisia and China have a long history of commercial activities. Since 1958, China and Tunisia signed numerous trade agreements. In addition, Cooperation mechanisms established such as the China–Tunisia Cooperation Forum and the Tunisia–China Investment and Trade Forum were developed to strengthen the relations. (Rakhmat, 2014)

The projects aided by China includes the Ben Arous sports center, the new university hospital in the southeastern province of Sfax, the Tunisian diplomatic academy and the construction of the Medjerda River canal.(Xinhua, 2019)

After Tunisia joined the BRI, it is clear that China was looking forward to investing in commercial/industrial projects. For example, during the 2019 China-Africa Cooperation Forum, two countries achieved agreements on the commercialization project around the port of Zarzis, including the construction of a railway line linking Médenine and Zarzis, which is the significant area of abundant minerals, also the petrochemical and processing industries of phosphates.(Zoubir, 2020)

- **Morocco**

Morocco is the second African country to recognize the People's Republic of China in 1958. It joined the BRI in 2017, while Morocco established 'strategic partnership' with China in 2016.(Guerraoui, 2016)

From 2014 to 2019, Chinese investments and contracts in Morocco reached US$1.26 billion, mainly focusing on the sections of transportation, energy and real estate.

There are some projects already done: In 2016, The construction of a bridge between Rabat and Sale made by China Railway Major Bridge Engineering Group, which is the longest bridge in Africa, 950 meters long. Since 2017, China's CHINT(正泰) Group took part in the Noor solar IV power station with Saudi Arabia's ACWA Power. In the words of Michaël Tanchum (2020), this huge project of solar power plant demonstrates 'the developmental business synergy of partners from China, the Arab Gulf countries, Europe and Morocco'.

A not-so-successful case is the project of the Mohammed VI Tangier Tech City, which was planned to be a $10 billion Chinese-funded industrial city in Tangier in 2016. However, the disagreements on the ownership of the City stopped the program. After some discussion and negotiations under the table, in 2019, China Communications Construction Company (CCCC) took over a scaled-down version of the project.

Except the investment on manufactory and infrastructure, Morocco's famous tourism brings some potential investment. The help of China-Morocco Tourism Cooperation Forum and private business organizations such as the Moroccan Society of Tourism Engineering (SMIT) plays an important role in introducing and attracting China's investment in the tourism industry.

- **Iraq**

Iraq is a big deal for China. The ambassador of China in Iraq said that '"China is considered the biggest trading partner of Iraq, and Iraq is the second biggest oil supplier to China, and the fourth biggest trading partner of China in the Middle East.' (Xinhua, 2019)

The Chinese government seems to develop Chinese investment in Iraq based on its distrust of investment in Western countries (especially the United States) after ISIS's attack and Iran-Iraq war. As the capability of building up basic infrastructures are necessary to rebuild the country, China's investment focused on the development of infrastructure for oil fields and electricity, as well as the social infrastructure, such as medical, educational and housing.

According to Foreign Brief's report(Honig, 2019), in 2019, China's Hilong Oil Service & Engineering Company signed an agreement with the Iraqi Drilling Company about a joint venture to exploit numerous oilfields of Iraq, which includes the Majnoon field—one of the world's largest oilfields.

When it comes to the semi-autonomous Kurdistan Regional Government(KPG), China's investment is also rapid and impressive: In 2020 October, the Chinese companies announced the plans for the construction of a cement plant based in Erbil, a big housing development and an urban tourist attraction, these contracts' amount is 210 million dollars.(Malik, 2021) Considering the Chinese government set up the consulate general OF KPG in 2014, the diplomatic layout and the early time of joining the BRI have made closer cooperation between China and Iraq.

- **Bahrain**

Bahrain officially joined the BRI in 2018. It established diplomatic relations with Beijing on April 15, 1989.

As one of the special Gulf countries, Bahrain's trade and investment with China is not dominated by natural resources. Considering Bahrain's own energy reserves and territory size, this situation is not unexpected. China-related investment mostly focuses on the sectors of financial services and information & communication technology (ICT). For example, Tencent just signed a memorandum of understanding to establish a data center in Bahrain in 2021. (O' Grady,2021)

- **Libya**

The situation in Libya is mainly divided into two stages: Before 2011 and after 2011. Frederic Wehrey (2020) pointed out in a report on Libya that in 2010，Libya provided 3% of China's crude oil supply， which was one-tenth of Libya's crude oil exports. Chinese companies were deeply involved in the Libyan oil industry, not just trade. All of China's top state-owned oil companies-PetroChina, Sinopec and CNOOC-have long-term infrastructure projects in Libya. Before the 2011 civil war, China had almost 36,000 workers — spread across 75 firms and 50 development projects — in the country. (Mezran and J. Samet, 2019)

After 2011, Beijing government developed a strategy: On one hand, they supported the central government supported by UN: Government of National Accord (GNA), on the other hand, facing the northern region, which shows the tendency of autonomy, China did not interfere in military and political activities and only provides oil-related investment. Libya signed the MoU in 2018, GNA was willing to bring the investment back to Libya.

- **Malta**

Malta joined the BRI in 2018. Several specific cases of Chinese investment in Malta are natural gas power plants invested and constructed by the Shanghai Electric Power Company (SEP), which helped the country shift to providing cleaner, more reliable and cheaper power supplies. (MFA, 2020)

- **Oman**

China's investment in Oman is limited, focusing on the oil sector and the construction of industrial parks. One of the well-known investments is Chinese-Omani industrial Park which is at Oman's southern port of Duqm. According to official reports, China has invested more than US$10.7 billion in this project. (Xinhua, 2020)

Oman itself has certain investment risks, such as a high unemployment rate; Oman's oil and gas sector still accounts for about 72% of government revenue, and the country is greatly affected by oil price fluctuations; its policies are less competitive than neighboring countries such as Iran, etc. (Mogielnicki, 2020)

- **Qatar**

Qatar joined the BRI in 2019. It is famous for its storage of natural gas. (Iqtait, 2018) Due to the plan of Qatar National Vision 2030 (QNV2030), Qatar is willing to cooperate with China in terms of the pursuit of economic and social development.

According to the China Global Investment Tracker (2019), Beijing investments and contracts in Qatar during 2013-2018 reached $3.9 billion. Chinese enterprises have participated in the construction of several projects in Doha, such as the Hamad Port and 2022 World Cup main stadium. In terms of telecommunications, China's Huawei has an ICT project in Qatar: It helped Qatar launch a 5G network through the 3.5 GHz Spectrum, which was the first 5G network in the world commercially (Qatar Tribune 2018).

Chaziza (2020) agrees that 'Beijing's increasing interest in reducing dependence on traditional sources of energy and achieving green, sustainable economic development makes Doha's abundance of natural gas more precise.' It is clear from the amount of oil/gas trade between China and Qatar. Qatar is not among China's top 15 crude oil suppliers; its oil supplying is relatively small. In contrast, its natural gas business performance is particularly outstanding, recently China signed an agreement of receiving liquified gas for 15 years from Qatar(Middle East Monitor, 2021). It was between Qatar Petroleum (QP) and China National Offshore Oil Corporation (CNOOC).

- **UAE**

UAE is a strong business partner in the Gulf area. Actually, it is already the mainly cooperator among all the rest of MENA countries, account to the amount of trades and investment: In 2018, the total amount of Chinese investment and contracts in the UAE was US$8.16 billion, surpassing Saudi Arabia, the second largest recipient, by nearly US$3.4 billion.

UAE joined the BRI in 2019, while the investment happened earlier than that moment. According to HSBC(2021), The deals after UAE's visit in 2015 included the approval of the first Chinese state-owned financial ser-vices firm to set up in the Abu Dhabi Global Market Center, as well as a U.S.$1.6 billion hydrocarbon survey contract to China National Petroleum by the Abu Dhabi National Oil Company (ADNOC). Other projects are also big deal-makers. One Chinese company invests U.S.$300 million in construction and machinery at the terminal at the Khalifa port for the exchange of 35-year concession with the port.

According to the report of Geoff De Freitas(2019) , in the Abu Dhabi's KIZAD Industrial Hub, over 20 Chinese companies have showed interest and joined until July 2019, which brought more than $1.7 billion's investment, with the help of Jiangsu Provincial Overseas Cooperation and Investment Company (JOCIC).

- **Saudi Arabia**

Riyadh is an ambitious player in Gulf area. It has also a '2030 vision' for a multi-industrial development. While attending the Saudi-China Investment Forum, Saudi's Vice Minister of Business and Investment mentioned that the '2030 Vision' shared objectives with Chinese industrial capability building within the BRI. More importantly, Saudi Arabia's strategic location will facilitate Sino-Saudi cooperation in trade, investment, logistics and infrastructure naturally. It is obvious from the investment flow: The total investment flows between China and Saudi Arabia increased more than twentyfold during 2005- 2015.(Chen & Han, 2019)

The big deals include a high-speed railway between Mecca and Medina by the China Railway Construction Corporation (CRCC), which helps the Muslim community to travel and benefit the development of local religious tourism; the Industrial Zone in Jazan city, which uses Saudi Arabia's Red Sea coastline to connect with two Chinese projects: Egypt's Port at the north of Suez Canal and the military base in Djibouti.

- **Yemen**

Yemen has a long period friendly relation with China, it was the first among the Gulf countries who developed the diplomatic relations with China in 1956. Since the civil war in 2011, the international investment ran out of Yemen. The Initiative from China is a good chance to bring some hot money back.

In 2012, the China National Corporation for Overseas Economic Cooperation (CCOEC) signed a deal to build three natural gas-fired power plants in Yemen.(TRTWorld, 2019)

In 2013, there was a plan to expand two container ports in the southern cities of Aden and Mokha with a total cost of $508 million, which will be helpful to China's trades through Gulf area. (Al-Khawlani, 2021) The big problem is that Yemen was still facing unsure situation under the domestic conflicts, which leads to the slow pace of construction and investment.

- **Iran**

Some strategic analyses point out that Sino-Iran relations are not limited to the supply and demand of natural resources (oil), but more in the sense that they have common demands in terms of geopolitics and political stances (relationships with the United States). In this paper, we do not put the factors of politics into consideration, only talk about the investment in arms, energy, manufactured goods, and technology. Three-quarters of imports from Iran to China are energy(oil and gas), basic materials and petrochemical products, while Iran's imports from China are more diversified, Including high-tech (weapons), engineering services, financial services, etc.

Dorraj (2016) believes that, after China's open-door economic policies in 1978, Its need for energy supplying was booming. Plus, Beijing government was looking for diversifying its energy mix from only coal, which led too much pollution in the crowded big cities and historically had been responsible for 60% to 75% of China's energy supply.

While Iran has the fourth largest oil reserves (157 billion barrels, roughly 10% of global reserves) and the largest gas reserves in the world (33.8 trillion cubic meters, roughly 18.2% of the world supplying), and its infrastructure is limited due to the block of US and the war with Iraq, Dorraj said, 'low rate of extraction and huge amount of reserves shows that Iran's energy sources are waiting to be developed'.

Under the combined effect of different geographical locations and different backgrounds, the relationship between MENA countries and China's direct investment is also full of differences. After learning more about the relevant countries, I would like to make some preliminary conclusions of my own.

1. Abundant natural resources: Most MENA countries are rich in energy such as oil and natural gas, as well as traditional non-oil sectors, such as precious metals and minerals. In recent years, China has a keen interest in renewable energy and also

wants to promote green and clean energy projects in BRI countries. It is believed that renewable energy investments (solar, wind, hydro) will be an important sector. It increased from 38% in 2019 to 57% in 2020(Wang, 2021).

2. Due to the special geographical location and the long coastline, the MENA countries have the control of the arteries/important supply points/gates of maritime transportation.

3. There are obvious differences in trade patterns (oil-producing countries and non-oil-exporting countries), and the income structure is closely related to energy sectors. According to IIGF Green BRI Center's report(2020), among the MENA countries along BRI, only Egypt, Yemen, Morocco, Tunisia and Djibouti are low middle/low income countries. We can conclude that North African countries account for the majority, and all of them are non-oil exporters except Yemen. The Income Group's information comes from World Bank Indicators.

4. Most of the Investment happened before the countries formally joining the BRI. The investment is not a sudden thing, most of the MENA countries have agreement with China before 2018. The time slots I choose (2011-2019) also make sense, because in the case of MENA countries, there is often a proper delay between the signing of investment or project contracts and the gradual implementation.

5. Most countries are seeking 10-20 years of industrial transformation/development of growth in non-oil fields. They believe that China's investment could be helpful to this progress. For example, the MENA countries have these programs: Qatar National Vision 2030, Saudi Vision 2030, New Kuwait 2035, Abu Dhabi 2030, 2040 Bahrain's Economic Vision 2030 and Oman Vision. In Fuller's(2019) report, he argues that these states are working to build stronger private sectors and diversify their economies, and infrastructure and construction projects are central to much of what they intend to accomplish. As such, the already strong Chinese experience in Gulf infrastructure is seen as a way to coordinate 'Vision' plans with the BRI.

1.3 Literature review

1.3.1 FDI's positive impact on the growth

Regarding the relationship between FDI and economic development, some existing studies have given positive assumption.

It is proved that the theoretical foundation for empirical studies on FDI and growth derives from either neo-classical model of growth or endogenous growth models(Nair-Reichert et al., 2001). In neoclassical models of growth, FDI increases the amount of investment and its efficiency, which may lead to positive effects on a long-term level and on a medium-term, intermediate increases in growth. While the new endogenous growth models see long run growth as a function of technological progress, and it tries to provide a framework in which FDI can permanently increase the rate of growth in the host economy through positive spillover effects.

Eduardo et al. (1998) test through the empirical work by a model of endogenous growth, it is found that foreign FDI can promote the development of the economy better than domestic investment (such as a rise in GDP). , The premise is that the FDI recipient country can provide sufficient levels of human resources, that is, there is a 'strong complementary effect between FDI and human capital'.

Another paper(Alfaro et al., 2010) use the developing countries' evidence but failed to prove FDI has positive/negative effects on the productivity of the host country firms or aggregate growth. But there is an improved conclusion proved that the positive effects are significant while the domestic financial market is more completed and developed, relatively.

The interesting part, which inspired my modeling, is from this 2010 paper, the author mentioned that Macro-empirical analysis of the effects of FDI on growth is mostly based on the single equation time averaged cross-section estimation approach. I decide to focus on the two variables: the GDP Stock and FDI.

There is some evidence proving that FDI contributes to increasing the employment rate and maintaining the competitiveness of the labor force. This case study can be found from African Development Bank Group: "In Africa, most foreign direct investment (FDI) in Africa is concentrated on natural resources, but investment in non-resource-based FDI, and in particular, FDI in manufacturing, generates more jobs and has the potential effect on alleviating the unemployment problem in Africa."(ECMR, 2019)

1.3.2 The possible negative effect on the growth

While refuting the positive effects of FDI, Herzer et al.(2008) analyzed some possibilities: 'Domestic firms using very backward production technology and low-skilled workers may be unable to learn from multinationals…Finally, knowledge spillovers will be realized only if local firms have the ability to invest in absorbing foreign technologies, which may be restricted by the domestic market.'

The specific way of China's investment received some criticism as well. Some countries have to carry heavy debt while cooperating with China, which may help China win the final ownership/long-term use rights of some projects. However, the worries about the debt trap did not cause panic among MENA countries.

On the contrary, after the countries that joined in the initial stage of the Initiative received a large amount of investment and trade dividends, their neighboring countries and regional competitors also followed up, essentially to make their voice heard in this cooperation.

Chapter 2 Research Methodology and Hypothesis

In this chapter, I discussed the process of collecting data and the explanation of modeling. What needs attention is the analysis of potential measurement errors. I will introduce research questions, data sources, and conjectures before regression analysis.

2.1 Research questions

My research question is about the FDI's effect in the MENA countries which join in the BRI with China.

After introducing the condition of the MENA countries and the development of China's outward Foreign Direct Investment, I have an idea for building up the research question: Does China's FDI bring economic development to the countries among the BRI?

If I can use some practical evidence to conclude that China's investment is helpful to countries that have joined the agreement, compared with countries in other regions of the BRI, whether China's investment in MENA countries enjoys the same positive benefits. While considering the effect within MENA countries, the time of joining the Initiative is different, and time may be used as a criterion to distinguish whether MENA countries benefit from China's investment.

The Research question is: Does China's outwards FDI bring positive impact on the economic growth in the MENA countries which are involved?

The **Sub-Question 1** is: Does the MENA countries who joined in the Initiative earlier than 2018 get some more benefits compared with the MENA ones who joined later?

The **Sub-Question 2** is: Does the Initiative brings some positive impact on the countries which joined the BRI?

2.2 Data source

The variables for the model I choose is the FDI outwards stock from China and the GDP annual of MENA countries. I collected the stock and flow of China's direct investment in MENA countries from 2009 to 2019 (see Appendix A.1&A.2). The data is from World Bank Indicators and MOFCOM's annual report on China's outwards investment. Both are authoritative organizations/government departments and have the ability to publish official data. All the data could be found on the published material/reports.

As an attempt to explain the continuous changes that occurred before and after the appearance of BRI, I set 2011-2019 as the time range, which included the formal date of China announcing the plan of the Initiative.

About the range of countries, I choose 38 countries in total, within 17 MENA countries, 13 Non-BRI member countries, and 8 participants in BRI from the other continents. The choice comes from the research question, for that purpose I need some other countries' data to make control test.

ID& Country name		
1 Algeria	**14 Saudi Arabia**	**27 Nigeria**
2 Bahrain	**15 Tunisa**	**28 Ethiopia**

3 Djibouti	16 UAE	29 Cameroon
4Egypt	17 Yemen	30 Thailand
5 Iran	18 Denmark	31 Peru
6 Iraq	19 France	32 Panama
7 Kuwait	20 Germany	33 Brazil
8 Lebanon	21 Spain	34bArgentina
9 Libya	22 Netherlands	35 Chile
10 Malta	23 Sweden	36 Mexico
11 Morocco	24 UK	37 US
12 Oman	25 Norway	38 Canada
13 Qatar	26 South Africa	

Table 2. The list of countries in the dataset

2.3 Measurement error

When it comes to big and reliable organizations, the measurement error should be avoid in advance, as they are with good reputation and they have strong data collecting procedure. I conclude the characteristics of the two data source.

Sources	World Bank	MOFCOM(Ministry of Commerce)
Characteristics	• Annual complied by global official statistics • Managed to collect from other meta database, like IMF and UNCTAD	• The official source on overseas investment and cooperation of China is the China Commerce Yearbook, which is published by the Ministry of Commerce. (Brautigam et al., 2019) • Figures from 2002 to 2005 only

		includes non-financial outward foreign direct investment, while numbers after 2006 has all industries included.

Table 3. The characteristics of the sources

I also analysis the Pros and Cons from the WBI and MOFCOM.

World Bank

Pros:

- The World Bank uses the weighted average numbers. Which means there may be some biases happen on the choice of year. Because the weighted average considers the relative significance of all values in the dataset, therefore it is a more accurate representation of the average of a set.
- The World Bank uses reliable methodologies to protect the accuracy of data. One of the methodologies is the DQAF. it covers the plenty quality aspects of data collection, processing, and dissemination. (IMF, 2012)
- Another methodology is General Data Dissemination System(GDDS). As the page of IMF said: "The e-GDDS framework is built around four dimensions -- data characteristics, quality, access, and integrity."(IMF, 2021)

Cons:

- The data may be underestimate. According to IMF's definition, the investments should account for at least 10 percent of voting stock to be counted as FDI. In reality, many countries set a higher threshold. And it seems that some countries fail to report reinvested earnings. The data may be inevitably missing somehow.
- FDI data do not give a complete picture of international investment in an economy. For example, balanced payments data on FDI do not include capital raised locally, which is a significant source of investment financing in some developing countries.

MOFCOM

Pros:

- Since Chinese government requires both state-owned and private companies investing abroad to submit detailed information regularly, when examining the reliability of data, the official Chinese data (the flow of FDI from the Ministry of Commerce) seems to be relatively reliable, especially the data in other developing countries which cooperate with China continually.

Cons:

- One potential problem which is already captured by other researchers is, the scheduled plan of investment is different from the realized investment project, where we can compare the data from MOFCOM OFDI project with the data from MOFCOM OFDI's flows: Shen (2015) checked data on the number of Chinese FDI projects from six African countries with corresponding data from the Ministry of Commerce (MOFCOM) and found that the number of projects from the data of host country is at least 2.5 times bigger than the number announced by the Ministry of Commerce, China. The result would lead to the overestimation on actual investment.

- The missing of data is common. The MOFCOM FDI flow data may miss smaller projects as the data has only recorded projects valued above $10 million.

In the paper, I accept the suppose that all the data are accurate and the measurement error has no big influence on the data analysis. Therefore, I could keep going to analyse the model.

2.4 Hypotheses

Following after the Research question, my hypotheses are like below:

H1: The investment from China may have a positive effect on the GDP variable, although it may not be significant as the difference between developing countries and developed countries is big. China's preference of investment is still on the developing world: The industrial upgrading and transforming in developed countries is close to the next stage, and the infrastructure and the design and planning of industrial park where China is good at in developing countries are not suitable for developed countries. All these factors may not lead to a very impressive result.

H2: Within the BRI participants, the Investment should be significant and have a positive impact on the economic growth. Actually, the impact of FDI on MENA countries was proved by the other papers, however, they did not know if the investment inflow from only one specific country could be significant as well.

H3: The time of joining the BRI could make a difference within MENA countries, as the time for China's cooperation and exchanges also depends on the results of communication and cooperation with other countries. Since 95% of China's direct investment is invested by state-owned enterprises and companies with official backgrounds during 2005-2019(Sidlo, 2020), the official attitude to the Initiative often determines the amount of investment.

2.5 Model

Considering the efforts made by Mehdi Behname (2012), I would like to use panel cointegration model to explore the impact of Investment from China on the economic growth(GDP annual data). The model contains 38 countries, including 13 countries which are not in the Initiative for now and 25 countries which are part of the Initiative.

$$Log(GDP_{ti}) = \alpha_{ti} + \beta_1 Log(FDI_{ti}) + \epsilon$$

With FDI: The Foreign Direct Investment stock from China

GDP: GDP annual of the host country

Chapter 3 Empirical Evidence

The progress was made in STATA 16. All the variables are as below.

a) Describe the variables

Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
t	418	6	3.166	1	11
id	418	19.5	10.979	1	38
GDP	418	1.060e+12	2.884e+12	.818	2.143e+13
FDI	418	3027.777	8128.165	.87	77797.5
lggdp	418	26.161	2.194	-.201	30.696
lgfdi	418	6.237	2.256	-.139	11.262
joinyear	418	1327.211	958.213	0	2019
bri	418	.658	.475	0	1
BRI	275	.36	.481	0	1
mena	418	.447	.498	0	1

Table 4. Summary of the variables in STATA

t: The time in the dataset, here I choose 2011-2019, so it is from 1 to 11 as a group, and the order from 1 to 11 is in the positive chronological order.

id: The number of each country, the order is the same in Table 2.I have 38 countries in total.

GDP: The unit of measurement for GDP is millions of dollars, with current exchange rate.

FDI: The unit of measurement for FDI is ten thousand dollars, with current exchange rate.

lggdp/lgfdi: Both are logarithms based on the original variables GDP/FDI.

joinyear: It is the time of BRI participants joining the Initiative. The non-participant shares a '0' in the dataset.

bri: It is a dummy variable, for explaining if the country joins the Initiative.

BRI: It is a dummy variable, to distinguish the if the country joins the Initiative before and in 2018.

mena: It is a dummy variable, to explain if the country is in MENA area, I have 17 of 38 countries which are MENA countries.

After the variables are clearly explained, I do a unit-root test for checking the stationary of the whole dataset.

b) Unit-Root Test

I choose LLC & IPC & LM Test for the unit-root test.

Unit Root Test results

Variable		LLC	IPS	LM
lggdp				
	Level	-10.9328***	-4.0844***	0.2363
		(0.0000)	(0.0000)	(0.4066)
	FD	-9.0785***	-4.6400***	-5.0050

		(0.0000)	(0.0000)	1.0000
lgfdi				
	Level	-5.5528*** (0.0000)	-2.7170** (0.0033)	26.7466*** (0.0000)
	FD	-6.5247*** (0.0000)	-4.0119*** (0.0000)	1.4105 (0.0792)

*(The numbers in parentheses are P-values, *** and ** indicate significant at the 1% and 5% significance levels, respectively, and no * means insignificant.)*

Table 5. The result for Unit-Root test of lggdp/lgfdi

The LLC and IPS test have the similar Null Hypothesis: 'All panels contain unit roots.' I should be able to reject the Null Hypothesis if I want to see the stationary in the variable. From the result in STATA, both of the variables are able to reject the Null Hypothesis, which means they are stationary.

LM Hadri test has a different Null Hypothesis. It is 'All panels are stationary.' So, the ideal situation(stationary) is to remain the Null Hypothesis from this test. For 'lggdp', I did not see the significant at any level, which means that it remains the Null Hypothesis, all panels are stationary. While for 'lgfdi', it is stationary on first difference level.

c) Panel data cointegration test

I choose to use Kao test for cointegration in STATA. Its Null Hypothesis is 'No cointegration'.

Cointegration Test

	Modified Dickey-Fuller test	Dickey -Fuller test	Augmented Dickey-Fuller test	Unadjusted modified Dickey-Fuller test	Unadjusted Dickey-Fuller test
	6.6872*** (0.0000)	10.1622*** (0.0000)	10.9046*** (0.0000)	-14.1361*** (0.0000)	-15.4280 *** (0.0000)

*(The numbers in parentheses are P-values, *** and ** indicate significant at the 1% and 5% significance levels, respectively, and no * means insignificant.)*

Table 6. The result for Cointegration Test

From Table 5, I could reject the Null Hypothesis, which means all panels should be cointegrated.

d) Panel causality test: 'Xtgcause' command

As the variables are stationary(at least on the level of first difference), It is time to do a causality test for the dependent/independent variable. I choose '***xtgcause'*** for testing the Granger causality between GDP and FDI variables. This procedure is proposed by Dumitrescu and Hurlin (2012, Economic Modelling 29: 1450–1460).

First Let me check the causality between two variables: lgfdi and lggdp.

```
. xtgcause  lgfdi lggdp


Dumitrescu & Hurlin (2012) Granger non-causality test results:
--------------------------------------------------------------
Lag order: 1
W-bar =          1.4846
Z-bar =          2.1124   (p-value = 0.0347)
Z-bar tilde =    0.1863   (p-value = 0.8522)
--------------------------------------------------------------
H0: lggdp does not Granger-cause lgfdi.
H1: lggdp does Granger-cause lgfdi for at least one panelvar (id).

. xtgcause lggdp lgfdi


Dumitrescu & Hurlin (2012) Granger non-causality test results:
--------------------------------------------------------------
Lag order: 1
W-bar =          1.8620
Z-bar =          3.7575   (p-value = 0.0002)
Z-bar tilde =    1.0172   (p-value = 0.3091)
--------------------------------------------------------------
H0: lgfdi does not Granger-cause lggdp.
H1: lgfdi does Granger-cause lggdp for at least one panelvar (id).
```

From running this command, it is obvious that P-value is too big to refuse the Null hypothesis, which means the variables of FDI and GDP does not have a causality, from both directions.

Considering that it is a panel with different countries, I set a new dummy variable on 'bri': whether the country is a participant in BRI.

The second time test's result is below.

```
. xtgcause lggdp lgfdi if bri==1


Dumitrescu & Hurlin (2012) Granger non-causality test results:
--------------------------------------------------------------
Lag order: 1
W-bar =          2.1021
Z-bar =          3.8964   (p-value = 0.0001)
Z-bar tilde =    1.2537   (p-value = 0.2100)
--------------------------------------------------------------
H0: lgfdi does not Granger-cause lggdp.
H1: lgfdi does Granger-cause lggdp for at least one panelvar (id).

. xtgcause lgfdi lggdp if bri==1


Dumitrescu & Hurlin (2012) Granger non-causality test results:
--------------------------------------------------------------
Lag order: 1
W-bar =          1.5503
Z-bar =          1.9455   (p-value = 0.0517)
Z-bar tilde =    0.2683   (p-value = 0.7884)
--------------------------------------------------------------
H0: lggdp does not Granger-cause lgfdi.
H1: lggdp does Granger-cause lgfdi for at least one panelvar (id).
```

From the Granger test, I find that in the BRI participants, the GDP and FDI does not have causality. Because the P-value is bigger than 0.05 on the level of 95%.

```
. xtgcause lgfdi lggdp if bri==0


Dumitrescu & Hurlin (2012) Granger non-causality test results:
--------------------------------------------------------------
Lag order: 1
W-bar =          1.3583
Z-bar =          0.9136   (p-value = 0.3609)
Z-bar tilde =   -0.0537   (p-value = 0.9572)
--------------------------------------------------------------
H0: lggdp does not Granger-cause lgfdi.
H1: lggdp does Granger-cause lgfdi for at least one panelvar (id).

. xtgcause lggdp lgfdi  if bri==0


Dumitrescu & Hurlin (2012) Granger non-causality test results:
--------------------------------------------------------------
Lag order: 1
W-bar =          1.4004
Z-bar =          1.0208   (p-value = 0.3074)
Z-bar tilde =    0.0005   (p-value = 0.9996)
--------------------------------------------------------------
H0: lgfdi does not Granger-cause lggdp.
H1: lgfdi does Granger-cause lggdp for at least one panelvar (id).
```

In the non-participant countries, the China's Investment have no obvious causality with the GDP variable.

Consider about the year of different countries joining in the BRI, I suppose that the causality between the countries who join in the Initiative is not existing as well. For checking this, I generate another variable 'BRI', which counts the join year of countries before or after 2018.

```
. xtgcause lggdp lgfdi if BRI==1


Dumitrescu & Hurlin (2012) Granger non-causality test results:
--------------------------------------------------------------
Lag order: 1
W-bar =          2.3945
Z-bar =          2.9582   (p-value = 0.0031)
Z-bar tilde =    1.0656   (p-value = 0.2866)
--------------------------------------------------------------
H0: lgfdi does not Granger-cause lggdp.
H1: lgfdi does Granger-cause lggdp for at least one panelvar (id).

. xtgcause  lgfdi lggdp if BRI==1


Dumitrescu & Hurlin (2012) Granger non-causality test results:
--------------------------------------------------------------
Lag order: 1
W-bar =          1.0033
Z-bar =          0.0070   (p-value = 0.9944)
Z-bar tilde =   -0.4251   (p-value = 0.6708)
--------------------------------------------------------------
H0: lggdp does not Granger-cause lgfdi.
H1: lggdp does Granger-cause lgfdi for at least one panelvar (id).
```

```
. xtgcause  lgfdi lggdp if BRI==0


Dumitrescu & Hurlin (2012) Granger non-causality test results:
--------------------------------------------------------------
Lag order: 1
W-bar =          1.8580
Z-bar =          2.4267   (p-value = 0.0152)
Z-bar tilde =    0.6542   (p-value = 0.5130)
--------------------------------------------------------------
H0: lggdp does not Granger-cause lgfdi.
H1: lggdp does Granger-cause lgfdi for at least one panelvar (id).

. xtgcause lggdp lgfdi if BRI==0


Dumitrescu & Hurlin (2012) Granger non-causality test results:
--------------------------------------------------------------
Lag order: 1
W-bar =          1.9376
Z-bar =          2.6518   (p-value = 0.0080)
Z-bar tilde =    0.7679   (p-value = 0.4425)
--------------------------------------------------------------
H0: lgfdi does not Granger-cause lggdp.
H1: lgfdi does Granger-cause lggdp for at least one panelvar (id).
```

I find that within the BRI countries, the causality does not exist. Both before and after 2018, the P-value is bigger than 0.05, which means the Null Hypothesis cannot be rejected.

e) Fixed effect/Random effect: Hausman Test

I designed three groups of tests to check the real impact of China's Investment to the GDP variable. All of them based on the Hausman Test.

1. Check the GDP of 38 countries and the investment.
2. Check the countries which are participant in BRI/ out of the Initiative.
3. Check the countries which joins in BRI in and before 2018/after 2018.
4. Check the MENA countries(17 of the 38 countries).

Hausman Test Result

	Prob>chi2
Null condition:	0.0000***
'bri=1'	0.0065**
'BRI=1'	0.1593
'mena=1'	0.0020**

*(The numbers in parentheses are P-values, *** and ** indicate significant at the 1% and 5% significance levels, respectively, and no * means insignificant.)*

Table 7. The result for Hausman Test

The result of the three groups tells that for group 1 and 3, I could choose fixed effect model. For group 2, the best choice is random effect model.

	(1)'bri' lggdp	(2)'BRI' lggdp	(3)'mena' lggdp	(4)Null lggdp
lgfdi	0.026	0.153***	0.081***	0.028
	(0.260)	(6.548)	(5.657)	(0.46)
_cons	25.135***	24.513***	24.716***	25.984***
	(44.686)	(79.620)	(339.297)	(66.56)
N	275	99	187	418

Table 8. The result of four groups

In conclusion:

1. The investment from China has a non-significant positive effect on the GDP growth in all 38 countries.
2. In BRI joining countries/non-participating countries, with using fixed effects model, the FDI has a non-significant positive effect on BRI-joining countries.
3. In the countries that joined the BRI before 2018, I chose random effects, which are significant, and still have positive impact.
4. In MENA countries, the investment from China has a significant positive effect on the GDP.

Chapter 4 Conclusion

As China see MENA countries as important strategic market and partners in the global development, the participation of developing countries and their activity in the BRI is relatively high. Therefore, attention and research on Chinese investment will gradually increase. Considering the short time for the official launch of BRI, I used a period of 11 years in my paper, including before the launch of BRI until almost all major countries have signed the MoU, mainly to explore the possible relations between Chinese investment and MENA countries' economic growth.

First of all, it is confirmed that there is no causality between GDP and FDI, which is in line with the logic of Chinese investment: investment is not based on the economic level of MENA countries, but based on possible strategic factors to choose investment objects. For example, a good history of cooperation, or rich natural resources, superior geographical conditions for trade. Also, the GDP from the MENA countries cannot only be decided by FDI from China, as Europe and America could still be their big and loyal partners, it is almost impossible to say that China's promising investment leads to the domestic growth. In this paper I did not have enough space and time to check more on the factors.

Although there is no causality existing, the literature review still tells me that the variables should be relevant: China's investment could be a booster to MENA countries.

Therefore, to answer the research questions, I design three dummy variables and use Hausman test to detect the suitable regression for the groups under the conditions of BRI members, joining the BRI before 2018 and MENA countries.

China's outwards FDI seems to bring some positive impact on the economic growth in the MENA countries. Hausman test tells that within the relevant models, although the three groups are not guaranteed to be significant, they do all have a positive tendency from the perspective of coefficients.

Considering the time of joining the BRI, my assumption is that if the time of joining is earlier than 2018, China's FDI will obviously have a positive effect on economic development. From the regression coefficients, it can be seen that China's FDI varies across time by 1 unit, which can bring about 15.3% growth (1 unit) for the relevant countries during 2011-2019.

When it comes to the MENA countries, China's FDI varies across time by 1 unit, which can bring about 8.1% growth (1 unit) for the relevant countries during 2011-2019. Although the MENA countries have different energy reserves and their policies toward China are various, plus the gap in investment amounts is also relatively large, they can obtain a certain degree of economic promoting force from China's FDI.

This may explain why the Westerners are cautious about China's investment in developing countries, but among Middle Eastern countries, China's investment has become a major channel for continuous development and corporations, and similar type of investment is getting welcome in their neighbor countries as well. As MENA countries are more likely to be open to different countries and continents(America, EU etc.), they are more independent than some other less-developed countries in the BRI. Of course, this conclusion is my inference based on literature review and empirical evidence. In fact, it should be supplemented by follow-up research.

All in all, the MENA countries are China's unique partners. China's policy of non-interference in their internal affairs has allowed the governments of MENA countries to see China's pragmatism and concentration on commercial activities in the region: It is a positive and friendly signal that China can give under the megatrend of industrial upgrading and transformation and the improvement of labor quality in MENA countries for the next 15-20 years.

Reference

Alfaro, L., Chanda, A., Kalemli-Ozcan, S. and Sayek, S. (2010). Does foreign direct investment promote growth? Exploring the role of financial markets on linkages. Journal of Development Economics, [online] 91(2), pp.242–256. Available at: https://www.hbs.edu/faculty/Publication%20Files/07-013.pdf [Accessed 29 Mar. 2021].

Al-Khawlani, H. 2021. China Prioritizes Gulf Economic, Oil Relationships; Yemen Can Wait. [online] Sana'a Center For Strategic Studies. Available at: https://sanaacenter.org/publications/analysis/13002 [Accessed 12 Jul. 2021].

Alkoutami, S. and Wehrey F., (2020). China's Balancing Act in Libya. [online] Carnegie Endowment for International Peace. Available at: https://carnegieendowment.org/2020/05/10/china-s-balancing-act-in-libya-pub-81757.

Agrawal, G. and Khan, M., 2011. Impact of FDI on GDP: A Comparative Study of China and India. International Journal of Business and Management, 6(10).

American Enterprise Institute and Heritage Foundation, China Global Investment Tracker (CGIT), January 2021, https://www.aei.org/china-global-investment-tracker/.

Borensztein, E., De Gregorio, J. and Lee, J., 1998. How does foreign direct investment affect economic growth?. Journal of International Economics, 45(1), pp.115-135.

Brautigam, Deborah; Diao, Xinshen; McMillan, Margaret S.; and Silver, Jed. 2019. Chinese investment in Africa: How much do we know? Synthesis Pieces 2. London, UK: Centre for Economic Policy Research; Private Enterprise Development in Low-Income Countries. https://pedl.cepr.org/publications/chinese-investment-africa-how-much-do-we-know

Calabrese, J., 2021. "The New Algeria" and China. [online] Middle East Institute. Available at: <https://www.mei.edu/publications/new-algeria-and-china#_ftn71> [Accessed 12 November 2021].

Chaziza, M., 2021. China Consolidates Its Commercial Foothold in Djibouti. [online] Thediplomat.com. Available at: <https://thediplomat.com/2021/01/china-consolidates-its-commercial-foothold-in-djibouti/> [Accessed 12 November 2021].

Chaziza, M., 2020. China's Strategic Partnership with Kuwait: New Opportunities for the Belt and Road Initiative. Contemporary Review of the Middle East, 7(4), pp.501-519.

Chaziza, M. 2020. China–Qatar Strategic Partnership and the Realization of One Belt, One Road Initiative. China Report, 56(1), pp.78–102.

Chen, D. and Han, W. 2019. Deepening Cooperation Between Saudi Arabia and China. King Abdullah Petroleum Studies and Research Centre.

Chen, J., Shu, M. and Wen, S. 2018. Aligning China's Belt and Road Initiative with Saudi Arabia's 2030 Vision: Opportunities and Challenges. China Quarterly of International Strategic Studies, 04(03), pp.363–379.

China Global Investment Tracker. 2019. Chinese Investments & Contracts in Kuwait. (2013–2019). https://www.aei.org/china-global-investment-tracker/.(accessed on 10 July 2021)

China Global Investment Tracker. 2019. 'Chinese Investments & Contracts in Qatar (2013 - 2018)', https:// www.aei.org/china-global-investment-tracker/ (accessed on 16 May 2021)

Cozza, C., Rabellotti, R. and Sanfilippo, M. 2015. The impact of outward FDI on the performance of Chinese firms. China Economic Review, 36, pp.42–57.

De Freitas, G. 2019. HKTDC Research. [online] research.hktdc.com. Available at: https://research.hktdc.com/en/article/MzE5ODIyODg4 [Accessed 15 Oct. 2021].

Dorraj, M., 2016. The Future of Sino-Iran Relations. Toward Well-Oiled Relations?, pp.206-215.

Fulton, J. 2019. China in the Gulf. [online] www.eni.com. Available at: https://www.eni.com/en-IT/global-energy-scenarios/china-new-silk-road.html [Accessed 15 Oct. 2021].

Gadallah, Y., 2016. An Analysis of the Evolution of Sino-Egyptian Economic Relations. Toward Well-Oiled Relations?, pp.94-114.

Guerraoui, S., 2016. Morocco establishes “strategic partnership” with China.[online] Available at: https://thearabweekly.com/morocco-establishes-strategic-partnership-china [Accessed 13 Nov. 2021].

Hansen, H. and Rand, J., 2006. On the Causal Links Between FDI and Growth in Developing Countries. The World Economy, 29(1), pp.21-41.

Hamaizia, A., 2020. Rebalancing Algeria’s Economic Relations with China. [online] Chatham House – International Affairs Think Tank. Available at: <https://www.chathamhouse.org/2020/12/rebalancing-algerias-economic-relations-china> [Accessed 12 November 2021].

Herzer, D., Klasen, S. and Nowak-Lehmann D., F., 2008. In search of FDI-led growth in developing countries: The way forward. Economic Modelling, 25(5), pp.793-810.

Honig, S. 2019. Iraq looks to China for investment as economy struggles to keep pace. [online] Foreign Brief. Available at: https://foreignbrief.com/daily-news/iraq-looks-to-china-for-investment-as-economy-struggles-to-keep-pace/ [Accessed 13 Oct. 2021].

HSBC., 2021. UAE economy offers increasing range of opportunities for Chinese investors. [HSBC online] Available at: https://www.business.hsbc.ae/en-gb/insights/growing-my-business/hsbc-china-uae-corridor#disclaimer [Accessed 15 Oct. 2021].

Ibrahim, S. and Salah, M. 2002, An economic analysis of the EU-Egypt partnership agreement, Proceeding of the 10th Conference of Agricultural Economists at the Egyptian Association of Agricultural Economics in Cairo, Egypt, EAEA Press, Cairo, pp. 27-39.

International Financial Law Review. 2018. Chinese Outbound Investment Guide 2018: Lebanon. [online] Available at: <https://www.iflr.com/article/b1lp1vm14sf28n/chinese-outbound-investment-guide-2018-lebanon> [Accessed 13 November 2021].

Iqtait, A. 2018., China’s rising interests in Qatar. [online] www.lowyinstitute.org. Available at: https://www.lowyinstitute.org/the-interpreter/china-s-rising-interests-qatar [Accessed 20 Sep. 2021].

Macroeconomics Policy, Forecasting and Research Department (ECMR)., 2020. Working Paper 335 - Intra-African Foreign Direct Investment (FDI) and Employment: A Case Study. [online] Banque africaine de développement - Bâtir aujourd'hui, une meilleure Afrique demain. Available at: <https://www.afdb.org/fr/documents/working-paper-335-intra-african-foreign-direct-investment-fdi-and-employment-case-study> [Accessed 18 May 2021].

Malik, O. (2021). What Is China’s Endgame in Northern Iraq? [online] Politics Today. Available at: https://politicstoday.org/china-northern-iraq-krg-economic-investments/ [Accessed 13 Sep. 2021].

Mogielnicki, R. 2020., Oman’s Bittersweet Economic Relations With China. [online] Arab Gulf States Institute in Washington. Available at: https://agsiw.org/omans-bittersweet-economic-relations-with-china/ [Accessed 15 Sep. 2021].

Mofcom.gov.cn. 2019. 中国加大对 MENA 地区国家的投资力度(China increases investment in countries in the MENA region). [online] Available at:

http://www.mofcom.gov.cn/article/i/jyjl/k/201911/20191102910231.shtml[Accessed 18 May 2021].

Middle East Monitor. (2021). Qatar signs 15-year liquified gas deal with China. [online] Available at: https://www.middleeastmonitor.com/20211001-qatar-signs-15-year-liquified-gas-deal-with-china/ [Accessed 20 Oct. 2021].

Mehdi Behname, 2012. Foreign Direct Investment and Economic Growth: Evidence from Southern Asia, Economic Analysis Working Papers (2002-2010). Atlantic Review of Economics (2011-2016), Colexio de Economistas de A Coruña, Spain and Fundación Una Galicia Moderna, vol. 2, pages 1-1, December.

Mezran, K. and J. Samet, D., 2019. China Has Quietly Carved out a Foothold in North Africa. [online] Thediplomat.com. Available at: <https://thediplomat.com/2019/07/china-has-quietly-carved-out-a-foothold-in-north-africa/> [Accessed 13 November 2021].

MFA (2020). Green Belt and Road - Cooperation between China and Central and Eastern European Countries. [online] www.mfa.gov.cn. Available at: https://www.mfa.gov.cn/chinaceec//eng/sbhz_1/t1839956.htm [Accessed 15 Nov. 2021].

Nassar, S. 1980, The development of vegetable cultivation in Egypt for the purpose of export, Proceeding of the Conference of Developing Egyptian Agricultural Exports in Cairo, Egypt, Ministry of Agriculture, Cairo, pp. 161-78

Nedopil, Christoph (2020): "Countries of the Belt and Road Initiative"; Beijing, IIGF Green BRI Center, www.green-bri.org(关于一带一路合作国家 MENA 中的比例)

O'Grady, V. (2021). Bahrain attracts more data centre investment. [online] Developing Telecoms. Available at: https://developingtelecoms.com/telecom-technology/data-centres-networks/10796-bahrain-attracts-more-data-centre-investment.html [Accessed 14 Oct. 2021].

Qatar Tribune. 2018. 'With World's First 5G, Qatar Leads in Communication Tech', 2 July, http://www. qatar-tribune.com/news-details/id/130696 [Accessed 10 Oct. 2021].

Shen, Xiaofang. 2015. Private Chinese Investment in Africa: Myths and Realities. Development Policy Review 33 (1): 83-106.

Taleb, W., 2020. China emerges as potential investor as Lebanon runs low on options. [online] Al-Monitor: The Pulse of the Middle East. Available at: <https://www.al-monitor.com/originals/2020/07/lebanon-china-money-investment.html#ixzz7C1oPmvyA> [Accessed 12 November 2021].

Tanchum, M., 2020. China's challenge in Morocco's Africa-to-Europe commercial corridor. [online] East Asia Forum. Available at: https://www.eastasiaforum.org/2020/08/01/chinas-challenge-in-moroccos-africa-to-europe-commercial-corridor/ [Accessed 13 Oct. 2021].

TIMEP. 2019. TIMEP Brief: China's Role in Egypt's Economy. [online] Available at: <https://timep.org/reports-briefings/timep-brief-chinas-role-in-egypts-economy/> [Accessed 11 November 2021].

TRTWorld (2019). What is China doing in Yemen? [online] What is China doing in Yemen? Available at: https://www.trtworld.com/middle-east/what-is-china-doing-in-yemen-32183 [Accessed 14 Sep. 2021].

WANG, C.N. 2021. China Belt and Road Initiative (BRI) Investment Report 2020 – Green Finance & Development Center. [online] https://greenfdc.org. Available at: https://greenfdc.org/china-belt-and-road-initiative-bri-investment-report-2020/ [Accessed 16 Oct. 2021].

WBV(We Build Value). 2021. Madinat Al-Hareer: Kuwait's impressive City of Silk - We Build Value. [online] Available at: <https://www.webuildvalue.com/en/megatrends/silk-city-kuwait-s-city-of-dreams.html> [Accessed 12 November 2021].

W. Sidlo, K. 2020. The Role of China in the Middle East and North Africa (MENA). Beyond Economic Interests? [online] www.iemed.org. Available at: https://www.iemed.org/publication/the-role-of-china-in-the-middle-east-and-north-africa-mena-beyond-economic-interests/#section-chinas-global-expansion-and-the-belt-and-road-initiative-nP2dI [Accessed 13 Oct. 2021].

Xinhua.2017. Full text: Vision for Maritime Cooperation under the Belt and Road Initiative | English.news.cn.[online] Available at: <http://www.xinhuanet.com/english/2017-06/20/c_136380414.htm> [Accessed 12 November 2021].

Xinhua. 2021. Interview: China to boost pragmatic cooperation with Lebanon in various fields: ambassador - Xinhua | English.news.cn. [online] Available at: <http://www.xinhuanet.com/english/2021-07/26/c_1310087747.htm> [Accessed 12 November 2021].

Xinhua. 2019. Tunisia, China sign economic, technical cooperation agreement - Xinhua | English.news.cn. [online] Available at: <http://www.xinhuanet.com/english/2021-04/07/c_139862971_2.htm> [Accessed 13 November 2021].

Xinhua, 2020., News Analysis: Oman-China ties to prosper under BRI after COVID-19, say experts - Xinhua | English.news.cn. [online] Available at: http://www.xinhuanet.com/english/2020-06/09/c_139125323.htm [Accessed 15 Oct. 2021].

Zoubir, Y.H. 2020. Expanding Sino–Maghreb Relations: Morocco and Tunisia, pp.19-24.

Appendix A：Tables

Table 1. China's Outward FDI Flows to the MENA countries in BRI during 2009-2019 (Millions of USD)

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Algeria	228.76	186.00	114.34	245.88	191.30	665.71	210.57	-99.89	-140.53	178.65	-123.62
Bahrain	N/A	N/A	N/A	5.08	-5.34	N/A	N/A	36.46	36.96	-2.35	-0.34
Djibouti	3.40	4.23	5.66	N/A	2.00	9.53	20.33	62.24	104.64	-81.06	26.64
Egypt	133.86	51.65	66.45	119.41	23.22	162.87	80.81	119.83	92.76	221.97	10.96
Iran	124.83	511.00	615.56	702.14	745.27	592.86	-549.66	390.37	-368.29	-567.33	-59.17
Iraq	1.79	48.14	122.44	148.40	20.02	82.86	12.31	-52.87	-8.81	7.73	887.09
Kuwait	2.92	22.86	42.00	-11.88	-0.59	161.91	144.44	50.55	175.08	192.08	-100.52
Lebanon	N/A	0.42	N/A	N/A	0.68	0.09	N/A	N/A	N/A	N/A	N/A
Libya	-38.55	-10.50	47.88	-6.68	0.45	0.13	-41.06	-17.05	-176.40	28.23	-129.34
Malta	0.22	-2.37	0.27	N/A	0.12	1.93	5.03	154.80	1.67	10.11	-1.18
Morocco	16.42	1.75	9.11	1.05	7.74	11.44	26.03	10.16	59.86	90.78	-95.16
Oman	-6.24	11.03	9.51	3.37	-0.74	15.16	10.95	4.62	12.73	51.91	-3.15
Qatar	-3.74	11.14	38.59	84.46	87.47	35.79	140.85	96.13	-26.63	-368.10	29.32
Saudi Arabia	90.23	36.48	122.56	153.67	478.82	184.30	404.79	23.90	-345.18	383.07	654.37
Tunisia	-1.30	-0.29	3.76	-0.65	7.06	0.71	5.64	-3.22	-0.82	5.96	19.96
UAE	88.90	348.83	314.58	105.11	294.58	705.34	1268.68	-391.38	661.23	1081.01	1207.41
Yemen	1.64	31.49	-9.12	14.07	331.25	5.96	-102.16	-413.15	27.25	10.45	-78.81

Table 2. China's Outward FDI Stock to the MENA countries in BRI during 2009-2019 (Millions of USD)

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Algeria	751.26	937.26	1059.45	1305.33	1497.21	2451.57	2531.55	2552.48	1833.66	2062.86	1775.35
Bahrain	0.87	0.87	1.02	6.80	1.46	3.76	3.87	37.36	74.37	71.96	70.74
Djibouti	7.03	12.47	18.13	17.99	30.55	40.08	60.46	125.40	232.86	178.49	125.26
Egypt	285.07	336.72	403.17	459.19	511.13	657.11	663.15	888.91	834.84	1079.26	1086.80
Iran	217.80	715.16	1351.56	2070.46	2851.20	3484.15	2949.19	3330.81	3623.50	3234.29	3055.62
Iraq	22.58	483.45	605.91	754.32	317.06	375.84	388.12	557.81	414.37	598.54	1377.52
Kuwait	5.88	50.87	92.86	82.84	89.39	345.91	543.62	578.10	936.23	1091.84	834.51
Lebanon	1.57	2.01	2.01	3.01	3.69	3.78	3.78	3.01	2.01	2.22	2.22
Libya	42.69	32.19	67.78	65.19	108.82	108.94	105.77	211.12	366.75	425.68	299.43
Malta	5.03	2.66	3.37	3.37	3.49	5.42	10.45	163.64	164.98	230.49	229.32
Morocco	48.78	55.85	89.48	95.22	102.96	114.44	156.29	162.70	318.21	382.29	303.29
Oman	7.97	21.11	29.38	33.35	174.73	189.72	200.77	86.63	99.04	150.68	116.34
Qatar	36.28	77.05	130.18	220.26	254.02	353.87	449.93	1025.65	1105.49	435.98	458.92
Saudi Arabia	710.89	760.56	883.14	1205.86	1747.06	1987.43	2434.39	2607.29	2038.27	2594.56	2527.73
Tunisia	2.27	2.53	6.29	5.69	13.86	14.56	20.84	16.30	15.08	21.53	36.62
UAE	440.29	764.29	1174.50	1336.78	1514.57	2333.45	4602.84	4888.30	5372.83	6436.06	7365.67
Yemen	149.30	184.66	191.45	221.30	549.11	555.07	453.30	39.21	612.55	623.00	544.19

Table 3. Description of Data Sources

Publisher	World Bank	MOFCOM
sources	World Development Indicators (WDI) database	The China Commerce Yearbook and the project level data also collected by MOFCOM
Data collection	Data collected from the IMF's BoP statistics, the Foreign direct investment (FDI) data are supplemented by the World Bank staff estimates using data from the United Nations Conference on Trade and Development (UNCTAD) and official national sources. *Data starting from 2005 are based on the sixth edition of the IMF's Balance of Payments Manual (BPM6).*	The reliable official data is from the *China Commerce Yearbook*, which is an annual source on overseas investment and cooperation of China. Also, *China Statistical Yearbook* includes investment data consistent with the *China Commerce Yearbook*.
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