FOREIGN DIRECT INVESTMENT AND ECONOMIC GROWTH: ADYNAMIC STUDY OF MEASUREMENT APPROACHES AND RESULTS

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Article history:		Abstract:
Received:	1ˢᵗ March 2023	The relationship between foreign direct investment and economicgrowth (FDI-EG) has been subject to extensive research. The firstdocument related to FDI-EG research in Web of Science was pub-lished in 1992 so that the research time is close to 30 years. Thisarticle aims to make a bibliometric study to measure the FDI-EGresearch from different points of view. 1,075 documents withrespect to FDI-EG research were collected, and a strong bibliomet-ric analysis was carried out by Bibliometrix software and review of approaches. from the "enemy" is undesirable, as it was during the cold war.
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INTRODUCTION

Investments are the engine of economic growth (Liesbeth et al.,2009) and humandevelopment (Torabi,2015), due to that it is an effective means to increase wealth innational economy, and human community. Amongst the multiple investments, for-eign direct investment (FDI) has a vital influence on the economic growth (EG) of anation, as a condition to attract investors to develop and improve the economy andthe quality of human resources (Simionescu & Naros,2019). The World TradeOrganization (WTO) gave the definition of FDI that occurs when an investor based in a country acquires an asset in another country with the intent to manage thatasset. The FDI contains many management dimensions, such as bonds, portfolioinvestment in foreign stocks. Since FDI can bring much-needed additional foreigncapital, and advanced technology and improved managerial skills, it is considered asan essential part of economic growth and the financial globalisation process (Alfarro,2017). Specially, FDI can also represent a decisive factor for EG at macroeconomicand microeconomic levels in some certain areas (Cicea et al.,2019). In general, EGcould be measured by the increase of gross domestic product and the quality of lifeand living standards (Botha et al.,2020).

FDI was the principal source of flow to thedeveloping countries in 1990 (Mahmoodi & Mahmoodi,2016). The characteristics ofFDI are that it shows a fewer volatility degree and has an irregular pro-cyclical behav-iour. Since the late 1980s and 1990s, the FDI inflows have increased rapidly almostaround the world, and it is very important for less developed countries to supportdevelopment and economic growth.

This issue makes it necessary to reveal the develop-ment of the study between foreign direct investment and economic growth (FDI-EG).Therefore, it is an important and necessary issue for countries or organisations to studythe FDI-EG research in the field of international economics. A bibliometric study ofthe FDI-EG is valuable to grasp the features and understand the research status fromvarious perspectives, as scholars always suffer more from economic problems.The purpose of this article aims to explore and provide a critical review for meas-uring the FDI-EG relationship according to bibliometric analysis via Bibliometrix, anopen-source instrument based on R language. The contributions of this article to theFDI-EG research lie in three ways:

(1) The relevant literature during past 30 years isanalysed and presented with a holistic assessment to reveal the development ten-dency, considering leading researchers, conceptual structure, and thematic evolution.

(2) With the identification of the citations of publications, the FDI-EG research isrevealed to outline the different perspectives from aspects of contents, the influentialdocuments, co-authorship, citation and co-citation.

(3) An objective view of the FDIresearch and a profound discussion of potential future pathways for measuring FDI-EG are presented, which not only would be beneficial for scholars who are interestedin this field, but also for a range of stakeholders when making the relevant eco-nomic decisions.

The structure of the article is organised as follows: We first describe the datasource and methodology. Subsequently, the bibliometric results on

the FDI-EG rela-tionship are present from three aspects. This is followed by a critical review for meas-uring the FDI-EG relationship from different perspectives. Finally, we end the articlewith the discussions and conclusions.

LITERATURE REVIEW

Concept of Economic Growth According to Nekipelov (2011), economic growth is dynamics of the volume of final goods and services ("aggregate product") produced during a selected time unit. There are different concepts of economic growth and ways of measuring it, but the core definition is in terms of growth in the long run productive capacity of the economy, typically measured by real growth in Gross Domestic Product (GDP). Gross Domestic Product is defined as the sum of all goods and services produced in a country over time, without double counting products used in other output. It is a comprehensive measure, covering the production of consumer goods and services, even government services, and investment goods (Lequiller et al, 2004).

This production includes that by the United States-owned companies as well as by production plants located in the United States and owned by foreign companies. As GDP increases, there is a tendency for company profits and interest rates to rise as well. Conversely, as GDP decreases, there is a tendency for company profits and interest rates to also decline. GDP Growth can be measured in terms of demand (total expenditure on goods and services), or supply (total goods and services produced). The growth in demand can outstrip supply for a while by borrowing, but is ultimately constrained by the income generated by supply. There are two kind of popular GDP growth in economic study, those are nominal and real GDP growth, Nominal GDP is GDP evaluated at current market prices. Therefore, nominal GDP will include all of the changes in market prices that have occurred during the current year due to inflation or deflation. Inflation is defined as a rise in the overall price level, and deflation is defined as a fall in the overall price level. In order to abstract from changes in the overall price level, another measure of GDP called real GDP is often used. Real GDP is GDP evaluated at the market prices of some base year. According to Kuznets (1934), GDP can be determined in three ways, all of which should, in principle, give the same result. They are the product (or output) approach, the income approach, and the expenditure approach. Expenditure approach is taken in this research by consideration that FDI as the object of this research is measured as gross investment from abroad which is calculated in bask of expenditure approached GDP. Ram and Zhang (2002) said that FDI can promote economic growth because FDI can provide financial resource for a country and it will increase a country's competitiveness in global market.

Generally, FDI supports a country to be ready and provide it access to global market, so it can globalize (Dondeti and Mohanty, 2007). However, FDI can increase growth rate if only its inflows are well managed (Bezuidenhout, 2009). The relationship between FDI and macroeconomic growth, and the stability of this growth, is a central consideration as host countries evaluate the trade-offs associated with foreign entry. Borensztein, De Gregorio, and Lee (1998) found a positive correlation between FDI and economic growth, they point out that human capital improvement in the host country should be sufficient in order to achieve the beneficial growth effect of the foreign inflow. Moreover, Alfaro (2003) conducted the similar research about how FDI in primary, manufacture and service sector affect economic growth, they pointed out the fact that inflow FD in different sector will affect economic growth differently.

DATA AND METHODOLOGY

Bibliometric analysis is one of the suitable methods to look into the study of theFDI-EG research, since it could reveal the evolution and measure the inner relation-ship of various items with the extensive intersection and combination of statistics,philology, and information science (He et al.,2017). It has been a mature way to ana-lyse the evolution of a journal or a subject (Shang et al.,2015) and has been widelyapplied in some fields, like group decision making (Wang et al.,2021), digitalisationand business models (Caputo et al.,2021) as well as journals, such asEconomicResearch-Ekonomska Istra zivanja(Wang et al.,2020), andTechnological andEconomic Development of Economy(Yu et al.,2019).This study makes the bibliometric analysis by Bibliometrix, an open-source instru-ment based on R language, which refers to some methods as follows: (1) Leadingresearchers'analysis.

RESULT

Researchers are key participants in driving the developmentwithin a particular field, and the productivity and impact are usually deemed as twoimportant facets for measuring their contributions (Forliano et al.,2021). In this rep-resentation, the area of the circle is proportional to the number of publications peryear, and the colour depth concerning the circle is proportional to the average annualcitations since publication (Shi et al.,2020). (2) Conceptual structure analysis. Thekeywords are distributed in the form of dots in the two dimensional space,

clearlyrevealing the relationship between them and the spatial distribution of the themes(Shi et al.,2020). To be specific, the stronger the relevance of the keywords, the closerthey are presented in the concept structure diagram. In addition, they would be distinguished by different colours and regions. (3) Thematic evolution analysis.Different kinds of topics would be distributed in four different quadrants, from thetwo dimensions of centrality and density, which allows us to have a nutshell andintuitive overview regarding the research hotspots (Cobo et al.,2011).

Specifically,centrality gauges the level of inter-cluster interaction, i.e., how well the current topicis connected to other topics, while density tells us the level of intra-cluster cohesion,i.e., how tightly the keywords in the cluster are connected (Forliano et al.,2021).Topics in the first quadrant (upper-right) are usually considered as the motor topics,topics in this area are well developed and vital for building the corresponding field.Highly specialised and isolated topics are usually located in the second quadrant(upper-left). Topics in the third quadrant (bottom-left) indicate emerging topics. Incontrast to the topics in the other quadrants, these topics are relatively weakly devel-oped. Finally, with high-centrality and low-density characteristics, topics in the fourthquadrant (bottom-right) are regarded as basic topics. These topics cover importantfuture research directions, but are not receiving effective attention at this stage (Lam-Gordillo et al.,2020). At the same time, each circle in the diagram represents a topic,the name of which is

determined by the keyword with the highest frequency. Also,the size of the circle is influenced by the frequency of keyword, the higher the fre-quency, the larger the area of the circle. depicts the year-wise distribution of the 20 most productive authors duringthe period 1995 to 2019 with citations. Obviously, it can be seen that the seminalauthor C. Chen from the Australian National University constantly produces researchon FDI-EG, with an uninterrupted series of papers from 1995 to 2019.

Preliminarywork on FDI-EG entitled"The role of foreign direct investment in China's post-1978economic development"was published in World Development, revealing the positivestimulating effects of FDI on China's economic reforms (Chen et al.,1995). Apartfrom C. Chen, C.F. Tang and Y. Wang are scholars who have been more active inthe FDI-EG field in recent years. In terms of longevity, J.W. Lee and B. Li have bothpublished consistently for more than 15 years over the course of their careers and arein the second and third positions respectively. Notable here is that most articles aregenerated from the 2010s onwards. It implies that the field of FDI-EG has gainedongoing academic attention in the last decade, thus attracting researchers to submittheir research results. Conversely, the indicator total citations per year is deployed toassess the impacts of publications written by researchers. In the specific case of theinfluential articles, C.F. Tang, J.W. Lee and M. Shahbaz received the higher numberof citations per year. For instance, J.W. Lee posted an article in 1998 called"
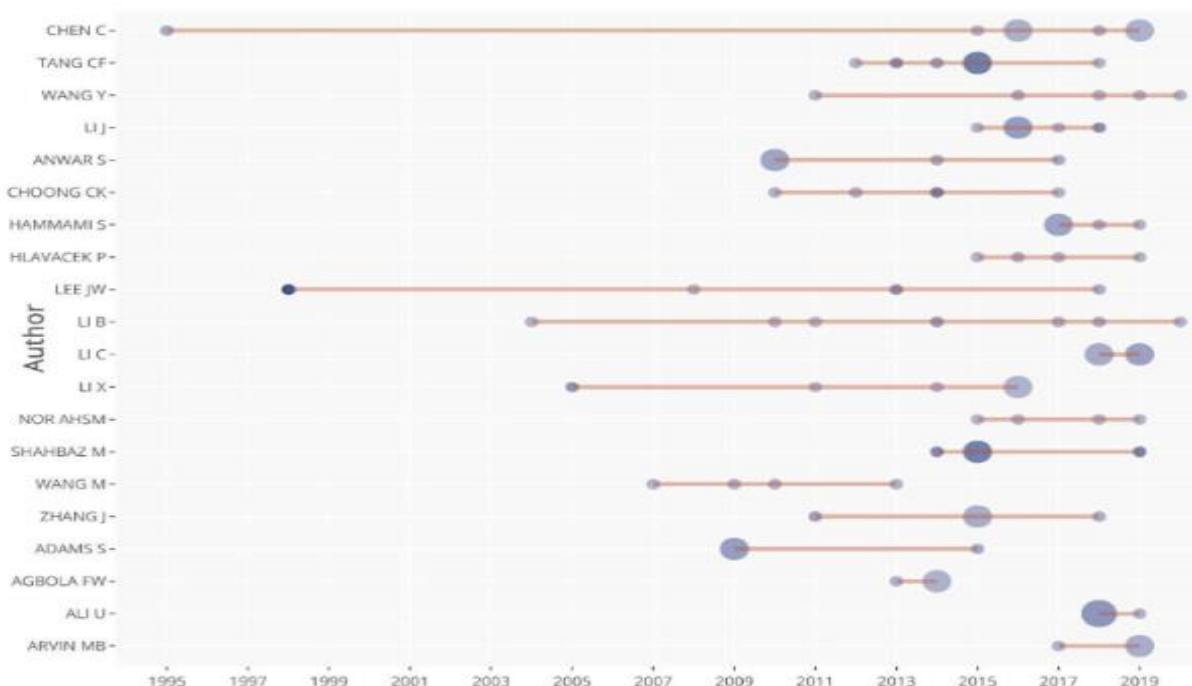
Figure 1.Top authors'production over the time (1995-2019).
Source: Authors'own research

In this part, we exploit the conceptual structure function embedded in Bibliometrixto explore the conceptual structure landscape of the FDI-EG research. According toAria and Cuccurullo (2017), diverse dimensionality reduction techniques could beemployed to achieve the identification of conceptual structure, including multidimen-sional scaling (MDS), multiple correspondence analysis (MCA) and correspondenceanalysis (CA). In this study, we adopt MCA, a generalisation of CA. By using the top50 high frequency keywords in the FDI-EG literature, thus, three clusters of docu-ments communicating similar concepts are outlined and exhibited inFigure 2.Asasupplementary instruction,Figure 3gives a detailed presentation on the topic dendro-gram of hierarchical cluster analysis within the top 50 high frequency keywords plusin the field of FDI-EG. Combining the outcomes ofFigures 2and 3, it could be easilyobserved that the first cluster (in red) contains 9 keywords, suggesting the concernson technology and firm performance. Cluster two (in blue) involves the most key-words (30 keywords), paying more attention on the research in modelling. WhilstFigure 1.Top authors'production over the time (1995-2019).

CONCLUSION

The research found that FDI in 10 sectors used simultaneously provide a significant impact on economic growth, real GDP growth is explained 90,4% by FDI growth while 9,6% is explained by other variables out of the model. However there are some differences occur in the result, manufacturing, wholesale trade, retail trade, information, real estate, rental, leasing and other industries contribute significantly and positively to the economic growth in the U.S, it is stand in line with previous studies while insurance, professional, scientific and technical service sector contribute significantly and negatively to the economic growth. Two industries: banking and finance sector don't provide significant impact in confidence level of 95%. Insurance sector contribute significantly and negatively because the disability of insurance companies to pay claim had lower the productivity in the U.S. FDI in professional, scientific and technical service sector also contribute significantly and negatively as it just makes the expense and productivity of companies become lower as the worse quality of foreign professionals.

The U.S. manufacturing has help to increase GDP since a long time ago from export and investment. Manufacturing represents nearly 60% of total U.S. exports in 2017. it provides positive and significant impact on economic growth. The foreign investment in both wholesaler and retail trade sector has increased consumption in the U.S. Personal consumption historically represents 70% of our nation's GDP therefore it provides positive and significant impact on economic growth. The U.S. continues to be the largest telecom market in the world and is expected to grow faster than most other developed countries to a total of $721 billion by 2015, or 3.7 percent every year, therefore foreign investment in this sector will provide positive and significant impact on economic growth. The stability of U.S. property markets still make them attractive destinations for FDI and it provides positive and significant impact on economic growth. Growing consumer demand and world class innovation – combined with a competitive workforce and supply chain capable of building, installing and servicing all energy technologies – makes the United States the world's most attractive market in the $6 trillion global energy market. It attracts more FDI to come and provide positive and significant impact on economic growth. Finance sector does not provide significant impact on economic growth in the U.S because finance sector are dominated by local investors and banking sector also does not provide significant impact on economic growth as people in U.S tend to spend their money for investment than saving. However this research had some limitations:

1) This research uses only one source to seek for data, it is from the U.S. Chamber of Commerce because there is tendency that ratio data from different sources cannot be exactly the same when the objective is macroeconomic data in which survey must be conduct to cover very large area,

2) This research only uses real GDP growth to represent economic growth and there is no externality or other relevant explanatory variables involved in this research and 3) This research does not provide detail information about the reason of each sector impact on economic growth.

Future researchers is suggested to collect more data about foreign direct investment in each industry from more than one source so that they can obtain more observation and prevent bias better than this research did. The measurement welfare of a country can also be observed from another indicator instead of GDP such as income equality, GDP per capita and so forth. The next researcher is also expected to conduct a research for one specific sector by using the result of this research as their hypothesis, this is important to know what factors make that sector contribute like this empirical

finding say and it can be conducted in the United States again.

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