



**The Moderating Role of Financial Development on the
Relationship between Financial Inclusion & FDI: Case of
Lower- Middle Income Group of Countries**

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Abstract

This study aims to examine the relationship between FDI & financial inclusion (FI) without any moderators, and examines if a moderator like FD, which has an effect on both FI & FDI can affect the relationship between FDI & FI. The study uses panel data analysis with the available data of 2010–2020-time span for 48 countries classified under the class of lower middle-income group. And it is found that FDI has a significant positive effect on FI directly without any moderator. Additionally, FI has a significant impact on FDI in existence of the moderator FD.

Keywords: financial inclusion - foreign direct investment - financial development – exclusion – financial stability – sustainable development – economic growth – ending poverty – lower middle-income group – inclusive growth.

Introduction¹:

Achieving sustainable development goals became the main concern for lots of countries especially, the goal of ending poverty & the goal of achieving equitable growth. Because of achieving high growth without equitable growth let the economic growth's fruits basically exclude poor people, which may increase poverty & affect sustainable development negatively.

Hence, the focus of the existing governments is based on inclusive growth. Since, achieving the targets of economic growth and development are not easy if the majority suffer from poverty & inequity. But inclusive growth is probable, if there is a dynamic contribution of the excluded segment in the growth process. And that is possible through financial inclusion (FI). So, FI is one of the most important tools to achieve inclusive growth. Since financial inclusion lets financial services reachable to the poor, beside the credit facilities which suit their demands and create more self-employment opportunities.

Hence, supporters of financial inclusion, such as the World Bank and other financial institutions, noticeably focus on the process of adding lots of entities (businesses & individuals) into the financial system without any exclusion. Especially, this process promotes income equality, alleviates poverty, enhances rate of savings, promotes investment decisions, and improves the overall economic welfare in order to avoid the consequences of financial exclusion, which is one of the main obstacles for development.

Accordingly, from an economic point of view, financial inclusion is considered as one of the main enablers of economic development. In this vein, the participants of the Alliance for Financial Inclusion (AFI) indicated in the

¹Bhowmik K, and Saha,D. (2013). Financial Inclusion of the Marginalized.Springer. India:1-4

Maya Declaration on Financial Inclusion¹ that FI plays an important role in promoting the inclusive growth especially in developing countries². Since many studies, such as the work of Thorat (2008) illustrate that increasing the number of excluded people from accessing to the formal financial services leads to increasing poverty and inequality ratios³.

In this vein, on the demand side of credit, the vulnerable & the lower income groups fundamentally depend on personal savings in order to invest in their professional, personal, and social areas to get the benefits of growth opportunities. But on the supply side, financial institutions including banks are the most active players in providing formal credit to those groups. This process actually demands a financially developed environment, which refers to the importance of financial development (FD) for achieving FI.

Additionally, FD attracts more FDI to provide more funds to the financial markets which are needed for inclusion. So, the formal financial system could be well developed in order to achieve financial inclusion, especially in lower middle-income group of countries where the population is large, diverse with

¹The Maya Declaration is a global initiative for responsible and sustainable financial inclusion that aims to reduce poverty and ensure financial stability for the benefit of all. It is a statement of common principles regarding the development of financial inclusion policy. Launched at the 2011 Global Policy Forum (GPF) in Mexico's Riviera Maya, the Maya Declaration represents AFI's core values and the first global and measurable set of commitments by developing and emerging country governments towards advancing the financial inclusion agenda. A public commitment to the Maya Declaration is a means of championing financial inclusion and contributing to a range of Sustainable Development Goals (SDGs), including goal 1 (no poverty), goal 5 (gender equality), goal 8 (decent work and economic growth) and goal 13 (climate action).

²<https://www.afi-global.org/global-voice/maya-declaration/> access time at 1st of October 2021

³Thorat U. (2008). Financial Inclusion and Information Technology. Centre for Advanced Financial Research:1-20. available online on https://www.researchgate.net/publication/23777897_Financial_Inclusion_and_Information_Technology. Access time 1/10/2021.

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enormous segments in rural & unorganized areas. Even in areas covered by banks, there are segments of society prevented from the banking services. Since some segments in the urban & rural areas still experience difficulties in order to get credit from formal institutions.

So, it is important to understand the meaning of FI, the reasons behind it and its relationship with FDI through the financial development. Especially, FD is a symbol of stable economies for foreign investors, so it attracts more of FDI which may affect FI positively. So, in this research, the relationship between FI & FDI through the role of FD will be examined to figure out the fact of this relationship & its direction in lower middle-income group of countries.

Problem of the study:

Despite of the effect of FI in achieving sustainable development, and the international initiatives that have been made regarding promoting FI, the number of depositors on average for the lower middle-income group of countries from 2010 to 2020 (the period of the study) increased from 419.13¹ to 597.5 per 1000 adults². Although the global average for this indicator is 778.61 bank accounts, which means the lower middle-income group of countries still below the average³.

Additionally, the number of ATMs per 100,000 adults was 12.6 on average in 2010, which increased to be 26 ATMs in 2020⁴ (which means one ATM for each 3846 adults), and the global average is 61.3 ATMs per 100,000 in 2020⁵,

1https://www.theglobaleconomy.com/rankings/bank_accounts/WB-low-mid/Access time 1/10/2021.

2<https://data.worldbank.org/indicator/FB.CBK.DPTR.P3?locations=EG>Access time 1/10/2021

3https://www.theglobaleconomy.com/rankings/bank_accounts/Access time 1/10/2021

4<https://data.worldbank.org/indicator/FB.ATM.TOTL.P5?locations=EG>Access time 1/10/2021

5www.Thegobaleconomy.com/rankings/ATM_machines. Access time 1/10/2021

which means the lower middle-income group of countries still far from the global average.

Surprisingly, the lower middle-income group of countries have dissimilar situation regarding FD. Since, they have on average 8.57 for FD index in 2010 & that increased to be 9.5 among 184 countries for the global FD index in 2018 (the latest available data about this index), which reflects the good situation of those countries¹.

And regarding FDI in lower middle-income group of countries, the governments realize the importance of FDI in achieving economic growth, which in turn can enable a country to achieve some of the 17 SDGs, but the policies & procedures that the governments did still ineffective in increasing net inflow of FDI, which was on average 2,027,504,710\$ in 2010 & it increased to be 2,747,510,000 \$ in 2020². And the global average is 6,805,167,091 in 2020³, which means the lower middle-income group of countries still far from the global average.

From the above data, the researcher can illustrate the problem of the study through the following points:

Is there an effect of FI on FDI in the lower- middle income group of countries through the moderating effect of FD? & Without this moderating effect?

Is there an effect of FDI on FI in the lower-middle income group of countries through the moderating effect of FD? & Without this moderating effect? and from these questions the hypothesis can be formed as follows:

¹ <https://data.imf.org/?sk=f8032e80-b36c-43b1-ac26-493c5b1cd33b&sId=1485894037365>.
Access time 1/10/2021

² <https://data.worldbank.org/indicator/BX.KLT.DINV.CD.WD?locations=EG&view=chart>
Access time 1/10/2021.

³ www.Thegobaleconomy.com/rankings/ATM_machines. Access time 1/10/2021

Hypothesis development

H1: There is a significant effect of FI on FDI.

H2: There is a significant effect of FDI on FI.

H3: There is a significant effect of FI on FDI through the moderating role of FD.

H4: There is a significant effect of FDI on FI through the moderating role of FD.

Purpose –

- First: the purpose of the work is to address the relationship between financial inclusion & foreign direct investment directly without any moderator,
- Second: the purpose of the work is to examine the same relationship through the moderating effect of financial development, or in the other word the purpose of this work is to address the role of financial development in affecting the relationship between financial inclusion & foreign direct investment.

Originality/value – There are many studies on FI aspect, although few attempted to find out & estimate the relationship between FI & FDI, especially with the moderating role of FD. So, this study concerns with this matter with focusing on the lower-middle income group of countries.

The scope of the study- This work is based on the lower-middle income group of countries, and the study covers the period from 2010 to 2020 depending on the availability of data of the selected variables, especially the variables of FI which are recently available in the form of a continuum of time.

Study plan:

The theoretical framework

The methodology/ approach

Results & findings

Policies Implications

References

Appendix

 **The theoretical framework**

Financial inclusion definition¹:

FI is a broad concept with several definitions in the literature. The researcher sees that the first attempt to explain the definition was done by explaining the opposite of FI. Since Leyshon & Thrift defined financial exclusion in 1995 as it is “the processes that prevented individuals from disadvantaged backgrounds from accessing the financial system”, or in other word, it is identified as “the problem of specific groups of people that are not able to get the financial services”². Those groups include low-income groups, youth, women, rural communities, and other deprived groups because of the poor economic conditions.³

Demirguc-Kunt, Klapper, Singer, and Van Oudheusden (2015)⁴ defined FI as “having an account in a bank, used regularly, plus making payments affordable & easily”. Thus, FI can be defined as “a process that ensures the availability & the easy access to formal financial services, and that is for all segments of the society”.

The World Bank (WB) defined financial inclusion as follows: “financial inclusion means that individuals and businesses have access to useful and affordable financial products and services that meet their needs – transactions,

¹Lai T, Nguyen T, and Tram T. (2021). Constructing a composite financial inclusion index for developing economies. Elsevier. Holland:1-3

²Gopalan S, and Kikuchi T. (2016). Financial Inclusion in Asia: Issues and Policy Concerns. Macmillan Publishers Ltd. London:5-6

³Ali A, Ali Khalifa, and Azrag M. (2020). Enhancing Financial Inclusion through Islamic Finance, Volume II. Springer Nature. Switzerland AG:3

⁴Kunt D, Oudheusden V, and Singer K. (2015). Financial Inclusion and Inclusive Growth: A Review of Recent Empirical Evidence. World Bank Group. USA:2-4

Available online on: <https://openknowledge.worldbank.org/handle/10986/26479> access time on 1/11/2021.

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payments, savings, credit, and insurance – delivered in a responsible and sustainable way.”

To simplify all those definitions, the researcher sees that financial inclusion means “providing financial services affordably, such as remittance facilities, savings, insurance services, loans, and access to payments, from the formal financial institutions to the excluded groups”.

In terms of measuring FI, according to the literature, there are two methods for measurement:

- ✓ The method that focuses on individual indicators, which are gained from worldwide databases like Financial Access Survey (FAS – IMF), as well as the Global Findex survey (Findex- WB). These surveys describe FI using various financial service indicators like the number of automatic teller machines (ATMs) & the number of bank branches, and
- ✓ The method that builds a composite index of FI with the world-wide databases.

Beck, Demirguc-Kunt, and Peria (2007) have the first attempt to measure the access to the financial services with creating new variables for banking access for 3 kinds of services (lending, payments, and deposits) with 2 dimensions: use & access to financial services. This method delivers useful information about a country’s access to financial services plus specific dimensions of FI. However, it is still hard to combine all these factors together for an overall estimation of FI¹.

For example: Sarma (2016) figured out that Albania had the rank of four regarding the ratio of loans/income, but it had the rank of 85 regarding the number of branches of commercial bank for each 100,000 adults. So,

¹ Beck, Kunt D, and Peria (2007). Access to and use of banking services across countries. *Journal of Financial Economics*. Elsevier.holand:1-20

differences in such variables hamper assessment of FI within / across countries¹.

But there are some attempts that create a composite index of FI like Wang & Guan, 2017; Anwar, Tanz, & Mostafa, 2017; Goel & Sharma, 2017; Sethi & Sethy, 2019, and Huang & Zhang 2020. This opens the discussion about that there isn't an agreement on the way to measure FI. The studies are different in not only the method, but they also differ in the selected indicators to estimate the FI index².

○ **Global initiatives³:**

The first try to explain FI was made by Leyshon and Thrift in 1995 as mentioned before, but the evolution of FI appeared obviously through financial crisis reforms during 2008, and these reforms are based on the linkages between financial institutions, and the wider financial system using prudential tools in order to eliminate & control the systemic risks.

And before the financial crisis occurred, the UN pointed to the importance of FI & the financial development in controlling & eliminating risk effects on persons through the UN declaration in 2006 that states that "access to a well-functioning financial system can economically and socially empower individuals, in particular poor people, allowing them to better integrate into the economy of their countries, actively contribute to their development and protect themselves against economic shocks".

In this vein, FI had also the attention of central banks & international financial institutions. Hence, in 2016 the international standard of the prudential

¹SarmaM(2016). "Measuring Financial Inclusion using Multidimensional Data," World Economics, World Economics, London, United Kingdom:15-40.

²LaiIT, Nguyen T, and TramT.. Op.cit:1-3

³Alexander K, and Karametaxas X. (2020). Digital Transformation and Financial Inclusion. SSRN Electronic Journal:1-8

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regulation for banks had been set. Since the Basel Committee of Banking Supervision published its publication, which titled “Guidance on the application of the core principles for effective banking supervision is to the regulation and supervision of institutions relevant to financial inclusion”.

FI has also entered the 2030 SDG Agenda. Since FI is considered as an enabler to achieve some of the SDGs. Especially, the focus on FI in this agenda stems from the effective role of the financial system in achieving a more sustainable economy.

In 2016 the G20 promoted its initiative for basics of innovative FI by approving “the G20 High-Level Principles for Digital FI”. Then the WB Group applied in 2017 “the Financial Inclusion Global Initiative (FIGI)” in order to accelerate the application of the country reform plans to achieve national FI targets.

These initiatives called for the access & the availability of financial services, which are essential for promoting development, especially in developing countries.

○ **Obstacles of financial inclusion¹:**

There are many issues that face the expansion of FI in many countries including lower-middle income group such as the lack of trust, living in remote zones, depending upon informal sector (such money lenders), high interest rates, and lack of awareness.... etc. Here are some of them as follows:

According to the study of Mohamed Bin Mousa, which is about the impact of awareness on FI during 2017 in 117 countries, the financial literacy explains 84.7% of the value of changes of FI, and when the knowledge is added to

¹Bhowmik, Saha D, and Sharit K..op.cit: 1-4

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financial literacy, the explanatory power became 86.5%, which reflects the powerful influence of financial awareness on FI¹.

Regarding high interest rates, the demanders for FI from the excluded groups are probably the needier group for it. So, they have no option rather than demanding credit from the informal lenders with high interest rates, which negatively affect their economic progress.

In terms of trust, from the literature review, trust promotes FI significantly. According to the work of Saibal Ghosh (2012), trust achieves a major improvement in FI in terms of both account property & use. This finding means the absence of trust may affect financial inclusion negatively².

Above all of that, there are some common obstacles regarding FI in many countries, which is the lack of financial technology (FT). Since according to the study of Somaya Haraq & Zahabia Latrash in 2020, the role of FT in many countries still weak in decreasing the FI gap. This is because of the absence of laws about licenses, the limitation of digital financial culture, and poor business environment³. This finding is consistent with the finding of Zahraa Saleh Hamdy (2020), which is about the importance of the FT in enhancing FI by referring to international experience⁴.

1Mousa M.(2018). The Impact of Knowledge and The Financial Literacy on Financial Inclusion During 2017. Ben Hameed Ben BadeesMosteghanem University, Algeria; 2.(in Arabic)

2Ghosh S.(2021). How important is trust in driving financial inclusion? Elsevier.Holand:3

3 HaraqS , and Latrash Z.(2020).The reality of Financial Technology in Arabic countries and its importance in promoting Financial inclusion in SMEs. EchahidHammaLakhdar El ouedUniversity, Algeria.;p2.(in Arabic)

4Bhowmik, Saha D, and Sharit K.op.cit:1-4.

○ **Difference between financial inclusion & financial development (FD)¹:**

Although FI relates to FD closely, the two conceptions are not synonymous. FD is defined as “enhancements in the size, stability, and efficiency of the financial system”. FI means that entities (individuals & businesses) can access affordably to financial services that suit their needs. Through FI, the components of FD increase. As the more consumers of financial services, the larger the size of the financial services sector, and the FD (size, stability, & quality) will increase directly as a size, and it requires better controlled & monitored by central banks, which enhances financial stability, and quality.

And the relationship between FI & FD can be illustrated more in details in the following part of the research.

Moreover, a review by Levine (2005) shows that FD is a key determinant of economic growth. Since bringing more individuals to the financial system goes forward to a well-functioning financial system and accelerates economic growth. But GDP growth may not decrease inequality & poverty, if FD gains are intense in the upper percentages of individual incomes.

However, as illustrated by Beck, Demirguc, Levine, and Kunt (2007), the more financially developed nations, the lower severe poverty controlling. Hence, the economy gets less benefits with higher income growth. The reason behind this result is the uneasiness of credit restrictions which affect the poor groups more, above positive growth impact regarding better allocation of capital². So, FD needs FI, which helps the poor to improve their standards of

¹HlopheN.(2019).Does financial development mean financial inclusion? A causal analysis for Eswatini. *African Review of Economics and Finance*. South Africa:121- 122

²K. Rajamani, G. Rekha, and G. Resmi. (2021). Digital Financial Inclusion, Economic Freedom, Financial Development, AndGrowth: Implications from A Panel Data Analysis. *Asian Development Bank Institute*.Japan:1-3

living by providing affordable financial services, in order to improve equality to get more benefits from higher income growth.

So, FI is a key determinant of FD, and this result is consistent with the work of Sanjaya Kumar Lenka (2021), which is about the link between FI and FD in India during the period (1980–2017). The study pointed out a unidirectional relationship between FI & FD in India. So, it reveals that FI is a main factor for FD.

○ **The relationship between financial inclusion, and FDI through the literature review:**

In this paper, the focus will be on the FI and its relationship with FDI, because of their importance in promoting economic growth & development (SDG 8). And from the literature review, it is illustrated that the mutual relationship between FI & FDI may be illustrated directly without moderator & indirectly with moderator through achieving financial development (the area of interest in this work) & economic growth as follows:

- ✓ Directly: there is a relationship between FI, and overseas investment in developing countries. Additionally, a positive shock in FI is positive connected with overseas investment. And that pointed out from the work of Jianguo Wei & Md Qamruzzaman, which is about the effect of FI and development of stock market on attracting FDI in developing countries considering a study of 58 countries from 1993 to 2017¹. These findings are like the findings of Genan M Khodeer, and Mohamed N Elzobeedy in their work about the relationship between FI & FDI (obstacles & solving) in Iraq, which confirmed the positive effect of FI on FDI in Iraq². The

¹Qamruzzaman M., and Wei J. (2019). Do financial inclusion, stock market development attract foreign capital flows in developing economy: a panel data investigation. Aimspress:1.

²Elzobeedy M, andKhodeerJ. (2021). Financial Inclusion, and Foreign Direct investments\ Obstacles & Solutions. Warith Scientific Journal.Iraq:1. (In Arabic).

same results showed through the work of Farma Andiansyah, which is about the effect of FI and Macroeconomic on FDI in the nations of Organization of Islamic Cooperation using data panels in 8 OKI members during the 2012-2018. The results showed that the available variable (the number of bank branches for each 100,000 adults) has a significant positive influence on FDI¹.

✓ Indirectly through some moderators as the following:

First: the effect of FI on FDI:

- FI can attract FDI through achieving economic growth: FI is expected to contribute considerably to achieving economic growth, especially for developing countries. This appears clearly through many studies such as Anarfo et al (2019), who investigates the connection between FI, and economic growth in sub-Saharan Africa. The study illustrates that FI is a vital factor in enhancing financial sector development. Additionally, a perfect financial system can transform deposits into investment and get the maximum of resource allocation, which affects economic growth positively. And high economic growth rate can attract more of FDI since the more economic growth in a country, the more attraction of FDI.
- FI can attract FDI through achieving financial development (FD): FI can attract FDI through achieving financial development and this point of view can be illustrated through the following:

➤ The effect of FI on FD:

First of all, financial stability is a part of financial development, and the focusing of FI should be on saving accounts rather than credit access in order to have an encouraging impact on financial stability. Since a micro credit

¹Andiansyah F. (2021). The Influence of Financial Inclusion and Macroeconomic on Foreign Direct Investment (FDI) Flows in The Organization of Islamic Cooperation (OIC) Countries. OPTIMUM: JurnalEkonomidan Pembangunan:1.

program cannot increase average income & consumption for households. Hence the concept of “one size fits all” for micro credit isn’t ideal, as it raises the number of borrowers without creating a final worthy return investment, because of the high interest rates. Accordingly, Karlan and Zinman (2010) found that poverty reduction was greater from increased deposit savings than from credit extension.

Additionally, some studies like Mehrotra & Yetman (2015) pointed out that deposit inclusion has an effect on financial stability. Since FI means a deeper & more varied base of deposit savings, and that is estimated to have a promoting impact on financial stability¹. There are also links between loan & deposit inclusion because more savings decrease the cost of credit. However, deposit inclusion precipitates in funding crisis in case small or new depositors want to withdraw the savings in crises. In order to examine this matter empirically, Han & Melecky (2013) figured out that changes that happened in deposits during the 2008 financial crisis emphasized the problem significantly². They found that nations with higher access to deposits had a lower drop in the growth of deposits during the crisis. This assumes that deposit inclusion does positively affect the flexibility of bank liquidity, and banks’ capability to recover fast after a financial crisis, which means more financial stability (more financial development).

¹Mehrotra A, and Yetman James J. (2015). Financial inclusion – issues for central banks. BIS Quarterly Review. Available at SSRN: <https://ssrn.com/abstract=2580310>. Access time at 1/10/2021

²Martin M, and Rui H. (2013). Financial Inclusion for Financial Stability: Access to Bank Deposits and the Growth of Deposits in the Global Financial Crisis. Policy Research Working Paper; No. 6577. World Bank, Washington, DC. World Bank:1. Available online on <https://openknowledge.worldbank.org/handle/10986/16010> License: CC BY 3.0 IGO. Access on 16/9/2021.

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Morgan & Pontines (2018) found that an increase in credit services for small & medium-sized companies does positively affect banks. They related this finding to the benefits of spreading loans across different kinds of firms. Ahamed & Mallick (2019) also found a strong positive connection between FI and bank stability, mainly for banks with a large pool of deposits, larger market power, and lesser marginal costs, especially in nations with solid institutions.

In contrast, Cihák, Mare & Melecky (2016) found a negative correlation between FI and financial stability¹. Sahay et al. (2015) depended on panel regression model and found that the greater access to credit, the greater the risk default, and the greater the economic growth volatility. Other kinds of access do not negatively affect stability. But note that, they also pointed that the negative impact is more pronounced for nations with less effective regulation & supervision.

As Lopez & Winkler pointed, “it remains a policy challenge to expand FI without contributing a potentially destabilizing credit boom”. Hence, many credit booms like the U.S mortgage crisis, micro finance crisis in India, Euro zone crises in Greece & Ireland...etc. had stressed the risks on financial stability because of the unchecked credit growth. Additionally, Schularick & Taylor (2012) found, by covering 140 years of data across 14 developed countries, that an increase in credit is the strongest forecaster for future financial crises².

Financial stability promotion (as a part of FD) is linked with an increase in financial access, mainly for non-credit financial services such as mobile

¹Čihák M, and Melecky M, SDavide.(2016).The Nexus of Financial Inclusion and Financial Stability A Study of Trade-Offs and Synergies. World Bank Group:3.

² Alan M.Taylor, Jorda O, andSchularick D.(2012).When Credit Bites Back: Leverage, Business Cycles, and Crises.Federal Reserve Bank of San Francisco:37

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money accounts, government subsidies to open savings accounts. Theoretically, the effect can be damaging if depositors unexpectedly withdraw deposits, but practically, their actions aren't volatile, plus reserves cover many small deposit accounts in most countries.

These findings are consistent with the work of Khalil Feghalia, Nada Moraa, and Pamela Nassif who examined the relationship between FI & financial stability. They used data about FI from Findex¹, and they found that inclusion of access to payments & savings accounts had a positive or unbiased impact on financial stability. Although access to credit can weaken financial stability in case credit growth happens without making sure that the borrower is able to repay².

Moreover, FD sustains in the long term, since most people have good financial access. Additionally, the well-functioning financial system is to enhance economic growth as well as it presents financial products & services affordably in order to achieve sustainable financial growth. Since in order to sustain FD in a country, the policy makers have to spread awareness about FI to support the demand side of financial services, which also will lead to economic growth³. On the other hand, economic development follows FD as an end result of the increasing need for financial services⁴.

➤ The effect of FD on FDI:

And regarding the effect of FD on FDI, In the first place, FD is a very broad concept which concludes many elements such as the development of financial

¹Findex is the global financial inclusion database, which depends on household surveys including samples from more than 140 nations.

²K Feghalia, Moraa N, and NassifP. (2021). Financial inclusion, bank market structure, and financial stability: International evidence. Elsevier.Holand:1. available online on:<https://www.sciencedirect.com/science/article/abs/pii/S1062976921000132>. Access time at 1/10/2021.

³LenkaS. (2021). Relationship between financial inclusion and financial development in India: Is there any link? Wiley.USA:1-6

⁴K. Rajamani, G. Rekha, and G. Resmi.op.cit:1-3.

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markets including financial institutions, and international capital inflows, or in the other words FDI¹.

And a successful monetary market, which is a part of FD, can support businesses & FDI inflows by attracting international participants which always look to the financial development as if it is a symbol of stable economies, transparency, and a business-friendly atmosphere. So, FD affects FDI positively².

Second: The effect of FDI on FI:

- The FDI can affect FI through promoting economic growth:

In terms of the importance of FDI, FDI brings capital to a host nation, management experience, and cutting-edge technology, and investments that come from international firms create jobs for the residents, and many other benefits for the economy as a whole. So, it promotes technological progress, and subsequently the economic growth of the host nation.

Economic growth can increase the number of deposits in the banks & the pool of savings, which in turn enhance the opportunity for the excluded people to be financially inclusive by facilitating access to some of the financial services & products.

- The FDI can affect FI through promoting FD:

According to the work of Desai et al. (2006), the increase in FDI supports the total sum of money available for the national economy and facilitates the intermediate role of financial institutions via money markets, which may affect FI positively³.

¹Lenka S.op.cit:1-3

²Ahmad M., Jiang P, Khan M. A, Majeed A, and OlahJ. (2021). The Impact of Foreign Direct Investment on Financial Development: New Evidence from Panel Cointegration and Causality Analysis. *Journal of Competitiveness*, 13(1), 95–112. <https://doi.org/10.7441/joc.2021.01.06>. p 1 – 4

³Ahmad M., Jiang P, Khan M. A, Majeed A, and Olah J. Ibid.p1 – 4

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According to the work of Porta et al. (1998) plus the work of Kholdy & Sohrabian (2005) FDI decreases the effect of elite decisions regarding the host country, because FDI can order the political elite to apply economic friendly reforms which promote the growth of the financial sector. So FDI may affect FD positively¹.

The previous finding agrees with the results of Sanjaya Kumar Lenka's work (2021), which found that there is a connection between FD & FDI. Since the researcher used some indicators to measure FD including (inflows of FDI, private sector credit, remittance inflows, credit to government, financial systems deposits, and central bank assets). So, the FD depends mainly on FDI. If FDI increases FD will also increase². As well as the accessibility of firms to foreign capital depends mainly on FD. Since the greater FD in a country, the greater the number of active producers. This means that higher level of FD has a greater over-all access to FDI.

In this vein, because of financial limits, many firms cannot be corporate to FDI. Others have to produce smaller sizes in order to decrease the fixed costs needed to corporate with FDI. As they cannot pay for having external finance needed to continue in the business at the optimal level in the foreign market. For the latter group of firms, FDI will join, but the size of its project supposed to be small compared to projects without financial constraints. On the other hand, with higher FD, more firms can corporate with FDI, and pay for the fixed costs at their optimal levels of production, causing a raise in the number & the size of FDI.

¹Ahmed K, and SohShady.(2005). Financial Markets, FDI, and Economic Growth: Granger Causality Tests in Panel Data Model. SSRN Electronic Journal:1-20
Available online on:
https://www.researchgate.net/publication/256066740_Financial_Markets_FDI_and_Economic_Growth_Granger_Causality_Tests_in_Panel_Data_Model. Access on 1/10/2021.

²Lenka S.op.cit:2-6

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The above findings are consistent with the results of the work of Rodolphe Desbordes & Shang-Jin Wei, which is about the effects of FD on FDI. The researchers used the sample to the period 2003-2006 in many developed countries, because it was not wanted for the empirical analysis to be contaminated by the credit crisis which started around 2007-2008, as the sample could distort the estimates. It is found that firms in financially developed nations are probable to attract more of FDI compared to those in less financially developed nations. Generally speaking, higher FD promotes access to FDI for firms that need foreign capital in order to grow in foreign markets & in order to produce at their best levels. This is the main positive effect of FD on FDI¹.

As mentioned before FDI increases the economic growth rate of a country, which in turn may affect FI positively. So, from the above review, it is clear that FI can affect FDI through many channels like promoting the economic growth rate, enhancing the financial development. And at the same time FDI can affect FI positively through promoting FD & economic growth rate.

Design/methodology/approach–

The study analyses the variables & indicators of FI that may affect FDI in the lower-middle income group of countries with/without the existing effect of FD, and at the same time, the study examines the effect of FDI on FI with/without the existing effect of FD. Besides making a comparison between the variables of FI according to their ability to affect FDI in existing of FD, and estimating the effect of FDI on FI in existing of FD, in order to get more reliable results to achieve the purpose of the study. In order to do that the Panel Data (longitudinal data), which combines all of Cross-Sectional Data (48 middle income group of countries), and Time Series Data (11 years from 2010

¹Desbordes R, and WeiS. (2014). The Effects of Financial Development on Foreign Direct Investment. World Bank Group. Development Research Group. Trade and International Integration Team Public. USA:12 – 40

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to 2020) will be used. This technique is known by allowing analysis of the data for n (countries) & fort of time period, which will be annual as shown in the statistical analysis as follows:

▪ **Statistical analysis:**

The data were analyzed using some statistical methods and tests in order to estimate the relationship between FI & FDI through the moderating role of FD in the lower- middle income group of countries. The study sample consisted of 48 lower-middle income group of countries during the period from 2010 to 2020. Table (1) gives a description of all the variables used in the statistical analyses as follows:

Table (1): Description of the variables

Variables Type	Variables		Symbol
Dependent Variable	Financial Direct Investment		FDI
Independent Variables	Financial Inclusion indicators (FI)	Commercial bank branches	CBB
		Borrowers from commercial banks	BFCB
		Depositors with commercial banks	DWCB
Moderator Variable	Financial Development		FD

So, the statistical analysis will investigate the validation of the following study hypotheses:

H₁: There is a significant effect of FI on FDI.

H₂: There is a significant effect of FDI on FI.

H₃: There is a significant effect of FI on FDI through the moderating role of FD.

H₄: There is a significant effect of FDI on FI through the moderating role of FD.

The method has been used Panel Data (longitudinal data), which combines all Cross-Sectional Data (48 lower- middle income group of countries), and Time Series Data (11 years from 2010 to 2020) through applying the 3 following longitudinal data:

-Pooled Regression Model.

-Fixed Effect Model

-Random Effect Model.

According to the combined regression model, all observations are considered as one entity without considering both differences between countries of the study and differences over time. This model is estimated by Ordinary Least Square (OLS)

So that the equation constant is (β_0) and the regression coefficients are (β 's), which are constant for all countries over time, as shown in Equation (1).

As for the fixed effects model, the regression model will be estimated by taking into account the differences between the countries of the study, which allows for each country to have its own equation constant is (β_0i). This is because of the different characteristics of each country, but this difference is constant over time, which means the regression coefficients (β 's) are constant for all countries over time. Besides The fixed effects model is estimated by using Least Square Dummy Variables (LSDV) as illustrated in equation (2). And as for Random Effect Model, the regression model will be estimated by taking into accounts that all countries are different in their random error (ϵ_i). Especially Random Effect Model deals with the differences between countries and differences over time as random variables, so these differences are added to the random error term as random components. So, the random effects model will be estimated by using Generalized Least Square (GLS) as shown in equation (3).

$$Y_{it} = \beta_0 + \beta_1 X_{1it} + \beta_2 X_{2it} + \dots + \beta_k X_{kit} + e_{it} \quad (1)$$

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$$Y_{it} = \beta_0 i + \beta_1 X_{1it} + \beta_2 X_{2it} + \dots + \beta_k X_{kit} + e_{it} \quad (2)$$

$$Y_{it} = \beta_0 + \beta_1 X_{1it} + \beta_2 X_{2it} + \dots + \beta_k X_{kit} + \varepsilon_i + e_{it} \quad (3)$$

Since:

X_{1it} : is the first independent variable of country (i) during the period (t) .

X_{2it} : is the second independent variable of country (i) during the period (t) .

X_{kit} : is the last independent variable of country (i) during the period (t) .

Y_{it} : is the dependent variable of country (i) during the period (t) .

e_{it} : is the random error that is resulted from regression model.

ε_i : Random error for each country.

In order to determine the best model to represent data from the previous three models, the three steps will be used as follows:

- Wald test (Restricted F-test) will be applied to compare between the Pooled model and the fixed effects model. If the p-value of the test is greater than the value of the significance level ($\alpha = 0.05$), the Pooled Model is the best for representing data, but if the p-value is less than the value of the significance level ($\alpha = 0.05$), the fixed effects model is the best model is the best for representing data.
- Breusch-Pagan LM (Lagrange Multiplier) will be applied to compare between the Pooled Model and the random effects model. If the p-value of the test is greater than the value of the significance level ($\alpha = 0.05$), the Pooled Model is the best for representing data, but if the p-value is less than the value of the significance level ($\alpha = 0.05$), the random effects model is the best for representing data.
- Hausman test will be applied to compare between the fixed effects model and the random effects model. That is in case the fixed effects model and the random effects model are better than the Pooled Model.

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If the p-value of the test is greater than the value of the significance level ($\alpha = 0.05$), the random effects model is the best for representing data, but if the p-value is less than the value of the significance level ($\alpha = 0.05$), the fixed effects model is the best model is the best for representing data. The following are the statistical tests and analyzes used, and it should be mentioned that E-views 10 is the statistical program used to analyze the data.

○ **Descriptive statistics**

The following step is making descriptive statistics, and to make it, the minimum, the maximum, the mean, the median, and standard deviation for the variables of the study should be calculated as shown in table (2).

Table (2): Descriptive Statistics

Variables	Sample Size	Descriptive Statistics			
		Minimum	Maximum	Mean	Std. Dev.
FDI	528	- 740000000 0	978000000 00	2880000000	7470000000
CBB	528	0.0100000	71.230000	12.152580	12.124190
BFCB	528	0.6300000	705.54000	102.69320	93.024570
DWCB	528	12.010000	3383.3600	614.63520	504.58550
FD	528	0.0351800	0.8335490	0.1904050	0.0938800

○ **Time Series Stationarity test**

Unit Root Tests is used to know the level of stationarity for the time Series. Time series are stationarity if there is a constant in the mean & the deviation value over time.

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Therefore, if the time series of the variables contain a unit root (that means the time series of the variables are non-stationary, and as the result of that problems of standard inference will be found. Hence, this will lead to a false regression. Hence, unit root tests are a prerequisite for time series analysis to reach to logical results.

So, if the variables of the study are stable in their original form, or in other word the variables of the study are not stable at (the level), the first difference will be taken, and if the time series of those variables are still unstable after taking the first difference the second difference will be taken, and so on until the time series of variables become stable. Then Levin, Lin & Chut, Phillips–Perron (PP), and Augmented Dicky-Fuller (ADF) will be applied.

Table (3) will illustrate the results of unit root tests for the non-binary study variables at (the level), and after taking the first difference.

Table (3): Stationarity test

Variables	Stationary	Levin, Lin & Chu t test		Augmented Dicky-Fuller test		PP - Fisher Chi-square test	
		Test value	<i>p-value</i>	Test value	<i>p-value</i>	Test value	<i>p-value</i>
FDI	Level	3.7949	0.9999	96.2986	0.4722	87.0469	0.7320
	1 st Diff	-17.5361	0.0000	351.459	0.000	367.015	0.0000
CBB	Level	-91.6337	0.0000	247.139	0.0000	181.163	0.0000
	1 st Diff	-138.046	0.0000	627.481	0.0000	660.644	0.0000
BFCB	Level	0.28321	0.6111	110.763	0.1439	131.051	0.0101
	1 st Diff	-12.6148	0.0000	340.240	0.0000	356.434	0.0000
DWCB	Level	0.90363	0.8169	88.2849	0.6999	110.842	0.1428
	1 st Diff	-9.82798	0.0000	276.452	0.0000	279.040	0.0000
FD	Level	9.69154	1.0000	77.7769	0.9131	78.2660	0.9065
	1 st Diff	-11.8530	0.0000	337.172	0.0000	368.181	0.0000

It is clear from table (3) that the time series of the variables (FDI, BFCB, DWCB, FD) are nonstationary at Level that means it is unstable in its original form, as the probability value of most tests for those variables increase the significance level ($p\text{-value} > \alpha = 0.05$). So, the first difference for the time series was taken for all variables, especially unstable ones, to get rid of the unit roots. Therefore, all the variables became stable, as the probability value of all tests has become less than the value of the significance level ($p\text{-value} < \alpha = 0.05$). Since all the variables have become stable at the first difference, so the time series of the variables became integrated of the same degree that means, they are integrated at first degree I(1). So, it is suitable to apply a linear regression model to estimate the relationship between the independent variables and the dependent variable.

○ **Correlation Matrix**

Correlation coefficients were calculated among the variables, to know the degree of the relationship of the variables. Note that the correlation coefficient is denoted by the symbol (r), and its value is between (-1) and (+1). The closer the value of the correlation coefficient is to (1) (regardless of the sign), the stronger the relationship between the variables, and the farther the value of the correlation coefficient is from (1), the weaker the relationship between variables. On the other hand, the sign of the correlation coefficient describes whether the relationship is direct or adverse. Negative sign means increasing in one of them leads to a decrease in the other, and if the sign is positive (+), this indicates that the relationship between the two variables is direct. An increase in one of them leads to an increase in the other (the two variables move in the same direction). Table (4) shows a matrix Correlation coefficient between study variables using Pearson's correlation coefficient.

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Table (4): Correlation matrix between variables

Variables	Corr.	FDI	CBB	BFCB	DWCB	FD
FDI	Corr.	1				
	<i>p</i> -value					
CBB	Corr.	-0.0235	1			
	<i>p</i> -value	0.5900				
BFCB	Corr.	0.6418	0.2624	1		
	<i>p</i> -value	0.0000	0.0000			
DWCB	Corr.	0.2471	0.6395	0.6621	1	
	<i>p</i> -value	0.0000	0.0000	0.0000		
FD	Corr.	0.6400	0.4720	0.7925	0.6170	1
	<i>p</i> -value	0.0000	0.0000	0.0000	0.0000	

It is clear from table (4) that: There is a direct, statistically significant correlation between (FDI) and all BFCB, DWCB and FD with a significant level of 5%, where $p\text{-value} < \alpha = 0.05$.

○ **Test of hypothesis**

Then, statistical analyzes will be made to test the hypothesis of the study (3 hypothesis) as follows:

○ **Test of the 1st hypothesis**

Through this section, a statistical model was built to test the validity/correctness of the first hypothesis, which is "There is a significant effect of FI on FDI" as shown in equation (4):

$$FDI_{it} = \beta_0 + \beta_1 CBB_{it} + \beta_2 BFCB_{it} + \beta_3 DWCB_{it} + e_{it} \quad (4)$$

Table (5) illustrates the results of Panel Data Models (Pooled Model, Fixed Effects Model, Random Effects Model) including Regression Coefficients,

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Standard Error (S.E.), and the results of t-test to make sure of the significance of the independent variables of the models, in addition the result of Coefficient of Determination (R^2), Adjusted R^2 , F-test, Wald test (Restricted F-test), Breusch-Pagan LM (Lagrange Multiplier) and Hausman test.

Table (5): Regression model of the relationship between FI indices& FDI

Variables	Pooled Model				Fixed Effect Model				Random Effect Model			
	Coefficients		t-test		Coefficients		t-test		Coefficients		t-test	
	Value	S.E.	T	p-value	Value	S.E.	t	p-value	Value	S.E.	t	p-value
Constant	-1.07E+09	3.98E+08	-2.6825	0.008	-3.72E+09	6.15E+08	-6.0544	0.000	-2.84E+09	7.60E+08	-3.7409	0.000
CBB	-50219562	26485433	-1.8961	0.059	-73937761	49242995	-1.5015	0.134	-78701673	39910318	-1.9720	0.049
BFCB	66449883	3541194	18.7648	0.000	78540485	4583025	17.1373	0.000	75509881	4192034	18.0127	0.000
DWCB	-3683104	819443.3	-4.4946	0.000	-910808.2	1143489	-0.7965	0.426	-1745163	1025656	-1.7015	0.089
R²	0.472				0.768				0.469			
Adjusted R²	0.469				0.743				0.466			
S.E.	5.4E+09				3.8E+09				3.8E+09			
F-test(p-value)	156.009 (0.000)				31.523 (0.000)				153.991 (0.000)			
Wald-test(p-value) = 12.9251 (0.000), LM-test(p-value) = 609.5139 (0.000), Hausman-test(p-value) = 12.960 (0.005)												

It is clear from table (5) that:

- Probability value of *Wald*-test is lower than significance level (p -value=0.000< α = 0.05), which indicates that the Fixed Effect Model is better than the Pooled Model.
- Probability value of *LM*-test is lower than significance level (p -value=0.000< α = 0.05), which indicates that the Random Effects Model is better than the Pooled Model.
- Probability value of Hausman-test is lower than significance level (p -value=0.005< α = 0.05) which indicates that Fixed Effect Model is better than the Random Effects Model.

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According to the above findings, Fixed Effects Model will be used. Getting back to table (5), it is found that:

- There is a positive and statistically significant impact only of the BFCB on FDI at significance level 5%, whereas the probability value of t -test for this variable is lower than significance level (p -value = $0.000 < \alpha = 0.05$). Moreover, the regression model is statistically significant at significance level 5%, whereas the probability value of F-test is lower than the significance level (p -value = $0.000 < \alpha = 0.05$). Additionally, the variables forming the model can explain (76.8%) of the changes in FDI, and the remaining (23.2%) is because of the random error or other factors that may affect FDI and that influences are not studied in this research.
- Increasing in BFCB by 1% increases FDI by 78540485.
- Finally, there is a significant effect of one of FI indices on FDI, so the first hypothesis is partly accepted.

○ **Test of the 2nd hypothesis**

Through this section, a statistical model was built to test the validity/correctness of the second hypothesis, which is "There is a significant effect of FDI on FI" as shown in equations (5), (6) and (7):

$$\mathbf{BBit} = \beta_0 + \beta \mathbf{FDI}it + (5)$$

$$\mathbf{BFCBit} = \beta_0 + \beta \mathbf{FDI}it + (6)$$

$$\mathbf{DWCBit} = \beta_0 + \beta \mathbf{FDI}it + (7)$$

Tables (6), (7), (8), illustrates the results of Panel Data Models (Pooled Model, Fixed Effects Model, Random Effects Model) including Regression Coefficients, Standard Error (S.E.), and the results of t-test to make sure of the significance of the independent variables of the models, in addition the result of Coefficient of Determination (R^2), Adjusted R^2 , F-test, Wald test (Restricted F-test), Breusch-Pagan LM (Lagrange Multiplier) and Hausman test

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Table (6): Regression model of the relationship between FDI&CBB

Variables	Pooled Model				Fixed Effect Model				Random Effect Model			
	Coefficients		t-test		Coefficients		t-test		Coefficients		t-test	
	Value	S.E.	T	p-value	Value	S.E.	T	p-value	Value	S.E.	t	p-value
Constant	12.2626	0.5661	21.6627	0.000	12.1269	0.2128	56.9982	0.000	12.1305	1.6863	7.1934	0.000
FDI	-3.8E-11	7.1E-11	-0.5391	0.590	8.9E-12	3.7E-11	0.2411	0.810	7.7E-12	3.7E-11	0.2090	0.835
R²	0.001				0.889				0.0001			
Adjusted R²	-0.001				0.878				-0.0018			
S.E.	12.132				4.231				4.2274			
F-test(p-value)	0.291 (0.590)				80.171 (0.000)				04.044 (0.834)			
Wald-test(p-value) = 81.826 (0.000), LM-test(p-value) = 2036.628 (0.000), Hausman-test(p-value) = 0.077 (0.781)												

Table (7): Regression model of the relationship between FDI&BFCB

Variables	Pooled Model				Fixed Effect Model				Random Effect Model			
	Coefficients		t-test		Coefficients		t-test		Coefficients		t-test	
	Value	S.E.	T	p-value	Value	S.E.	T	p-value	Value	S.E.	t	p-value
Constant	79.6362	3.3317	23.9024	0.000	84.5903	1.7444	48.492	0.000	84.2981	9.1955	9.1673	0.000
FDI	8.0E-09	4.2E-10	19.1931	0.000	6.3E-09	3.0E-10	20.715	0.000	6.4E-09	3.0E-10	21.4019	0.000
R²	0.412				0.874				0.464			
Adjusted R²	0.411				0.861				0.463			
S.E.	71.407				34.691				34.771			
F-test(p-value)	368.375 (0.000)				68.966 (0.000)				455.941 (0.000)			
Wald-test(p-value) = 37.225 (0.000), LM-test(p-value) = 1476.148 (0.000), Hausman-test(p-value) = 3.421 (0.064)												

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Table (8): Regression model of the relationship between FDI&DWCB

Variables	Pooled Model				Fixed Effect Model				Random Effect Model			
	Coefficients		t-test		Coefficients		t-test		Coefficients		t-test	
	Value	S.E.	t	p-value	Value	S.E.	T	p-value	Value	S.E.	t	p-value
Constant	566.475	22.834	24.8080	0.000	572.288	10.464	54.6916	0.000	572.05	65.999	8.6675	0.000
FDI	1.7E-08	2.9E-09	5.8494	0.000	1.5E-08	1.8E-09	8.0782	0.000	1.5E-08	1.8E-09	8.2193	0.000
R²	0.061				0.845				0.114			
Adjusted R²	0.059				0.830				0.112			
S.E.	489.398				208.095				207.915			
F-test(p-value)	34.216 (0.000)				54.574 (0.000)				67.674 (0.000)			
Wald-test(p-value) = 51.709 (0.000), LM-test(p-value) = 1768.467 (0.000), Hausman-test(p-value) = 0.092 (0.762)												

It is clear from tables (6), (7) and (8) that:

- Probability value of *Wald-test* is lower than significance level ($p\text{-value} = 0.000 < \alpha = 0.05$), which indicates that the Fixed Effect Model is better than the Pooled Model.
- Probability value of *LM-test* is lower than significance level ($p\text{-value} = 0.000 < \alpha = 0.05$), which indicates that the Random Effects Model is better than the Pooled Model.
- Probability value of *Hausman-test* is greater than significance level ($p\text{-value} > \alpha = 0.05$), which indicates that Random Effects Model is better than the Fixed Effect Model.

According to the above findings, Random Effects Model will be used. Getting back to tables (6), (7) and (8), it is found that:

- There is a positive and statistically significant impact of the FDI only on BFCB and DWCB at significance level 5%, whereas the probability value of *t-test* is lower than significance level ($p\text{-value} = 0.000 < \alpha = 0.05$). Moreover, the regression models are statistically significant at

significance level 5%, whereas the probability value of F-test is lower than the significance level ($p\text{-value} = 0.000 < \alpha = 0.05$). Additionally, FDI can explain 46.4% and 11.4% of the changes in BFCB and DWCB respectively, and the remaining is because of the random error or other factors that may affect BFCB and DWCB and that influences are not studied in this research.

- Increasing in FDI by 1% increases BFCB and DWCB by 6.4E-09 and 1.5E-08 respectively.
- Finally, there is a significant effect of FDI on FI, so the second hypothesis is accepted.

4.3- Test of the 3rd hypothesis

Through this section, a statistical model was built to test the validity/correctness of the third hypothesis, which is "There is a significant effect of FI on FDI through the moderating role of FD" as shown in equation (10):

$$FDI_{it} = \beta_0 + \beta_1 CBB_{it} + \beta_2 BFCB_{it} + \beta_3 DWCB_{it} + \beta_4 FDI_{it} + \beta_5 CBB_{it} * FDI_{it} + \beta_6 BFCB_{it} * FDI_{it} + \beta_7 DWCB_{it} * FDI_{it} + e_{it} \quad (8)$$

Table (9) illustrates the results of Panel Data Models (Pooled Model, Fixed Effects Model, Random Effects Model) including Regression Coefficients, Standard Error (S.E.), and the results of t-test to make sure of the significance of the independent variables of the models, in addition the result of Coefficient of Determination (R^2), Adjusted R^2 , F-test, Wald test (Restricted F-test), Breusch-Pagan LM (Lagrange Multiplier) and Hausman test.

Table (9): Regression model of the relationship between FI indices& FDI

Variables	Pooled Model				Fixed Effect Model				Random Effect Model			
	Coefficients		t-test		Coefficients		t-test		Coefficients		t-test	
	Value	S.E.	t	p-value	Value	S.E.	T	p-value	Value	S.E.	t	p-value
Constant	4.68E+08	5.49E+08	0.8521	0.395	-6.45E+08	9.59E+08	-0.6722	0.502	-3.79E+08	8.37E+08	-0.4529	0.651
CBB	-3.18E+08	75490848	-4.2107	0.000	-82475441	90292961	-0.9134	0.362	-1.43E+08	82062681	-1.7426	0.082
BFCB	-50278958	6016050	-8.3575	0.000	-47119938	7177813	-6.5647	0.000	-46228456	6458797	-7.1574	0.000
DWCB	7449969	2253728	3.3056	0.001	4409059	2375954	1.8557	0.064	4836686	2231438	2.1675	0.031
FD	9.50E+09	3.63E+09	2.6176	0.009	1.55E+10	5.27E+09	2.9441	0.003	1.48E+10	4.53E+09	3.2721	0.001
CBB*FD	9.45E+08	3.12E+08	3.0311	0.003	55109759	3.47E+08	0.1589	0.874	2.41E+08	3.23E+08	0.7474	0.455
BFCB*FD	2.89E+08	22355676	12.9370	0.000	2.28E+08	23292464	9.7868	0.000	2.36E+08	21644543	10.8842	0.000
DWCB*FD	-36211441	9824054	-3.6860	0.000	-17007081	9644619	-1.7634	0.079	-20299359	9225732	-2.2003	0.028
R ²	0.787				0.905				0.784			
Adjusted R ²	0.784				0.894				0.781			
S.E.	3.47E+09				2.43E+09				2.45E+09			
F-test(p-value)	275.031 (0.000)				83.218 (0.000)				269.383 (0.000)			
Wald-test(p-value) = 12.409 (0.000), LM-test(p-value) = 572.613 (0.000), Hausman-test(p-value) = 16.059 (0.025)												

it is clear from table (9) that:

- Probability value of *Wald*-test is lower than significance level (p -value=0.000< α = 0.05), which indicates that the Fixed Effect Model is better than the Pooled Model.
- Probability value of *LM*-test is lower than significance level (p -value=0.000< α = 0.05), which indicates that the Random Effects Model is better than the Pooled Model.

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- Probability value of Hausman-test is lower than significance level (p -value=0.025< α = 0.05) which indicates that Fixed Effects Model is better than the Random Effect Model.

According to the above findings, Fixed Effects Model will be used. Getting back to table (9), it is found that:

- There is a statistically significant impact of the BFCB and DWCB on FDI through the moderating role of FD at significance level 5% and 10%, whereas the probability value of t -test for BFCB*FD and DWCB*FD is lower than significance level 5% and 10% respectively. Moreover, the regression model is statistically significant at significance level 5%, whereas the probability value of F-test is lower than the significance level (p -value = 0.000< α = 0.05). Additionally, the variables forming the model can explain (90.5%) of the changes in FDI, and the remaining (9.5%) is because of the random error or other factors that may affect FDI and that influences are not studied in this research.
- Finally, there is a significant effect of most FI indices on FDI through the moderating role of FD, so the third hypothesis is accepted.

○ **Test of the 4th hypothesis**

Through this section, a statistical model was built to test the validity/correctness of the fourth hypothesis, which is "There is a significant effect of FDI on FI through the moderating role of FD" as shown in equations (9), (10) and (11):

$$\text{CBB}it = \beta_0 + \beta_1 \text{FDI}it + \beta_2 \text{FD}it + \beta_3 \text{FDI} * \text{FD}it + (9)$$

$$\text{BFCB}it = \beta_0 + \beta_1 \text{FDI}it + \beta_2 \text{FD}it + \beta_3 \text{FDI} * \text{FD}it + (10)$$

$$\text{DWCB}it = \beta_0 + \beta_1 \text{FDI}it + \beta_2 \text{FD}it + \beta_3 \text{FDI} * \text{FD}it + (11)$$

Tables (10), (11) and (12) illustrates the results of Panel Data Models (Pooled Model, Fixed Effects Model, Random Effects Model) including Regression

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Coefficients, Standard Error (S.E.), and the results of t-test to make sure of the significance of the independent variables of the models, in addition the result of Coefficient of Determination (R^2), Adjusted R^2 , F-test, Wald test (Restricted F-test), Breusch-Pagan LM (Lagrange Multiplier) and Hausman test.

Table (10): Regression model of the relationship between FDI & CBB

Variables	Pooled Model				Fixed Effect Model				Random Effect Model			
	Coefficients		t-test		Coefficients		t-test		Coefficients		t-test	
	Value	S.E.	t	p-value	Value	S.E.	T	p-value	Value	S.E.	t	p-value
Constant	-5.387825	1.047912	-5.141	0.000	3.7067	1.1253	3.294	0.001	2.63493	1.61175	1.635	0.103
FDI	-1.12E-09	1.58E-10	-7.091	0.000	-1.4E-10	1.1E-10	-1.303	0.193	-1.9E-10	1.1E-10	-1.791	0.074
FD	106.9649	5.669675	18.866	0.000	47.8449	6.2035	7.713	0.000	54.2287	5.85492	9.262	0.000
FDI*FD	4.05E-10	2.54E-10	1.595	0.111	-2.5E-10	1.6E-10	-1.586	0.113	-2.5E-10	1.5E-10	-1.623	0.105
R²	0.405				0.902				0.138			
Adjusted R²	0.402				0.891				0.133			
S.E.	9.378				3.998				4.049			
F-test(p-value)	118.959 (0.000)				87.405 (0.000)				27.936 (0.000)			
Wald-test(p-value) = 51.201 (0.000), LM-test(p-value) = 1533.231 (0.000), Hausman-test(p-value) = 16.399 (0.001)												

Table (11): Regression model of the relationship between FDI & BFCB

Variables	Pooled Model				Fixed Effect Model				Random Effect Model			
	Coefficients		t-test		Coefficients		t-test		Coefficients		t-test	
	Value	S.E.	t	p-value	Value	S.E.	T	p-value	Value	S.E.	t	p-value
Constant	-28.6880	6.0656	-4.730	0.000	-5.7366	8.5134	-0.674	0.501	-11.617	10.1600	-1.143	0.253
FDI	4.5E-09	9.2E-10	4.922	0.000	1.3E-09	8.4E-10	1.530	0.127	1.7E-09	8.1E-10	2.102	0.036
FD	637.523	32.8174	19.426	0.000	539.703	46.9320	11.50	0.000	568.273	42.3704	13.41	0.000
FDI*FD	-3.0E-09	1.5E-09	-2.034	0.042	2.0E-09	1.2E-09	1.665	0.097	1.2E-09	1.1E-09	1.077	0.282
R²	0.661				0.904				0.606			
Adjusted R²	0.660				0.894				0.604			
S.E.	54.281				30.244				30.301			
F-test(p-value)	341.265 (0.000)				90.173 (0.000)				269.208 (0.000)			
Wald-test(p-value) = 25.763 (0.000), LM-test(p-value) = 1203.114 (0.000), Hausman-test(p-value) = 4.977 (0.1735)												

Table (12): Regression model of the relationship between FDI & DWCB

Variables	Pooled Model				Fixed Effect Model				Random Effect Model			
	Coefficients		t-test		Coefficients		t-test		Coefficients		t-test	
	Value	S.E.	t	p-value	Value	S.E.	T	p-value	Value	S.E.	t	p-value
Constant	-137.12	43.0864	-3.182	0.002	28.0088	52.8261	0.530	0.596	3.88567	69.9070	0.056	0.956
FDI	-9.6E-09	6.5E-09	-1.478	0.140	6.2E-09	5.2E-09	1.199	0.231	5.0E-09	5.1E-09	0.993	0.321
FD	4162.50	233.117	17.856	0.000	3081.16	291.215	10.580	0.000	3226.46	270.541	11.926	0.000
FDI*FD	-1.3E-08	1.1E-08	-1.261	0.208	-1.8E-08	7.4E-09	-2.459	0.014	-1.8E-08	7.1E-09	-2.542	0.011
R²	0.419				0.875				0.301			
Adjusted R²	0.416				0.862				0.297			
S.E.	385.581				187.667				187.798			
F-test(p-value)	126.168 (0.000)				66.656 (0.000)				75.351 (0.000)			
Wald-test(p-value) = 36.915 (0.000), LM-test(p-value) = 1483.808 (0.000), Hausman-test(p-value) = 3.733 (0.2918)												

It is clear from tables (10), (11) and (12) that:

- Probability value of *Wald-test* is lower than significance level ($p\text{-value}=0.000 < \alpha = 0.05$), which indicates that the Fixed Effect Model is better than the Pooled Model.
- Probability value of *LM-test* is lower than significance level ($p\text{-value}=0.000 < \alpha = 0.05$), which indicates that the Random Effects Model is better than the Pooled Model.
- Probability value of *Hausman-test* is lower than significance level ($p\text{-value} < \alpha = 0.05$) for CBB which indicates that Fixed Effects Model is better than the Random Effect Model, while Probability value of *Hausman-test* is greater than significance level ($p\text{-value} > \alpha = 0.05$) for BFCB and DWCB which indicates that Random Effects Model is better than the Fixed Effect Model.

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According to the above findings, Fixed Effects Model will be used for CBB, and Random Effects Model will be used for BFCB and DWCB. Getting back to tables (10), (11) and (12) it is found that:

- There is a statistically significant impact of the FDI DWCB through the moderating role of FD at significance level 5%, whereas the probability value of *t*-test of FDI*FD is lower than significance level ($p\text{-value} = 0.011 < \alpha = 0.05$). Moreover, the regression model is statistically significant at significance level 5%, whereas the probability value of F-test is lower than the significance level ($p\text{-value} = 0.000 < \alpha = 0.05$). Additionally, FDI can explain 30.1% of the changes in DWCB, and the remaining is because of the random error or other factors that may affect DWCB and that influences are not studied in this research.
- Finally, there is a significant effect of FDI on one of FI indices through the moderating role of FD, so the fourth hypothesis is partly accepted.

▪ **Summary of the statistical analyses:**

The method has been used Panel Data (longitudinal data), which combines all Cross-Sectional Data (48 countries), and Time Series Data (11 years from 2010 to 2020) through applying the 3 following longitudinal data: Pooled Regression Model, Fixed Effect Model (which is estimated by using Least Square Dummy Variables (LSDV)), and Random Effect Model. This model is estimated by Ordinary Least Square (OLS). Wald test (Restricted F-test) will be applied to compare between the Pooled model and the fixed effects model. Breusch-Pagan LM (Lagrange Multiplier) will be applied to compare between the Pooled Model and the random effects model. Hausman test will be applied to compare between the fixed effects model and the random effects model. Then Time Series Stationarity test: Unit Root Tests is used to know the level of stationarity for the time series. Then, Correlation Matrix will be

applied. Correlation coefficients were calculated among the variables, to know the degree of the relationship of the variables. Additionally, it is found the following:

- There is a positive and statistically significant impact only of the BFCB on FDI at significance level 5%, whereas the probability value of t -test for this variable is lower than significance level (p -value = $0.000 < \alpha = 0.05$). Additionally, the variables forming the model can explain (76.8%) of the changes in FDI, and the remaining (23.2%) is because of the random error or other factors that may affect FDI and that influences are not studied in this research.
- Increasing in BFCB by 1 degree increases FDI by 78,540,485.
- Finally, there is a significant effect of one of FI indices on FDI, so the first hypothesis is totally rejected.
- There is a positive and statistically significant impact of the FDI only on BFCB and DWCB at significance level 5%, whereas the probability value of t -test is lower than significance level (p -value = $0.000 < \alpha = 0.05$). Additionally, FDI can explain 46.4% and 11.4% of the changes in BFCB and DWCB respectively, and the remaining is because of the random error or other factors that may affect BFCB and DWCB and that influences are not studied in this research.
- Increasing in FDI by 1 degree increases BFCB and DWCB by $6.4E-09$ and $1.5E-08$ respectively.
- Finally, there is a significant effect of FDI on FI, so the second hypothesis is accepted.
- There is a statistically significant impact of the BFCB and DWCB on FDI through the moderating role of FD at significance level 5% and 10%, whereas the probability value of t -test for BFCB*FD and DWCB*FD is lower than significance level 5% and 10% respectively. Additionally, the variables forming the model can explain (90.5%) of

the changes in FDI, and the remaining (9.5%) is because of the random error or other factors that may affect FDI and that influences are not studied in this research.

- Finally, there is a significant effect of most FI indices on FDI through the moderating role of FD, so the third hypothesis is accepted.
- There is a statistically significant impact of the FDI, DWCB through the moderating role of FD at significance level 5%, whereas the probability value of *t*-test of FDI*FD is lower than significance level ($p\text{-value} = 0.011 < \alpha = 0.05$). Additionally, FDI can explain 30.1% of the changes in DWCB, and the remaining is because of the random error or other factors that may affect DWCB and that influences are not studied in this research.
- Finally, there is a significant effect of FDI on one of FI indices through the moderating role of FD, so the fourth hypothesis is rejected.

Results & findings –

- Regarding the effect of FI on FDI without the moderator (FD): BFCB has a positive impact on FDI, and that may occur because once the number of borrowers increases, the demand may increase, which attract more of foreign investors to the hosting country as it is a big market for the foreign investors. So, once the number of borrowers increases by 1000 borrowers, FDI increases by 78,540, 4854\$. But there are 2 variables of FI (DWCB & CBB), which are insignificant. So, the result of the effect of FI on FDI should be insignificant as 2 of 3 variables are insignificant. Finally, there is a significant effect of one of FI indices on FDI, so the first hypothesis is totally rejected.
- Regarding the effect of FDI on FI without the moderator (FD): it is found that FDI has a significant positive impact on FI through 2 variables (BFCB & DWCB), which indicates that increasing FDI, may increase the wealth of people, which also may increase the number of

depositors in the bank as a result. On the other hand, increasing FDI may increase the number of borrowers (as they want to buy more & more of the new products that the investors create by their FDI in the hosting countries). So as a result, increasing FDI has a positive effect on FI. Since increasing FDI by 1 degree, increases the number of borrowers, and the number of depositors by $6.4E-09$ and $1.5E-08$ respectively. so the second hypothesis is accepted

- Regarding the moderating effect of FD on the effect of FI on FDI: BFCB has a positive effect on FDI through the moderating role of FD, which also consists with the above result. But DWCB has a negative effect on FDI through the moderating role of FD, which indicates that increasing the number of depositors in the banks, because of increasing the pool of savings, decreases the foreign capital inflows. Since the foreign investors don't consider the hosting country as a marketplace or attracting country for their investment. So, increasing the number of depositors by 1000 adults decreases FDI by 17,007,081\$. So, there is a significant effect of most FI indices on FDI through the moderating role of FD, so the third hypothesis is accepted.
- Regarding the moderating effect of FD on the effect of FDI on FI: FDI has a significant negative effect on DWCB, and that result is consistent with Regarding the moderating effect of FD on the effect of FI on FDI: above result. Since FDI can increase the demand in the hosting countries by the attracting cutting-edge products that produced by their investment that may increase the demand & decrease the pool of savings & the number of depositors as a result. So increasing FDI by 1 degree decreases the number of depositors by $-1.8E-08$. but regarding the effect of FDI on the other 2 variables of FI (BFCB & CBB), it is found that there is no significant effect of FDI on both, which means that FDI can affect FI positively through only one variable of the 3 variables of FI. So, there is a significant effect of FDI

on one of FI indices through the moderating role of FD, so the fourth hypothesis is rejected.

 **Policies Implications:**

- It is recommended from the study to focus on FDI & create attracting environment to the foreign inflows in the lower middle-income group of countries as FDI has a positive impact on FI & on the economy as a whole.
- It is recommended for the lower middle-income group of countries to pay more attention to achieve financial development, and at the same time they should facilitate the requirements for borrowing from banks, which increases the number of borrowers that in turn promotes FDI in existence of FD. Since financially developed country which has a large number of borrowers indicates that there is a big stable marketplace for foreign investors, so it attracts more of FDI. Since achieving FD in a country enables FI to attract more of FDI. So, these countries can achieve 2 targets with just one action.

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الدور الوسيط للتنمية المالية في العلاقة بين الشمول المالي والاستثمار الأجنبي المباشر: حالة الدول ذات الدخل المتوسط المنخفض

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الملخص

تهدف هذه الدراسة إلى اختبار العلاقة بين الاستثمار الأجنبي المباشر والشمول المالي بدون أي وسيط في العلاقة، وكذلك اختبار تلك العلاقة في حالة وجود وسيط يؤثر على كل من الاستثمار الأجنبي المباشر والشمول المالي مثل التنمية المالية، وتعتمد الدراسة أسلوب البنائ في النموذج الإحصائي باستخدام البيانات المتاحة لحوالي ٤٨ دولة من الدول ذات الدخل المتوسط المنخفض وذلك في الفترة من ٢٠١٠ - ٢٠٢٠م.

وتبين من الدراسة أن للاستثمار الأجنبي المباشر تأثير معنوي وإيجابي على الشمول المالي بدون وجود أي وسيط مؤثر على العلاقة بين الشمول المالي والاستثمار الأجنبي المباشر، وقد اختلفت النتائج في حالة تدخل الوسيط (التنمية المالية) حيث وجد أن الشمول المالي له تأثير معنوي على الاستثمار الأجنبي المباشر.

الكلمات الافتتاحية

الشمول المالي - الاستثمار الأجنبي المباشر - التنمية المالية - الإقصاء المالي - الاستقرار المالي - التنمية المستدامة - النمو الاقتصادي - القضاء على الفقر - الدول ذات الدخل المتوسط المنخفض - النمو الشامل