

Journal of Economic Cooperation & Development

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Raditya Sukmana, Sri Herianingrum, Ririn Tri
Ratnasari, Imron Mawardi and Siti Zulaikha**

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Editorial

This issue of the Journal of Economic Cooperation and Development includes eight papers that examine current drivers and efficiency of foreign direct investment in selected developing countries, including OIC member countries. Various foreign direct investment implications can be derived from the empirical results of these papers, with causal effects explained by economic growth, fiscal and monetary policy, and political institutions.

Al Mustofa et al. evaluated how country risk, institutional quality, inflation level, exchange rate, economic output, political infrastructure, and the composite score of the International Country Risk Guide affect the inflows of Foreign Direct Investment in 13 Organization of Islamic Cooperation countries from 2002 to 2019. The results showed that the sample countries tend to have a moderate level of country risk exposure and a low level of institutional quality. As investors prefer to invest in countries with low exposure to risks, the institutional quality must develop by enhancing the flow of foreign investments.

Pakistan is placed among the family of aid dependent developing countries and this characteristic of Pakistan's economy makes it a pertinent case for scrutinizing budgetary response to aid. Mukhtar and Brueckner observe the impact of disaggregated aid flows on key fiscal variables in Pakistan and find a dismal picture within Pakistan. Aid loans and grants are largely earmarked for development and non-development public spending. They tend to displace tax revenue in the country which is a grave adverse fiscal consequence of aid for the country.

Hengchao et al. assess the contagion effect of the global financial crisis (GFC) and the European debt crisis (EDC) on Islamic and conventional stock market indices of the US, GCC and Malaysia. They find that the Malaysia Islamic stock market is exempted from the contagion effect of GFC and EDC when the shock stems from the US Islamic stock market. Investors in the US Islamic equity markets can create a safety net by reallocating some of their portfolios into the Malaysia Islamic stock market, which appears to be more resilient. However, we do find a significant contagion influence between the US Islamic and GCC Islamic stock market, suggesting that the GCC Islamic stock market cannot provide an effective hedge for the US investors seeking a Shariah-compliant investment.

Tahmid et al. identify the literature gap in electronic human resource management (e-HRM) practices. They find that Germany, USA, China, and other notable technology-advanced nations lead in research regarding e-HRM. From the results of the thematic map, trend topics, bibliometric coupling, three-field plot and co-occurrence network, they highlight the future research agenda of e-HRM.

Sökmen study the interaction between government expenditures and economic growth in the Turkish economy between 1971 and 2019. Their results imply the existence of a bi-directional causality between government expenditures and economic growth in the Turkish economy. This result is valid in the long run. In the shorter time frequencies, direction of causality turns into uni-directional running from government expenditures to economic growth.

Lan and Canh investigate the impacts of foreign aid on FDI and whether this impact is different across provinces with hetero-quality governance. Based on balanced panel data from 2006 through 2017, they find a negative impact of foreign aid on FDI at the provincial level, but the effect is different cross-province with different proxies of the quality of governance. These empirical results shed light on the foreign aid allocation policies and management to increase the attractiveness of FDI inflow in Vietnam.

Smolo explores the impact of foreign direct investment (FDI) and institutional quality on the economic growth in Albania, Bosnia and Herzegovina, Montenegro, North Macedonia, and Serbia. The results shows that FDI significantly negatively impacts growth within the sample countries; additionally, the results indicate that institutional development has a significantly negative or no role on growth directly. Furthermore, when FDI and institutional development measures interact, both indicators become insignificant, including their interaction terms.

Rashid investigates the determinants of FDI inflows in BRICS countries – the fastest-growing and the most resource-full group of developing countries in the world. He found that Globalization, corruption control, market size, and economic growth exhibit strong positive influence on FDI inflow. Financial development (credit to GDP ratio) negatively influences FDI inflow. Corruption exhibits a ‘U-shaped’ relationship with FDI inflows. When combined using a moderation effect, globalization and corruption control exerts a better strategic impact on FDI inflow than their stand-alone impact. Further, MNEs will prefer a country as their next destination that carries a ‘regionally integrated’ open economic policy, bigger local market size, and clear policies to mitigate risk attached to corruption and excessive domestic credit.

Nebil DABUR
Editor-in-chief

Determining Factors of Inward Foreign Direct Investment (FDI) in Selected Muslim Countries

Muhammad Ubaidillah Al Mustofa¹, Raditya Sukmana², Sri Herianingrum³,
Ririn Tri Ratnasari⁴, Imron Mawardi⁵, and Siti Zulaikha⁶

ABSTRACT

This study analyzed the impact of country risk, regulatory quality, and selected macroeconomic factors on the inflows of Foreign Direct Investment (FDI) into selected Muslim countries. A quantitative study was applied using the panel regression method on data of 13 Organization of Islamic Cooperation (OIC) countries from 2002 to 2019. The developed panel regression models evaluated the country risk, institutional quality, and selected macroeconomic factors which included the country's inflation level, exchange rate, economic output, and political system. These factors are deemed important in many Muslim countries which are known to be associated with poor institutional quality and high exposure to risks due to a multitude of factors such as political instability, wars, and poor management of natural resources. The composite score of the International Country Risk Guide was applied to analyze the impact of country risk on the inflows of FDI and to provide managerial relevancies for different stakeholders. The results showed that in general, Muslim countries tend to have a moderate level of country risk exposure and a low level of institutional quality. As investors prefer to invest in countries with low exposure to risks, the institutional quality must be enhanced to play a vital role in enhancing the flow of foreign investments. Countries with higher economic output have more opportunities to receive higher investment flows.

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ملخص

تدرس هذه الورقة البحثية بالتحليل كل من تأثير المخاطر القُطرية والجودة التنظيمية وعوامل مختارة من عوامل الاقتصاد الكلي على تدفقات الاستثمار الأجنبي المباشر إلى بلدان إسلامية مختارة. وتم تطبيق دراسة كمية باستخدام طريقة انحدار بيانات اللوحة على بيانات 13 دولة عضو في منظمة التعاون الإسلامي (OIC) من 2002 إلى 2019. وقيمت نماذج انحدار اللوحة المطورة المخاطر القُطرية، والجودة المؤسسية وعوامل مختارة من عوامل الاقتصاد الكلي التي تضمنت مستوى التضخم في الدولة، وسعر الصرف، والنتائج الاقتصادية، والنظام السياسي. وتعتبر هذه العوامل مهمة في عدد من البلدان الإسلامية والتي من المعروف أنها مرتبطة بضعف جودة المؤسسات والتعرض الكبير للمخاطر بسبب العديد من العوامل مثل عدم الاستقرار السياسي والحروب وسوء إدارة الموارد الطبيعية. وتم تطبيق النتيجة المركبة للدليل الدولي للمخاطر القُطرية لتحليل تأثير مخاطر البلد على تدفقات الاستثمار الأجنبي المباشر وتوفير الصلات الإدارية لمختلف أصحاب المصلحة. وأظهرت النتائج أنه بشكل عام، تميل البلدان الإسلامية إلى أن يكون لديها مستوى معتدل من التعرض للمخاطر القُطرية ومستوى منخفض من الجودة المؤسسية. ولأن المستثمرين يفضلون الاستثمار في البلدان ذات التعرض المنخفض للمخاطر، يجب تحسين الجودة المؤسسية للعب دور حيوي في تعزيز تدفق الاستثمارات الأجنبية. كما أن البلدان ذات الإنتاج الاقتصادي الأعلى تتمتع بفرص أكبر لتلقي تدفقات استثمار أعلى.

ABSTRAITE

Cette étude a analysé l'impact du risque pays, de la qualité de la réglementation et de certains facteurs macroéconomiques sur les flux d'investissements directs étrangers (IDE) dans certains pays musulmans. Une étude quantitative a été appliquée en utilisant la méthode de régression par panel sur les données de 13 pays de l'Organisation de la coopération islamique (OCI) de 2002 à 2019. Les modèles développés de régression en panel ont évalué le risque pays, la qualité institutionnelle et certains facteurs macroéconomiques, notamment le niveau d'inflation, le taux de change, la production économique et le système politique du pays. Ces facteurs sont jugés importants dans de nombreux pays musulmans, dont on sait qu'ils sont associés à une mauvaise qualité institutionnelle et à une forte exposition aux risques dus à une multitude de facteurs tels que l'instabilité politique, les guerres et la mauvaise gestion des ressources naturelles. Le score composite de l'International Country Risk Guide a été appliqué pour analyser l'impact du risque pays sur les flux d'IDE et pour fournir des éléments de gestion pertinents aux différentes parties prenantes. Les résultats ont montré qu'en général, les pays musulmans ont tendance à avoir un niveau modéré d'exposition au risque pays et un faible niveau de qualité institutionnelle. Comme les investisseurs préfèrent investir dans des pays peu exposés aux risques, la qualité des institutions doit être améliorée pour jouer un rôle essentiel dans l'accroissement des flux d'investissements étrangers. Les pays dont la

production économique est plus élevée ont plus de chances de recevoir des flux d'investissement plus importants.

Keywords: Country Governance, Country Risk, Foreign Direct Investment, Institutional Quality

JEL Classification: F21, F36

1. Introduction

In many developing economies, the internal state-generated revenues alone are not adequate to finance the intended government development projects, leading to the need for other sources of financing. There are two common sources of funding for countries, which are by creating more investment inflows or by using public debt. Depending on public debt burdens the state's economy, as the debt needs to be repaid through scheduled installments on the principal and its interest. In contrast, Foreign Direct Investment (FDI) encourages economic growth by promoting new economic activities, creating job opportunities, reducing unemployment, and improving people's welfare. In addition, the inflows of foreign capitals provide opportunities for local companies to invest in expanding the scope of their businesses as well as to improve the quality and quantity of production. Foreign investment helps the transfer of technology and increases the level of market competitiveness for local businesses ([Alfaro et al., 2004](#); [Alguacil et al., 2011](#); [Madura, 2010](#); [Nor et al., 2015](#); [Pegkas, 2015](#); [Widiastuti et al., 2020](#)).

Most Organization of Islamic Cooperation (OIC) members are developing countries that require massive sources of funding to finance numerous national development projects. These Muslim countries have great potentials to grow into developed countries and are blessed with abundant natural sources and a large population. At present, Muslim countries contribute to approximately 23% of the world's total population. The global Muslim population enjoys a growth, whereby a projection from the United Nations Population Fund (UNFPA), as shown in Table 1, shows that the Muslim population will reach 2,588 million out of the world's total population of 9,322 million in 2050.

Table 1: Muslim and World Populations

Population (In million)	1950	2000	2015	2025	2050
World Population	2.520	6.057	7.270	7.937	9.322
Muslim Population	361	1.209	1.625	1.921	2.588

Source: United Nation Population Fund (UNFPA, 2012)

In addition to promising human capital, Muslim countries are blessed with abundant natural resources. In the global oil production industry, Muslim countries currently hold between 66.2 to 75.9% of world oil reserves through Saudi Arabia, Iraq, Iran, Kuwait, United Arab Emirates, Qatar, Yemen, Libya, Nigeria, Algeria, Kazakhstan, Azerbaijan, Malaysia, Indonesia, and Brunei. In the global trading market, Muslim countries have control over many of the world's important economic trade routes. Another industry that has enormous potential to be developed in Muslim countries is the agricultural industry. These countries have an area of 2,935 million hectares, which is about 22 percent of the world's land area of 13,392 million hectares. Utilizing this vast land area for agricultural use will secure the food needs of Muslim countries and reduce their over-reliance on other countries ([Majoka et al., 2012](#)). The increasing population, abundant natural resources, controls over many crucial economic trade routes, and agricultural privileges provide Muslim countries with huge opportunities for economic growths. These growths require enormous capital which would be best met through inflows of FDI.

Prior studies that focused on the relationship between country-specific macroeconomic variables and FDI found that inflation ([Asamoah et al., 2016](#); [Bengoa and Sanchez-Robles, 2003](#); [Boateng et al., 2015](#)), the exchange rate ([Asamoah et al., 2016](#); [Bénassy-Quéré et al., 2001](#); [Kosteletou and Liargovas, 2000](#)), and economic output ([Boateng et al., 2015](#); [Kayalvizhi and Thenmozhi, 2018](#); [Muslim, 2016](#)) affect the inflow of FDI. Other studies found that investors prefer to invest in countries with low exposure to risks and stable macroeconomic conditions ([Asamoah et al., 2016](#); [Aziz, 2018](#); [Busse and Hefeker, 2007](#); [Grosse and Trevino, 2005](#); [Madura, 2010](#)). In addition, the quality of the country's governance, or the institutional quality, also plays an important role in the inflow of foreign investments ([Asamoah et al., 2016](#); [Aziz, 2018](#); [Busse](#)

[and Hefeker, 2007](#); [Herrera-Echeverri, Haar, and Estévez-Bretón, 2013](#); [Mina, 2007](#); [Quazi, 2007a](#)).

This study aims to investigate the impact of country risk, institutional quality, and macroeconomic factors which include the inflation level, exchange rate, economic output, and political system on the inflow of FDI. The work extends the studies by [Muslim \(2016\)](#) and [Sarwedi \(2002\)](#), who studied macroeconomic impacts on Indonesia's FDI, with the additional factors of country risk and institutional quality included. The results are anticipated to highlight the significant roles of country risk and institutional quality in determining FDI inflows and could serve as guidance for the governments in Muslim countries when establishing policies concerning FDI.

2. Literature Review

2.1. Macroeconomic Impacts on FDI

The inflation level in a country provides a sign of internal economic stability, as it indicates price stability. High inflation level causes the price of goods and services to increase, raising the cost of wages and raw materials for their production. In a high inflationary environment, the value of real money falls, which leads to a continuing decline in the production of goods and services at the aggregate level. High inflation indicates the failure of the government to balance the budget using effective monetary and fiscal policies. In severe cases, continuing inflation can lead to hyperinflation, where the money loses its value and ceases to be a useful medium of exchange. Such conditions lead to an economy that is unattractive for investors and thus hamper new investment. For example, [Boateng et al. \(2015\)](#) discovered that Norway's inflation produced significantly negative results in attracting foreign investment while [Asamoah et al. \(2016\)](#) found that inflation volatility adversely affects the FDI inflows in 40 countries. [Bengoa and Sanchez-Robles \(2003\)](#) analyzed the impact of macroeconomic conditions on FDI using the panel data for 18 Latin American countries between 1970 and 1996. The findings showed that inflation has a negative and significant effect on foreign investment. In contrast, [Sánchez-Martín et al. \(2014\)](#), [te Velde and Bezemer \(2006\)](#), and [Quazi \(2007b\)](#) found insignificant coefficients of inflation on inward FDI.

In the business environment, a stable exchange rate means simpler a business operation as the profits on investments can be estimated directly. The fluctuations and uncertainties in the exchange rate affect investment decisions. An appreciation in the local currency will increase the costs for the factors of production, as foreign firms and corporations will have to pay higher wages or salaries and acquire raw materials at higher prices ([Madura, 2010](#)). In addition, when the exchange rate is volatile, there is a potential reduction in the anticipated earnings on investments. The exchange rate distortions and volatility could lead to a fall in the value of assets invested by foreign multinational companies and is detrimental to the inflow of FDI ([Asamoah et al., 2016](#); [Madura, 2010](#)). In contrast, [Kosteletou and Liargovas \(2000\)](#) argued that there is no clear impact of the exchange rate volatility on FDI and that the two can be positively or negatively correlated. [Bénassy-Quéré et al. \(2001\)](#) claimed that entrepreneurs prefer to invest in countries with a low level of exchange rates as the labor wages and transportation costs are cheaper.

The economic output reflects a country's economic development. One of the common measures for the economic output is by estimating the Gross Domestic Product (GDP), which is based on the value of goods and services produced by a country within a particular year. A high GDP illustrates a high income of the population, which influences the consumers' consumption pattern and companies' profits. Achieving a high GDP reflects the realization of the country's economic objective and shows that a decent economic environment is in place, which promotes investment. Economic growth is usually associated with a fertile business climate that is supported by a good investment. Increased FDI will positively affect the production process in the economy and promotes household consumption, therefore increasing the country's economic growth ([Akalpler & Adil, 2017](#); [Azam, 2016](#); [Özek, 2020](#)). [Boateng et al. \(2015\)](#) discovered that Norway's real and sectoral GDP has a positive and significant impact on FDI inflow. A similar positive impact is also found in studies by [Jaafar and Hossain \(2007\)](#), [Ang \(2008\)](#), [Frenkel et al. \(2004\)](#), [Kimino et al. \(2007\)](#), [Majeed and Ahmad \(2010\)](#), [Lean and Tan \(2011\)](#), [Kolstad and Wiig \(2012\)](#), [Al-jaifi et al. \(2016\)](#) and [Kayalvizhi and Thenmozhi \(2018\)](#).

As shown in previous studies, inflation, exchange rate, and economic growth contribute to the inflow of FDI. Thus, it is important to determine

the impact of these variables on the inflow of FDI to the Muslim countries in this study. The following hypotheses are proposed:

Hypothesis 1: Higher inflation discourages the inflow of foreign investment.

Hypothesis 2: Appreciation in local currency reduces the inflow of foreign investments.

Hypothesis 3: Higher economic output encourages the higher inflow of FDI.

2.2. Institutional Quality Impact on FDI

Country governance, or institutional quality, is an essential factor that promotes the inflow of FDI and helps to ensure a stable rate of economic growth. A stable and structured government affects the motivation of investors to carry out investment activities. Foreign investors prefer to invest in countries that are considered to have a proper bureaucratic system, responsive public services, political stability, a healthy economic environment, and adequate security. The investment environment in a country requires an ethical governance framework in which companies could continue to strengthen their performance through better corporate governance. A good existing ethical corporate governance framework can encourage foreign investors, as it is an instrument for assessing organizational structures that are formally recognized in an economy. To overcome government inefficiencies, the governments in countries with developing economies can set the right corporate governance standards by enforcing specific rules and conditions for conducting any business activity. Rational investors believe that when companies trade internationally, there are significant impacts and needs on the structure of corporate governance. Effective corporate governance will protect the rights of minority investors, thereby encouraging FDI. Empirical analysis on 22 developing countries confirms that corporate governance standards influence investment decisions, although many of these standards are not implemented effectively and efficiently. The institutional environment in the economy affects investment decisions and a favorable investment environment reduces business risk ([Kayalvizhi and Thenmozhi, 2018](#)).

[Busse and Hefeker \(2007\)](#) found that the quality of bureaucracy and institutional frameworks encourage the flow of foreign investment. A decent structure of the government and corporate institutions influences the forming of an internationalization strategy and diversification of international companies. [Asamoah et al. \(2016\)](#) examined how

institutional quality influences the foreign investment inflows in 40 countries in Sub-Saharan Africa from 1996 to 2011. The study confirmed that the institutional quality in both the government and institutional circles at the company and industry levels increases the motivation of foreign investors to spread investment portfolios in certain countries. [Aziz \(2018\)](#) found that the performance of regulatory institutions and their quality lead to the ease of doing business and the increase in investment flows. These findings are in line with the results from [Asamoah et al. \(2016\)](#) and [Mina \(2007\)](#). [Herrera-Echeverri et al. \(2013\)](#) studied the foreign investment trends in 87 countries and found a strong positive correlation between state governance and FDI inflows. The study of [Quazi \(2007b\)](#) found that the inclusion of investment was heavily dependent on the policies taken by the government. Investment inflows are negatively correlated with changes in government policies that hinder international trade, more regressive taxation, tighter foreign investment regulations, more repressive financial systems, outrageous price and wage controls, and excessive bureaucracy. It can be concluded that many multinational companies, foreign investors, and governments consider institutional quality as a significant factor in promoting FDI. Thus, for this study, the following hypothesis is proposed:

Hypothesis 4: Better country governance encourages more inflows of foreign investment.

2.3. Country Risk and FDI Inflow

[Madura \(2010:477\)](#) defined country risk as the potential adverse impact of a country's environment on companies' cash flows and divided it into political and financial risks, while [Hoti and McAleer \(2003\)](#) defined country risk as the capability of a country to pay off its international obligations. Country risk includes the credit obligations in a country and other risks from the economic, financial, and social conditions that are likely to affect the investments made in that specific country. The assessment of county risk is one of the crucial elements in the decision-making process for a company when initiating investment in foreign countries. Rationally, investors would avoid investing in a country with extreme risk, and those who already invested in a country would divest their businesses when there is an increasing risk. Most multinational companies will not be affected by every event that occurs but will pay attention to any incidents that may affect the industry.

[Madura \(2010:478-480\)](#) further discussed the forms of political risk. Firstly, the risk relates to the attitude of the consumers in a country, which is the tendency for the residents to buy and acquire specific products. Secondly, the risk can be due to the action of the government, law enforcement, and regulations, which may affect the company's cash flows. Next, security issues such as wars and terrorist attacks can make the business environment more volatile, threatening the safety of the employees and the asset of the corporations. In addition, inefficient government bureaucracy and corruption can complicate the process for business expansion and investment in new projects. For instance, unethical government employees expect gifts before approving applications submitted by companies, leading to unhealthy business competition through the awards of contracts or projects to companies that bribe government officials. The extreme form of political risk is in cases where the government could take over a business without any compensation.

Along with political risk, financial risk represents the current and potential state of the country's economy. The demands for products, services, and commodities strongly depend on the economy. Economic growth is one of the variables used for the assessment of the financial factor affecting the country's businesses. In some cases, forecasting future economic growth is necessary for the evaluation. [Madura \(2010\)](#) believed that three factors influence the growth of the economy: inflation, currency exchange rate, and interest rates. High inflation reduces the consumers' purchasing power and the consumption of goods and services. The currency exchange rate influences the demand for a product made in the country, whereby a strong currency reduces the market for the country's export, and vice versa. The interest rate affects economic growth; a higher rate tends to slow down the economic growth while a low rate stimulates faster growth.

Several studies analyzed the impact of country risk on FDI inflows. [Grosse and Trevino \(2005\)](#) argued that political risk and corruption play significant negative roles in the FDI inflows in Central and Eastern Europe. In contrast, institutional variables that reduce uncertainties and costs for MNEs encourage the flows of inward FDI. [Busse and Hefeker \(2007\)](#) conducted a study on 83 developing countries to find the linkage between the political risk, institutional variables, and the FDI inflow. The results show that government stability, internal and external conflicts,

corruption and ethnic tensions, law and order, democratic accountability of government, and quality of bureaucracy are highly significant determinants of FDI inflows.

In summary, the overall thrust of the institution-based view is that the institutional framework of the host country shapes a firm's internationalization strategy. [Asamoah et al. \(2016\)](#) examined how macroeconomic volatility affected the FDI in 40 countries in the Sub-Saharan African region over the period between 1996 and 2011. They concluded that while macroeconomic uncertainty adversely affects FDI, a good institutional quality increases the FDI inflow into the host country. [Hayakawa et al. \(2013\)](#) studied the impact of country risk in 89 countries and found the political risk to be the most dominant factor in attracting FDI, whereas financial risk does not play a significant role. The political risk is negatively correlated with the FDI inflow; the decrease in the political risk results in a higher inflow of FDI. The negative impact of political risk on FDI is also reported in the study by [Meon and Sekkat \(2012\)](#), [Al-jaifi et al. \(2016\)](#), and many recent studies. Thus, for this study, the following hypothesis is proposed:

Hypothesis 5: Greater exposure of country risk reduces the inflow of foreign investment.

2.4. Political System on FDI Inflow

The existing studies on the effect of the political system on FDI inflow provide a mixed view. [Asiedu and Lien \(2011\)](#) believed that a democratic political system leads to a more volatile business environment, as such system requires frequent and more complex changes in establishing any economic and government policies. An autocratic system, on the other hand, provides stabilities of commercial regulations and a more conducive business environment. In contrast, [Holmes et al. \(2013\)](#) argued that a democratic political system offers opportunities for managers of MNEs to influence changes in the regulations, policies, and methods through lobbying, election, and interest groups. In the autocratic system, however, these managers would require strong power, political connection, and efforts to influence the government to change its policies and regulations in their favor. [Uddin et al. \(2019\)](#) found that the Pakistani military government system is more successful than a democratic government system in promoting the inflow of FDI. A democratic system

would lead to more uncertainties as many individuals and groups are fighting to reach the peak of the system. For this study, the following hypothesis is proposed:

Hypothesis 6: The political system affects the inflow of inward foreign investments

3. Data and Methodology

This study examined the FDI trends in 13 Muslim countries with the highest population, including Indonesia, Pakistan, Nigeria, Bangladesh, Egypt, Iran, Turkey, Uganda, Algeria, Iraq, Morocco, Arab Saudi, dan Malaysia. Sudan, Afghanistan, and Uzbekistan were excluded from the list due to insufficient data. The Muslim population data was derived from the SESRIC. The panel regression method using the Fixed Effects (FE) approach was applied, whereby the effects of the omitted country-specific variables were treated as fixed constants over time. Although this approach provided consistent (but not necessarily efficient) parameter estimates, it removed any time-invariant information ([Egger & Winner, 2005](#)) and allowed the unobserved country effect (the heterogeneity effect) to be controlled ([Wooldridge, 2010](#)). The FE approach only considered short-term influences of the variables of interest ([Pirotte, 1999](#)). Extended models were introduced with a lag parameter of 1 for robustness purposes. This study used secondary data in the form of annual frequency between 2002 and 2019. The details of each explanatory variable in this study are as follows.

The country risk was derived from the International Country Risk Guide (ICRG) Composite Country Risk indicator, which indicates the risk associated with a specific country. The country risk was assessed by three indicators of risk consisting of economic, financial, and political risks, where each indicator carried different weights and scores. The compilation of these indicators created a single composite country risk indicator (CR in equation (1)), which ranged from 0 to 100. A higher score of the composite country risk indicates that the specific country is exposed to a low level of risks derived from economic, financial, and political uncertainties, and vice versa ([ICRG, 2016](#)). The institutional quality was represented by the regulatory quality (RQ in equation (1)) indicator from the World Bank's World Governance Indicator (WGI). The indicator ranged from 0 to 100, where a higher score indicates better institutional quality.

For the macroeconomic factors, the GDP, currency exchange rate (ER in equation (1)), and the Consumer Price Index (CPI) values were obtained from the World Bank database. The CPI was used to represent the inflation level.

Based on the information above, the empirical model to examine the influence of the dependent variables on the FDI is as follows:

$$FDI_{it} = \alpha + \beta_1 ER_{it} + \beta_2 GDP_{it} + \beta_3 CPI_{it} + \beta_4 RQ_{it} + \beta_5 CR_{it} + \varepsilon_{it} \quad (1)$$

Where FDI, ER, GDP, CPI, RQ, and CR denote Foreign Direct Investment Inflow, Local Currency against USD, Gross Domestic Product, Consumer Price Index, Regulatory Quality, and Country Risk, respectively. Further, α , β , i , t , and ε denote constant or intercept, coefficient slope, i -unit, t period, and residual (*error term*), respectively.

To increase the robustness of the model, two exogenous variables were introduced into the regression model in equation (1): the type of government (GOV, as democratic or non-democratic political systems) and the labour force (LBF). The type of government ([Asiedu and Lien, 2011](#); [Holmes et al., 2013](#); [Uddin et al., 2019](#)) and labors ([Sarwedi, 2002](#); [Jaafar and Hossain, 2007](#); [Kimino, Saal and Driffield, 2007](#)) are important determinants of FDI inflow. The inclusion of the government type into the model aimed to evaluate the foreign investors' preferences towards a specific political system. The labour force indicates the employment level in a particular country, where a higher labour force provides a country with the ability to produce more outputs. The revised regression models are as follows:

$$FDI_{it} = \alpha + \beta_1 ER_{it} + \beta_2 GDP_{it} + \beta_3 CPI_{it} + \beta_4 RQ_{it} + \beta_5 CR_{it} + \beta_6 GOV_{it} + \varepsilon_{it} \quad (2)$$

$$FDI_{it} = \alpha + \beta_1 ER_{it} + \beta_2 GDP_{it} + \beta_3 CPI_{it} + \beta_4 RQ_{it} + \beta_5 CR_{it} + \beta_6 LBF_{it} + \varepsilon_{it} \quad (3)$$

GOV is a dummy variable representing a government system where 1 is a democratic political system, and 0 is a non-democratic political system. LBF stands for the labor force.

4. Results and Analysis

The descriptive statistics are presented in Table 2. As shown, the average regulatory quality score among the selected countries is 35.39%,

indicating a relatively low level of quality governance. The average ICRG Composite Country Risk score is 66.05%, which shows that the selected countries generally have a moderate level of country risk.

Table 2: Descriptive Statistics

	FDI	ER	GDP	CPI	RQ	CR
Mean	5.36E+09	2027.882	3.01E+11	13.093	35.38658	66.051
Median	2.75E+09	64.583	1.99E+11	7.3107	33.64929	65.271
Maximum	3.95E+10	29011.49	1.09E+12	81.863	75.96154	81.833
Minimum	-6.14E+08	1.301522	1.13E+10	-2.194	1.020408	36.396
Standard Deviation	6.82E+09	4456.006	2.46E+11	18.307	20.10899	8.057
Observations	181	181	181	181	181	181

Source: Author's calculation derived from EViews

The correlation matrix of the variables is presented in Table 3, which shows the relationship between the FDI and the other variables in the model.

Table 3: Correlation Matrix

	FDI	ER	GDP	CPI	RQ	CR
FDI	1					
ER	-0.081	1				
GDP	0.280	0.048	1			
CPI	0.082	0.044	-0.006	1		
RQ	0.151	0.007	0.070	-0.018	1	
CR	0.175	-0.107	0.200	0.034	0.220	1

Source: Author's calculation derived from EViews

In general, we expect that all five factors that include exchange rate, GDP, inflation, regulatory quality, and country risk are positively related to FDI inflows except inflation. The matrix shows negative correlations of the exchange rate and country risk against FDI, while inflation positively correlates with FDI. The multivariate regression results are presented in Table 4 and Table 5.

Table 4: Regression Results

Variable	Model 1		Model 2		Model 3		Model 4	
	Coefficient	t-statistics	Coefficient	t-statistics	Coefficient	t-statistics	Coefficient	t-statistics
ln ER	-0.733***	-3.301			0.013	0.503		
ln GDP	2.203***	8.423			0.837***	13.565		
CPI	0.000	0.021			-0.006	-1.556		
RQ	0.027***	3.075			0.016***	3.791		
CR					0.016*	1.766		
ln ER (-1)			-0.425**	-2.042			-0.001	-0.050
ln GDP (-1)			1.361***	5.581			0.795***	15.375
CPI (-1)			-0.003	-0.640			-0.005	-1.608
RQ (-1)			0.016*	1.949			0.0150***	4.155
CR (-1)							0.012	1.620
Constant	-33.410***	-5.381	-12.230**	-2.110	-1.669	-0.996	-0.058	-0.042
R2	0.687		0.698		0.616		0.675	
Adjusted R2	0.662		0.673		0.605		0.665	
F-statistics	27.550***		27.905***		54.045***		70.08***	
Durbin Watson	0.950		1.090		0.815		1.014	
Adjusted Observation	218		210		174		175	
Observation Period	2002-2019		2003-2019		2002-2015		2003-2016	

Source: Author's calculation derived from EVIEWS Note: * Significant at the ten percent confidence level (less than $\alpha = 0.10$)

** Significant at five percent confidence level (less than $\alpha = 0.05$) *** Significant at one percent confidence level (less than $\alpha = 0.01$).

4.1 Hypothesis 1: Higher inflation discourages the inflow of foreign investment.

The results in Table 4 and Table 5 show that inflation is not a strong factor for investment decisions in the selected Muslim countries. The insignificant role of inflation agrees with the findings in [Sánchez-Martín et al. \(2014\)](#), [te Velde and Bezemer \(2006\)](#), and [Quazi \(2007b\)](#). The results, however, contradict the findings in [Asamoah et al. \(2016\)](#) and [Bengoa and Sanchez-Robles \(2003\)](#). Similarly, [Bénassy-Quéré et al. \(2001\)](#) claimed that entrepreneurs prefer to invest in countries with a low level of inflation.

Table 5: Robustness Test Results

Variable	Model 5		Model 6		Model 7		Model 8	
	Coefficient	t-statistics	Coefficient	t-statistics	Coefficient	t-statistics	Coefficient	t-statistics
ln ER	-0.775***	-3.693	0.021	0.809	0.014	0.502	0.036	1.161
ln GDP	4.358***	8.846	0.886***	11.541	0.841***	11.345	0.94***	9.775
CPI	0.003	0.541	-0.006*	-1.744	-0.006	-1.374	-0.006	-1.495
RQ	0.023***	2.732	0.017***	5.039	0.016***	3.733	0.018***	4.031
CR					0.016*	1.678	0.012	1.274
LBF	-4.397***	-5.055			-0.008	-0.079		
GOV			-0.239	-1.345			-0.302	-1.388
Constant	-14.646	-2.111	-1.866	-0.911	-1.610	-0.879	-4.139*	-1.695
Adjusted Observation	218		218		174		174	
Observation Period	2002-2019		2002-2019		2002 - 2015		2002 - 2015	

Source: Author's calculation derived from EViews Note: * Significant at the ten percent confidence level (less than $\alpha = 0.10$)

** Significant at five percent confidence level (less than $\alpha = 0.05$) *** Significant at one percent confidence level (less than $\alpha = 0.01$)

4.2 Hypothesis 2: Appreciation in local currency reduces the inflow of foreign investments.

In terms of the exchange rate, only models 1 and 5 show significant negative correlations of the exchange rate with FDI. The results agree with the findings of [Kosteletou and Liargovas \(2000\)](#), who argued that there is no clear impact of the exchange rate volatility on FDI, as the impact can be positively correlated or otherwise depending on the benefits that are foreseen by potential investors. For example, [Sirin \(2017\)](#) studied the determinant factors of foreign direct investment in Turkey and found that the exchange rate was negatively and significantly correlated with the inflow of FDI. Similar evidence of negative relationships was found in studies of [Grosse and Trevino \(2005\)](#) in 13 European countries and [Ang \(2008\)](#) in Malaysia. In contrast, many previous studies such as those conducted by [Boateng et al. \(2015\)](#), [Asamoah et al. \(2016\)](#), [Frenkel et al. \(2004\)](#), and [Yol and Teng \(2009\)](#) found a positive and significant correlation of the exchange rate on FDI inflows. From the perspective of foreign investors, a higher exchange rate of the local currency (devaluation) against the USD makes a factor of production and raw materials cheaper, making it an attractive investment prospect. The reverse is true in cases where the currency appreciates against the USD, where the foreign investors must pay for factors and production materials at higher prices ([Madura, 2010](#)). The negative relationship between the local currency exchange rates and FDI found in this study indicates decent economic prospects for Muslim countries, especially in the field of exports.

4.3 Hypothesis 3: Higher economic output encourages the higher inflow of FDI.

The results show that the GDP appears to be the indicator with the strongest impact and that the trend is consistent in all models. The positive coefficient of the GDP and its strong significance shows that the economic output and its outlook play a significant role in determining the inflow of foreign investments. These results support the findings of [Boateng et al. \(2015\)](#), [Muslim \(2016\)](#), [Sarwedi \(2002\)](#), [Al-jaifi et al. \(2016\)](#), [Jaafar and Hossain \(2007\)](#), and [Kayalvizhi and Thenmozhi \(2018\)](#), which suggested that investors prefer to conduct business in countries with better economic outlooks. Economic evaluation gives an essential initial signal for the investment worthiness of a country. It would

be more attractive to invest in a country with robust economic growth and avoid investing in a country with an uncertain economic outlook and a looming economic crisis. The economic outlook of the selected Muslim countries is expected to remain strong despite the turmoil in certain countries such as Yemen and Syria.

4.4 Hypothesis 4: Better country governance encourages more inflows of foreign investment.

Table 4 and Table 5 show that institutional quality plays a significant role in determining the flow of foreign investment and is found to be consistent in all models. A better institutional quality implies better country governance, which increases the confidence and motivation of investors and encourages the inflow of FDI. The results agree with the findings of [Kayalvizhi and Thenmozhi \(2018\)](#), [Busse and Hefeker \(2007\)](#), [Asamoah et al. \(2016\)](#), [Aziz \(2018\)](#), [Mina \(2007\)](#), [Uddin et al. \(2019\)](#), and [Herrera-Echeverri et al. \(2013\)](#). The known governance-related problems in Muslim countries, such as corruption, wars, fraud, and a heavily bureaucratic system, make institutional quality an important factor for investors when deciding for FDI in these countries. Thus, preserving decent regulations and improving country governance is necessary.

4.5 Hypothesis 5: Greater exposure of country risk reduces the inflow of foreign investment.

The positive correlation of country risk on FDI inflow is found only in models 3 and 6 at a 10% significance level. The results imply that higher political, economic, and financial uncertainties will reduce the inflow of FDI, which is in agreement with the findings of [Hayakawa et al. \(2013\)](#), [Al-jaifi et al. \(2016\)](#), [Meon and Sekkat \(2012\)](#), [Asamoah et al. \(2016\)](#), [Busse and Hefeker \(2007\)](#) and [Grosse and Trevino \(2005\)](#). The results also agree with the findings in [Aziz \(2018\)](#), who studied the inflow of FDI in 16 Arab countries from 1984 to 2012 and found that foreign investors tend to invest in countries with low exposure to risks. Similar results were reported in [Moniruzzaman \(2010\)](#), who stated that unfavorable business environments and a high level of political instability are responsible for the low FDI performance in Muslim countries. In addition, [Abdel Latif \(2019\)](#) found strong evidence that the Arab Spring and other political turmoil have led to a plunge in FDI flows in the MENA region. To protect the value of assets or capitals that has been invested and to minimize their

potential losses, rational investors avoid countries with high risks and prefer to conduct investment in countries with a stable political, economic, and financial environment. This rationalism is in line with the Islamic teachings related to risk management, whereby Islam encourages taking the steps in dealing with potential risk through necessary preparations, as explained in the Quran, Surah al-Hashr verse 18.

4.6 Hypothesis 6: The political system affects the inflow of inward foreign investments.

The government system plays no essential role in deriving foreign investments, as shown by the results of models 6 and 8 in Table 5. Muslim countries are blessed with different types of political systems, which provide foreign investors with a variety of choices when planning for investments. The results imply that foreign investors do not consider the type of government system as a crucial factor when deciding on an investment. The finding contradicts the results of [Uddin et al. \(2019\)](#) and [Asiedu and Lien \(2011\)](#), which stated that a non-democratic political system is more successful than a democratic government system in promoting the inflow of FDI. Furthermore, the labor force appears to affect the inflow of FDI negatively as shown in model 5, which contradicts with the findings in [Sarwedi \(2002\)](#), [Jaafar and Hossain \(2007\)](#), and [Kimino et al. \(2007\)](#) who stated that a larger labor force is associated with higher demand of economic outputs and better opportunities for investments.

5. Managerial Relevance

The findings highlighted the important impact of country risk and the institutional quality of the selected Muslim countries on the FDI. Policies that encourage the entry of foreign investment need to be maintained and improved, such as by reducing investment tax in specific sectors. Similarly, policies to increase institutional quality must be created and enforced. Law enforcement needs to be upheld, especially in aspects that can hinder the establishment of sound quality governance such as corruption, complicated bureaucracy, fraud, bribery, and others. Further, the results suggest that managers of multinational companies formulate several hedging strategies by conducting careful risk evaluation and assessment before making investment decisions. It is essential to preserve

and protect a suitable investment environment from the exposure of macroeconomic uncertainties.

Muslim countries under the Organization of Islamic Cooperation (OIC) are expected to cooperate among themselves to enhance development in terms of economy, education, defense, and others. Functional interactions between the Muslim countries will benefit the world's Muslim community. Although the inclination of Muslim countries to conduct trade with non-Muslim countries is not discouraged, the natural resources and human capital potentials in Muslim countries should be managed through cooperation between fellow Muslim countries. The government bodies, especially the Central Banks, Ministry of Trade, and Ministry of Finance should establish smart policies to reduce economic uncertainties, including maintaining stable inflation and exchange rate and providing support for Small and Medium Enterprises.

6. Conclusion

Foreign Direct Investment (FDI) helps countries by providing funds and technology for economic development. This study examines the impact of selected macroeconomic variables, country risk, and institutional quality on the inflow of foreign investment in selected Muslim countries. The results show the GDP as the variable with the highest impact. Among the factors for the low foreign investment in the selected Muslim countries is the low institutional quality due to instabilities in the political environment, problematic bureaucracy, rampant corruption, collusion, and nepotism. The increase in country risk is found to contribute negatively to the inflow of foreign investment, while the type of the political system carries no significant impact. The findings indicate that to improve FDI inflow, the quality of the existing government must be improved through revision of the laws, reduction of bureaucracy, and enforcement of the law and regulations that can improve government governance. A periodic assessment of country risk is needed to evaluate the risks and predict which risk determinants have the most impact. This study can be extended to investigate other factors that affect the flow of foreign investment, including technology and innovation, the level of public debt, interest rate, and culture.

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Fiscal Response to Foreign Aid in an Aid-Recipient Economy: Reassessment for Pakistan

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ABSTRACT

Pakistan is placed among the family of aid dependent developing countries and this characteristic of Pakistan's economy makes it a pertinent case for scrutinizing budgetary response to aid. The present study looks at the impact of disaggregated aid flows on key fiscal variables in Pakistan using a fiscal response model applied to time series data over the period 1972 to 2016. The findings of the study paint quite a dismal picture prevailing in the country. Aid loans and grants are largely earmarked for development and non-development public spending respectively, and they tend to displace tax revenue in the country which is a grave adverse fiscal consequence of aid for the country.

ملخص

تُصنف باكستان ضمن عائلة البلدان النامية التي تعتمد على المساعدات، وهذه السمة المميزة للاقتصاد الباكستاني تجعلها حالة وثيقة الصلة بتمحيص الاستجابة المتعلقة بالميزانية للمساعدات. والدراسة الحالية تبحث في تأثير تدفقات المعونة المصنفة على المتغيرات المالية الرئيسية في باكستان باستخدام نموذج الاستجابة المالية المطبق على بيانات السلاسل الزمنية خلال الفترة الممتدة ما بين 1972 إلى 2016. وترسم نتائج الدراسة صورة كئيبة سائدة في البلاد. فالقروض ومنح المعونة تُخصص إلى حد كبير للإنفاق العام التنموي وغير التنموي على التوالي، وهي تميل إلى إزاحة الإيرادات الضريبية في البلاد، وهو ما يعد نتيجة مالية خطيرة معاكسة للمساعدة من أجل البلاد.

ABSTRAITE

Le Pakistan fait partie de la famille des pays en développement dépendant de l'aide et cette caractéristique de l'économie pakistanaise en fait un cas pertinent

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pour l'examen de la réponse budgétaire à l'aide. La présente étude examine l'impact des flux d'aide désagrégés sur les principales variables budgétaires au Pakistan en utilisant un modèle de réponse budgétaire appliqué aux données de séries chronologiques sur la période 1972 à 2016. Les conclusions de l'étude dressent un tableau assez sombre de la situation dans le pays. Les prêts et les subventions de l'aide sont en grande partie destinés aux dépenses publiques de développement et de non-développement respectivement, et ils ont tendance à déplacer les recettes fiscales du pays, ce qui constitue une conséquence fiscale négative grave de l'aide pour le pays.

Keywords: Foreign aid, Fiscal response, Total impact, GMM, Pakistan

JEL classification: C30, F35, H30

1. Introduction

Foreign economic assistance has been a vital wellspring of development financing for the capital deficit underdeveloped economies since the conclusion of the World War II. Both the United States (US) and the United Soviet Socialist Republics (USSR), keeping in mind the end goal to keep up their political dominion, offered enormous monetary and technical aid to various poor nations. Apart from this political reasoning, the economic motivation for aid to developing countries has been well justified by the two gap and three gap models (see, for instance, Chenery and Bruno, 1962; Chenery and Strout, 1966; Bacha, 1990). However, the extent to which foreign aid programs have promoted economic development in these countries, at best remains controversial as reflected in the vast body of economic literature that exists under the banner of structuralism and dependency theories. One important factor impeding the full impact of foreign aid in developing countries is the phenomenon of fungibility³ of aid flows, which is also recognized by donors and supporters of foreign aid. In the face of serious domestic resource constraints these countries tend to shift the flow of foreign aid from productive to non-productive uses. This phenomenon has serious consequences in a situation of sudden stoppage of foreign aid. Hence, it raises the query as to how an aid recipient government will prioritize the allocation of resources among different spending heads. This inquiry was dealt with by Heller (1975) through his seminal piece of work which gave a well specified analytical tool to bring under investigation budgetary

³Fungibility occurs when aid earmarked for one use is diverted to alternative uses.

response to aid in the context of aid recipient economies. Heller's work opened the channels for further research in this area.

Due to widespread concern about the fungibility of foreign economic assistance in the donor community, a quantitative study of the aid-recipient country's fiscal response is an important exercise in and of itself. An empirical investigation of aid- fiscal behaviour nexus certainly enables the researchers to look at the aid- growth association from a different perspective. From the analysis of fiscal response models donors can attain significant knowledge with regard to the impact of their economic assistance on the fiscal actions of a recipient government, notably how do revenue and expenditure sides of government budget get affected from foreign aid inflows. Foreign aid is a critical component of fiscal management in general, since a significant chunk of aid spent in a country goes to or by a public authority, or accounts the arrangement of public goods that would otherwise create pressure on the national exchequer (Morrissey, 2015a). Aid is expected to trigger observable changes not only in government expenditure but also in tax collection, either by influence on tax effort or through causing variations in tax rates or the tax base as a result of introducing fiscal reforms as per aid conditionality (Morrissey, 2015b). Likewise, donor conditionality can require aid to be linked to a reduction in the amount of public borrowing from domestic sources.

Moreover, one of the big blemishes attached with the existing aid effectiveness literature is that it overlooks difference in the nature of aid funds. Aid is heterogeneous, and hence it can rightly be anticipated that each of its components has diverse macroeconomic ramifications for the economy of an aid-recipient. Therefore, the common tradition of using a single figure for aid in the relevant body of literature is plagued with the limitation that it bitterly fails to consider the element of aid heterogeneity. Consequently, no one can exclude the existence of aggregation bias in the outcomes documented by the aid effectiveness literature (Mavrotas and Ouattara, 2003).

From the economic history of Pakistan, it is evident that since its emergence as a sovereign state in the world in 1947, Pakistan has greatly been depending upon foreign economic assistance, even though it does not fall in the community of the poorest economies. The basic stated motive of the country behind lusting for aid is to supplement its domestic

resources, needed for economic growth and development. Due to increasing foreign debt burden, unnecessary tough conditionalities attached with aid flows besides economic and strategic interests of donors, especially, of the US, the Pakistan's economic assistance history does not portray a pleasant picture. This inauspicious reality has incited a hot debate concerning the repercussions of foreign aid for the macroeconomic performance of the country. It is an undeniable fact that foreign economic assistance to Pakistan has remained quite significant during the last seven decades, but the growth experience of the country is not remarkable which provokes the issue of aid effectiveness in Pakistan. As almost all the amount of foreign aid initially becomes a part of the national exchequer, understanding fiscal response to aid is a pre-requisite to identify broader effects of aid on the economy. Unfortunately, in case of Pakistan the aid-growth literature fails to explicitly recognize the fact that aid is given primarily to the government and hence any impact of aid on macroeconomic performance of the economy will be mediated by the government fiscal behaviour.

The present study aims at determining the fiscal response to aid in Pakistan by gauging its impact on spending and revenue sides of the budget. This analysis is chosen because of the ongoing hot debate between the aid-donor agencies and the policy-makers in Pakistan. It has policy implications not only for the government's foreign borrowing strategy but also for its fiscal policy. Like most developing countries, the role of the public sector in economic activities has been considerable in Pakistan. Moreover, increases in taxes have become growingly difficult for the public decision makers because of economic cost and political resistance of the masses. The significance of the present study is apparent from its distinctive nature vis-a-vis existing studies related to fiscal response and aid association in case of Pakistan as briefly discussed in subsequent section on literature review. This study will hopefully provide useful guidelines to the policy-makers and the donors at the same time.

Following this introduction, the rest of the study is structured as follows: section 2 consists of survey of literature mainly pertaining to Pakistan; section 3 describes in detail the fiscal response model to be used in the study; section 4 elaborates the data and estimation technique; section 5 presents detailed discussion on the results; and finally, section 6 gives the conclusion and policy recommendations.

2. Literature Review

Although there is a large body of literature on aid-growth association in case of developing world yet it is also true that there is no consensus on the contribution of aid flows in achieving economic development objectives in aid recipient economies. Since foreign aid is primarily delivered through the national exchequer of aid recipient governments, a debate about the implications of aid for fiscal policy formulation and implementation in developing economies has arisen in the literature on aid effectiveness. To this end, Heller (1975) developed an econometric model of the public sector of eleven African countries to examine the role of aid in shaping fiscal responses. In view of Heller the decision-makers, in the less developed countries, maximise a well-defined utility function consisting of public policy objectives subject to financing constraints. Heller's (1975) work led to the development of vast literature on the subject of fiscal response to aid, particularly in developing countries. For the last three decades the number of researches applying fiscal response models has been increasing (see, for instance, Khan and Hoshino, 1992; McGillivray and Ahmed, 1999; Swaroop, Jha, and Rajkumar, 2000; Mavrotas, 2002, 2005; Gupta et al., 2003; McGillivray and Ouattara, 2003; Mavrotas and Ouattara, 2003; Ouattara, 2006a, 2006b; Feeny, 2007; Erden and Guven, 2009; McGillivray, 2009; Feeny and McGillivray 2010; Clistz and Morrissey, 2011; Bakhtiari, Izadkhasti, and Tayebi, 2013; Dayanath and Ichihashi, 2013; Thamae and Kolobe, 2016; Bwire, Lloyd, and Morrissey, 2017, among others).

Despite the importance and relevance of the issue empirical research with regard to foreign assistance and fiscal response has been very limited in Pakistan. Furthermore, the existing relevant literature needs to be reviewed critically to highlight its shortcomings which limit its reliability and application. The first significant study by Khilji and Zampelli (1991) covering the period 1960 to 1986 analyzes Pakistan's expenditure allocations for defense, public non-defense, private investment, and private consumption with reference to the US military and non-military assistance to Pakistan. Their results indicate that both the US military aid and non-military aid are quite fungible. This study is beset with two serious caveats. Firstly, the assumption that both public and private goods are produced under the constant returns to scale technology does not hold in Pakistan. Secondly, the study restricts itself only to the US aid to Pakistan, whereas, Pakistan is a multilateral aid recipient. Hence, the

outcomes of the study fail to assist in chalking out broader fiscal policy in the presence of aid inflows to the country. Studies by Chishti and Hasan (1992) and Otim (1996) apply the Heller's model to Pakistan for investigating the relationship between foreign economic assistance and budgetary response but ignore to account for the limitations of the Heller's model which are well documented in the fiscal response literature (see, for instance, Binh and McGillivray, 1993; White, 1994; McGillivray and Morrissey, 2001). Considering this we have adopted a modified version of the fiscal response model keeping in view the deficiencies associated with the Heller's model.

Iqbal (1997) analyzes the effect of inflow of foreign aid on fiscal behavior in Pakistan over the period 1976 to 1995. The study evaluates government's fiscal response to aid with reference to social, development, non-development expenditures, and tax revenue. The results of the study show that foreign aid has a positive impact on non-development and social expenditures while its impact on development expenditure is although positive yet it is relatively small. The study also reveals that availability of foreign aid leads to a shift of public domestic resources from development projects to non-development projects. Furthermore, foreign aid enhances tax collection efforts by the government. However, the findings of the study are questionable for three reasons. Firstly, the study has a very small sample size, which is not desirable to conduct a time series analysis. Secondly, the study does not disaggregate aid variable in terms of either grants and loans or program aid and project aid. Finally, the study assumes that domestic borrowing is allocated only for development purposes, which does not coincide with the actual fiscal practice of the government of Pakistan.

To quantify the role of aid in shaping fiscal behaviour in Pakistan, Franco-Rodriguez et al. (1998) have estimated a fiscal response model that treats aid as an endogenous variable. The inquiry spans the years 1956 through 1995. A number of structural and reduced form equations have been derived and estimated. The study's outcomes divulge that the government spends only half of aid funds on consumption; aid has a positive relationship with the public sector investment; foreign aid discourages tax effort; and aid inflows cause domestic borrowing. However, there are a number of shortcomings in this research. Firstly, it does not provide any justification for utilizing the pre-1972 data since Pakistan was segregated into two sovereign states namely, Bangladesh and Pakistan in December

1971. Secondly, the assumption that foreign aid is an endogenous variable is factually incorrect as evident from the foreign economic assistance history of the country. Thirdly, they claim that data for target fiscal variables do not exist in Pakistan is invalid since all fiscal data are available in the annual budget statements published by Ministry of Finance, Islamabad. Finally, the regression technique adopted by the study to acquire values of target variables has been questioned by White (1994).

McGillivray (2000) probes the fiscal effects of foreign aid in Pakistan by employing annual time series data over the period 1956 to 1995. The study reports that 85 percent of grants; 68 percent of the tax revenue; 50 percent of loans; and 31 percent of domestic borrowing are earmarked for public investment respectively. Therefore, the study concludes that external aid is primarily used for public investment and it does not have any effect on taxation. The study's findings are skeptical because the pre and post 1971 data are not compatible as pointed out earlier. Furthermore, when 11 out of 16 estimated parameters are insignificant it indicates some inherent deficiency of the econometric methodology adopted by the study.

Ahmed (2002) analyzes the fiscal response to foreign aid over the period 1980 to 2000. The results of the study show that foreign aid (loans and grants) is a significant driver of the fiscal actions of the government of Pakistan. Foreign debt is mainly used for public sector development programs, and grants supplement the non-development expenditures of the government. Furthermore, foreign loans and grants have opposite impact on the tax revenue collection efforts in Pakistan; the former increases tax revenue collection efforts while the latter induces a decline in tax revenue collection. However, this study is beset with serious methodological flaws. Firstly, the sample size of the study consists of twenty-one observations which is fairly inadequate to obtain reliable results from a time series analysis. Secondly, the study's generated values of the target variable by means of a regression method are flawed as pointed out by White (1994). Furthermore, as mentioned earlier, all data on the required target variables are available in Pakistan's annual budget statements. Finally, the study works with single equation models while a meaningful analysis on the topic requires a simultaneous equation framework as developed by Heller (1975).

Butt and Javed (2013) study the effects of foreign aid on the fiscal behavior of the government over the period 1960 to 2010. They estimate three interdependent equations by employing the Autoregressive Distributed Lag (ARDL) model. The study shows that foreign aid tends to reduce the domestic tax revenue collection. However, on the expenditure side, both development and non-development expenditures are positively related to foreign aid. This study is also plagued with data and methodological issues. Firstly, the scope of the study is restricted since it considers only the grant component of external aid. Over a period of time, the grant component is almost negligible and debt burden of loans has increased enormously. Hence, the fiscal response to aid cannot be accurately estimated by excluding the debt component of aid from the analysis. Secondly, the study does not justify the model employed as it does not qualify to be in the class of standard Heller's fiscal response model or any of its modified versions. It is not clear why the study is trying to estimate a set of interdependent equation by means of the autoregressive distributive lag (ARDL) model which is a single equation technique.

Moreover, all the studies concerning the fiscal response to aid in Pakistan are based on an assumption that the government does not set any target for domestic borrowing. But this assumption is extremely erroneous as it does not have conformity with real fiscal actions of the government of Pakistan. Every year the government sets a particular target for its domestic borrowing in its annual budget. Therefore, due to their methodological and data issues the existing relevant studies fail to yield convincing outcomes and policy recommendations for the donors and the policy-makers in Pakistan to better utilize foreign aid. The present study is an attempt to quantify fiscal response to foreign aid analysis for Pakistan in an empirically sound way.

3. Analytical Framework

3.1. The Model

Although aid-growth nexus has attracted huge volume of researches wherein focus is on identifying the role of foreign aid in bringing variations in the productive capacity of the less developed economies yet fiscal response to aid aspect could not gain due attention in this literature. It is well known that the amount of aid first becomes a part of national

treasury in the developing countries. Due to fungibility problem, a fraction of aid goes to other spending heads for which aid is not originally intended. This situation tends to affect the fiscal management of a country, which is certain to influence the macroeconomic variables of the economy including economic growth. Thus, examining the fiscal response to aid is essential to judge the aid effectiveness (McGillivray and Morrissey, 2000). In this regard Heller (1975) comes up with a fiscal response model in an econometric form which has continued to serve as the basis for the rising stock of literature in the area of fiscal response to aid. Heller assumes that his fiscal response model reflects the action of a set of decision-makers in the less developed economies. The public decision-makers strive for utility maximisation given some budget constraints. His model identifies not only the nature of association among budget aggregates it also reveals the efforts of a government to achieve certain revenue and expenditure targets.

Subsequently, Gang and Khan (1991), Khan and Hoshino (1992), Otim (1996), and Gupta et al.(2003) preferred to apply this model in their research endeavours. However, over a period of time it has been discovered that this model is plagued with some severe defects. First of all the inclusion of linear terms in the utility function makes it impossible to achieve maximum utility despite attaining target values of choice variables (Binh and McGillivray,1993). Regression based method of generating values of target variable as presented by Heller is rejected on the ground that it is certain to create an issue of consistency between targets so computed and budget constraints (White, 1994). Additionally, in a developing state like Pakistan the government usually does not allocate domestically borrowed funds to its development programs only which is absolutely in contrast to the one of the core assumptions of the Heller's model. Finally, it is a standard practice in Pakistan and other such like countries that their governments set some annual targets for domestically borrowed capital but Heller has built his model negating this reality. The above-mentioned deficiencies in the Heller's model have significantly brought down its value and attraction as fundamental tool of examining role of foreign aid flows in shaping fiscal actions in aid recipients. Since 1990s the researchers have engaged in developing some modified fiscal response models to better investigate the budget response to aid (see, for instance, Binh and McGillivray,1993; White,1994; McGillivray, 2000; Mavrotas and Ouattara, 2003). Consequently, for a valid and meaningful fiscal response analysis it is required that some

better alternative of the Heller's model ought to be employed. The present study is a move in this direction.

The task of public decision-makers in Pakistan is to allocate revenues among expenditure categories subject to budgetary constraints. It is assumed that they reflect their preferences through the following utility function:

$$U = f(D, T, S, C, B; L, G) \quad (1)$$

where,

D = public sector development expenditure

T = tax revenue

S = socio-economic expenditure

C = current expenditure

B = domestic borrowing

L = foreign loans from all sources

G = foreign grants from all sources.

Following the standard approach in the fiscal response literature the utility function (1) can be represented as a quadratic loss function:

$$U = \beta_0 - \frac{\beta_1}{2}(D - D^*)^2 - \frac{\beta_2}{2}(T - T^*)^2 - \frac{\beta_3}{2}(S - S^*)^2 - \frac{\beta_4}{2}(C - C^*)^2 - \frac{\beta_5}{2}(B - B^*)^2 \quad (2)$$

where the asterisks show exogenous targets of endogenous variables and $\beta_i \geq 0$ for $i = 1, \dots, 5$. From utility function (2) it transpires that the government of Pakistan sets targets for revenue and expenditure categories every year and it makes efforts to achieve these targets. Any deviation from these targets leads to loss in utility. The public decision-makers face the following two budget constraints which are pivotal in utility maximization process:

$$D = (1 - \rho_{12})T + (1 - \rho_{22})L + (1 - \rho_{32})G + (1 - \rho_{42})B \quad (3)$$

$$S + C = \rho_{12}T + \rho_{22}L + \rho_{32}G + \rho_{42}B \quad (4)$$

where, $0 < \rho_i < 1$ for all i ($i = 12, 22, 32, 42$) and

- $1 - \rho_{12}$: share of tax earmarked for development spending;
- $1 - \rho_{22}$: proportion of aid loans allocated for development spending;
- $1 - \rho_{32}$: part of aid grants reserved for development spending;
- $1 - \rho_{42}$: share of domestically borrowed fund for financing development spending.

Contrary to all fiscal response studies related to Pakistan, we have dropped the assumption that public decision-makers set zero target for domestically borrowed money because it does not coincide with the real situation prevailing in the country. For maximizing (2) subject to (3) and (4) results in the following Lagrangian function:

$$L = \beta_0 - \frac{\beta_1}{2}(D - D^*)^2 - \frac{\beta_2}{2}(T - T^*)^2 - \frac{\beta_3}{2}(S - S^*)^2 - \frac{\beta_4}{2}(C - C^*)^2 - \frac{\beta_5}{2}(B - B^*)^2 + \lambda_1(D - \rho_{11}T - \rho_{21}L - \rho_{31}G - \rho_{41}B) + \lambda_2(S + R - \rho_{12}T - \rho_{22}L - \rho_{32}G - \rho_{42}B) \quad (5)$$

where λ_1 and λ_2 are Lagrange multipliers. The solution of the first order conditions obtained from the Lagrangian function (5) yields the following system of structural equations:

$$C = \phi_1(\rho_{12}T + \rho_{22}L + \rho_{32}G + \rho_{42}B) - \phi_1S^* + \phi_2C^* \quad (6)$$

$$S = (1 - \phi_1)(\rho_{12}T + \rho_{22}L + \rho_{32}G + \rho_{42}B) - \phi_2C^* + \phi_1S^* \quad (7)$$

$$D = \gamma_1(\rho_{41})^2 D^* + \gamma_2(\rho_{11}T + \rho_{21}L + \rho_{31}G + \rho_{41}B^*) - \gamma_3\rho_{41}\rho_{42}(S - S^*) \quad (8)$$

$$T = \phi_3T^* - \phi_5L - \phi_6G - \phi_4B + \phi_8\rho_{11}D^* + \phi_7\rho_{12}(S^* + C) \quad (9)$$

$$B = \delta_1B^* - \delta_3T - \delta_5L - \delta_6G + \delta_4\rho_{41}D^* + \delta_2\rho_{42}(C + S^*) \quad (10)$$

Equations (6) to (10) level the ground for gauging role of foreign aid in shaping budgetary actions in Pakistan. However, they can provide direct impact of given categories of revenue variables including foreign aid on three types of government spending. The following reduced form equations are derived from the set of structural equations (6) to (10) to have total impact (direct and indirect) analysis:

$$C = \Theta_1 T^* + \Theta_2 B^* + \Theta_3 S^* + \Theta_4 L + \Theta_5 G + \Theta_6 D^* + \Theta_7 C^* \quad (11)$$

$$B = \Theta_8 B^* + \Theta_9 T^* + \Theta_{10} S^* + \Theta_{11} L + \Theta_{12} G + \Theta_{13} D^* + \Theta_{14} C^* \quad (12)$$

$$T = \Theta_{15} T^* + \Theta_{16} B^* + \Theta_{17} S^* + \Theta_{18} L + \Theta_{19} G + \Theta_{20} D^* + \Theta_{21} C^* \quad (13)$$

$$S = \Theta_{22} S^* + \Theta_{23} C^* + \Theta_{24} T^* + \Theta_{25} B^* + \Theta_{26} L + \Theta_{27} G + \Theta_{28} D^* \quad (14)$$

$$D = \Theta_{29} D^* + \Theta_{30} T^* + \Theta_{31} B^* + \Theta_{32} S^* + \Theta_{33} L + \Theta_{34} G + \Theta_{35} C^* \quad (15)$$

3.2. Data and Econometric Methodology

The fiscal behaviour of the Pakistan's government in the face of aid inflows is examined using consistent time series data from 1972 to 2016. All the required data are sourced from Annual Budget Statements, Government of Pakistan, Annual Reports of the State Bank of Pakistan and Pakistan Economic Survey (various issues), Government of Pakistan. All the data are taken at constant prices of 2010 and the variables are transformed as percent of GDP. Degree of disaggregation is one of the distinctive attributes about the data of Pakistan's economy. The statistics in the budget document in Pakistan are disaggregated into four components; revenue receipts and expenditures and capital receipts and expenditures. Both the revenue and expenditures are further disaggregated as revenue expenditures on current account, revenue expenditures on development account, capital expenditures on current account and capital expenditures on development account. Revenue expenditures comprise of all those expenses which are not generating any assets, whereas, revenue receipts incorporate revenue from taxes as well as from other sources. Capital expenditures include creation of physical assets like buildings, roads, water systems, and electricity generation plants etc. A receipt that results in either reduction in government assets (sale of shares, disinvestment) or increase in some liability (government borrowings) is a capital receipt. Capital receipts include domestic borrowing, foreign loans, small savings and Government Provident Funds etc.

The objective of this study is to estimate two systems of simultaneous equations, one for direct impact analysis (equations from 6 to 10) and the other for total impact analysis (equations from 11 to 15) for the purpose of drawing inference about budgetary response to aid in Pakistan. Due to

simultaneity issue the endogeneity problem is likely to occur in our fiscal response model. Therefore, we prefer to employ the Generalized Method of Moments (GMM) technique, developed by Hansen (1982) for estimation purpose.

4. Results and Discussion

The estimated results of the structural equations (6) to (10) are reported in table 1. We begin our discussion of the results looking at the value of J test statistic and its associated probability value

Table 1. Estimates of Structural Parameters

Parameter	Estimate	t-Statistic
ρ_{12}	0.901***	20.840
ρ_{22}	0.172***	18.665
ρ_{32}	0.613***	3.099
ρ_{42}	0.806***	13.132
$\emptyset_1$	0.664***	32.541
$\emptyset_2$	0.330***	17.594
$\emptyset_3$	0.743***	46.202
$\emptyset_4$	0.001*	1.771
$\emptyset_5$	0.369***	15.175
$\emptyset_6$	1.245***	6.631
$\emptyset_7$	0.172***	5.183
$\emptyset_8$	1.368	0.911
γ_1	0.014***	17.148
γ_2	0.458***	5.445
γ_3	0.328*	1.748
δ_1	7.631***	3.440
δ_2	0.779***	3.946
δ_3	0.316**	2.098
δ_4	0.116	0.235
δ_5	2.817**	2.487
δ_6	0.532	0.284
J-Stats	0.259	Probability
		0.971

Note: ***, ** and * denote significant at 1%, 5% and 10% levels respectively.

given at the bottom of table 1. The value of the J test statistic is 0.259 having probability value 0.971 which confirms the validity of the instruments used in estimating the model consisting of equations (6) to (10) and this outcome also points to the correct specification of the model. This finding tends to increase our confidence in the estimation strategy of the study. The estimated coefficients of budget constraint equations ρ_{12} , ρ_{22} , ρ_{32} and ρ_{42} are within the theoretical range i.e. between 0 and 1 which implies that only the available amount of each revenue is allocated in three main categories of public expenditure in Pakistan. Moreover, all the structural parameters carry a positive sign as expected⁴. We see that the estimate of $\rho_{12} = 0.901$ [coefficient of T] which implies that tax revenue chiefly remains in current budget such that nearly 90 percent of tax money is used to finance the public spending under current and socio-economic heads while 10 percent of the taxes flows to public sector development programs. This finding implies that the availability of domestic borrowing and foreign aid persuades the public decision-makers in Pakistan to allocate more of tax money in financing the current budget. The tragedy with the country is that on one hand its overall tax to GDP ratio remained low i.e. it ranged between 9 to 14 percent approximately during the sample period of the study while on the other hand the economic management team of the country failed to make development oriented use of the tax revenue. Overall, our finding is consistent with the results of Heller (1975) for eleven African countries, Gang and Khan (1991) for India, Chishti and Hasan (1992), Otim (1996), Iqbal (1997) and Franco-Rodrigues et al. (1998) in case of Pakistan and Feeny and McGillivray (2010) in case of Papua New Guinea. However, McGillivray (2000) reports that only one third of total tax revenue is allocated to the public consumption spending in Pakistan which is surprising and it points to some inherent problem in data and model estimation as the government statistics refute this evidence.

The estimate of ρ_{22} [coefficient of L] is 0.172 which indicates that almost 17 percent of foreign loan goes to current and socio-economic expenditure

⁴To have consistency between a theoretical fiscal response model and its empirical results the coefficients of budget constraint equations ρ_{ij} must lie between 0 and 1 while all the structural parameters must be positive (McGillivray and Uttara, 2005; Feeny and McGillivray, 2010). Unfortunately, most of the existing studies related to the fiscal response overlooked this consistency condition.

in Pakistan. This finding clearly conveys that the aid loans have predominantly development-oriented use (i.e. just about 83 percent of aid loans is allocated to public sector investment) in the country as the donors are more concerned about the recovery of their loans so they try to make it sure to see flowing of the loans to development related projects which will generate returns in future. Similar evidence has been documented by some previous studies related to various developing countries including Pakistan (see, for example, Heller, 1975; Khan and Hoshino 1992; Otim, 1996; McGillivray, 2000; Ouattara, 2006a; Martins, 2007; Senbet and Senbeta, 2009; Feeny and McGillivray, 2010). Nonetheless, Feeny (2007) reports a contradictory finding for Melanesia⁵ where aid loans are mainly used in financing current public spending.

The estimate of ρ_{32} [coefficient of G] is 0.613 which suggests that nearly 61 percent of foreign grants is used in funding non-development spending. Only 39 percent of their share is going to the public sector development projects in the country. This outcome corroborates earlier findings by Heller (1975), Khan and Hoshino (1992), Otim (1996), McGillivray (2000), Ouattara (2006b), Martis (2007), Senbet and Senbeta (2009), and Feeny and McGillivray (2010).

Finally, value of the regression coefficient of domestic borrowing (ρ_{42} is 0.806) which indicates that major chunk [nearly 81 percent] of the domestically borrowed fund is consumed by current and socio-economic spending which leaves a small share of 19 percent for public sector investment in the presence of foreign aid. This result reflects the real tragedy with Pakistan that domestic public debt is mounting day by day without causing a noteworthy increase in the productive capacity of the economy. When domestically borrowed money is primarily earmarked for non-development category of expenditure, it cannot play its due role in improving economic growth performance through increasing volume of public sector investment. This finding is akin to that of Mavrotas and Ouattara (2003) and Mavrotas (2005).

As the aim of the study is to estimate fiscal response to aid in Pakistan, we skip the interpretation of the structural parameters (i.e. ϕ s, γ s and δ s) given in table 1. It does not mean that these parameters are of no use in

⁵Four sovereign states, namely, Fiji, Papua New Guinea, the Solomon Islands and Vanuatu are included in this region.

our study. Indeed, they play their role in determining incremental direct impact of aid and other revenue variables on different endogenous variables of the fiscal response model. For this incremental analysis, we have substituted the values of all the parameters given in table 1 into the system of structural equations (5) to (10) and the results are reported in table 2.

With regard to aid loans, it can be seen that their association with non-development spending in Pakistan is not reasonably large because on average every rupee of loans leads to increase current and socio-economic expenditure by 0.114 rupee and 0.058 rupee respectively. The whole direct impact of loans on non-development expenditure is estimated to be 0.172 which is associated with one rupee increase in aid loans. Foreign loans largely tend to enhance the volume of public sector development spending as due to one rupee of loans an increase of 0.379 rupee in development expenditure takes place in the country. This finding reflects correct strategy of the government economic management team to divert aid loans mainly towards development programs so that the desired aim of improving growth performance in the economy through foreign loans can be made possible. It also implies that even when the government sets some positive target for domestic borrowing, it continues to earmark foreign loans largely in its development projects.

Table 2. Incremental Impact Results

Impact	Mechanism	Estimate
<i>L on C</i>	$\phi_1 \rho_{22}$	0.114
<i>L on S</i>	$(1 - \phi_1) \rho_{22}$	0.058
<i>L on D</i>	$\gamma_2 (1 - \rho_{22})$	0.379
<i>L on T</i>	$-\phi_5$	0.369
<i>L on B</i>	$-\delta_5$	-2.817
<i>G on C</i>	$\phi_1 \rho_{32}$	0.407
<i>G on S</i>	$(1 - \phi_1) \rho_{32}$	0.206
<i>G on D</i>	$\gamma_2 (1 - \rho_{32})$	0.177
<i>G on T</i>	$-\phi_6$	-1.245
<i>G on B</i>	$-\delta_6$	-0.532
<i>T on C</i>	$\phi_1 \rho_{12}$	0.598
<i>T on S</i>	$(1 - \phi_1) \rho_{12}$	0.303
<i>T on D</i>	$\gamma_2 (1 - \rho_{12})$	0.045
<i>T on B</i>	$-\delta_3$	-0.316
<i>B on C</i>	$\phi_1 \rho_{42}$	0.535
<i>B on S</i>	$(1 - \phi_1) \rho_{42}$	0.271
<i>B on T</i>	$-\phi_4$	-0.001

For the direct impact of aid grants it is apparent that this component of foreign economic assistance principally funds the current and socio-economic expenditures. One rupee of grants is associated with 0.407 rupee and 0.206 rupee increase in current and socio-economic expenditures respectively. It implies that on average one rupee of grants is associated with 0.613 rupee increase in non-development spending. Nonetheless, each additional rupee in the form of aid grants leads to enhance development spending by 0.177 rupee. Hence, it is evident that grants affect both the development and non-development expenditures in Pakistan though their direct impact is larger in case of latter as compared to the former. This outcome suggests the unwise strategy of the decision-makers in Pakistan as they drastically failed to enhance the contribution of grants in development programs.

We see that both the components of foreign aid have an adverse impact on tax revenue collection in Pakistan. Their direct effect is quite noticeable and especially foreign grants have emerged as bringing

substantial reduction in tax collection efforts against foreign loans. This finding again proves that foreign aid is one of the hurdles in the way of increasing tax to GDP ratio in the country.

Finally, foreign aid has emerged as substitute for domestic borrowing as incremental impact of both the components of foreign aid is negative. Foreign loans influence the domestic borrowing more than the foreign grants. One additional rupee of foreign loans leads to a decline of 2.82 rupee in domestic borrowing, whereas, an additional one rupee of foreign grants leads to bring a fall in domestic borrowing by 0.53 rupee. This relationship between foreign aid and domestic borrowing is theoretically reasonable and understandable because as long as the government has the opportunity to get foreign loans, it is least interested to go for increasing domestic borrowing. In case of Pakistan, we see that domestic interest rate is higher than the interest rate on foreign loans, therefore, whenever government has the opportunity to get foreign loans it is not interested in domestic borrowing. Foreign loans result in increased inflow of foreign exchange which is always considered to be a blessing for developing countries like Pakistan.

The direct impact of taxes on non-development expenditure is quite noticeable as every additional rupee of tax revenue brings an increase of 0.598 rupee and 0.303 rupee in current and socio-economic heads of expenditure in the country. In other words, it can be stated that on average with one rupee increase in tax collection there will occur 0.901 rupee increase in current and socio-economic expenditures. On the other side the direct impact of taxes on public sector development spending is negligible i.e. one rupee of tax revenue is associated with 0.012 rupee increase in development spending of the government. This finding suggests that the availability of foreign capital in the form of aid persuades the decision-makers in Pakistan to make less productive use of taxes which is not a healthy signal for the future economic management of the economy. As far as the direct impact of taxes on the domestic borrowing is concerned, we see that both the variables have emerged as substitute to each other because the former is adversely related to the latter in the presence of aid inflows.

Next, we move to the case of domestic borrowing. The results are quite surprising that domestic borrowing has appreciable and greater incremental impact on the non-development activities in Pakistan. Hence,

the role of domestic borrowing in enhancing public sector development programs in the country is minimal. This clearly indicates that non-development needs of the government are mainly met through domestic borrowings which create a serious problem with regard to the use of domestic debt at the government level. This has led to the phenomenal rise in domestic debt as well as poor economic growth performance of the country. The direct incremental impact of domestic borrowing on tax revenue collection is negative which implies that the availability of domestic loans to meet its needs blunts government actions to bring an increase in tax to GDP ratio. In other words, we can say that the governments in Pakistan have deliberately kept the tax to GDP ratio low and they continue to increase domestic borrowing for meeting their spending requirements.

The outcomes contained in table 2 are obviously partial to the extent that they overlook indirect feedbacks, working through the simultaneous system of structural equations. Of more prominent policy pertinence are the total, direct and indirect, impacts of exogenously determined changes in foreign aid on three categories of public spending, taxation and domestic borrowing as shown by the reduced equation parameters. Table 3 exhibits the results.

Table 3. Total Impact of Foreign Aid

Impact	Parameter	Estimate
L on C	Θ_4	0.016
L on S	Θ_{26}	0.170
L on D	Θ_{33}	0.311
L on T	Θ_{18}	-0.273
L on B	Θ_{11}	-0.108
G on C	Θ_5	0.065
G on S	Θ_{27}	0.719
G on D	Θ_{34}	0.022
G on T	Θ_{19}	-1.786
G on B	Θ_{12}	-0.101

Note: Reduced form parameters are obtained from system of structural equations keeping all the insignificant parameters equal to zero.

First, we analyze the total effect of foreign loans on three types of public spending categories along with tax revenue and domestic borrowing. It transpires from table 3 that total effect of loans on current spending, socio-economic spending and development spending is positive but it is less than its direct impact in case of current spending and development spending. However, it tends to go up in case of socio-economic spending vis-à-vis its direct impact. Furthermore, the total impact of loans on public sector development expenditure still dominates its impact on non-development expenditure in Pakistan. This finding again underlines the development-oriented use of aid loans in the country. The signs of estimated reduced form aid loans parameters are negative in case of tax revenue and domestic borrowing which implies that total effect of loans is adverse for tax revenue and domestic borrowing. However, the extent of negative effect is less in case of tax revenue but more in case of domestic borrowing as compared to the direct impact analysis. The total impact of foreign grants is also similar to that of aid loans on three categories of public expenditure in Pakistan. This finding strengthens the direct impact case that grants mainly go to the non-development spending sides of the budget. Total negative impact of grants on tax revenue exceeds its direct effect on its counterpart. Finally, total impact of grants on domestic borrowing is negative but its extent is less than that of direct impact case.

5. Conclusion and Policy Recommendations

Pakistan is an exemplary case for a foreign aid dependent country because since its emergence as a sovereign state on the world map in 1947 the nation has been relying on foreign economic assistance for improving its developmental outlook. This study, using a modified version of the Heller's (1975) fiscal response model, shows that foreign aid is a significant driver of moulding the public spending, tax revenue collection and domestic borrowing in the country. By disaggregating foreign aid into aid loans and aid grants, the study has succeeded in identifying separate impact of both the components of aid on budgetary response in Pakistan. Aid loans are mainly earmarked for public sector development projects whereas foreign grants are largely channelled to non-development public spending. This outcome indicates that the decision-makers in Pakistan are quite cautious about the use of aid loans but they are making non-productive use of aid grants. With regard to tax revenue response to aid, it has been found that aid is a tax effort discouraging agent in Pakistan as

both the constituents of aid affect tax revenue collection unfavourably. This finding reflects the approach of the policy-makers in Pakistan; when aid is available, there is no need to bring the nation under more tax burden. Instead, in the presence of aid more and more tax concessions are provided and nobody at the public decision-making level contemplates future prospect of rise in foreign debt and fall in tax revenue in terms of tax to GDP ratio. Finally, foreign aid has led to a crowding out of the domestic borrowing in Pakistan. This result indicates that the government of Pakistan considers aid and domestic borrowing as substitutes, and economic wisdom supports this type of finding and thinking. Non-development expenditures in Pakistan are chiefly met from tax revenue and domestic borrowing, while tax revenue and domestic borrowing are substitutes.

The findings of the study lead to three key policy recommendations. Firstly, as Pakistan is unable to make full productive use of foreign economic assistance because a significant portion of it is used to meet non-development expenditures. The current pattern of aid use should be modified so that more foreign aid allocations are made in order to increase the size and level of public sector investment in the country. Secondly, the negative association between foreign aid inflows and tax revenue effort indicates that government can revise its current fiscal management strategy such that tax to GDP ratio can be raised and the government's dependence on foreign aid can be reduced. To this end, the best policy will be to concentrate heavily on proper documentation of the economy in order to expand the country's tax base. Finally, since foreign economic assistance has been shown to be fungible, donors should provide it in the least fungible type of public expenditure. Moreover, both donors and the government of Pakistan should put in place controls to restrict the extent of fungibility. Another option to donors may be to tie all aid to very specific projects or expenditure categories.

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Are Islamic Stock Markets Immune from Contagion during the Financial Crisis?

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ABSTRACT

We assess the contagion effect of the global financial crisis (GFC) and the European debt crisis (EDC) on Islamic and conventional stock market indices of the US, GCC and Malaysia. We run the asymmetric dynamic conditional correlation GARCH specification on daily closing prices of relevant indices from 1 January 2006 through 31 December 2016. Our results show that the Malaysia Islamic stock market is exempted from the contagion effect of GFC and EDC when the shock stems from the US Islamic stock market. Investors in the US Islamic equity markets can create a safety net by reallocating some of their portfolios into Malaysia Islamic stock market, which appears to be more resilient. However, we do find a significant contagion influence between the US Islamic and GCC Islamic stock market, suggesting that the GCC Islamic stock market cannot provide an effective hedge for the US investors seeking a Shariah-compliant investment. Contagion effect generally is inconsistent and not significant for conventional stock markets of these three countries.

ملخص

نقوم بتقييم تأثير العدوى للأزمة المالية العالمية (GFC) وأزمة الديون الأوروبية (EDC) على مؤشرات أسواق الأسهم الإسلامية والتقليدية في الولايات المتحدة ودول مجلس التعاون الخليجي وماليزيا. ونقوم

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54 Are Islamic Stock Markets Immune from Contagion during the Financial Crisis?

بتطبيق مواصفات الارتباط الشرطي الديناميكي غير المتماثل، التباين الذاتي الشرطي المعمم على أسعار الإغلاق اليومية للمؤشرات ذات الصلة من 1 يناير 2006 حتى 31 ديسمبر 2016. وتظهر نتائجنا أن سوق الأوراق المالية الإسلامية في ماليزيا مستثنى من تأثير عدوى الأزمة المالية العالمية وأزمة الديون الأوروبية عندما تأتي الصدمة من سوق الأوراق المالية الإسلامية في الولايات المتحدة. فالمستثمرين في أسواق الأسهم الإسلامية الأمريكية بإمكانهم إنشاء شبكة أمان عن طريق إعادة تخصيص بعض محافظهم الاستثمارية في سوق الأوراق المالية الإسلامية الماليزية التي تبدو أكثر مرونة. ومع ذلك، فإننا عثرنا على وجود تأثير للعدوى بين سوق الأوراق المالية الإسلامية الأمريكية ودول مجلس التعاون الخليجي، مما يشير إلى أن سوق الأوراق المالية الإسلامية في دول مجلس التعاون الخليجي لا يمكن أن توفر تحوطا فعالا للمستثمرين الأمريكيين الذين يسعون إلى استثمار متوافق مع الشريعة الإسلامية. تأثير العدوى بشكل عام غير متسق وغير مهم بالنسبة لأسواق الأوراق المالية التقليدية لهذه البلدان الثلاثة.

ABSTRAITE

Nous évaluons l'effet de contagion de la crise financière mondiale (GFC) et de la crise de la dette européenne (EDC) sur les indices boursiers islamiques et conventionnels des États-Unis, du CCG et de la Malaisie. Nous exécutons la spécification GARCH de corrélation conditionnelle dynamique asymétrique sur les prix de clôture quotidiens des indices pertinents du 1er janvier 2006 au 31 décembre 2016. Nos résultats montrent que le marché boursier islamique de Malaisie est exempté de l'effet de contagion du GFC et de l'EDC lorsque le choc provient du marché boursier islamique américain. Les investisseurs sur les marchés d'actions islamiques américains peuvent se créer un filet de sécurité en réaffectant une partie de leurs portefeuilles sur le marché des actions islamiques de Malaisie, qui semble plus résilient. Cependant, nous trouvons une influence de contagion significative entre le marché boursier islamique américain et celui du CCG, ce qui suggère que le marché boursier islamique du CCG ne peut pas fournir une couverture efficace aux investisseurs américains qui cherchent un investissement conforme à la charia. L'effet de *contagion* est généralement inconsistant et non significatif pour les marchés boursiers conventionnels de ces trois pays.

Keywords: Contagion; Financial crisis; Asymmetric dynamic conditional correlation (A-DCC); Islamic indices.

JEL Classification: G15, F65

1. Introduction

Financial liberalisation and globalisation have been the focus of policymakers in both developed and developing economies over the last three decades. The subsequent increased capital flows between countries has amplified the financial liberalisation and globalisation further (Ceballos et al., 2012). Given the historically assumed advantages of financial globalisation, for example, economic development of the nation and improved returns on financial investments, consolidated markets would often raise domestic market exposure to negative shocks from outside the countries (Caramazza et al., 2004). In a nutshell, amid economic instability, the domestic capital markets tend to co-move in tandem with their regional peers.

According to Forbes & Rigobon (2002), adverse shocks are transmissible via key economic links between countries, primarily via foreign trade and financial networks. This occurrence is known as market interdependence. A string of market meltdowns has uncovered a peculiar framework for cross-market transmitting adverse financial shocks since the 1990s. Unlike the conventional mechanism of transmitting economic shocks through plunged international trade, financial market's volatility has spread quickly from the crisis-originating country to other countries that share restricted economic relations (Billio and Caporin, 2010). Such crashes or crises are prevalent in the 1990s, for example, the 1994 Mexican currency crisis, the 1997 Southeast Asian currency crisis, the 1999 Russian Ruble crisis, and the latest one was the 2008 US subprime crisis. For starters, in 1997, when currency speculators attacked Hong Kong dollar, its equity market plummeted sharply. Countries like Brazil and South Africa too are not immune to financial crises. Forbes and Rigobon (2002) postulate that despite having different financial market sizes and structures, these countries' financial markets appeared to have co-moved and dropped significantly when Hong Kong's stock market plummets.

Since the negative shocks are transmissible to countries with little or no economic and trade relations, the increased cross-market co-movements are challenging to be justified by shared economic fundamentals argument (Billio and Caporin, 2010). In this scenario, fundamental economic linkages between countries will be insufficient in explaining the intensified market correlations. Instead the shift of the transmission

mechanism is believed to play pivotal role in the dramatic increase of cross-market co-movements in wake of the financial demise. In particular, such an occurrence has been referred to as the financial contagion effects of external shocks (Bekaert, Harvey, and Ng, 2005).

The topic of contagion vs financial interdependence has been a subject of academic debate in international finance. In general, past researches on this subject have focused on its two aspects of implications, namely the resilience of a country's financial system, and the risk-return benefits of diversified international portfolio investments. In order to improve the vulnerability of financial system against external shocks, it is crucial for the domestic policymakers to disentangle the mechanism through which adverse turbulences are transmitted to the domestic economy. With adequate knowledge on the transmission mechanism of shocks, effective preventive policies can be structured to improve the resilience of the domestic economy against external economic turbulences. In the scenario that adverse external shocks are spread to the domestic market through the fundamental economic linkages, the preventive policies should emphasise on the uplifting of the macroeconomic fundamentals (Moser, 2003).

With regards to the international portfolio investments, the primary concern of investors is to optimise the risk-return benefits of their diversified international portfolio investments. In finance, portfolio diversification can yield maximum benefit when assets can be diversified into financial markets with little or no cross-market correlations (Masih and Masih, 2001). Since the financial contagion effect will significantly increase the cross-market co-movements in the wake of the adverse economic shocks, the potential diversification benefits of the portfolio investments will be severely undermined, when they are needed the most (Pericoli and Sbracia, 2003). Thus, it is crucial for the international portfolio investors to consider financial contagion risk in structuring their optimal portfolio investments.

Given the enormous implications of the contagious financial crises, voluminous research has been conducted to explore the presence of the financial contagion among emerging as well as mature equity markets. Such trends have been dramatically picking-up after the incidence of the 1997 Asian financial crisis (Khalid and Kawai, 2003), and then pushed to new heights after the demise of the recent 2008 US Subprime Crisis

(Forbes, 2012). However, past researches have revealed mixed evidence on the presence of financial contagion, even if the crisis period and countries under investigation are the same. Some believed that the cross-market transmission of crisis is because of the fundamental links between countries; others upheld that it is the contagion effects of the crisis that induced those transmissions.

Another observation from the past financial contagion studies is the concentration of research on conventional stock markets. Over the last two decades, the Islamic finance industry has experienced dramatic growth across the global, partially contributed by the resilience of Islamic financial system (Pok, 2012) and the rapid accumulation of wealth in the major oil producing Muslim nations (Ho, Masood, Rehmand, and Bellalah, 2012). The size of the global Islamic finance industry has expanded more than 40 percent since 2012 to approximately \$2.4 trillion in 2017 (Hanieh, 2019). Among all the inventions of Islamic financial instruments, Shariah-compliant stock market indices is believed to be a significant design which enables both Islamic institutional and individual investors to profit from diversifying their investments into Shariah-compliant stocks (El Khamlichi, Sarkar, Arouri, and Teulon, 2014). It is believed that due to the Shariah-compliance characteristics, namely the advocacy of real economic activities rather than debt stimulated growth, and the prohibition of *maisir* (gambling), *riba* (usury), *gharar* (ambiguity), and financial derivatives (Smolo and Mirakhor, 2010), Islamic stocks have outperformed their conventional counterparts during the economic turmoil (Arif et al., 2021; Welling, 2020). And increasingly, Islamic stock markets have been populated as safe-havens for portfolio investors to diversify their investments.

Finally, though Islamic stock markets have often been perceived to be an effective avenue for diversifying portfolio investment risk, these benefits would be severely undermined when the markets are affected by financial contagion effects. Thus, a comparison of the contagiousness of financial market meltdowns like between Islamic and conventional stock markets in both developed and developing countries, such as the US, Malaysia and GCC is essentially needed, so that researchers can suggest and formulate better portfolio investment strategies for more effective domestic fiscal policies in these financial markets.

GFC is deemed as one of the most severe economic turmoil in the last two decades by many analysts. A case in point is about Fannie Mae and Freddie Mac, two US government special investment vehicle that was involved in the US secondary market for housing loan securities – they wrote about 40 percent of housing loans in the US. To rescue the US banking system, Fannie and Freddie, in 2008, the US government introduced the Troubled Asset Relief Program. The financial community believes the cross-countries propagation of the systematic risk during the GFC has resulted in the demise of the European debt market in the middle of 2009, and eventually the rising anxieties of contagion effects into international financial markets (Kenourgios, Naifar, and Dimitriou, 2016). The EDC problem started with the failure of the banking structure in Iceland, after which, it infected banks in Portugal, Italy, Ireland, Greece and Spain, Greece, Ireland, Italy as well as Portugal. The crisis has resulted in a massive loss of public confidence in European economies. Some European countries that were anxious about the possibility of financial contagion following the fall of the Euro had stepped in to write a financial guarantee to the International Monetary Fund (IMF). To stave off EDC, the European Central Bank announced that it would not hesitate to buy government as well as private bonds. Debts of a few Eurozone countries then were downgraded by rating agencies. EDC reached its peak between 2010 and 2012.

Our current study aims at assessing the financial contagion effect of both GFC and EDC on equity market indexes in the selected Muslim countries, as well as their Islamic indexes counterpart. We claim this is our main contribution – whilst many past kinds of research have explored the effect of contagion of the financial markets' meltdowns on regional markets, but almost no research has studied both conventional and Islamic stock market indices simultaneously. We believe our study is essential as many scholars have argued for the resiliency of the Islamic markets – that Islamic markets are immune to the crisis – if this conjecture is true, then Islamic stock markets should provide a compelling investment or hedge strategy to investors.

2. Review of Literature

In spite of the surge of research interests recently on the subject of financial contagion effects, researchers cannot agree on the definition of the issue. In general, there are three main types of financial contagion: a)

fundamental contagion, b) pure contagion, c) shift contagion. For the first category, financial contagion refers to the co-movements of asset market returns that result from fundamental economic linkages, namely common global factors, trade linkages, or financial linkages (Karolyi, 2003). Since these fundamental linkages are mostly stable across both the tranquil and crisis periods, past financial contagion studies have commonly perceived such scenarios as the market interdependency (Forbes & Rigobon, 2001; Karolyi, 2003), or the loose form of financial contagion based on the classification given by World Bank (World Bank, 2009).

Specifically, the latter two categories of the financial contagion are commonly known as the restrictive versions, in accordance with the classification of the World Bank. The shift contagion indicates that the strength in the propagation of shocks become stronger during the turmoil periods in comparisons with the tranquil periods (Forbes & Rigobon, 2001). According to their definition, the evidence of financial contagion can be examined through the magnitude of deviations in the cross-market correlations. In particular, when the correlation between the crisis-originating and another country increases significantly during the period of crisis relative to the period of tranquil, it signifies the presence of the financial contagion effects from the first to the second market.

Several empirical studies have applied the correlation coefficient-based approach to examine the evidence of the shift contagion. For instance, King & Wadhwani (1990) investigated the changes in the bivariate correlations of stock market returns in London, New York, and Tokyo before and after the US stock market meltdown in 1987. The analysis revealed the significant increase of correlations between the market, hence indicating the existence of contagion effect. In a latter study, Calvo and Reinhart (1996) explored the contagion effects of the 1994 Mexico currency crisis between Latin American and Asian stock markets. The authors concluded that since the correlations between the Asian and Latin American stock markets increased dramatically after the Mexican currency crisis, they confirmed the existence of the shift contagion. Forbes and Rigobon (2002) too documented shift contagion effect in the 1997 Asian financial crisis, 1994 Mexican currency crisis and 1987 the US stock market meltdown.

Though shift contagion is relatively easier to be tested empirically, researchers need to be cautious. Since the correlation between stock

markets are conditioned on the stock market volatilities, it will increase too when the stock market variance increases in the crisis period; such analysis provides biased results towards the acceptance of contagion hypothesis (Forbes and Rigobon, 2002). As an effective remedy, the authors propose adjusting this bias by correcting the increased volatility in the correlation analysis. However, the modified correlation coefficient approach will be appropriate when the assumptions of no exogenous global shocks or feedback of shocks from non-crisis to crisis-hit countries are upheld (Forbes & Rigobon, 2002). After applying this adjusted correlation approach, the authors have rejected the hypothesis of contagion effects for the three selected crisis periods.

Using the same approach, Collins and Biekpe (2003) rejected the contagion effects hypothesis originating from the 1997 Asian financial crisis to the African equity markets. In the same vein, Serwa and Bohl (2005) did not find contagion effects emanating from the 1997 Asian financial crisis to either Central or Eastern or Western European equity markets. Corsetti et al. (2005) argued since the common global factor was found to be one of the main drivers in spreading idiosyncratic shocks from the crisis to the non-crisis countries, the proposal to adjust the correlation in the absence of feedback shocks seems unrealistic. As a result, the adjusted correlation measure is believed to be biased towards rejecting the presence of significant financial contagion effects (Serwa & Bohl, 2005).

As for the last category, pure contagion can be considered as a crisis in one market to another. The market equilibrium was affected so much so that investors' expectations changed dramatically (Shen, Li, Wang, & Su, 2015). To this point, Masson (1999) argued that how the shocks being transmitted between countries can not be explained by fundamental factors. Thus, the initial condition to test for such contagion is to identify the fundamental linkages between countries. In general, past researches have controlled the effects of fundamental linkages through the regression of the model residuals. Since the market return models cannot explain the residuals, it represents the extent of cross-market correlations that failed to be captured by the fundamental linkages between the markets.

For instance, having controlled for the effects of fundamental linkages between countries, both the currency and equity market returns of the Southeast Asian countries had declined substantially, after the Asian crisis in 1997. Baig and Goldfajn (1998) argued since there was a

substantial rise in the co-movement between markets following the crisis, this surge in co-movements indicates the presence of the financial contagion effects in these asset markets. In another study, Kaminsky and Reinhart (2000) examined the evidence of the contagion effects in Asia, Europe, and Latin America, during the period between 1970 and 1998. After controlling for the fundamental impacts of trade and finance, the study concluded that a crisis elsewhere is most likely to be propagated into the stock markets of the sampled countries. In other words, the study confirmed the presence of the contagion effects in these markets, in the aftermath of the 1994 Mexican, 1997 Asian, and 1998 Russian crises.

Despite its popularity in the past empirical contagion studies, the pure contagion studies have encountered some difficulties in identifying the set of macroeconomic variables that are causing contagion – in other words, it is almost impossible to control for the confounding effect (Baele & Inghelbrecht, 2010). To overcome such constraints, past empirical research studies have proposed two approaches. First is to use the latent factor models to represent the asset market returns, which avoids the explicit specification of the fundamental variables (Karolyi, 2003). More specifically, a latent world factor can be installed in the asset market return model to represent the fundamental variables that determine asset returns (Dungey et al., 2005). Besides such constraints, pure contagion is still believed to account for a broader view of the contagion, and the application of this definition in the financial contagion analysis model is expected to provide information on the source of contagion (Rigobon, 2002).

In this study, we use Masson's (1999) description of financial contagion. Financial contagion occurs when shocks are transmitted beyond fundamental economic linkages between the markets. This definition assumes that the extreme cross-market co-movements have resulted in the structural break. These dynamics are beyond risk-return relationship explanation. Shen et al. (2015) indicated that such contagion is often caused by financial panic, irrationality behaviour, and incomplete information or risk aversion, and the financial mechanism to explain these phenomena could be the informational-friction mechanism of Calvo and Mendoza (2000) and the herding mechanism of Khan and Park (2009).

3. Data & Methodology

3.1. Data description

Having said the primary objective of this study is to provide the comparative evidence on the resilience of conventional and Islamic stock markets to the contagion effect of the GFC and EDC, we performed data search from Bloomberg database on both conventional and Islamic stock market indices in 57 member countries in the Organization of Islamic Cooperation (OIC) for the period spanning from 1st January 2006 to 31st December 2016. Due to the constrain of the available data on conventional and Islamic stock market indices for the sampled period in the targeted countries, we have only managed to retrieve ten years of daily closing price data in US Dollars for Dow Jones GCC Index (for GCC countries) and FBM Exchange Main Board All-Share Index (for Malaysia). In addition, since the U.S. financial market is commonly perceived as the origin of the GFC and EDC, we have also collected data from Dow Jones Industry Average Index and Dow Jones Islamic Market U.S. Index for the U.S. conventional and Islamic stock market, respectively. For ease and clarity, the conventional as well as Islamic indices for the US, GCC and Malaysia, are written in the tables as DJ, DJ-i, GCC, GCC-i and Msia, Msia-i, respectively (-i denotes Islamic index).

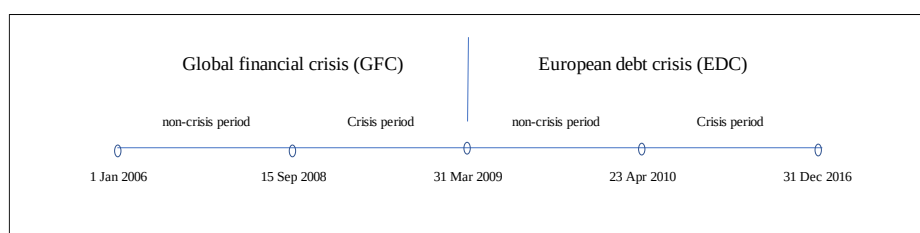
The application of the daily data in our study is to enable us to have a sufficient number of observations to avoid the potential data inefficiency issue in our Asymmetric DCC analysis (Kenourgios et al., 2016). For each index, the price series p_t has been transformed into a continuous return by taking natural log returns or $r_t = \log p_t - \log p_{t-1}$.

The selection of the data range has also taken into consideration the stable and turmoil period for both GFC and EDC. The examination of the financial contagion requires identification of the changes in the pair-wise dynamic correlations between crisis and non-crisis periods. Past empirical researches on financial contagion effects have primarily relied on two approaches to determine the crisis period and its duration, namely, the economic approach and the statistical approach. The former is also commonly referred to as the ad-hoc approach, which determines the crisis windows based on the fundamental news or critical economic events, for instance in studies by Forbes & Rigobon (2002), Bau (2012), Dimitriou et al. (2013), On the contrary, the statistical approach relies on the

econometric models to estimate the crisis windows. This approach has been adopted by Dungey and Gajurel (2014), Dungey, Milunovich, Thorp, and Yang (2015).

Since both approaches are believed to possess some degree of arbitrariness (Baur, 2012), in this study, we define the crisis and non-crisis period of GFC and EDC by using the economic approach. We define the crisis periods for GFC and EDC as from 16 Sep 2008 through to 31 Mar 2009 and 23 Apr to 31 Dec 2016. Whereas, we describe non-crisis periods for GFC and EDC as from 1 Jan 2006 to 15 Sep 2008 and 1 Apr 2009 to 22 Apr 2010, respectively. Please refer to Figure 1 below.

Figure 1. Classification of crisis and non-crisis period for GFC and EDC



Note: This figure shows the classification of crisis and non-crisis period for the global financial crisis (GFC) and the European debt crisis (EDC) defined in this study.

3.2 Methodology

We employ multivariate GARCH models to explore the transmission mechanism as well as correlation and volatility dynamics among financial markets. We first apply the vector GARCH (VECH) model of Bollerslev, Engle, Wooldridge, Engle, and Wooldridge (1988). This model has two significant drawbacks: first, the guarantee on the positive-definite of the conditional covariances; and second, the problem of dimensionality resulting from a considerable number of variables in the specification (Jerez, Casals, and Sotoca, 2009).

To address the drawback of the multivariate GARCH model, the BEKK⁴ model has been suggested. Bollerslev (1990), in contrast, proposed the Constant Conditional Correlation (CCC) specification to simplify the

⁴ BEKK is the acronym for the multivariate ARCH models developed by Yoshi Baba, Rob Engle, Dennis Kraft, and Ken Kroner (Engle and Kroner, 1995).

estimation and inference procedures. However, the constant correlations assumption is a bit too idealistic for time-series data, especially in times of stress when correlations can rapidly change (Frank and Hesse, 2009).

Extending from the CCC model, Engle (2002) proposed the Dynamic Conditional Correlation (DCC) model to incorporate the time-varying correlations. Then Cappiello, Engle, and Sheppard (2006) went further to modify the DCC model to include the asymmetric specification to capture the heterogeneity of the disturbances on the dynamics of the conditional correlation. Engle (2002) then advanced the CCC model by incorporating time-varying characteristic specification – he termed as Dynamic CCC model. Cappiello, Engle and Sheppard (2006) afterwards went a step further to improvise the model to capture the heterogeneity of the disturbances by incorporating the asymmetric specification. This model is as ADCC (Asymmetric DCC) model.

3.2.1. Model specification

We examine financial contagion effects by assessing the dynamic structural break in the correlation between stock markets' (cross-markets) returns, and it is essential to construct a proper model to represent the asset market returns for the sampled countries. Following Kenourgios et al. (2016), our model specification is as follows:

$$r_t = \beta_0 + \beta_1 r_{t-1} + \varepsilon_t \quad (1)$$

$$\varepsilon_t | I_{t-1} \sim N(0, H_t), \quad (2)$$

where $r_t = [r_{1t}, r_{2t}]$ is a 2 multiply 1 vector of daily returns of the stock markets, and $\varepsilon_t = [\varepsilon_{1t}, \varepsilon_{2t}]$ is a 2 multiply 1 vector of innovations. We assume the error term to be normally-distributed at time t-1 (I_{t-1}). The ε_{t-1} in the equation is an AR (1) term, and the inclusion of which follows the conventional approach of the DCC model.

Next, we decompose the variance-covariance (conditional) of matrix H_t as listed below:

$$H_t = D_t P_t D_t \quad (3)$$

where P_t is a correlation matrix, conditional and time-varying. From the univariate GARCH models, D_t is a k multiply k matrix (diagonal) of

variance conditioned with $\sqrt{h_{it}}$ on the i th diagonal. We then specify D_t as follows:

$$h_{it} = \omega + a_1 h_{i,t-1} + \beta_1 \varepsilon_{i,t-1}^2 \quad (4)$$

where $z_{it} = r_{it}/\sqrt{h_{i,t}}$ is the standardized residential $[0,1]$, and h_{it} is the conditional variance. The coefficients then need to fulfil two constraints: $a_1 > 1$ and $a_1 + \beta_1 < 1$, to ensure that h_{it} is stable.

Having obtained the conditional variances, the DCC model can be evolved into the following:

$$Q_t = (1 - a - b)\bar{P} + a\varepsilon_{t-1}\varepsilon'_{t-1} + bQ_{t-1} \quad (5)$$

$$P_t = Q_t^{*-1}Q_tQ_t^{*-1} \quad (6)$$

where $\bar{P} = E[\varepsilon_t, \varepsilon'_t]$, and a and b are scalars that must fulfil the condition of $a + b < 1$. Besides, Q_t^* is a matrix (diagonal) that contains the square root of the i^{th} diagonal component of Q_t , which can be represented as $\sqrt{q_{ii,t}}$. If Q_t is positive, Q_t^* will be a matrix that satisfies $P_t = Q_t^{*-1}Q_tQ_t^{*-1}$.

To address the issue of an asymmetric factor in the model, Cappiello et al. (2006) modified the specification in the DCC model as below:

$$Q_t = (\bar{P} - A'\bar{P}A - B'\bar{P}B - G'\bar{N}G) + A'\varepsilon_{t-1}\varepsilon'_{t-1}A + G'n_{t-1}n'_{t-1}G + B'Q_{t-1}B \quad (7)$$

where G , B and A are k multiply k parameter matrices, $n_t = I[\varepsilon_t < 0] \circ \varepsilon_t$ ($I[\cdot]$ is a k multiply 1 function (indicator) that takes on the value of 1 if the arguments are correct and 0 if false, and “ $\circ$ ” is the Hadamard matrix) and $\bar{N} = E[n_t n'_{t-1}]$. Equation (7) above shows the specification for Asymmetric Generalised DCC Model (AG-DCC).

To test for changes in the dynamic correlation in the DCC model across crisis and turbulent periods, following Kenourgios et al. (2016), we incorporate dummy variables (DM_{GFC} and DM_{EDC}) to enable us to determine which of the two crises (GFC and EDC) induces significant financial contagion effects. In particular, we create two dummies and specify the mean equation as follows:

$$\rho_{ij,t} = c_0 + k_1 DM_{GFC} + k_2 DM_{EDC} + \eta_{ij,t} \quad (8)$$

where $\rho_{ij,t}$ describes the pair-wise dynamic conditional correlation (DCC), whereas DM is a dummy (predictor) variable for the crisis under study. In particular, DM_{GFC} denotes GFC (16 Sep 2008 to 31 Mar 2009), while DM_{EDC} denotes the EDC (23 Apr 2010 to 31 Dec 2016), respectively.

The crisis dummy will tell if structural changes do exist in the correlation coefficient. We describe the null and alternative hypotheses as follows:

$H_0: k_\mu \leq 0$ (No Financial Contagion Effects exist)

$H_1: k_\mu > 0$ (Financial Contagion Effects exist)

In the hypothesis, $\mu = 1, 2$ denote the GFC and EDC, correspondingly. We employ t-test statistic to test whether the dummy coefficients in Equation 8 are significant. A significantly positive dummy coefficient suggests that the correlation coefficient derived from the turmoil period is different significantly as compared to that of the stable period, hence providing evidence of the existence of the financial contagion effects.

4. Results and Discussion

4.1. Descriptive statistics

We provide descriptive statistics in Table 1. The average stock market index returns are positive and quite similar for all the markets under study, with the exception of the GCC indices. Both GCC Islamic and conventional stock market indices depict negative average returns. The standard deviations of market return which measure market volatility, show that the US Islamic stock market index return is the most explosive, succeeded by the US conventional stock market index.

Table 1. Descriptive statistics of conventional and Islamic indices of US, GCC and Malaysia

	US		GCC		Malaysia	
	DJ	DJ-i	GCC	GCC-i	Msia	Msia-i
No of days	2768	2768	3620	3620	2716	2716
Std dev	0.0117	0.0122	0.0098	0.0114	0.0105	0.0104
Variance	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
Skewness	-1.3519	-1.2714	-1.2024	-1.1657	-1.339	-1.2586
Kurtosis	11.2806	11.8017	11.0089	11.6277	11.0841	11.5878
Minimum	-0.082	-0.097	-0.0786	-0.0913	-0.1233	-0.1095
Maximum	0.1051	0.1174	0.0657	0.0816	0.053	0.0565
Mean	0.0002	0.0002	-0.0002	-0.0002	0.0002	0.0002
ADF Stat.	-30.638***	-36.679***	-34.893***	-38.143***	-33.930***	-30.140***
JB Stat.	25.403***	24.760***	32.210***	21.214***	12.538***	42.218***
BG LM Stat (5)	10.8622***	10.2671***	27.6369***	23.0308***	7.3432***	1.2430***
ARCH (4)	98.3923***	114.4596**	303.2303***	138.6006***	188.4808***	47.496***

Note: This table shows descriptive statistics of conventional and Islamic indices of the US, GCC and Malaysia data used in this study. “-i” denotes Islamic index. “***”, “**”, and “*” denote statistical significance at the 1% level, 5% level, and 10% level, respectively. “JB” stands for Jarque-Bera Normality Test. “BG LM” denotes the Breusch–Godfrey’s LM test. Four lags have been applied in the ARCH-LM test. The automated lag selection has been employed in the ADF test, and the optimal lag length is determined through AIC.

Notably, the returns series for all the sampled countries unveil negative skewness as well as excessive kurtosis. The excess kurtosis is measured as the value in excess of the normal distribution’s reference value of 3. The presence of high excess kurtosis implies the data resembles the pattern of high peaks and fat tails, as well as asymmetry towards the negative values in the distributions of the series of market returns. Further, we apply the Jarque-Bera test to examine the normality of the sampled returns series and find the sampled market returns generally are not normally distributed.

We then apply the Augmented Dickey-Fuller (ADF) test to assess the stationarity of the return series of our data sample. After that, we select the Akaike Information Criterion (AIC) to determine the optimal lag length. The ADF test results rejected the unit root hypothesis at the 1% significance in all of our data sample. Subsequently, we run the Breusch-

Godfrey's Lagrange Multiplier (BG LM) test on the autocorrelation of the sampled data. The results from the autocorrelation tests up to five (5) lags which indicate the presence of significant autocorrelation for all levels of significance. Finally, the ARCH Lagrange Multiplier (LM) statistic tests show the existence of significant ARCH effects up to four (4) lags for the return series of all the sampled countries. Based on the characteristics of the dataset, we believe the Asymmetric GARCH is the most suitable model to capture the asymmetry.

4.2 Asymmetric DCC GARCH

In order to test for the financial contagion effects of GFC and EDC among the sampled stock markets through the Asymmetric DCC GARCH model, we apply a three-step approach in our analysis. First, we estimate a univariate GARCH (1,1) for each market time series. In particular, the GARCH (1,1) transformed mean and variance equations for each time series are listed as follows:

Malaysia conventional stock market index (Msia):

$$r_{Msia,t} = 0.0002 - 0.4342r_{Msia,t-1} + 0.0462r_{Msia,t-2} + 0.2305u_{Msia,t-1} + u_{Msia,t} \quad (9)$$

$$\sigma_{Msia,t}^2 = 0.0528 + 0.2146u_{Msia,t-1}^2 + 0.7839\sigma_{Msia,t-1}^2 \quad (10)$$

Malaysia Islamic stock market index (Msia-i):

$$r_{Msia-i,t} = -0.6152 - 0.7r_{Msia-i,t-1} + 0.6796r_{Msia-i,t-2} + 0.6482u_{Msia-i,t-1} + u_{Msia-i,t} \quad (11)$$

$$\sigma_{Msia-i,t}^2 = 5.29 \times 10^{-6} + 0.1162u_{Msia-i,t-1}^2 + 0.8724\sigma_{Msia-i,t-1}^2 \quad (12)$$

GCC conventional stock market index (GCC):

$$r_{GCC,t} = 0.0005 - 0.1376r_{GCC,t-1} + 0.0795r_{GCC,t-2} + 0.2462u_{GCC,t-1} + u_{GCC,t} \quad (13)$$

$$\sigma_{GCC,t}^2 = 0.0136 + 0.4295u_{GCC,t-1}^2 + 0.2394\sigma_{GCC,t-1}^2 \quad (14)$$

GCC Islamic stock market index (GCC-i):

$$r_{GCC-i,t} = 0.0005 + 0.7239r_{GCC-i,t-1} - 0.7633u_{GCC-i,t-1} + u_{GCC-i,t} \quad (15)$$

$$\sigma_{GCC-i,t}^2 = 1.7 \times 10^{-6} + 0.1050u_{GCC-i,t-1}^2 + 0.8882\sigma_{GCC-i,t-1}^2 \quad (16)$$

The US Conventional Stock Market index (DJ):

$$r_{DJ,t} = 0.0003 - 0.9385r_{DJ,t-1} + 0.0213r_{DJ,t-2} + 0.3467u_{DJ,t-1} + u_{DJ,t} \quad (17)$$

$$\sigma_{DJ,t}^2 = 0.0436 + 0.8356u_{DJ,t-1}^2 + 0.2946\sigma_{DJ,t-1}^2 \quad (18)$$

The US Islamic stock market index (DJ-i):

$$r_{DJ-i,t} = 0.0007 - 0.7734r_{DJ-i,t-1} + 0.0213r_{DJ-i,t-2} + 0.3240u_{DJ-i,t-1} + u_{DJ-i,t} \quad (19)$$

$$\sigma_{DJ-i,t}^2 = 3.5 \times 10^{-6} + 0.096u_{DJ-i,t-1}^2 + 0.0896\sigma_{DJ-i,t-1}^2 \quad (20)$$

Further, we estimate the A-DCC based on the bivariate A-DCC GARCH model (Equation 7). In Table 2 below, we show the estimated coefficients from the A-DCC model.

Table 2. Estimates of bivariate asymmetric DCC GARCH model

Parameter	Conventional Stock Markets indices			Islamic stock market indices		
	DJ -Msia	DJ - GCC	Msia - GCC	DJ-i - GCC-i	DJ-i - Msia-i	Msia-i - GCC-i
a _i	0.0137*	0.0052**	0.0052**	0.0048**	0.0052**	0.0001
b _i	0.2231**	0.8202	0.8682**	0.2222**	0.8682**	0.0001
g _i	0.0262***	0.0067*	0.0076**	0.0002**	0.0076**	0.0001

Note: This table shows bivariate estimates derived from the asymmetric DCC GARCH model (Equation 7), when the matrices A, B and G are replaced by the scalars a, b, g. "***", "**", and "*" denotes statistical significance at the 1%, 5%, and 10%, respectively.

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The estimated coefficients a_i and b_i are significantly positive and dissimilar from zero, except for the $b_{DJJ-DJGCC}$. Furthermore, the estimated asymmetric coefficient g_i is a positive sign, suggesting that the asymmetric movements are significantly present. The A-DCC estimates generally imply that the bivariate correlations between the stock markets under study are markedly higher during the crisis than that of during the good times. Overall, these estimates indicate that, in general, the data set fits the A-DCC GARCH model. Therefore, the derived A-DCC series in our study can be used to reflect the evolution of correlations over time.

Finally, we model the bivariate A-DCC correlations with intercept breaks to test the proposition that the GFC and EDC produce a substantial effect on the bivariate A-DCC correlations, so as to provide evidence for financial contagion effect. We tabulate the estimates on the significance of the crisis dummy variables for GFC and EDC based on Equation 8 in the following Table 3.

Table 3. Results (estimates) of the contagion effect.

Parameter	Conventional Stock Markets indices			Islamic stock market indices		
	DJ -Msia	DJ - GCC	Msia - GCC	DJ-i - GCC-i	DJ-i - Msia-i	Msia-i - GCC-i
K_1	-0.0002	-0.0083*	0.0022**	0.0029**	-0.0063***	-0.0031***
	-0.0023	-0.0028	-0.0028	-0.0014	-0.0013	-0.0011
K_2	-0.0002	-0.0002	0.0018	-0.0006	-0.0051***	0.0032***
	-0.0017	-0.0017	-0.0018	-0.001	-0.0009	-0.0008
C_0	-0.0842***	0.0218***	-0.0088***	-0.0211***	0.0196***	0.0328***
	-0.0002	-0.0002	-0.0002	-0.0003	-0.0003	-0.0003

Note: This table shows the results (estimates) of the contagion effect. The estimates are derived from Equation 8; K_1 and K_2 represent the impact of GFC and EDC on the dynamics of the bivariate A-DCC correlations, and C_0 denotes the significance of the constant term in the equation. The statistical significance tests used in this study are based on t-statistics. Figures in parentheses are standard errors. "***", "**", and "*" denotes statistical significance at the 1%, 5%, and 10%, respectively.

At first sight, the GFC dummy coefficient k_1 show significantly negative values (dissimilar to those of the pre-crisis period) for all Islamic stock indices pairs under study. Meanwhile, for the conventional stock markets GFC dummy coefficient k_1 is negative and significantly different only for

US stock market (DJ) with the GCC stock market (GCC) (-0.0083), but positive and significant for Malaysia stock market (Msia) with GCC stock markets (GCC) (0.0022). This result indicates that the Islamic markets generally offer a relatively more effective shield for investors during the GFC. In other words, the GFC, resulting from the US Subprime Crisis and the global economic downturn, could have induced investors to diversify their investments into Islamic stock markets.

These investments seem to have provided Islamic market investors higher returns as compared to that of conventional markets during the financial crisis. This phenomenon can be explained by the *Shariah*-compliance filtering, where the firms with high toxic assets and high debt-leverage ratios are excluded from the Islamic indices (A. Hassan, Antoniou, & Paudyal, 2005; Saiti, Bacha, & Masih, 2014).

The only significant contagious effect during the GFC (when k_1 is significantly positive) could be seen from the US Islamic stock market (DJ-i) to the GCC Islamic stock market (GCC-i), which yields a positive and significant coefficient (0.0029), and for the conventional stock markets; is from Malaysia (Msia) to GCC (0.0022). These findings indicate that investors have options to allocate their portfolios during the GFC; for those investors who are exposed to the GCC Islamic stocks, they could allocate their portfolio into Malaysia Islamic stocks to obtain better returns. As for those investors who were exposed to the US conventional stocks, they could diversify their portfolio to include investment in GCC conventional stocks.

Looking at the estimates for dummy coefficients during the EDC, k_2 is the only significantly negative coefficient for one equity pair, that is, the US Islamic stock market (DJ-i) and the Malaysia Islamic stock market (Msia-i) (-0.0051). This finding indicates that Malaysia Islamic stock market (Msia-i) is somewhat immune to the adverse impact of crisis during EDC. Interestingly, there is a significant and positive contagion effect between the Malaysia Islamic (Msia-i) and the GCC Islamic stock markets (GCC-i) (0.0032). However, for the conventional stock markets, the contagion effect is not significant for all pairs of stock markets. These findings indicate that Islamic stock markets do exhibit some advantages over their conventional counterparts in mitigating the financial contagion risk during a crisis. For the US Islamic investors, it appears that allocating their portfolio into Malaysia Islamic stock market (Msia-i) could provide

them with the much-needed hedge and safety nets as well as returns enhancement.

5 Conclusion

In this study, we assess the effect of financial contagion of the GFC and EDC on selected stock markets (Islamic and conventional) in the US, GCC and Malaysia. We run A-DCC GARCH on daily closing prices data of relevant stock (equity) market indexes, that covers the period from 1 Jan 2006 through to 31 Dec 2016. We define financial contagion as the transmission of shocks beyond the fundamental economic linkages between the markets (Masson, 1998). According to this definition, the phenomenon of contagion can be detected from the structural break inherent in the time-varying correlation dynamics resulting from the explosive cross-market co-movements beyond the inter-temporal risk-return relation. To examine the evidence of this phenomenon, in this study, we utilise Cappiello, Engle, and Sheppard's (2006) Asymmetric Dynamic Conditional Coefficient (A-DCC) GARCH specification.

Generally, we find a significant asymmetry for all the stock markets returns under study. Our results suggest that the bivariate correlations among the sampled return series are significantly higher during the downturns than during the upturns. Thus, the bivariate asymmetric DCC series are fit to be used for examining the pair-wise correlation changes among the sampled stock market indices. We then investigate the evidence of significant financial contagion effects by modelling the bivariate A-DCC correlations with intercept break and crisis dummies. Our estimates on the significance of the crisis dummies have three crucial findings. First, the Malaysia Islamic stock market generally is exempted from the financial contagion risk that stems from the US Islamic stock market in both GFC and EDC. During the GFC, however, it seems there exists a significant contagion effect between US Islamic and GCC Islamic stock market, suggesting the GCC Islamic stock market does not provide an effective hedge for investors. Secondly, considerable contagion effects are found between Malaysia conventional and GCC conventional stock market during GFC as well as between Malaysia Islamic and GCC Islamic stock market during EDC – a signal that intra-regional portfolio investments and rebalancing between Malaysia and GCC may not be an effective strategy, and in fact, it should be avoided. This result perhaps can be explained by the fact that Malaysia is one of the prominent leaders

in the world's Islamic capital market. Third, the results of contagion effect of GFC and EDC for conventional stock markets of the US, GCC and Malaysia are mixed at best – during GFC, there is a weak hint of no contagion between the US conventional and GCC conventional stock market and evidence of contagion between Malaysia conventional and GCC conventional, but there are no significant results of contagion or no contagion during EDC.

By and large, our results indicate that Malaysia Islamic stock markets can provide an effective hedge strategy for US investors seeking *Shariah*-compliant investments. In the event of the economic meltdown or financial crisis, it seems that the Malaysia Islamic stock market is more resilient to shocks (compared to GCC Islamic stock markets) that are coming from US Islamic stock markets. But somehow the results for contagion effects between Malaysia Islamic and GCC Islamic stock markets yield opposite results for GFC and EDC. These inconsistent results suggest that intra-regional portfolio investments between Malaysia and GCC may not be an effective diversification strategy for risk mitigation during financial turmoil and that the temporary calming approach, like the pre-emptive monetary policy to increase the interest rates, or unrelenting intervention in the foreign exchange market to protect against speculative currency attacks, must be undertaken by governments in both financial markets to mitigate the intra-regional transmission of shocks during the global economic turbulence (Saiti, Bacha, & Masih, 2015).

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What did We Miss? A Bibliometric Review of Electronic Human Resource Management and Research Agenda

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and Md. Abul Kalam Azad⁴

ABSTRACT

This study identifies the literature gap that will guide academics and researchers in their future research initiatives in electronic human resource management (e-HRM) practices globally. For this, a comprehensive bibliometric analysis is conducted on 148 documents published in the Scopus database from 2004 to 2019. The use of bibliometrix package in R software and VOSviewer software has revealed that tech advanced countries like Germany, USA and China have been examining this topic and as such authors of those countries appear as the top authors considering total citations and number of publications. From the results of the thematic map, trend topics, bibliometric coupling, three-field plot and co-occurrence network, potential research areas are found. Furthermore, the examination of the theories and methods highlighted in literature pointed at the future research agenda.

ملخص

تحدد هذه الدراسة الفجوة القائمة على مستوى الأدبيات التي ستوجه الأكاديميين والباحثين في مبادراتهم البحثية المستقبلية في ممارسات إدارة الموارد البشرية الإلكترونية (e-HRM) على مستوى العالم. ولهذا الغرض، تم إجراء تحليل بيبليومتري شامل على 148 وثيقة منشورة في قاعدة بيانات

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Scopus من 2004 إلى 2019. وأظهر استخدام حزمة بيبليومتريكس في برنامج R و VOSviewer أن البلدان المتقدمة في مجال التكنولوجيا مثل ألمانيا والولايات المتحدة الأمريكية والصين كانت تدرس هذا الموضوع، وبهذا يظهر مؤلفو تلك البلدان كأفضل المؤلفين الذين يأخذون في الاعتبار إجمالي الاستشهادات وعدد المنشورات. ومن خلال نتائج الخريطة الموضوعية، ومواضيع الاتجاهات، والاقتران الببليومتري، ورقعة ثلاثية الميادين وشبكة التواجد المشترك، تم العثور على مجالات البحث المحتملة. وعلاوة على ذلك، أشار فحص النظريات والأساليب التي تم إبرازها في الأدبيات إلى أجندة الأبحاث المستقبلية.

ABSTRAITE

Cette étude identifie les lacunes de la littérature qui guideront les universitaires et les chercheurs dans leurs futures initiatives de recherche sur les pratiques de gestion électronique des ressources humaines (e-HRM) au niveau mondial. Pour cela, une analyse bibliométrique complète est menée sur 148 documents publiés dans la base de données Scopus de 2004 à 2019. L'utilisation du paquet bibliometrix dans le logiciel R et du logiciel VOSviewer a révélé que les pays avancés sur le plan technologique, comme l'Allemagne, les États-Unis et la Chine, se sont penchés sur ce sujet et que les auteurs de ces pays apparaissent comme les principaux auteurs au regard du nombre total de citations et du nombre de publications. Les résultats de la carte thématique, des sujets de tendance, du couplage bibliométrique, du diagramme à trois champs et du réseau de cooccurrence permettent de trouver des domaines de recherche potentiels. En outre, l'examen des théories et des méthodes mises en évidence dans la littérature a permis de définir le futur programme de recherche.

Keywords: Electronic Human Resource Management; bibliometric; Human Resource Information Systems.

JEL Classification: C23, R41 (up to 5 codes)

1. Introduction

Human resources management (HRM) and its strategic application in organizations have been respected as the underlying factor for organizational effectiveness (T. Bondarouk & Ruël, 2013; Khashman, 2019; Janet H Marler & Emma Parry, 2016). However, in recent days, immense technological advancements in the fast-changing world have reshaped HRM into electronic HRM (e-HRM). A holistic definition given by Janet H Marler and Emma Parry (2016) is enough to explain e-HRM. According to them, e-HRM is a combination of computer hardware, software and electronic networking tools that aids in

performing actual HR functions of an organization like policies, process and services by synchronization and sharing of information at the individual and societal level within the organization. As such, today's organizations are too much inclined towards e-HRM for various reasons.

The reason why organizations have been increasingly adopting e-HRM for more than four decades is the hope of attaining administrative and strategic benefit (Tanya Bondarouk, Emma Parry, & Elfi Furmueller, 2017; Kovach, Hughes, Fagan, & Maggitti, 2002; Stefan Strohmeier, 2009). After researching in five large organizations based on a case study, Ruël, Bondarouk, and Van Der Velde (2007) identified the goals of the organization for stepping towards e-HRM and classified this into four types namely cost reduction/gain of efficiency, improvement of client service, developing strategic orientation of HRM and integrating HR functions of different units of the organization or the whole organization (Tanya Bondarouk, Huub Ruël, & Beatrice van der Heijden, 2009). Besides, by identifying the factors affecting adoption of e-HRM namely technology, organization and people a framework has been developed referred as 'TOP' framework (Tanya Bondarouk et al., 2017). E-HRM is a vast concept and it covers all the activities of HRM in an organization and as such the whole organizational activities covered by e-HRM has been classified into 3: operational HRM, transformational HRM and relational HRM (Lepak & Snell, 1998). Further Wright and Dyer (2000) distinguished areas based on face-to-face or electronic means of giving HR services as transactional HRM, traditional HRM, and transformational HRM (Tanya Bondarouk & Ruël, 2005).

By the welfare of e-HRM the activities of the organization previously performed by HR professionals physically consuming a lot of time can now be performed online. (Tanya Bondarouk & Ruël, 2005). On one hand, employees have exposure to whatever they need to know and change like personal files, development plans, processing financial documents and new job applications on the other hand manager has control of everything sitting on his desktop. They make performance appraisals, generate the report for turnover and absenteeism, calculate employee costs, manage their training and what not (Roehling et al., 2005). Considering the digitization of corporate culture, it can be presumed that e-HRM has come a long way and is being used very generously amongst all organizations specially in the western world (Siam & Alhaderi, 2019).

This study examines a bibliometric literature review to find an overall summary of electronic human resource management or e-HRM in organizations over years. The contribution of different prolific authors, journals and countries showing interest in this research topic can also be identified from the research findings. Statistics reveal that Tanya Bondarouk is the most productive author in this field but Stefan Strohmeier tops the list in terms of total citations. International journal of human resource management having the highest publication and Human Resource Management Review having the highest citations serve as the primary directory for this research. Stefan Strohmeier's Research on e-HRM: Review and implications is the highest cited document in this topic so far making it the milestone for future research in this field. Country-wise analysis reveals that Germany is the leading country in e-HRM research.

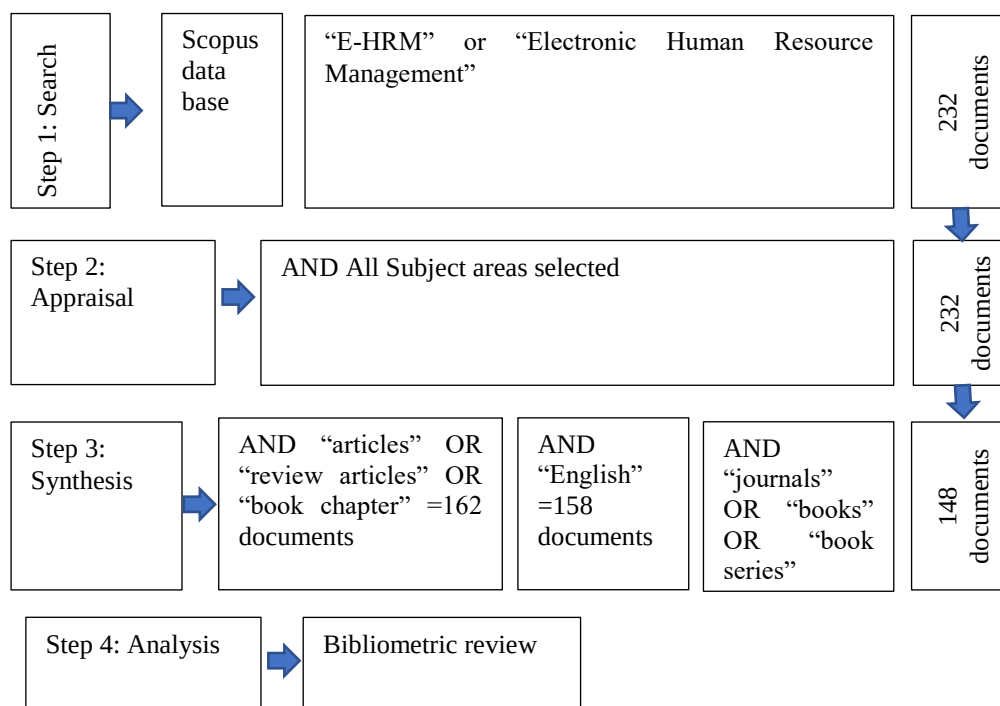
The rest of this paper is organized into additional five chapters. Chapter 2 mentions the methodology used in this study followed by the analysis of the results from bibliometric analysis in chapter 3. Chapter 4 describes the implications and conclusions of this study.

2. Methodology and data

Over the years, several review techniques have been applied such as structured review (Rosado-Serrano, Paul, & Dikova, 2018), review for model/framework development (Paul & Mas, 2019), meta-analysis (Knoll & Matthes, 2017), review based on theory (Paul & Rosado-Serrano, 2019), hybrid-future research (Kumar, Paul, & Unnithan, 2019), framework-based (Paul & Benito, 2018), bibliometric review (Randhawa, Wilden, & Hohberger, 2016), and systematic review (Chang & Chen, 2020), (Tranfield, Denyer, & Smart, 2003). Among these techniques, the bibliometric and systematic review techniques are applied in this study. The widely used SALSA method has been put into practice to address the research goals and establish an impartial data analysis. (Papaioannou, Sutton, Carroll, Booth, & Wong, 2010). Search, Appraisal, Synthesis, and Analysis stand for SALSA. Firstly, nearly every possible source and keyword is used in the search (data collection), ensuring that any valid data is not missed. Using the search words "E-HRM" or "Electronic Human Resource Management" resulting in 232 articles, the search has been expanded to document titles, abstracts and keywords of the entire Scopus dataset. Second, the searched data in the first stage are scrutinized

in the appraisal stage. But as our study topic, e-HRM covers all subject areas, filtering using subject area was not done. Then, only 162 records existed for analysis by limiting the collected data collection to articles, review articles and book chapters. Finally, restricting this dataset to English only resulted in a total of 158 published articles and 148 articles for the research were found restricted to sources such as journals, books and book series. Third, the study applied bibliometrix package in R programming language and VOSviewer software as a bibliometric tool for the synthesis stage relevant to the development of an analytical system using the dataset (Aria & Cuccurullo, 2017). Finally, for the detection of possible literature gaps, a systematic literature review has been implemented. The SALSA method and procedural steps in the selection process are illustrated in Figure 1.

Figure 1: Data Selection and Analysis Procedure Steps of SALSA



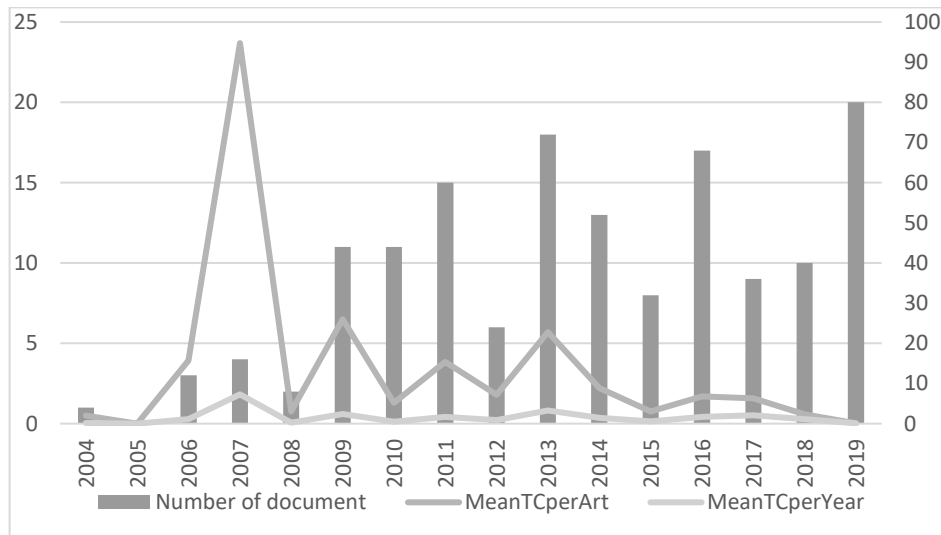
3. Bibliometric results and discussions

The importance of e-HRM has seen to rise for quite a long time along with a hope and promise of increasing HRM administrative effectiveness

(T. Bondarouk, Schilling, & Ruël, 2016; Heikal, Ciptaningsih, Nguyen, Laxmi Lydia, & Shankar, 2019; Rushit Gnana Roy & Jegan, 2019; Zareena, 2018). Considering the significance of this topic and increasing interest among authors, a bibliometric search on 148 documents published in Scopus database from 2004 to 2019 is performed. Among these documents, it is observed that total 251 authors have contributed in production of these documents. The newness and scope of this topic may have motivated authors to participate in publishing these articles. Collaboration among the specialists of different fields is the key for exploring and understanding of this topic which can be presumed observing only 31 (20.94%) documents written by 25 (9.97%) authors. Detailed information regarding the significant influence of this research topic and increasing interest of authors in this trending issue over the years can be found from the following subsections.

3.1. Publication and citation trend

An analysis of yearly publication and citation trend of about 148 articles from the year 2004 to 2019 is shown in Figure 2. Number of documents published is depicted through bar graph while mean total citation per article and mean total citation per year are depicted using line graphs. The bars that is the number of documents published shows a growing tendency having the largest number of documents published in 2019. Meanwhile, a steady rise has been observed in the mean total citation per article and mean total citation per year since the beginning and a sudden sharp rise during the year 2007. Afterwards, these graphs have been showing both upward and downward tendencies. It is obvious that the recent publications have not gained many citations as it can also be seen from the graph because time is needed for creating impact after publication. The year 2019 being the most productive year, the main topics of research has been cloud computing and information system relating to e-HRM followed by the year 2013 most research has been conducted concerning the adaptation and impact of e-HRM in organization. Since the beginning the interest of research in this field seemed to remain intact and in the recent year it is more on rise as e-HRM is being increasingly accepted by organizations globally due to growing awareness and advancement of information technology (Zareena, 2018)

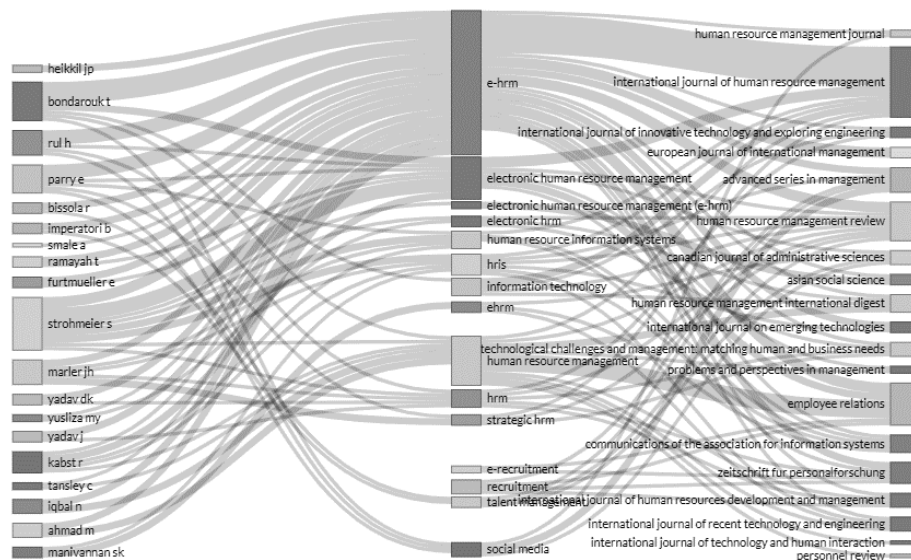
Figure 2: Publication and citation trend

3.2. Three-fields plot

Figure 3 visualizes the three items of this study and how they are interrelated. The left field displays authors, keywords in the middle field and sources in the right field are presented. From the top authors' list, it is seen that Tanya Bondarouk is the most dominant author because she seems to be contributed in major keywords and published in major journals. Among the keywords, e-HRM is the most used keyword and International Journal of Human Resource Management is the most cited source from source perspective. For convenience, the keywords field has been classified into four categories. The first part contains all keywords that are relevant to electronic human resource. The second is traditional HRM followed by recruitment and the last one is about social media. The first category is the largest one containing all the keywords synonymous to e-HRM or human resource information system. For the second category words like human resource management, HRM and strategic HRM are used. Among all the documents in e-HRM, authors and journals have primarily focused on recruitment as it seen from third category of keywords. Lastly, the word social media, a completely different from the other categories has been used in journals like Advance Series in Management and Human Resource Management Journal. The application of social media was linked to studies that explored the potential of information sharing for employer branding through social media and the

future envisioned by HR professionals.(Tatiana Bondarouk, Huub Ruël, Elena Axinia, & Roxana Arama, 2013) Be it recruitment or branding, the whole of HR activities has, nowadays, been associated with social media and, as a result, studies concerning this key word has been on the rise.

Figure 3: Three-fields plot



3.2. Source impact

The most influential journals are listed in Table1 highlighting their h_index, g_index, m_index, total citations and total number of publications. The h-index is an author level grading system that helps to measure citation impacts of publications and productivity, the g-index is a calculation based on the distribution of citations received by a given researcher's publications whereas the m index is the h-index divided by the number of years that a researcher has been active. The data indicates that the International Journal of Human Resource Management is the most productive journal considering number of publications, h-index, g-index and m-index whereas *Human Resource Management Review* is the most influential having highest total citations. With only 6 publications, the *Human Resource Management Review* has 6 h-index, 0.429 m-index with total 488 citations. All of the 6 articles of the journal have high citation indexes but two articles, Research in e-HRM: Review and implications

(195) and The psychology of talent management: A review and research agenda (163) together encompass the most citations. While h-index is mostly used for calculating the cumulative impact of research output, g-index is proposed to boost the h-index by giving frequently cited papers more weight. However, the g-index is equal to h-index meaning that the publications were able to fulfill the targeted h index. In some cases, citations are zero like *International Journal of Innovative Technology and Engineering*, *International Journal of Recent Technology and Engineering* and *International Journal of Emerging Technologies* as these are the newest in publications from the years 2018 and 2019 but their rate of publications seems high which is an indication of the apparent growth of the research. During the initial years, it is found that the pioneer journal is *International Journal of Human Resources Development and Management* with negligible publications and citations but have been the basis of this research topic.

Table 1: Most influential Journals

Source	h_index	g_index	m_index	TC	NP
International Journal of Human Resource Management	9	14	0.750	357	14
Advanced Series in Management	5	6	0.500	44	10
Employee Relations	7	8	0.500	152	8
Human Resource Management Review	6	6	0.429	488	6
European Journal of International Management	4	5	0.364	26	5
Handbook of Research on E-Transformation and Human Resources Management Technologies: Organizational Outcomes and Challenges	3	5	0.250	25	5
Asian Social Science	2	3	0.250	9	3
Canadian Journal of Administrative Sciences	3	3	0.600	22	3
Human Resource Management International Digest	1	1	0.077	1	3
Human Resource Management Journal	3	3	0.300	83	3
International Journal of Technology and Human Interaction	2	2	0.182	7	3
Zeitschrift Fur Personal forschung	3	3	0.333	36	3
Communications of The Association for Information Systems	2	2	0.400	21	2

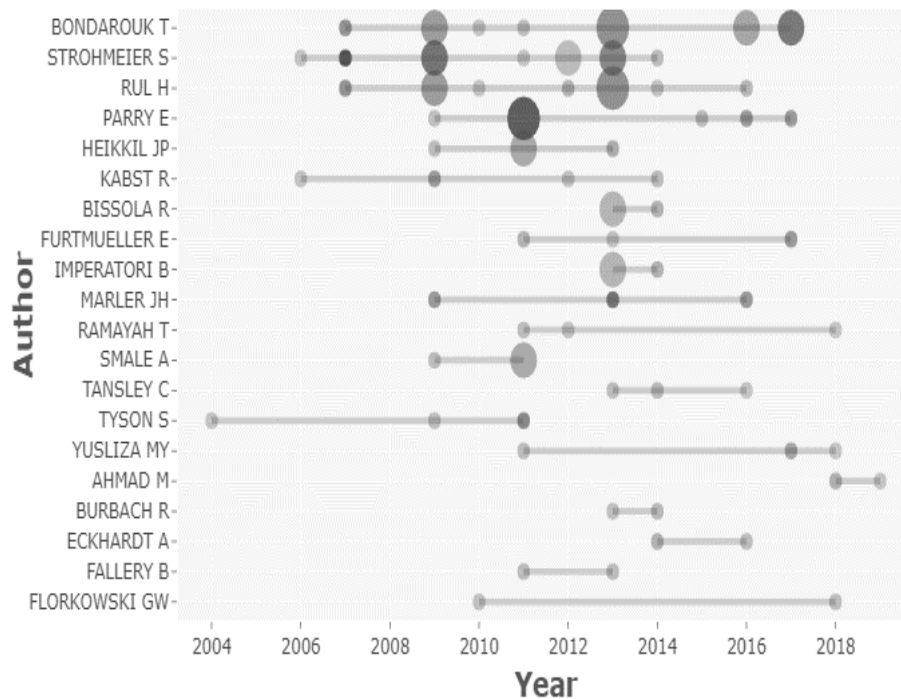
Source	h_index	g_index	m_index	TC	NP
International Journal of Business Information Systems	2	2	0.182	9	2
International Journal of Human Resources Development and Management	2	2	0.118	4	2
International Journal of Innovative Technology and Exploring Engineering	0	0	0.000	0	2
International Journal of Recent Technology and Engineering	0	0	0.000	0	2
International Journal of Training and Development	2	2	0.167	20	2
International Journal on Emerging Technologies	0	0	0.000	0	2
Journal of Strategic Information Systems	2	2	0.250	27	2

This table presents the annual citations during our study period that is from 2004-2019. Here TC=Total citations, NP=Number of publications and 3 indexes h, g and m are seen.

3.4. Most influential authors

Figure 4 outlines the top contributing authors identifying their total citation, total citations per year and frequency of writing. Results reveal that Tanya Bondarouk is the most productive author in all three of the categories. Her frequency of writing remained apparently unchanged from 2007 until 2018 whereas her total citations surprisingly doubled in a span of one year and total citations per years also changed accordingly from 3.4 to 8.5. Tanya Bondarouk produces 11 articles followed by Stefan Strohmeier having 10 articles. While it is seen that the work of Stefan Strohmeier may be clarified by the flexibility of methodologies and theories he has used, Tanya Bondarouk uses more descriptive case studies and empirical approaches. It can be seen from the figure that new authors like Mansoor Ahmad, Gary Florkowski, T. Ramayah have been gaining special attention and the fact that these authors are residents of different parts of the world conveys that the research topic has been in rise all over the world. Mansoor Ahmed from Pakistan, Gary Florkowski of USA, T. Ramayah of Malaysia are some emerging authors working and gaining popularity in this research topic.

Figure 4: Most influential author



While figure 4 ranks authors based on their number of publications and total citations throughout the years, table 2 gives the idea about author impact considering h_index , g_index and m_index . Considering h_index which is an author level grading system to measure citations, Tanya Bondarouk occupies the first place while second place is occupied by Stefan Strohmeier, Van den Rul H, Emma Parry simultaneously having equal h_index of 6 which means their cumulative impact of research output is the same. But when g_index and m_index are considered there is slight change in the ranking. Tanya Bondarouk still tops the list with g_index greater than h_index meaning that she not only fulfilled her targeted citations rather did better. The second, third and fourth place are occupied by Stefan Strohmeier, Van den Rul H, Emma Parry but the new researchers like Mansoor Ahmed, Gary Florkowski lagged in this consideration. By comparing this figure4 with that of table 2 an interesting fact is found that being new, Mansoor Ahmed was ahead of Stefan Strohmeier, Van den Rul H and Emma Parry in terms of frequency and total citations but he is in 16th place out of 20 authors because of having only 2 documents. Any how it is fascinating that these new researchers like Mansoor Ahmed, Gary Florkowski who have been indulged in

research from the recent times are showing much interest in this research area.

Table 2: Author impact

Author	h_index	g_index	m_index	TC	NP
Bondarouk T	8	11	0.667	158	11
Strohmeier S	6	10	0.4	373	10
Rul H	6	8	0.5	125	8
Parry E	6	7	0.5	172	7
Heikkil JP	3	4	0.25	60	4
Kabst R	3	4	0.2	69	4
Bissola R	3	3	0.375	27	3
Furtmueller E	2	3	0.2	38	3
Imperatori B	3	3	0.375	27	3
Marler JH	3	3	0.25	154	3
Ramayah T	2	3	0.2	11	3
Smale A	2	3	0.167	39	3
Tansley C	2	3	0.25	15	3
Tyson S	2	3	0.118	75	3
Yusliza MY	2	3	0.2	23	3
Ahmad M	1	2	0.333	7	2
Burbach R	2	2	0.25	14	2
Eckhardt A	2	2	0.286	19	2
Fallery B	2	2	0.2	16	2
Florkowski GW	2	2	0.182	7	2

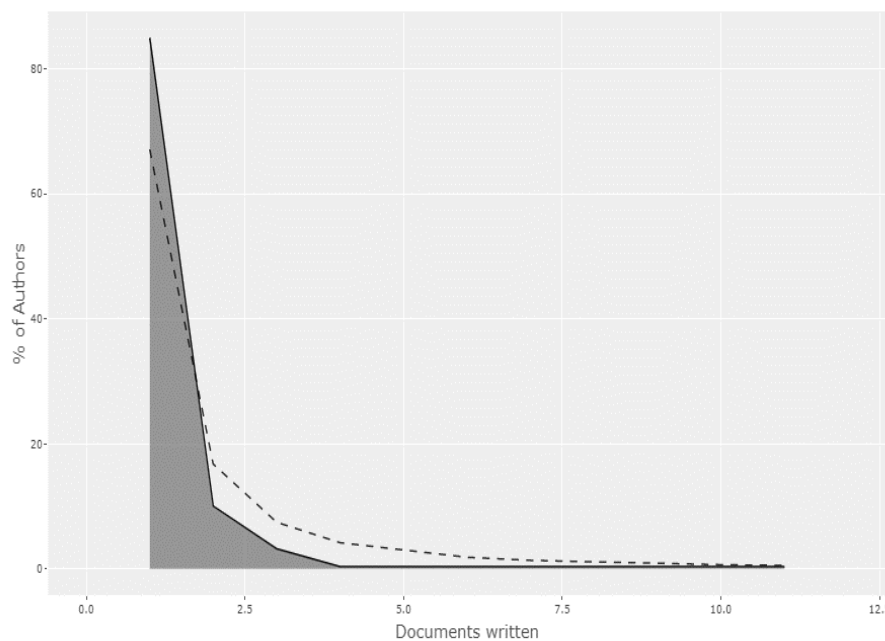
TC=Total citations, NP=Number of publications

3.5. Lotka's Law

It is very important to know the impact of scientific productivity for any researcher or academics in each period of time which can be visualized using the Lotka's law. Figure 5 depicts that 83.7% (210 authors) contributed to only one paper, 10.4% or 26 authors produced two papers and only 3.6% contributed to more than two papers between 2004 to 2019.

That means the number of authors contributing only one paper is dominant considering authorship productivity pattern. It is observable that the percentage of authors contributing to single paper is higher than Lotka's expected percentage but in case of more than one paper the expected percentage has not been fulfilled. In fine, the Lotka's law will be beneficial for the later researchers interested in research concerning e-HRM as they will have an idea about the behavioral pattern of the publishers. Moreover, the expected contribution by the researchers would only be possible, as per Lotka's law, if more authors contribute in more than one document in e-HRM literature.

Figure 5: The frequency distribution of scientific productivity



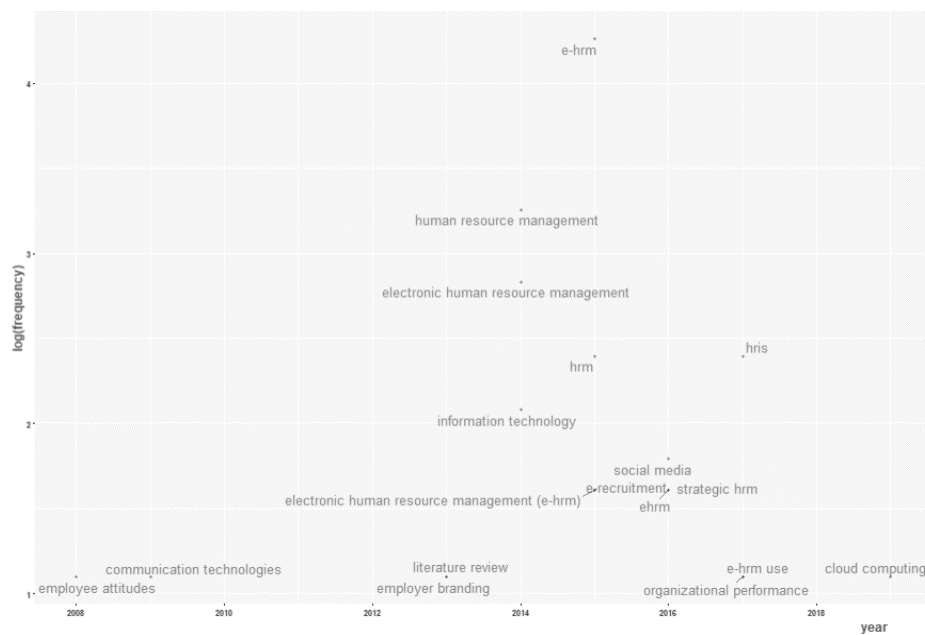
3.6. Most influential documents

From a period of 2004 to 2019 on the basis of total citations, Stefan Strohmeier's Research in e-HRM: Review and implications (2007) tops the list of most influential documents. The contribution of Stefan Strohmeier who is a Professor at Saarland University in Saarbruecken, Germany is noteworthy in this area of research. His other dominant articles include Concepts of E-HRM consequences: A categorization, review and suggestion (2009), Organizational adoption of e-HRM in

Europe: An empirical exploration of major adoption factors (2009), Domain driven data mining in human resource management: A review of current research (2013). Stefan Strohmeier's top cited article summarizes recent empirical work on electronic human resources management (e-HRM) and addresses some implications for future research. His other papers are mainly about general understanding of e-HRM consequences. The psychology of talent management: A review and research agenda of Nicky Dries holds the top position in terms of total citations per year and the second position on the basis of total citations. Tanya Bondarouk is another productive author in this area of research. She is regarded as a co-founder of the Electronic/Digital Human Resource Management interdisciplinary academic area and her articles such as e-HRM efficacy in a public sector organization: a multi-stakeholder perspective is the product of a qualitative analysis undertaken in a public sector organization. The strategic value of e-HRM: findings from an exploratory study in a government organization represent results from an exploratory study on the strategic value of electronic human resource management in a government organization (e-HRM). It is seen that the same author's articles are mostly in the leading position having greater citations revealing their interest in this field and all the articles addresses the key issues and necessary explanatory analysis regarding our topic of interest that is e-HRM.

3.7. Trend topic

The buzz topics in e-HRM literature from 2008 to 2018 are presented in the figure 6. During the initial periods, major studies were concerning employee attitude and communication technologies whereas the latest studies focuses mostly on cloud computing, HRIS etc. Overall during these 10 years, most research has been conducted on the condition of human resource management in organization and the gradual advancement of it with the progress of information technology and involvement of social media for e-recruitment, branding and other purposes. The main theme that could be found from the figure was the gradual change in trend topics from traditional to technical concerning human resource management.

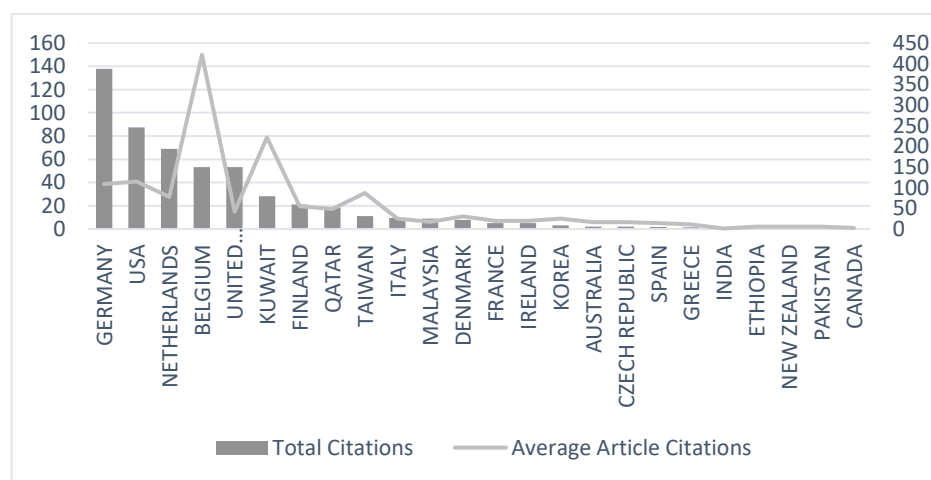
Figure 6: Trend topic

3.8. Country-wise analysis

Countries have been in competition in identifying problems and development of solutions by research and publications. Research being an important element in the advancement of knowledge and growth of any country, most countries try to focus and invest on research and as such a competition is observed which can be analyzed from the figure 7. The figure gives a pictorial view of the countries involved in this research field on the basis of total citations and average article citations. While considering total citations, Germany is seen to be the most influential country but Belgium tops the list if average article citations are considered. Among the 15 articles published in Germany found in Scopus, Research in e-HRM: Review and implications by Stefan Strohmeir itself has the highest total citation of 195 among 388 total citations of Germany. It is noteworthy that the most influential author in this research field, Stefan Strohmeir is a professor of Saarland University in Saarbruecken, Germany. On the otherhand though only 1 article, The psychology of talent management: A review and research agenda by Nicky Dries is found in Scopus to be published in Belgium, it has helped Belgium top

the list receiving highest average article citations. The second place has been occupied by USA in terms of total citations and Kuwait in terms of average article citations. Here a captivating fact is that though the first world countries are inclining towards this research and reaching the pinnacle, Canada is at the nadir both in terms of total citations and average article citations.

Figure 7: Country wise analysis

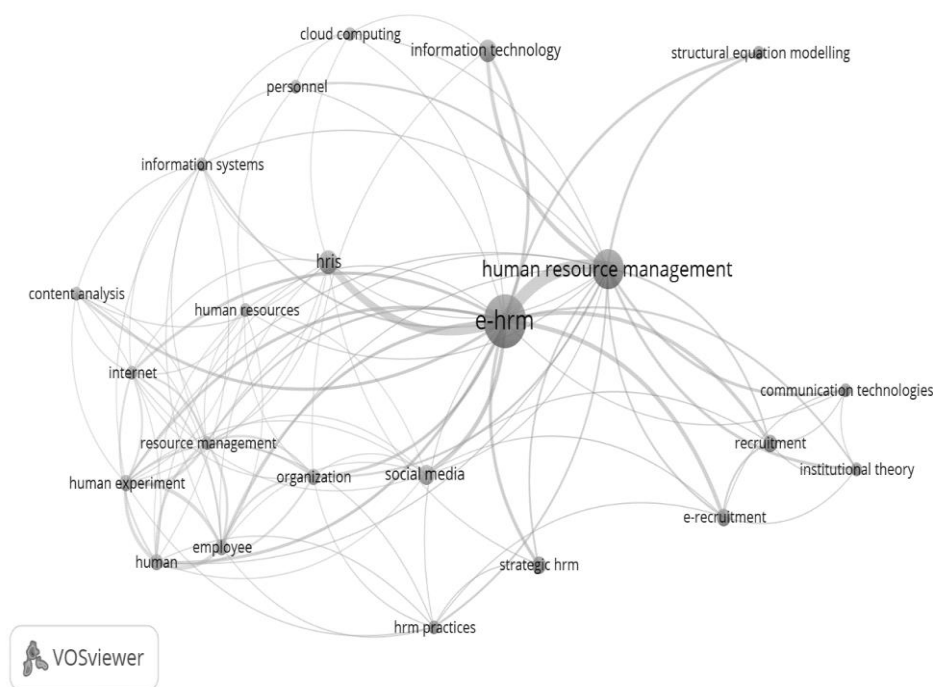


3.9. Conceptual Structure

Keywords provide information about the core contents of any document. The main keywords used in e-HRM research is presented in figure 8 considering a threshold of 3 occurrences from which the most used topics of this research can be identified. The main keyword is e-HRM in cluster 2 and has occurred 78 times. The keywords positioned in the center, human resource management, e-HRM etc. are firmly connected to the rest of the keywords. The red lines that is the cluster 1 shows the keywords which are newly generated and have high strength connection like internet, social media, content analysis, human experiment etc. Among the newly generated high strength words, social media is the mostly used having been occurred 7 times and fully connected with the keywords of cluster 1. As the power of information sharing has been identified by the HR professionals the application of the keyword social media is escalating. (T. Bondarouk, H. Ruël, E. Axinia, & R. Arama, 2013). The widely used theory and method both having occurrence of 3 has been

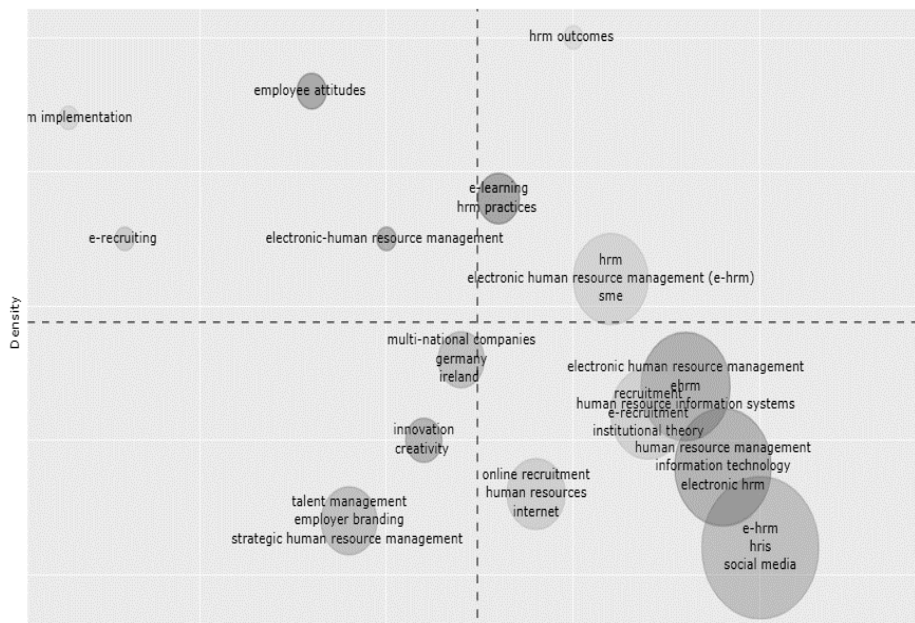
revealed in the cluster 2. Institutional theory is one of the most used theories (Heikkilä, 2013) and structural equation modelling used for structural relationship analysis is one of the most used methods in the e-HRM research (Al-Ajlouni, Nawafleh, & Alsari, 2019 {Iqbal, 2018 #36}). Lastly cluster 3 contains technology related keywords and shows how they are linked with e-HRM. Cloud computing is mainly connected with the word of its own cluster but information technology is connected with organization of cluster 1 depicting its increasing use in organizations and HRIS being mostly connected with the words of cluster 2 shows that it is associated with the newly generated, high strength words and is in trend. (T. Bondarouk & Ruël, 2013). Thus the findings from the co-occurrence networks of keywords will help in gaining deeper information and the explanation of issues under study.

Figure 8: Co-occurrence network of keywords



3.10. Thematic map analysis

The thematic map provides the visualization of 4 distinct typologies of bibliometric analysis based on two dimensions, namely density and centrality. Density is the strength of internal links between all the keywords used to define the theme of the research and centrality is the impact of external links to other themes by leveraging the area of keywords of the authors as shown in the figure. Here the upper right quadrant that is the motor theme which is high in density and has strong centrality is mostly vacant having only 3 small clusters containing keywords like HRM outcomes, HRM practices, Small and medium enterprises (SME) etc. As this quadrant shows the most developed themes, the presence of the keyword SME is an indication of how developed research of e-HRM has been in the SMEs sector.(Bissola & Imperatori, 2013; T. Bondarouk, ter Horst, & Engbers, 2009; Carvalho & Machado, 2016; Hooi, 2006) . The upper-left quadrant shows themes of high density but unimportant external links that suggest its limited relevance to the e-HRM field. The keywords present in this quadrant are employee attitude, e-recruiting etc that is the general keywords used by the authors while analyzing e-HRM.(Mishra & Pavan Kumar, 2019; Ramkumar, 2018; Waheed, Xiaoming, Waheed, & Ahmad, 2019). The lower left quadrant with both low density and weak centrality contains some important keywords including name of some countries like Germany and Ireland which are among the most productive countries for research and talent management, employer branding, innovation etc which are few trending topics in this field. However, being placed in the lower left quadrant recommends that these areas should be prioritized more. It is observable that e-HRM research has focused more on topic specific efficiency rather than country specific ones. Finally, basic and transversal themes are shown in the lower-right quadrant. This arena has the highest and most trending themes as can be seen like online recruitment. HRIS, social media, information technology etc. It is surprising that despite the significance of these keywords in the recent times in e-HRM, these have been positioned in the last quadrant. So, focus should be given in this quadrant for eliminating this literature gap and for improving the quality of research.

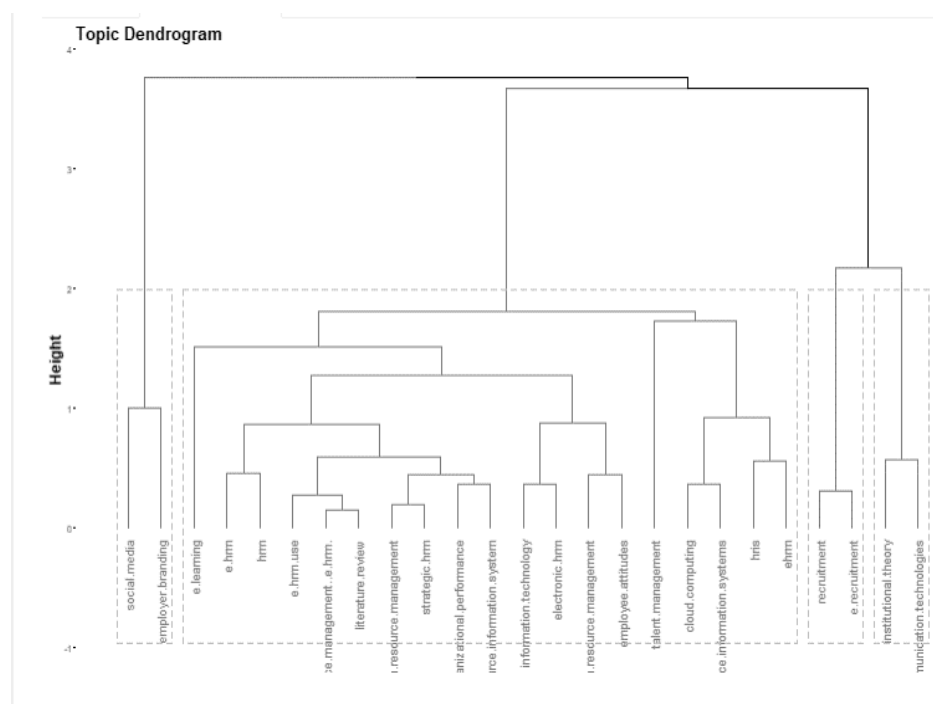
Figure 9: Thematic map

3.11. Conceptual structure analysis

The dendrogram in figure 10 shows the hierarchical relationship between keywords generated as an output from hierarchical clustering. Three relatively small clusters and one large cluster has been demonstrated in the figure with four different colors. The clusters have been formed for illustrating the keywords used together by researchers while describing e-HRM. Cluster 1 or the blue cluster contains words like recruitment, e-recruitment, the most talked about topic of e-HRM as a way to improving communication between job seekers and employers (Sek Khin, Poorangi, & Zahiruddin, 2011). This cluster has joined with the cluster 4 that is the red cluster which accommodates two words. One is institutional theory, a dominant theory in e-HRM research concerning the institutional dimensions affecting e-HRM practices in organizations (Heikkilä, 2013; S. Strohmeier, 2007) and other is communication technology without whose advancement the whole concept of e-HRM would go in vain. These two clusters made a larger cluster joining with cluster 3 having the keywords social media and employer branding. Keywords like social media and employer branding are related in the same way as the words from cluster 1 and 4 are related with the words in cluster 3. This type of

connection is found as social media is not only encouraging communication among employee- employers but also helping in recruiting the right personnel.(Martin, Parry, & Flowers, 2015; Waheed et al., 2019). Lastly the largest cluster that is cluster 2 appears to be discriminant enough to form different clusters within itself. This indicates that the researchers were able to form different clusters among those keywords and the other 3 clusters joining cluster 2 indicates how all these keywords are related.

Figure 10: Conceptual structure map (Topic dendrogram)

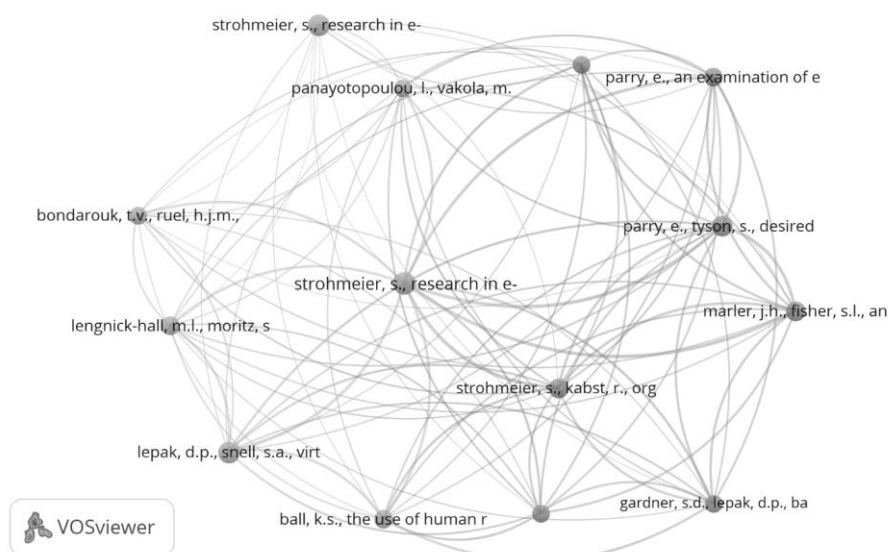


3.12. Intellectual structure

Co-citation is commonly defined as the frequency by which other documents cite two documents together. The more co-citations obtained by two documents, the greater their intensity and the more likely they are to be semantically related. In the figure 11, a co citation network has been shown where out of 8080 references, 14 references have met the criteria for minimum 10 citations of a reference. Two clusters having different colors with a total of 14 nodes representing references having link

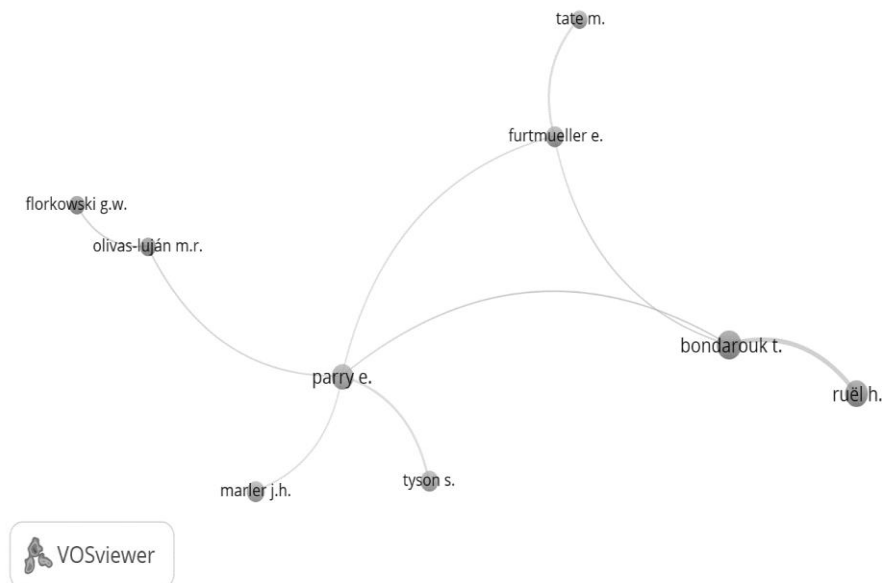
between each other has depicted the co citation among the references. All the nodes are linked with each other revealing that all the documents are co-cited with each other. The biggest node in cluster 1 containing Stefan Strohmeir's Research in e-HRM: Review and implication having the highest citations (30) is considered as the stepping stone for research in this field (Tanya Bondarouk et al., 2017). It has been found that the papers which have been published earlier and served as path finder for future research have been placed in cluster 1 like Virtual HR: Strategic human resource management in the 21st century of David P. Lepak and Scott A. Snell published in 1998, The impact of e-HR on the human resource management function by Mark L. Legnick and Steve Moritz published in 2003 etc. (S. Strohmeier, 2007) . And the papers present in cluster2 are mostly the aftermath of those in cluster1 like An evidence-based review of e-HRM and strategic human resource management by Janet H. Marler and Sandra L. Fisher published in 2013 (T. Bondarouk, E. Parry, & E. Furtmueller, 2017). It can be noticed that most paper of cluster 1 have higher citations but those of cluster 2 has higher total link strength which is evident because the papers of cluster 2 are the outcomes of cluster 1. Thus, the co-citation network gives the idea about how the papers are connected and the advancement of research in this field.

Figure 11: Co citation network of references



3.13. Social structure

Co-authorship analysis shows the collaborative network and is an efficient way to investigate authors' relationships that lead to knowledge development. reveals the collaboration network and is an effective method for exploring relationships among authors that helps in knowledge development (Hu & Racherla, 2008). Geographical and institutional proximity has a major influence on the collaboration network (Ponds, Van Oort, & Frenken, 2007). Figure 12 shows a collaboration network of 9 authors meeting the minimum threshold of 2 documents out of 251 authors. It is found that most authors who have collaborated are either working from the same institutions or are the residents of the same country. Collaboration is found among Tanya Bondarouk and Huub Ruël publishing 8 documents together from University of Twente, Netherlands. Such collaboration is also found between Emma Parry and Shaun Tyson as they are from the same institution, Cranfield School of Management and published 3 documents together. In the figure, 4 clusters can be seen and each cluster deals with the collaboration of an individual author with the others. The cluster 1 shows the collaboration between Emma Parry and other authors like Jannet H. Marler, Shaun Tyson, Tanya Bondarouk and Miguel R. Olivas-Luján. Emma Parry on average has 3 documents with each of them and most of them were published between 2011 to 2013. Diverse documents were published by her while working with different authors, some dealing with the cause while others with the outcomes relating to e-HRM (T. Bondarouk et al., 2017; J. H. Marler & E. Parry, 2016; Parry & Olivas-Luján, 2011; Parry & Tyson, 2011). The second cluster is all about the collaboration of authors with Tanya Bondarouk. Most collaboration is found with Huub Ruel as they are from the same institution as mentioned earlier and their average publication year was 2011 to 2012. Besides many multi authored documents are found to be published by Tanya Bondarouk along with Elfi Furtmueller, Emma Parry, Huub Ruel etc. (T. Bondarouk et al., 2017; T. Bondarouk, H. Ruël, & B. van der Heijden, 2009; T. Bondarouk et al., 2016; Ruël et al., 2007). Lastly, cluster 3 depicts the collaboration of authors with Elfi Furtmueller and cluster 4 with Miguel R. Olivas-Luján. While the average publication year of cluster 3 is 2013-2014, it is 2010-2011 for cluster 4. It is evident that with the passage of time the collaboration among the authors are increasing but the dominance of geographical and institutional proximity is still visible.

Figure 12: Collaboration network

4. Conclusion

The administration's perspective on its representatives began to shift, with companies paying noteworthy attention to human resources along with money-related capital and anticipating that they need workers capable of giving other organizations a decisive competitive advantage. This improvement in the HR practice paradigm is an outcome of e-HRM (Yadav, Yadav, & Malik, 2019). This study focuses on a bibliometric literature review to investigate the status of research in e-HRM review performed on 148 research papers covering almost all subject areas considering the diversification of HRM in all fields. Identifying the literature gap that guides academics and researchers in their prospective research initiatives is the key contribution of this research study. The results primarily provide a diverse analysis of citations and a framework for co-citation and publication patterns from 2004-2019. Along with a temporal analysis and author affiliations, a conceptual structure map and correspondence analysis help to summarize important research findings. From the findings of this report, the contributions of numerous prolific scholars, journals identifying the importance of this topic and a country-

wise participation in pursuing a solution can also be detected. Thus, this study will act as a guideline for researchers and others for figuring out the future research gaps in this field and enable them to work on those.

Like any other studies, this study is also not immune to limitations. Using only Scopus database for searching papers is one of the main limitations. As only a single database has been used it is likely to miss few potential and significant papers relevant to this research. In addition, the studies listed for this research are extensive, but not exhaustive, since they were chosen from the journals mentioned. Therefore, future studies can keep these limitations into mind and can explore further for research in this topic. Analyses of data obtained from the Scopus database offer observations that will contribute to the identification of more clear and vibrant ways of gaining an understanding of e-HRM and its organizational effectiveness. In addition, practitioners are required to learn further about new and emerging sectors involved in this literature and to perform empirical research to provide more precise findings of the proposed context. Besides practitioners will be able to figure out the purpose for using the methods and theories and why those were preferred by researchers. They will be able to contribute more by working on the potential research gaps. Therefore, our research paper will serve as a guide for summarizing all the previous literature in this field and will enable the future researchers to do more tests and analyses for identifying the gaps and findings and contribute to development of society and the country at large.

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Does Relation between Government Consumption and Economic Growth Still Exist? Evidence from Long Run Data

Ferhat Şirin Sökmen¹

ABSTRACT

The relation between government consumption in the context of fiscal policies and economic growth was investigated in the related literature. The effect of government expenditures on economic growth and needs for government expenditures in the growth path of an economy were explained by researchers and reached various results for each country. In this study, it is aimed that interaction between government expenditures and economic growth in the Turkish economy via advanced econometric methods between years 1971 and 2019. By doing so, longer period will be considered to get more robust results. Results imply that there is a bi-directional causality between government expenditures and economic growth in the Turkish economy. This result is valid in the long run. In the shorter time frequencies, direction of causality turns into uni-directional running from government expenditures to economic growth.

ملخص

جرت دراسة العلاقة بين الاستهلاك الحكومي في سياق السياسات المالية والنمو الاقتصادي في الأدبيات ذات الصلة. حيث شرح الباحثون تأثير الإنفاق الحكومي على النمو الاقتصادي واحتياجات الإنفاق الحكومي في مسار نمو الاقتصاد، وتوصلوا إلى نتائج مختلفة لكل دولة. وتهدف هذه الدراسة إلى تحليل التفاعل بين النفقات الحكومية والنمو الاقتصادي في الاقتصاد التركي عبر أساليب الاقتصاد القياسي المتقدمة بين عامي 1971 و 2019. وبهذا، سيتم النظر في الفترة الأطول للحصول على نتائج أكثر قوة. وتشير النتائج إلى وجود علاقة سببية ثنائية الاتجاه بين النفقات الحكومية والنمو الاقتصادي في الاقتصاد التركي. وهي صالحة على المدى الطويل. وفي الترددات الزمنية الأقصر، يتحول اتجاه السببية إلى تشغيل أحادي الاتجاه من الإنفاق الحكومي إلى النمو الاقتصادي.

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ABSTRAITE

La relation entre la consommation publique dans le contexte des politiques fiscales et la croissance économique a été étudiée dans la littérature correspondante. L'effet des dépenses publiques sur la croissance économique et les besoins en matière de dépenses publiques sur le chemin de la croissance d'une économie ont été expliqués par les chercheurs et ont abouti à des résultats différents pour chaque pays. Dans cette étude, on vise l'interaction entre les dépenses gouvernementales et la croissance économique dans l'économie turque via des méthodes économétriques avancées entre les années 1971 et 2019. Ce faisant, une période plus longue sera considérée pour obtenir des résultats plus robustes. Les résultats impliquent qu'il existe une causalité bidirectionnelle entre les dépenses publiques et la croissance économique dans l'économie turque. Ce résultat est valable à long terme. Dans les fréquences temporelles plus courtes, la direction de la causalité devient unidirectionnelle, allant des dépenses publiques à la croissance économique.

Keywords: Government Expenditures, Economic Growth, Turkish Economy

JEL Classification: C22, E62, F43

1. Introduction

An economic system is a series of systems that produce and distribute economic sources under interactive control of the society's members (Lee, et al., 2019: 2). In this regard, decisions of how investments will be made, which sectors will be developed are at the end conduct the type of development of the economy. Another point related to growth, who will make the investment and expenditures? In a no-government environment, investment and consumption expenditures will be made by households and private sector. This is valid for in pure capitalist environments. In opposite, in a socialist environment, expenditures will be made by government. According to Lee et al. (2019), an economic structure of a country is determined by a variety of factors such as history, culture and therefore it is not completely possible to classify countries as a free market economy and/or planned economy.

Another discussion related to question who will make expenditure is development level of economy. In a developed economy, infrastructure needed for private sector is already completed by government in the pathway to development. That is why in developed economies, necessity of government expenditures is not high. On the other hand, in developing

and less developed economies, the need for government expenditures in both investment and consumption expenditures is crucial for economic development.

The necessity level of government expenditures is investigated by several researchers in the literature. But the findings of these researches are some confusing. Initial reason of confusion is direction of causality. There four different explanation about the interaction between government expenditures and economic growth: uni-directional causality running from government expenditures to economic growth, uni-directional causality running from economic growth to government expenditures, bi-directional causality and neutrality. Another reason of confusion is about the type of country investigated. The initial studies focus on developed economies. But the results of these studies might be invalid for developing countries because of level of capital formation in the economy. Last reason is the time period examined. Initial studies take shorter periods into account, while latest studies have opportunity to test over fifty years for developed economies, especially.

In the light of explanations above, this study aims to investigate the Turkish economy empirically in the longer time periods, different from existing studies. By doing so, it will be possible to eliminate one of the confusions related to period. The longest time series possible for the Turkish economy is employed, 1971 – 2019. Moreover, the advanced causality methods are used to test the direction of causality and/or existence of it from different point of views.

In the second section, theoretical background about the interaction between variables is presented. The third section summarizes national and international literature. In the fourth section, empirical tests implemented, and results are described. In the conclusion section, findings are interpreted and compared with existing literature.

2. Literature Review

The relation between government expenditures and economic growth is one of the debates which is investigated in last decades. It is possible to conclude that there are two arguments in the literature explaining the interaction between them. One of them Wagner's law and other is Keynes's law. According to Wagner (1983), increasing expansion of

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public and particularly state activities is an outcome of economic growth. Therefore economic growth is Granger cause of increasing government expenditures and the direction of causality from economic growth to government expenditures. According to Wagner, there are three reasons to explain increasing government expenditure. These are, a) greater complexity of legal relationship, b) greater demand for education and public services, c) state neutralization of private monopolies and in some cases creation of state monopolization (Jean – Garcia, 2018: 14).

The Keynesian view implies that government spending accelerates economic growth. Because of this reason, government expenditure is regarded as an exogenous force that increase output (Loizides and Vamvoukas, 2005: 126). Because government expenditures are effective on private sector's decisions. An increase in government expenditures encourage private investment, which will translate to higher output growth (Nyasha and Odhiambo, 2019: 82).

Especially after World War II, Keynes's law was popular among developing economies to converge developed economies. The government of these economies aimed to grow the economy in accordance with the growth of government expenditure through multiplier effect (Wang et al., 2016: 42). Robinson's (1977) findings support this view. Larger government size promotes economic growth by reducing dependence in especially developing countries. Also developed economies between 1945 and 1965 presumed the necessity of expanding public spending and increasing relative size of government to achieve economic and social goals (Diamond, 1989: 1 – 2).

Besides the direction of causality is highly debated in the literature. Effect of government expenditures on economic growth is another debate to discuss in the literature. Is that positive or negative. According to Keynes's view, positive effect on economy occurs when government expenditures increase. By the beginning of 1970's, efficiency of overly high level of government expenditures on economic growth was queried empirically by researchers such as Landau (1986). According to this view, government expenditures can affect economy positively or negatively according to sub-components of government expenditures. If government expenditures focus on capital expenditures and/or expenditures on infrastructure, it would affect economic growth positively. If it focuses on current expenditures, it will affect economy negatively. Moreover, overly

high level of government expenditures induce increase in tax, and it would affect private sector negatively. In the literature, it is called as crowding out hypothesis, means that existence of government crowds out private sector.

In the light of theoretical explanations above, empirical literature is inconclusive in determination of the direction of causality and efficiency of government expenditures on economy, although there is a vast literature. One of the initial studies belongs to Barro. Barro (1990) implies positive effect of government expenditures on production by extending endogenous growth model. At the end of study, he finds out that government expenditures made for services increase savings and economic growth in the short run, but in the longer period growth performance reduces growth performance. Another study of Barro (1991) investigates factors affecting economic growth between years 1960 and 1985 for ninety-eight countries. According to analysis results, there is a positive correlation between growth rate of real gross domestic product per capita and initial human capital level and negative correlation between initial level of gross domestic product per capita real gross domestic product per capita. Also Barro (1991) reveals that economic growth is related to share of government's consumption expenditures negatively, but it is positively related to government's investment expenditures.

Devarajan et al. (1996) investigate fourty three countries in the context of Keynes's law. Authors empirically analyze twenty years between 1970 and 1990 via panel data method and take education expenditures, health expenditures, transportation and communication expenditures made by government. According to analysis results, an increase in current expenditures affects growth positively. On the other hand, there is a negative relation between investment expenditures and economic growth.

Agénor and Neanidis (2011) analyze optimal distribution of government expenditures between health, education, and infrastructure in the context of endogenous growth approach. The authors put private sector capital stock, government infrastructure services and human capital variables into model and analyze them in the context of over lapping generations model. According to analysis results, expenditures made to improve health and education technologies are important to grow for an economy. Especially, an increase in health expenditures increases consumption level and in the long run, it transforms to wealth.

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Al – Faris (2002) tests the relation between variables in the context of Gulf Cooperation Council. The period between 1970 and 1997 is investigated via Johansen co-integration and Granger causality test methods and employ gross domestic product per capita, ratio of government expenditures to gross domestic product, current expenditure per capita and capital expenditure per capita. According to analysis results, Wagner law is valid in the related countries, so increasing economic growth raises government expenditures.

Vu Le and Surukuga (2005) analyze the effects of foreign direct investment and government expenditures on economic growth for a hundred and five developing and developed economies between years 1970 and 2001. They employ constant effect panel regression analysis and panel Threshold regression analysis. Results obtained imply that foreign direct investment and government's investment expenditures and private investments affect economic growth positively. Also, governments' expenditures out of investment are negatively effective on economic growth.

Bose et al. (2007) investigate the relation between government expenditures and economic growth between years 1970 and 1990 in selected countries by employing panel data methods. Authors take budget constraints and variables not included in the model into account. At the end of model analysis, while there is a positive correlation between share of investment expenditures of government in gross domestic product and economic growth, current consumption expenditures have no effect on economic growth. Moreover, education expenditures and all expenditures made on education are effective on economic growth positively.

Srinivasan (2013) analyzes Indian economy and investigates the relation between years 1973 and 2012. Srinivasan employs co-integration analysis and vector error correction analysis methods. According to results, there is a uni-directional causality running from economic growth to government expenditures in both short and long run.

There have been many studies investigating the subject for the Turkish economy. One of them belongs to Ulutürk (2001). The author investigates possible effect of government expenditures on economic growth via ordinary least squares method. Ulutürk employs growth rate of gross domestic product, ratio of public and private investments to gross domestic product, employment level, total consolidated budget and

annual growth rate of government expenditures. The education and social security expenditures are positively, and health expenditures are negatively effective on economic growth. Lastly, infrastructure investments do not affect economic growth.

Kar and Taban (2003) also analyze the effect of government expenditures on economic growth between years 1971 and 2000. Ratios of government expenditures, education expenditures, social security expenditures, infrastructure expenditures to gross domestic product are the variables put into model. According to results obtained from Kremers, Ericsson and Dolado co-integration analysis, education and social security expenditures are effective on economic growth.

Arisoy (2005) investigates the validity of Wagner's law and Keynes's law in the Turkish economy in 1950 – 2003 period by testing the relation between government expenditures and economic growth. Data belonging to real GDP, real government expenditures, real current government expenditures, real government investment expenditures, real transfer expenditures and real total government expenditures are investigated via co-integration analysis method. At the end of study, Arisoy reveals that findings support Wagner's law. So current expenditures, investment expenditures and transfer expenditures are affected by economic growth performance of the Turkish economy in the long run.

Bagdigen and Çetintaş (2004) test the long run relation in the Turkish economy between years 1965 and 2000. Final consumption expenditures of government, total government expenditures, GDP and total population variables are used in Granger causality analysis. According to results, there is no causation linkage between variables.

Altunç (2011) investigates the relation between economic growth and total and sub-components of government expenditures in the Turkish economy between years 1960 and 2009. ARDL bounds test, vector autoregressive analysis, Granger causality analysis and block externality Wald test methods are employed. Results obtained from analysis imply that both of the laws are valid in the Turkish economy. Because there is a bi-directional causality between economic growth and government expenditures.

Gül and Yavuz (2011) analyze the relation for 1963 – 2008 period in Turkey. Annual data belonging to current expenditures, government

expenditures, investment expenditures, transfer expenditures and economic growth variables are tested by Johansen co-integration and Granger causality tests. Results indicate that government expenditures totally affect economic growth positively and also current, investment and transfer expenditures affect economic growth positively.

Telek and Telek (2016) investigate possible effects of government expenditures on the economic growth. Authors employ quarterly data belonging to 1998 – 2015 period. According to results, there is a uni-directional causality running from government expenditures to economic growth.

One of the latest studies belongs to Zabun (2020). Data belonging to 1999 – 2017 period are used to test relation via Johansen co-integration test and Granger causality test. According to results, Wagner's law is valid in the Turkish economy. Moreover, Keynes model is valid for investments.

As can be seen in the literature, the results are inconclusive about which law is valid for the Turkish economy and for the countries in different part of the world. Although empirical researches are made for Turkey, they do not employ the same data and variables. Also, methods employed have different robustness scores. To obtain more robust results in this study, the longest period available for the Turkish economy is employed.

3. Data and Methodology

In this study, the relation between government expenditures¹ (Billion United States Dollar, GOV, hereafter) and gross domestic product per capita² (Billion United States Dollar, GDPPC, hereafter) is investigated

¹ According to World Bank Definition "General government final consumption expenditure (formerly general government consumption) includes all government current expenditures for purchases of goods and services (including compensation of employees). It also includes most expenditures on national defense and security but excludes government military expenditures that are part of government capital formation. Data are in current U.S. dollars."

² According to World Bank Definition "GDP per capita is gross domestic product divided by midyear population. GDP is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. It is calculated without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources. Data are in current U.S. dollars."

via annual times series belonging to 1971 – 2019 by employing causality methods. Data belonging to each variable are obtained from the database of World Bank. In the first step, we convert series into logarithmic form to prevent heteroscedasticity.

Table 1: Descriptive Statistics

	In GDPPC	In GOV	Max	Min	Skewness	Kurtosis	Jarque-Bera (Probability)
lnGDPPC	1	-	9.442	6.120	-0.069	1.954	2.268 (0.321)
lnGOV	0.994	1	25.62	21.34	-0.016	1.742	3.231 (0.198)

According to correlation analysis, there is a strong and positive correlation between government expenditures and economic growth. Tale distribution of each variable is skewed to left and flattened. According to Jarque – Bera test null hypothesis which implies normal distribution for each variable is accepted. Parameters β_0 , β_1 and β_2 represent constant term, lagged values of independent term and lagged values of trend variable, respectively. Thus the unit root test model is as follows;

$$Y_t = \beta_0 + \beta_1 Y_{t-p} + \beta_2 Trend_{t-p} + \varepsilon_t \quad (1)$$

There are three different alternatives in the model. In the context of assumption that independent variable X_t is constant, regression is on origin in the first model. Second is the model including constant term and last one is the model with constant term and trend variable. If parameter β_1 equals to β_1 , it implies effect of one-unit shock. Thus, the null hypothesis $\beta_1 = 1$, means there is a unit root in the series (Pantula et al., 1994).

Table 2: ADF (1981) and PP (1988) Unit Root Test Results

	Variables	Level		First Difference	First Difference	
		ADF	PP		ADF	PP
Level	Constant	lnGOV	-1.545 (0) [0.502]	1.430 (3) [0.559]	-4.933 (0) [0.00] ***	-4.976 (3) [0.00] ***
		lnGDPPC	-2.078 (0) [0.254]	-2.002 (3) [0.284]	-6.591 (0) [0.00] ***	-6.602 (2) [0.00] ***
	Constant +Trend	lnGOV	-2.612 (1) [0.276]	-2.431 (4) [0.359]	-4.967 (0) [0.00] ***	-5.026 (3) [0.00] ***
		lnGDPPC	-2.322 (0) [0.414]	-2.651 (3) [0.260]	-6.770 (0) [0.00] ***	-6.779 (2) [0.00] ***

Not: ***, ** and * values show stationarity of series in significance level 1%, 5% and 10%, respectively.

According to Dickey-Fuller (1981) and Phillips-Perron (1988) unit root test results, series belonging to both variables contain unit root in level. On the other hand, they become stationary when the first difference is considered.

In the second step, Rolling Windows test based on corrected likelihood ratio (LR) developed by Balcilar et al. (2010) is implemented. In LR Granger causality test based on bootstrap, vector autoregression model with two variables and lag value p is as follows. ($t=1, 2, \dots, T$)

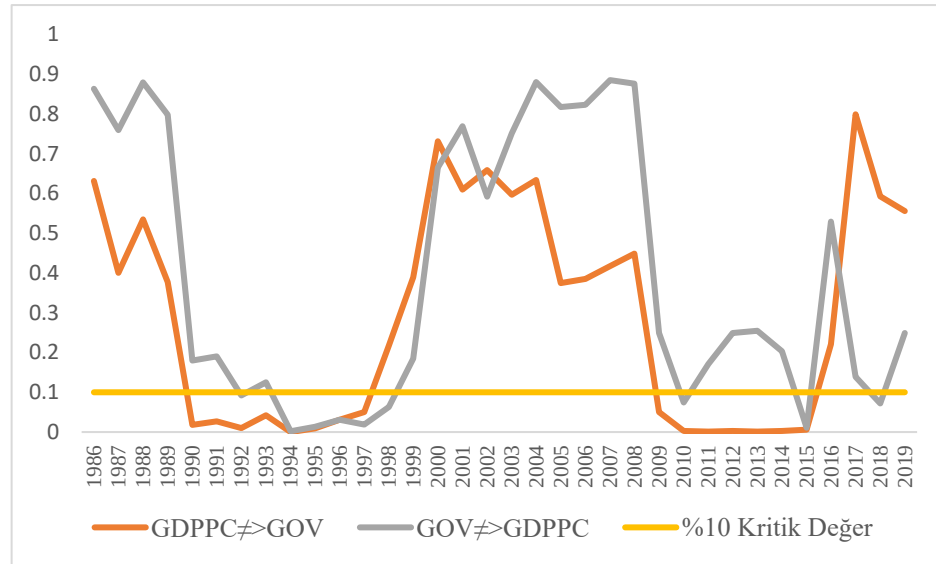
$$y_t = \Phi_0 + \Phi_1 y_{t-1} + \dots + \Phi_p y_{t-p} + \varepsilon_t \quad (2)$$

$\varepsilon_t = (\varepsilon_1, \varepsilon_2) \square iid(0, \sigma^2)$ error term is distributed independently. The matrix of the model is $y_t = [y_{1t}, y_{2t}]_{2 \times 1}$. Hence, it is possible to write the vector autoregression model with p lagged as follows;

$$\begin{bmatrix} y_{1t} \\ y_{2t} \end{bmatrix} = \begin{bmatrix} \phi_{10} \\ \phi_{20} \end{bmatrix} + \begin{bmatrix} \phi_{11}(L) & \phi_{12}(L) \\ \phi_{21}(L) & \phi_{22}(L) \end{bmatrix} \begin{bmatrix} y_{1t} \\ y_{2t} \end{bmatrix} + \begin{bmatrix} \varepsilon_{1t} \\ \varepsilon_{2t} \end{bmatrix} \quad (3)$$

While $\phi_{ij}(L) = \sum_{k=1}^p \phi_{ij,k} L^k$, $i, j=1, 2$ and lag operator is $L^k x_t = x_{t-k}$. The null hypothesis is $\phi_{12,i} = 0$ and implies y_{2t} is not Granger cause of y_{1t} .

Figure 1: Balçılar et al. (2010) Rolling Window Regression Causality Test Results



In Graph 1, direction of causality is presented. In the graph, period is placed in X-axis and probability ratio is placed in Y-axis. The null hypothesis in causality analysis developed by Balçılar et al. (2010) claims absence of causality and alternative hypothesis claims validity of causality between variables. Prob values are used to decide validity. If the prob value calculated is smaller than 10% (0,1) critical value, alternative hypothesis which implies the validity of causation linkage is accepted. In the light of investigation, there is a causality running from gross domestic product per capita to government expenditures between years 1990 and 1997 and between years 2009 – 2015. On the other hand, uni-directional causality runs from government expenditures to economic growth in 1992, from 1994 to 1998, 2010, 2015 and 2018.

According to results, in 1992, 1994 – 1998, 2010 and 2015 periods, there is a bi-directional causality. Moreover, there is a uni – directional causality running from gross domestic product per capita to government expenditures in crisis times.

In frequency domain causality test developed by Breitung and Candelon (2006), z_t denotes a vector with two dimensions in a determined vector autoregression model $z_t = [x_t, y_t]'$

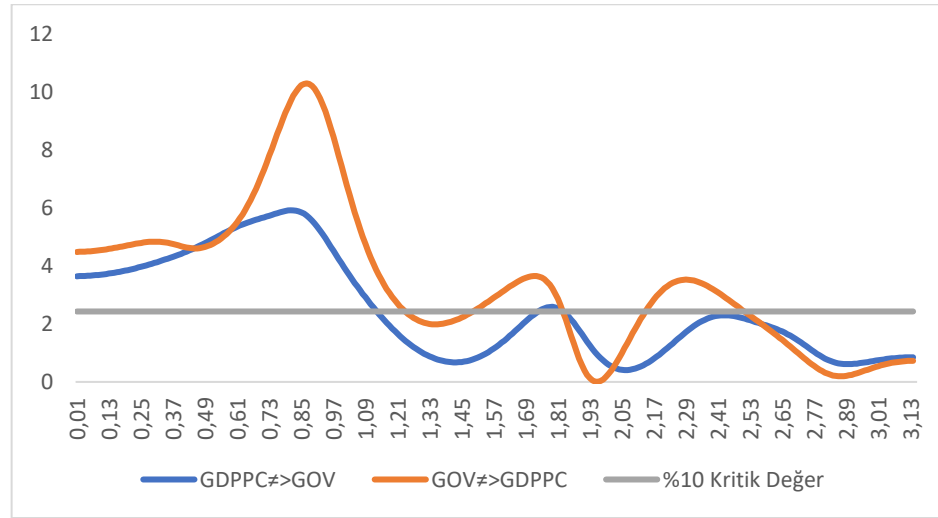
$$\Theta(L)z_t = \varepsilon_t \quad (4)$$

In the model, $\Theta(L) = I - \Theta_1 L - \dots - \Theta_p L_p$ and lag length is $L^k z_t = z_{t-1}$. Granger causality hypothesis in different time frequencies is as follows.

$$M_{y \rightarrow x} = \log \left[\frac{2\pi f_x(\omega)}{|\psi_{11}(e^{-i\omega})|^2} \right] = \left[1 + \frac{|\psi_{12}(e^{-i\omega})|^2}{|\psi_{11}(e^{-i\omega})|^2} \right] \quad (5)$$

$|\psi_{12}(e^{-i\omega})|^2 = 0$ states that there is no Granger causality running from Y to X in frequency ω . The most important advantage of frequency domain causality test is to give opportunity to test validity of causality in different time periods (Şengül, 2020: 270).

Figure 2: Breitung and Candelon (2006) Frequency Domain Causality Test Results



In the graph 2, F test statistics are placed in y – axis and frequency values between 0 – 3,14 are placed in X – axis. The null hypothesis of the test claims there is no causality, alternative hypothesis claims there is a causation linkage. In the decision phase, if F test statistics is bigger than 10% critical value, 2.427 in the F table, alternative hypothesis claiming existence of causality is accepted. Also, if frequency interval is between 0.01 and 0.99, it means long run causality, if it is between 1.00 and 1.99,

it means medium term causality and lastly, if it is between 2.00 and 3.14, it means short run causality.

According to results presented in graph 2, there is bi-directional causality between gross domestic product per capita and government expenditures in the long run. That means both Wagner's and Keynes's law are valid in the long run. On the other hand, results show that uni-directional causality running from government expenditures to gross domestic product per capita occurs in the medium and short time frequencies.

4. Conclusion

Theoretically, the relation between government expenditures and economic growth is explained via two approach. First one is Wagner's law and implies that economic growth increases government expenditures due to increasing demand for public services, demand for education, increasing complexity of legal relations and neutralization of private monopolization via government. On the other hand, Keynes's law implies that increasing government expenditures promote economic growth via multiplier effect of government expenditures.

The relation between government expenditures and economic growth is highly debated in the literature. The reason why it is popular among researchers is that it is important to determine how government expenditures are effective on economy. By doing so, expenditure policies will be designed according to most effective way of growth.

In this study, the relation is analyzed in the Turkish economy for a longer time period and the possible relation is analyzed for different time frequencies and also analyzed to get exact dates of causation linkage. By doing so, it is aimed to get more robust results. In this regard, two different causality analysis methods were performed. One of them is Balcilar et al. (2011) and the other one is frequency domain causality method developed by Breitung and Candelon (2006).

Results reveal that there is a bi-directional causality between variables, and it occurs in the long run. This result is expectable due to lagged effect of government expenditures, especially investment expenditures, on economic activities. Although lag length is shorter than monetary policy, it takes some time to appear itself on the economy. It is conducted that after a while an effect would appear and economy would accelerate. On

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the other hand, economic growth would increase wealth level of households and that would increase demand for public services. So, government expenditures would expand.

Moreover, results imply that uni-directional causality from economic growth to government expenditures appears from 2009 to 2015. This result supports Wagner's law. More importantly, the period includes post – crisis period where central banks increase the volume of money all over the world. So, expanding liquidity increases wealth and demand for leisure and consumption of public services. At the end government expenditures would increase in the context of expanding needs of households and firms.

In the light of all explanations above, it is clear that economic growth and government expenditures encourage each other in the Turkish economy. While growing economic structure asks for more government, increasing governmental activities will dominate economic growth and the process will continue. This would emerge in the long run. The exception is the period between years 2009 – 2015. The expanding monetary policies raise wealth and the need for leisure. It is possible to conclude that implementation of monetary policy via different ways can help to economic growth via increasing demand for public services and wealth increase.

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Foreign Aid, Governance, and Foreign Direct Investment in Vietnam: A Dynamic GMM Analysis

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ABSTRACT

Foreign direct investment (FDI) is essential for economic growth, and the attraction of FDI inflow is a solution to foster economic growth in developing countries. Literature has well documented that FDI is determined by many factors among which foreign aid has a controversial impact on FDI depending on complementary or substitute effects between these two capital flows. This study investigates the impacts of foreign aid on FDI and whether this impact is different across provinces with hetero-quality governance. Using the fixed-effect and dynamic generalized method of moments estimation models for balanced panel data for 2006–2017, this paper finds a negative impact of foreign aid on FDI at the provincial level, but the effect is different cross-province with different proxies of the quality of governance. These empirical results shed light on the foreign aid allocation policies and management to increase the attractiveness of FDI inflow in Vietnam.

ملخص

الاستثمار الأجنبي المباشر (FDI) عامل ضروري للنمو الاقتصادي، ويعتبر جذب تدفق الاستثمار الأجنبي المباشر الحل لتعزيز النمو الاقتصادي في البلدان النامية. وقد وثقت الأدبيات بشكل جيد أن الاستثمار الأجنبي المباشر يتم تحديده من خلال عدد من العوامل تشمل المساعدة الخارجية التي لها تأثير مثير للجدل على الاستثمار الأجنبي المباشر اعتمادا على الآثار التكميلية أو البديلة بين هذين التدفقين الرأسماليين. وتبحث هذه الدراسة في آثار المساعدات الخارجية على الاستثمار الأجنبي المباشر وما إذا كان هذا التأثير مختلفا عبر الولايات ذات الحوكمة غير المتجانسة. وباستخدام أسلوب تقدير اللحظات المعمم الثابت والديناميكي لبيانات لوحة متوازنة للفترة 2006-2017، عُثر عن وجود

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تأثير سلبي للمساعدات الأجنبية على الاستثمار الأجنبي المباشر على مستوى الولايات، ولكن التأثير مختلف عبر الولايات ذات ممثلين مختلفين لجودة الحوكمة. كما تسلط هذه النتائج التجريبية الضوء على سياسات وإدارة تخصيص المساعدات الخارجية لزيادة جاذبية تدفق الاستثمار الأجنبي المباشر في فيتنام.

ABSTRAITE

Les investissements directs étrangers (IDE) sont essentiels à la croissance économique, et l'attraction des flux d'IDE est une solution pour favoriser la croissance économique dans les pays en développement. La littérature a bien montré que les IDE sont déterminés par de nombreux facteurs parmi lesquels l'aide étrangère a un impact controversé sur les IDE en fonction des effets de complémentarité ou de substitution entre ces deux flux de capitaux. Cette étude examine l'impact de l'aide étrangère sur les IDE et si cet impact est différent dans les provinces où la gouvernance est de qualité inégale. En utilisant les modèles d'estimation de la méthode des moments généralisés à effet fixe et dynamique pour des données de panel équilibrées pour 2006-2017, ce document trouve un impact négatif de l'aide étrangère sur les IDE au niveau provincial, mais l'effet est différent d'une province à l'autre avec différents proxys de la qualité de la gouvernance. Ces résultats empiriques mettent en lumière les politiques d'allocation et de gestion de l'aide étrangère afin d'augmenter l'attractivité des flux d'IDE au Vietnam.

Keywords: Foreign aid, governance, FDI, provincial level, Vietnam

JEL Classification: F35, O16, E22

1. Introduction

Foreign direct investment (FDI) plays a vital role in receiving countries, particularly developing countries. It promotes economic growth through an increase in capital, modern technology, managerial skills, better governance, more extensive market expansion, and a better business environment. FDI is affected by several factors, including natural and social resources, and institutional, economic, and financial factors (Asiedu, 2006; Asiedu et al., 2009; Azémar & Desbordes, 2009). Many studies emphasize the role of foreign aid in attracting FDI inflow (Harms & Lutz, 2006; Selaya & Sunesen, 2012; Yiheyis & Cleeve, 2018).

There are two main strands of literature concerning the impacts of foreign aid on attracting FDI. The first encapsulates research stating that foreign

aid is supplementary to FDI. For example, foreign aid invested in projects improving the human resource, building infrastructures such as roads, railroads, electricity as well as improving institutions and the business environment, and this is termed as the “infrastructure effect” (Kimura & Todo, 2010). Foreign aid invested in these areas helps increase the marginal productivity of physical capital, resulting in more FDI inflows (Griffin & Enos, 1970; Harms & Lutz, 2006; Yiheyis & Cleeve, 2018). The second strand of literature indicates that foreign aid in companion with FDI builds domestic investment capital and directly contributes to production. For instance, foreign aid invested in production projects, such as producing goods and services, seek rent and this is termed as the “rent-seeking effect” (Kimura & Todo, 2010). As a result, the marginal product of capital would decline, and it would decrease the FDI inflows. Therefore, the theoretical impacts of foreign aids on FDI inflow are controversial and empirical results remain inconclusive. It is believed that the mixed empirical results can be explained by the high level of aggregation used for the foreign aid variable (Selaya & Sunesen, 2012).

With the collapse of the Soviet Union, a closed and major economic partner and donor of Vietnam, foreign aid to this country suddenly disappeared. However, the Vietnamese government successfully shifted its planned economy into a market-orientation economy with new policies calling for official development aid and FDI. Vietnam receives and effectively uses foreign aid resources, and this could be one of the reasons explaining the continuous increase in foreign aid disbursement to Vietnam. According to the statistics of the Ministry of Investment and Planning, the total cumulative foreign aid disbursed was nearly 86.6 billion USD by 2019. This foreign aid has contributed to the progress of poverty reduction, construction of infrastructures, improvement in education, public health, and other socio-economic fields. To accompany foreign aid, Vietnam attracted a considerable amount of FDI during 1989–2019, which accounted for 211.5 billion USD in approximately 33921 projects (GSO, 2021). This data poses the question of whether there is any interactive relationship between foreign aid and FDI attraction in the context of Vietnam.

This study examines the impacts of foreign aid on the inflow of FDI in Vietnam using balanced panel data from 63 provinces over the period 2006–2017. This research also discusses whether the impacts of foreign aid on FDI are different cross-province with better governance.

Estimations reveal that foreign aid has negative impacts on FDI inflows, or they substitute capital sources in the Vietnamese context. This impact is indifferent cross-provinces with better governance proxied by control of corruption, but the effect is stronger in the provinces with a higher level of transparency. This study is different from several perspectives. First, the paper uses disaggregated data on FDI and foreign aid at the provincial level within a post-communist developing country. Using the disaggregated data on foreign aid has two benefits. The FDI-attracting policies of the central government are common; thus, these effects are factored out. It overcomes the shortcoming of mixed empirical impacts of foreign aid on FDI due to the high aggregation of the measures. Second, the paper also investigates the role of provincial governance in moderating the effects of foreign aid on FDI inflows. Empirical results shed light on the adjustment of strategies on foreign aid attraction and allocation in Vietnam.

The rest of the paper is organized as follows. Section 2 provides a literature review on the impacts of foreign aid on FDI and the moderating role of governance. Section 3 mentions foreign aid and FDI in the Vietnamese context. Section 4 presents a theoretical model, empirically estimated models, and estimation issues. The data used in the paper is also presented in this section. Section 5 provides empirical results and discussion. Section 6 concludes the paper.

2. Literature Review

The theoretical impact of foreign aid on FDI is ambiguous whether it is positive or negative as foreign aid and FDI are complemented or substituted. The empirical finding shows positive, negative, and no impact of foreign aid on FDI inflows depending on the research sample and differences in economic conditions, technology, and typical characteristics of countries. Most researchers find a positive impact of foreign aid on FDI called the “infrastructure effects” (Kimura & Todo, 2010). Selaya and Sunesen (2012) found positive effects as foreign aid increases the productivity of private investments by financing complementary factors of production, such as infrastructure and human capital. Opoku (2015) studied the effect of aid on FDI in 42 African countries during 1996–2008 and found that total foreign aid to Africa has a positive effect on FDI regardless of the type of aid. Donaubauer et al.

(2016) found that aid for infrastructure helps attract FDI by improving recipient countries' endowment with infrastructure. Yiheyis and Cleeve (2018) presented that the impact of foreign aid on FDI depends on whether the foreign aid was committed to complementary or productive activities in the recipient countries. Many other studies also shared the empirical results from different research samples and the use of foreign aid. In these cases, foreign aid helps increase marginal products of capital in the recipient countries, a complement source of capital that improves the recipient countries' infrastructure and well-functioning bureaucracy; thus, it is more attractive for FDI inflows (Blaise, 2005; Donaubauer et al., 2016; Griffin & Enos, 1970; Harms & Lutz, 2006; Selaya & Sunesen, 2012; Yasin, 2005; Yiheyis & Cleeve, 2018).

On the other hand, Harms and Lutz (2006) argued that foreign aid discourages productive rent-seeking behaviors leading to a drop in the marginal product of capital. This impact is called the "rent-seeking effect" (Kimura & Todo, 2010) or substitution between foreign aid and FDI capitals. When a country receives foreign aid, private firms may engage in competition for rent and ignore investment in increasing productivity and thus discourage FDI flows in the recipient countries. Karakaplan et al. (2005) shared a similar empirical result when they conducted an empirical study on the effects of foreign aid on FDI using a sample of 97 countries during 1960–2004. Their empirical finding is that foreign aid is not necessary to attract FDI in the recipient countries as foreign aid directly invested in increasing physical capital would crowd out individual investment. Kimura and Todo (2010) found a mixed empirical effect of foreign aid on FDI that Japanese aid promotes FDI from Japan but does not attract FDI from other countries and called this the "Vanguard effect."

A few studies on the impacts of foreign aid on FDI do not find a statistically significant effect. For example, Kimura and Todo (2010) investigated how foreign aid facilitates FDI flows into less developed countries and found that foreign aid, in general, does not have any significant effect on FDI. Frot and Santiso (2008) studied stylized facts about development aid and capital flows to developing countries and found that foreign aid is not a major source of finance for these countries anymore and there is no relationship between foreign aid and FDI within developing countries over time. Jansky (2012) studied the relationship between foreign aid and FDI and found that there is no evidence of the

causal relationship between foreign aid and FDI among 180 countries during 1971–2007.

Besides, some previous studies found the importance of institutional measures on the impacts of foreign aid on FDI inflows. For instance, Harms and Lutz (2006) found a positive impact of foreign aid on FDI in countries where the private sector suffers a high regulatory burden as institutions are a robust determinant factor of FDI inflows (Tintin, 2013). In this sense, a country with a poor regulation system encourages a rent-seeking effect that does not dominate the infrastructure effect, or the quality of governance does not affect the rent-seeking effect but the infrastructure effect. Karakaplan et al. (2005) studied the impact of foreign aid on FDI in the different development levels of the financial market and found that more developed financial markets reinforce the positive effect of foreign aid on maintaining FDI inflows.

Literature on the theoretical and empirical impacts of foreign aid on FDI is not rich but more empirically complicated. A few studies have focused on the impact of foreign aid on FDI inflows in a post-communist developing country where each province is hetero in its governance quality, which has not been sufficiently considered in the most existing literature. A study on the impact of foreign aid on FDI inflows among provinces with a post-communist country, in which the policies are centrally issued but the understanding and interpretation is hetero across provinces, sheds light on designing the strategy for foreign aid and FDI attraction and allocation in transitional countries.

3. FDI and ODA in Vietnam

In 1987, the Law of Foreign Investment in Vietnam was officially put into effect, which was the first legislative foundation for the attraction of FDI. However, the collapse of the Soviet Union sharply decreased foreign aid and FDI inflows to Vietnam as almost all foreign capital inflows to Vietnam were from the Soviet Union and other Central and Eastern European countries. According to MPI (2019), after more than 30 years (1987–2019) of “welcoming” FDI, Vietnam attracted more than 27,900 FDI projects with a total registered capital of more than 349 billion USD from 126 countries and territories globally. The disbursement of FDI was 194 billion USD, equal to 55% of the total registered capital. FDI was a

substantial foreign supplementary source (accounting for 25% of the total annual social investment) with high-quality capital in terms of technology and managing experience. However, in the first phase, FDI attraction was called for without any significant concerns relating to the negative effects of foreign capital, and it focused on the number of projects and the size of capital invested. Due to the high expectations of FDI attraction, many provinces offered FDI-favorable policies, which exceeded the “standard” in spreading the “red carpet” for FDI without any consideration on the quality of investment projects. As a result, 94% of FDI enterprises received low and out-of-date technology (MPI, 2019); only 4.3% of the total FDI projects implemented technology transference for FDI enterprises in Vietnam; there was a shortage of prominent investors from developed countries, such as Europe and the United States, and FDI enterprises seriously caused environmental pollution (MPI, 2019). Recently, Resolution 50-NQ/TW issued in 2019 on “Orientation for the completion of institutions, policies for the improvement of quality and efficiency of co-operation in foreign investment towards 2030” has provided instructions on attracting FDI. This resolution emphasizes the autonomy in FDI attraction with a selective basis, which should concentrate on quality, efficiency, technology, and environment protection.

According to the Ministry of Finance, Vietnam has received more than 80 billion USD from foreign aid sources and preferential loans. It makes the country one of the biggest foreign aid receivers globally. In the early stages, foreign aid was provided through grant aids, which account for a large proportion of foreign aid. When Vietnam became a lower-middle-income country, there was a dramatic decrease in the aids granted, while preferential loans and trade loans increased. It poses a big challenge for provinces in Vietnam to foster their capabilities and actively apply innovation in project implementation to promote foreign aid disbursement. The orientation for foreign aid attraction in Vietnam is pursuing a “mixture” loan policy, which would reasonably combine aid, and preferential and foreign loans for the socio-economic development of the country. The current regulation on foreign aid postulates that a province should continue searching for and take advantage of loans from foreign preferential sources based on their reciprocal capital, guarantee for repayment, debt security, and national financial security. Therefore, the efficiency of foreign aid allocation should be considered and prioritized in the construction of infrastructure, institutional reforms, and

business environment rather than being allocated to manufacturing sectors, which is the strength of the private sector.

4. Methodology and Data

4.1. Theoretical models

This paper sets up a theoretical model based on the assumptions of a small opened economy with output per capita y , which grows due to two factors: (i) the accumulation of physical capital per capita k , and (ii) improvement of total factor productivity A . Thus, the Cobb-Douglas production function of this economy can be written in a form as $y = Ak^\alpha$, in which α is a constant that satisfies $0 \leq \alpha \leq 1$. It is also assumed that foreign aid contributes to output by increasing physical capital accumulation k and through the complementary factor or total factor productivity¹.

Assume that a proportion θ of the aid inflow ($0 \leq \theta \leq 1$) contributes to complementary factors and $(1-\theta)$ helps increase physical capital accumulation. The foreign aid flow increasing the initial stock of the total factor productivity is $A = a_0 + \theta * aid$, where aid is the foreign aid per capita and a_0 is an initial value of foreign aid per capita. In a small open economy, physical capital accumulation is funded by both domestic savings and FDI. Thus, the capital accumulation per capita can be expressed as follows:

$$\dot{k} = sy - (n + \delta)k + (1 - \theta)aid + fdi, \text{ or}$$

$$\dot{k} = s(a_0 + \theta * aid)k^\alpha - (n + \delta)k + (1 - \theta)aid + fdi \quad (1)$$

where n is the growth rate of the population; δ is the depreciation rate, which is constant; s is the saving rate; and fdi is the FDI per capita. According to the Solow model, in a steady state, the capital stock level does not change; as such, $\dot{k} = 0$ at any point in time.

¹For example, if foreign aid is invested in applying modern technology in agricultural production or other productive sectors, it would be referred to as supplementary capital. When the aid is spent on road infrastructure projects or projects improving the quality of governance institutions, it is referred to a complementary factor or total factor productivity.

In a small, open economy with free international mobility of capital, the return to physical capital (or marginal products to capital, MPK) is the same across countries. Any increase in foreign capital should reduce the MPK in the recipient country and crowd-out the other sources of capital. When savings are given, any increase in foreign aid, partly increasing physical capital, tends to crowd-out the FDI. The other part of the foreign aid has a complementary effect on the total factor productivity through better governance or modern production technology, which increases the MPK and attracts more FDI inflows. Note that more physical capital results in higher income; as such, it increases domestic savings and investments. A higher domestic investment would lower the MPK and thereby reduce additional attracted FDI inflows.

Based on equation (1), we now derive FDI per capita as a function of foreign aid per capita in the steady state:

$$fdi = (n + \delta)k^* - s(a_0 + \theta aid) k^{*\alpha} - (1 - \theta)aid$$

in which k^* is the level of capital in the steady state. By taking the partial derivatives with respect to aid , we obtain:

$$\frac{\partial fdi}{\partial aid} = (n + \delta) \frac{\partial k^*}{\partial aid} - \alpha k^{*\alpha-1} s(a_0 + \theta aid) \frac{\partial k^*}{\partial aid} - s\theta k^{*\alpha} - (1 - \theta) \leq \geq 0. \quad (2)$$

Equation (2) shows the components involved in the effect of foreign aid on FDI, which can be used to theoretically conclude that foreign aid has mixed effects, either positive, negative, or no impacts on FDI. Therefore, the net impact of foreign aid on FDI is ambiguous in theory. It is worthy to further investigate the empirical evidence to predict the relationship between foreign aid and FDI, and whether corruption influences the impacts of foreign aid on FDI to shed light on policies of foreign aid and FDI management in a specific context.

4.2. Empirical model

Literature reveals that many factors affect FDI inflows (Tintin, 2013). The importance of infrastructure, economic development, governance, culture, and social factors of the host countries in attracting FDI inflows has been found in many previous studies (Asiedu, 2006; Asiedu et al.,

2009; Dunning, 2004; Egger & Winner, 2006; Globerman & Shapiro, 2002; Opoku, 2015; Yiheyis & Cleeve, 2018). Together with the above factors, this paper argues that foreign aid is an important factor determining FDI inflow. However, it is different from the others that the impacts of foreign aid on FDI are examined at the provincial level, where political regime, institutional, and cultural factors insignificantly vary. We argue that foreign aid has a positive impact on FDI inflows, and this effect is stronger in the provinces where there is better governance. The model is possibly specified as follows:

$$\log FDI_{it} = \alpha + \gamma \log AID_{it} + X_{it}\beta + \theta \log AID_{it}X_{it} + \vartheta_i + \varphi_t + \varepsilon_{it} \quad (3)$$

in which the dependent variable is FDI inflow measured in a logarithm, actual AID is in a log form, X_{it} is a vector of other control variables of province i at time t , ϑ_i is unobservable province-specific factors, φ_t is unobservable time factors, and ε_{it} is independent and identically distributed error terms, which are unobservable both from province-specific and time factors. The vector X includes common factors that determine FDI inflow in the literature, such as GDP, level of openness, human capital, population, quality of governance, and state budget size. No further control variable is added here because the omitted variables bias is substantially reduced by including a full set of time dummies, individual province effects, the initial level of GDP per capita, and the lagged level of the dependent variable.

4.3. Estimation issues and methods

The estimated model specified in equation (3) may have the following potential issues. First, it is common in the macro data that aggregation and measurement errors are potential in the annual time-series variables. To overcome these problems and in recognition of the fact that foreign aid and FDI may take time before their effects are felt, we use a 3-year-averaged series, which is suggested by Kimura and Todo (2010) and Yiheyis and Cleeve (2018) for the relatively short sample period. The 3-year-average time-series also possess the advantage of dealing with missing observations. In this case, estimation methods controlling for province-specific effects, such as fixed effects and random effects, which are specified in equation (3), should be used.

Second, the AID variable may possibly show endogeneity. As Harms and Lutz (2006) argue, international donors systematically disburse more foreign aid to those neglected by private foreign investors. It would raise the issue of potential endogeneity and simultaneity bias. The estimated procedure to overcome endogeneity is as follows: (i) We start to estimate the model specified in equation (3) with an instrumentation strategy that follows cross-province studies and uses lags of the own foreign aid variables and lags of other control variables included in the model. (ii) We then use the dynamic generalized method of moments (GMM) for the panel data method introduced by Arellano and Bond (1991), which relies on lagged levels and differences as instruments for regressions in first differences. The difference GMM is used in this paper because of the two following reasons: (i) eliminating the unobservable province-specific factors (individual effect), which helps reduce the chance of endogeneity; (ii) using lagged levels and differences in both dependent and independent variables as instruments to deal with endogeneity. The estimated model specified in equation (4) and the dynamic GMM for the panel data with robust procedures are applied in this regard. Therefore, the estimated model is specified as follows:

$$\log FDI_{it} = \alpha + \rho \log FDI_{i,t-1} + \gamma \log AID_{it} + X_{it}\beta + \theta \log AID_{it} x X_{it} + \vartheta_i + \varphi_t + \varepsilon_{it} \quad (4)$$

Applying the procedure of Arellano and Bond (1991), equation (4) considers the first difference to eliminate the individual effect ϑ_i . The estimated model becomes a difference GMM and has its form in equation (5).

$$\Delta \log FDI_{it} = \rho \Delta \log FDI_{i,t-1} + \gamma \Delta \log AID_{it} + \Delta X_{it}\beta + \theta \Delta \log AID_{it} x \Delta X_{it} + \Delta \varphi_t + \Delta \varepsilon_{it} \quad (5)$$

4.4. Data

In this study, the provincial data are collected from two main sources: the General Statistics Office of Vietnam (GSO) and the Vietnam Chamber of Commerce and Industry (VCCI), which cover 63 provinces/cities in Vietnam over the period 2006–2017. The first data source comprises provincial data related to GDP, foreign aid, FDI, export turnover, import turnover, and state budget revenues, which are all measured in billion dong at the 2010 constant prices. In this database, the seasonality is

adjusted by the Holt-Winter technique. The other two variables of population and trained labor are measured in terms of number of people. The above data are exogenously processed and tested for consistency and homogeneity by the GSO.

The second source includes two sub-indexes of the provincial competitiveness index (PCI) that are exogenously calculated by VCCI and with assistance from the U.S. Agency for International Development (USAID). These indexes reflect the quality of governance in provinces/cities, including transparency and informal charges/corruption control. The transparency index measures whether firms have access to appropriate planning and legal documents necessary to run their businesses, whether those documents are equitably available, whether new policies and laws are communicated to firms and predictably implemented, and the business utility of the provincial webpage. Informal charges/corruption control measures how much firms pay in informal charges, how much of an obstacle those extra fees pose for their business operations, whether the payment of those extra fees results in expected results or “services,” and whether provincial officials use compliance with local regulations to extract rents.

These two sub-indexes are standardized among all provinces/cities and calculated with variation from 0 to 10. When the number is higher, the quality of governance is expected to be better.¹ Basic statistics of the variables are clarified in Table 1.

Table 1: Some descriptive statistic of variables

Variables	Mean	Std. Dev.	Min	Max
Log of FDI	6.019	2.468	0	10.748
Log of AID	5.586	1.879	0	10.101
Log of GDP	9.987	0.925	7.505	13.362
Openness	1.091	1.662	0.003	16.399
Log of population	7.053	0.571	5.670	9.022
Log of state revenue	8.434	0.997	5.997	12.329
Log of trained labor	4.520	0.768	2.532	7.404
Transparency	5.909	0.827	2.150	8.850
Corruption control	6.063	1.021	2.810	8.940

¹ Their computation methods are presented at <http://eng.pcivietnam.org/about/pci-methodology/>.

5. Empirical results and discussion

The paper checks if multicollinearity exists among independent variables in both estimated models. The Pearson correlation matrix is computed and presented in Table 2.

Table 2: Pearson correlation matrix of independent variables

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Log of AID	1.000							
Log of GDP	0.313	1.000						
Openness	0.108	0.433	1.000					
Log of population	0.366	0.839	0.250	1.000				
Log of state revenue	0.036	0.215	0.171	0.089	1.000			
Log of trained labor	0.310	0.841	0.363	0.848	0.158	1.000		
Transparency	0.107	0.297	0.144	0.201	0.055	0.257	1.000	
Corruption control	-0.023	0.009	-0.063	0.025	-0.045	-0.194	0.015	1.000

The correlations among the variables are so low that no evidence of multicollinearity is suspected. To estimate the impacts of foreign aid on FDI specified in equation (3), it is necessary to test if the fixed-effects or random-effect model is consistent. Hausman test results indicate that the fixed-effects model is consistent, and it is used to estimate the impacts of foreign aid on FDI in Vietnam. The fixed-effects models are used for annual panel data and 3-year average panel data as suggested by Kimura and Todo (2010) and Yiheyis and Cleeve (2018). Further, the dynamic GMM for panel estimation models is used to deal with potential endogeneity in the relationship between foreign aid and FDI developed by Arellano and Bond (1991). According to Arellano and Bond (1991) and Blundell and Bond (1998), a sample of $N=65$ and $T=12$ should be a good size of the dataset for dynamic GMM estimation. As discussed above, the difference GMM estimation of dynamic panel models was used in this study. The estimated results are presented in Table 3.

Table 3: Estimated results of the impacts of foreign aid on FDI

	Fixed Effect Models for three-year average data		Fixed Effect Models for annual data		Random Effect Models for annual data		Dynamic GMM Models for annual data	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Lag of log FDI							0.1462** (0.0585)	0.1436** (0.0586)
Log of AID	-0.1337* (0.0761)	-0.1381* (0.0802)	-0.0537* (0.0306)	-0.0505* (0.0293)	-0.0493* (0.0286)	-0.0517* (0.0278)	-0.0619** (0.0283)	-0.0680** (0.0293)
Log of GDP	1.125*** (0.3330)	1.152*** (0.3180)	1.300*** (0.4070)	1.584*** (0.4060)	0.970*** (0.2370)	1.102*** (0.2290)	0.0818 (0.6170)	0.1083 (0.6180)
Openness	0.231*** (0.0670)	0.235*** (0.0662)	0.154*** (0.0420)	0.139*** (0.0422)	0.153*** (0.0341)	0.148*** (0.0344)	-0.0158 (0.0552)	-0.0166 (0.0551)
Log of population	0.5653 (0.5040)	-0.00704 (0.5020)	-3.307** (1.4720)	-2.912* (1.5010)	-2.356* (1.2600)	-2.356* (1.2610)	2.8562 (2.8100)	2.8562 (2.8140)
Log of state budget revenue	0.3876* (0.2030)	0.3672* (0.2000)	0.0953 (0.0671)	0.0768 (0.0675)	0.0216 (0.0546)	0.00837 (0.0550)	0.1036 (0.0765)	0.0972 (0.0767)
Log of trained labor	0.0341 (0.3310)	0.6238* (0.3560)	-0.1571 (0.2890)	-0.1600 (0.2950)	0.102 (0.1960)	0.238 (0.2040)	0.0868 (0.3690)	0.0258 (0.3730)
Transparency	0.2225* (0.1207)		0.207*** (0.0607)		0.128** (0.0636)		0.0761** (0.0390)	
AID*Transparency	0.3081* (0.1784)		0.5584* (0.3306)		0.00216 (0.0330)		0.8641* (0.5065)	
Corr. Control		0.642* (0.3730)		0.9182** (0.4030)		0.751** (0.3789)		0.3096* (0.1869)
AID*Corr. Control		-0.049 (0.0648)		23.7409 (15.4953)		-0.0206 (0.0195)		2.8831 (3.4090)
Constant	-8.095* (4.4120)	-9.318*** (3.4720)	15.172* (8.7142)	8.213 (9.4253)	9.001*** (2.2020)	9.313*** (1.9050)	-14.673 (15.7709)	-16.348 (16.1702)
Observations	252	252	756	756	756	756	630	630
Adj. R-sq	0.21	0.21	0.23	0.24	0.24	0.23		

Note: Standard errors in parentheses;

*, **, and *** denote statistical significance at 10%, 5%, and 1%, respectively

The results presented in columns (1) and (2) are estimated from equation (3) by using the fixed-effects models for the 3-year average panel data in which the quality of provincial governance is proxied by the transparency and corruption control indexes, respectively. Columns (3) and (4) of Table 3 present estimated results using the fixed-effects models, while columns (5) and (6) provide estimates from the random-effect models for annual panel data. Similarly, empirical results presented in columns (7) and (8) are estimated from the dynamic GMM models for annual panel data, which is described in equation (4). Table 3 also provides evidence of a robustness check when four different model specifications are estimated, and in each model, two proxies for provincial governance are used. The estimated results in Table 3 indicate that robustness of results is achieved. The study also conducted two post-estimation tests to check whether the estimated model is specified. First, the study conducted a test for autocorrelation. The test result indicated auto-correlation in first-differenced residuals confirming no misspecification in the estimated model. Second, the Sargan test of overidentifying restrictions was performed and its result failed to reject the null hypothesis, meaning that it was not weakened by many instruments. The results of those tests showed that the dynamic GMM estimated models are specified.

Empirical results from the fixed effect (for both 3-year average and annual data), random effect, and dynamic GMM panel data models consistently indicate that foreign aid hurts FDI. The results suggest that foreign aid and FDI are substitutes and that foreign aid contributes to economic growth by increasing physical capital. When foreign aid is invested as a substitute for FDI, it decreases the marginal product of capital and then lowers FDI inflow as theoretically predicted. This empirical result suggests that foreign aid allocated into provinces has not been served as a supplementary capital source for provincial capitals, such as investments in the human capital, infrastructures, institutional reforms, and quality of governance. Therefore, the contribution of foreign aid has not fostered the marginal product of capital and FDI inflow at the provincial level. This result is explainable at the provincial level, where they can use foreign aid resources without strict responsibility for their investment. It would lead to the lower efficiency of foreign aid allocation and use, corruptive local government, and then restrict the attraction of more FDI inflow into the provinces. These empirical results of rent-seeking effects of foreign aid and FDI at the provincial level within a country are similar to the findings (Harms & Lutz, 2006; Karakaplan et al., 2005; Kimura & Todo, 2010).

Another estimated result is that the negative impacts of foreign aid on FDI are indifferent across-province with varying quality of governance. The estimated result indicates that interaction terms between foreign aid and governance variables, including transparency and corruption control, turned out to be mixed, statistical insignificance for the interaction terms of foreign aid and corruption control, but statistical significance at 10% for the interaction term of foreign aid and transparency. These empirical results suggest that foreign aid allocation based on transparency can mitigate the attractiveness of recipient provinces to foreign private investors. In other words, foreign aid would be a more supplementary capital source of FDI in more transparent provinces. However, the impacts of foreign aid on FDI are indifferent among provinces where their corruption control varies. It is common in places where corruption is considered a norm (Le et al., 2021; Nguyen et al., 2016).

Further, there are some interesting empirical results. Provinces with higher openness of their economy would attract more FDI and provinces with a better quality of governance have statistically significant effects on FDI inflows. These results also suggest the importance of integration and quality of provincial governance on FDI attractive policies.

6. Conclusion

This paper investigates the impacts of foreign aid on FDI at the provincial level in Vietnam during 2006–2017. Theoretically, the impacts of foreign aid on FDI are ambiguous as foreign aid may have two opposite effects: substitution and complementary on FDI inflows. The empirical results obtained using the difference GMM for panel data estimation techniques reveal that foreign aid harms FDI inflows and the impact is stronger in more transparent provinces. The results suggest that foreign aid has been used as a substitute for FDI, or in other words, it has not improved the attractiveness of recipients to foreign private investors. It may naturally raise the question of discovering an optimal balance between foreign aid to developing countries and how they should be distributed between physical capital and complements to capital. The positive effects of two proxies for quality of governance on FDI inflow into provinces imply that foreign aid should be allocated to make institutional changes, making foreign aid more meaningful in signaling investment to foreign investors.

The paper has two limitations. Data availability does not allow to check whether the “Vanguard effect” exists. It is believed that foreign aid from Korea and Japan may have the “Vanguard effect” as Vietnam has received a huge amount of foreign aid and FDI from Korea and Japan. This is a potential issue for further research on the impacts of foreign aid on FDI in an emerging/transitional country such as Vietnam. Another limitation of this paper is the availability of foreign aid by types of commitment. A further study can break foreign aid down into various parts and better understand the far-reaching effects of foreign aid on FDI inflows.

Although the study has some limitations, it may provide several implications. From a theoretical perspective, the impact of foreign aid on FDI inflows not only depends on the types of aid commitment but also the quality of governance. The complement or substitute effects of foreign aid on FDI are moderated by governance quality. From a managerial perspective, the study may provide some policy implications. First, foreign aid attraction and allocation should focus on areas that would increase the attractiveness of FDI inflows. It should be considered a new agenda for foreign aid allocation and management in Vietnam. Foreign aid should not be allocated to state-owned enterprises for their production expansion or other substitutes for FDI capital. Second, the provincial government should gradually improve its quality of governance, focusing on transparency and corruption control. Actions that make provincial governance better would increase the attractiveness of foreign investors. They also increase the impacts of foreign aid on FDI at the provincial level. Third, potentially, a decrease in foreign aid when Vietnam becomes a lower medium-income country could be offset by FDI inflows because of the substitution effects empirically found between foreign aid and FDI inflows. It could be opened for FDI capital invested in state-owned enterprises in the sectors that do not require state control.

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The FDI and Economic Growth in the Western Balkans: The Role of Institutions

Edib Smolo¹

ABSTRACT

This study explores the impact of foreign direct investment (FDI) and institutional quality on the economic growth of the Western Balkan economies – Albania, Bosnia and Herzegovina, Montenegro, North Macedonia, and Serbia. The conventional wisdom says that FDI plays a significant role in economic development and that institutional development may also affect this relationship. Using a panel data analysis for 20 years (2000-2019) and in contrast to this conventional wisdom, the study shows that FDI significantly negatively impacts growth within the sample countries. At the same time, the results indicate that institutional development has a significantly negative or no role on growth directly. The results depend on the proxy used for institutional development. Furthermore, when FDI and institutional development measures interact, both indicators become insignificant, including their interaction terms. This may be because the institutions within the sample countries are at low levels of development to make any significant impact on either growth or FDI-growth relationship.

ملخص

تستكشف هذه الدراسة تأثير الاستثمار الأجنبي المباشر (FDI) والجودة المؤسسية على النمو الاقتصادي لاقتصادات غرب البلقان - ألبانيا والبوسنة والهرسك والجبل الأسود ومقدونيا الشمالية وصربيا. وتفيد الحكمة التقليدية أن الاستثمار الأجنبي المباشر يلعب دورا مهما في التنمية الاقتصادية وأن التطور المؤسسي قد يؤثر أيضا على هذه العلاقة. باستخدام تحليل بيانات اللوحة لمدة 20 عاما (2000-2019) وعلى عكس هذه الحكمة التقليدية، تُظهر الدراسة أن الاستثمار الأجنبي المباشر يؤثر بشكل كبير على النمو داخل بلدان العينة. وفي الوقت نفسه، تشير النتائج إلى أن التطور المؤسسي له دور سلبي أو لا دور له في النمو بشكل مباشر. وتعتمد النتائج على الممثل المستخدم للتطوير المؤسسي. وعلاوة على ذلك، عندما يتفاعل الاستثمار الأجنبي المباشر وتدابير التنمية المؤسسية، يصبح كلا

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المؤشرين غير مهم، بما في ذلك شروط التفاعل بينهما. وقد يكون هذا بسبب أن المؤسسات داخل بلدان العينة في مستويات منخفضة من التطور لإحداث أي تأثير كبير على علاقة النمو أو نمو الاستثمار الأجنبي المباشر.

ABSTRAITE

Cette étude explore l'impact des investissements directs étrangers (IDE) et de la qualité des institutions sur la croissance économique des économies des Balkans occidentaux - Albanie, Bosnie-Herzégovine, Monténégro, Macédoine du Nord et Serbie. La sagesse conventionnelle veut que les IDE jouent un rôle important dans le développement économique et que le développement institutionnel puisse également affecter cette relation. En utilisant une analyse de données de panel sur 20 ans (2000-2019) et contrairement à cette sagesse conventionnelle, l'étude montre que les IDE ont un impact négatif significatif sur la croissance au sein des pays de l'échantillon. Par ailleurs, les résultats indiquent que le développement institutionnel a un rôle significativement négatif ou nul sur la croissance directement. Les résultats dépendent de l'indicateur utilisé pour le développement institutionnel. En outre, lorsque les mesures des IDE et du développement institutionnel interagissent, les deux indicateurs deviennent non significatifs, y compris leurs termes d'interaction. Cela peut s'expliquer par le fait que les institutions dans les pays de l'échantillon sont à des niveaux de développement faibles pour avoir un impact significatif sur la croissance ou sur la relation IDE-croissance.

JEL classification: C23, E2, F21, F43, O43, P2

Keywords: institutional development, foreign direct investment, FDI, economic growth, transition economies, Western Balkan.

1. INTRODUCTION

The Western Balkan region that encompasses Albania, Bosnia and Herzegovina, Kosovo, Montenegro, North Macedonia, and Serbia has been the central stage to several world affairs that sometimes changed the global history. During the 1990's period, the region faced several military conflicts that, for several years, impacted the region's development. Since then, these countries have been moving to the market economy at a languid pace. Although significant changes have been introduced within the countries' economic and political arena, they are far from meeting the European Union's (EU) standards to which the region aspires.

Impacts of foreign direct investment (FDI) and institutional development attracted significant attention among researchers. Depending on the underlying conditions in a particular state, these variables may cast different effects on economic growth. However, the overall impact of FDI and institutional development is expected to be positive. In particular, it is expected that FDI would lead to spillovers and technological innovation of know-how to the less developed economies (Kisswani et al., 2015). Thus, any type of FDI is generally welcomed, especially in the case of transition economies such as those from the Western Balkans. The significance of FDI is closely related to the development of financial sectors and institutions, political stability, and the quality of human capital. Perhaps among the main reasons for low levels of FDI inflow into the Western Balkan region are the underdevelopment of financial sectors and institutions.

As economic growth is affected by many factors, the same is true for FDI inflows. According to Hunady and Orviska (2014), a country's economic openness, labor and firing costs, income level, public debt, and financial and economic crisis significantly impact FDI. At the same time, the study finds no significant effect of corporate tax rates on FDI. All these point to the importance of institutional quality and effectiveness for the practical impact of FDI on growth.

Being transition economies, the Western Balkan countries are undertaking numerous institutional reforms. Over the years, improvements have been made on this ground, but much needs to be done. The region is ranked among the highest corrupted ones where the rule of law is at its lowest. (Popovic et al., 2020). These factors affect the foreign direct investment (FDI) inflows and economic growth of these countries.

The Western Balkans countries in particular and transition economies, in general, are in dire need of FDI inflows that would support infrastructural and other developmental projects that could boost economic growth. The main objective of this study is to look at the effect of FDI and institutional development on economic growth, focusing on the Western Balkans countries. These countries are important for several reasons. First, due to its strategic position within geopolitical and geoeconomic relations, the region represents an overall threat to the stability of the EU and the wider area. Functional and stable economies of the region would benefit the stability of the EU as well. Second, the Western Balkan countries are potential candidates for the EU enlargement agenda. Inheriting countries

with weak institutions could lead to possible disagreement between the EU member states and eventually the EU's instability. Third, being transition economies, the study provides an evaluation of the institutional development of the region. This can also be seen as a success or a failure of the EU, as the EU has played an active role in the region's development since the 1990s.

For this research, we will apply the pooled OLS and fixed-effects methods developed by Driscoll-Kraay (1998). This method is the best suitable for the sample where the period (T) is larger than group (N). By using Driscoll-Kraay standard errors regression, we will be able to meet the objective.

The rest of the paper is structured as follows. Section 2 provides a literature review. Section 3 describes the data and methodology used, while section 4 discusses empirical results. Finally, Section 5 offers concluding remarks.

2. LITERATURE REVIEW

The relationship between economic growth and the level of FDI on one side and institutional quality/development on the other has attracted considerable attention among scholars, yet results are far from being conclusive. In the following subsections, we are discussing these studies and their findings briefly.

Over the years, the developed world attracted the majority of the international FDI. However, in recent years this trend has been changing. According to the World Investment Report (UNCTAD, 2019), the global flows of FDI in 2018 decreased to \$1.3 trillion (from \$1.5 trillion in 2017) with a fall of 13 percent, the lowest since the 2008 global financial crisis. The inflows to developing countries have been steadily rising with an annual 2 percent increase and have now reached a share of 54 percent of the global FDI amount, an all-time high.

When it comes to empirical studies, the literature provides conflicting results. For instance, Blomstoern et al. (1992) found a positive correlation between FDI inflows (measured as a percentage of GDP) and GDP per capita across developed countries. They argue the countries with higher per-capita income levels benefit from FDI inflows more than countries with lower per capita income levels. According to them, local businesses in developing countries are too far behind in technological and

human capital levels, making them less competitive and less attractive to large corporations. Similar findings are reported by Bengoa & Sanchez-Robles (2003), Zhang (2001), Elboiashi (2015), and Borenstein (1998). They emphasized how FDI inflows are highly significant for the economy only if the host country meets minimum requirements of human capital needed, i.e., that the economy is absorbent enough to use and efficiently utilize the FDI.

In contrast to the above studies, some authors challenge the positive impact of FDI on economic growth. For instance, FDI inflows may reduce the labor productivity and local firms' comparative advantages, as the results show that firms not receiving FDI had better performance in specific regional industries (Lutz & Talavera, 2004; Minović et al., 2021). Further, Anetor (2020) finds that FDI has a significantly negative impact, while portfolio investment has a positive but insignificant effect on the economic growth of sub-Saharan African (SSA) countries. In addition, other studies show no significant impact of FDI on development either in developed or developing economies (Carkovic & Levine, 2002), 17 transition economies of the Central and Eastern Europe region (Lyroudi et al., 2004), as well as in the case of three different country groups² (Angelopoulou & Liargovas, 2014) and the Western Balkan countries (Estrin & Uvalić, 2016).

Similarly, the literature on institutional development and economic growth relationship attracted a lot of attention among researchers. The literature's most commonly used institutional development measures are property rights, press freedom, bureaucratic procedures, democracy levels, political stability, business environment indices, and others. While research results are primarily straightforward, suggesting the positive impact of a highly-developed institutional framework on economic growth, many factors influence institutional development itself. Consequently, Murtaza and Faridi (2016) find that efficient government and functional democracy lead to institutional efficiency that eventually lead to economic growth in the case of Pakistan. In the case of SSA countries, institutional quality contributes to economic growth both directly and indirectly through public debt (Sani et al., 2019). Similarly, reviewing the literature over the 1992–2016 period, Urbano et al. (2019)

² The three different groups are 27 EU, 16 EMU member states, and 18 transition economies with an emphasis on different levels of economic integration within the unions as well as across the states individually.

claim that institutions contribute to economic growth through entrepreneurship.

Controlling nations' bureaucratic quality, property rights, and political stability is crucial for economic growth and investment (Knack & Keefer, 1995). In line with that, corruption negatively impacts economic growth (Easterly, 1999; Hakimi & Hamdi, 2017; Minović et al., 2021). Similarly, the concentration of political authority in few hands within a society (an elite segment with great political power, as is the case with the majority of the Western Balkan countries) would lead to institutions and regulations that benefit only a tiny proportion of the society (Nigar, 2015). Hence, this leads to non-efficient resource allocation, directing them to the upper-income level of society and hindering the economic growth prospects (Sonin, 2003; Nigar, 2015).

In this regard and based on the existing literature, both FDI and institutions are necessary for economic growth. Improving overall institutional quality would lead to better economic growth and FDI inflows (Van Bon, 2019; Hayat, 2019; Raza et al., 2019). These results, however, are more evident for the low and middle-income countries. As for the high-income countries, the study found that FDI inflows slow down economic growth (Hayat, 2019). Corruption – another proxy of institutional development – hinders the economic growth of MENA countries by negatively affecting investment and FDI inflows (Hakimi & Hamdi, 2017). Furthermore, Haini (2020) found a positive and significant impact of the rule of law on economic growth, and it plays a complementary role in financial development. The complementary role of institutional quality is also found by Kutan et al. (2017), who detects the positive impact of FDI inflows on growth.

In contrast, Agbloyor et al. (2016) found no impact of either FDI or institutions on growth in SSA countries. The results also show that the effect of FDI on growth is not affected by institutions. Also focusing on SSA, Asamoah et al. (2019) found positive and negative impacts of institutional quality and FDI on economic growth. On top of that, while positive on growth, institutional quality hinders the positive effects of FDI and trade openness on growth (Nguyen et al., 2018). It seems that the positive impact of FDI on economic growth depends on the level (threshold) of institutional development (Jude & Leveuge, 2015; Trojette, 2016). Hence, before attracting FDI, developing countries should enhance their institutional quality.

All in all, this study contributes to and fills in the gaps within the existing literature on FDI-institutions-growth relationships in several ways. First, the current literature on FDI-growth, institutions-growth, FDI-institutions-growth relationships provides mixed results. Second, these relationships have not been adequately addressed within the Western Balkan countries. Only a few papers discuss this region that is strategically very important for the overall stability of the EU and the region. Furthermore, these countries are on the EU membership waiting list, and this membership is subject to, among other things, countries' institutional development that is currently not at the desired level. This study represents an attempt to quantify the existing conditions of institutions within the region and provide valuable recommendations to policymakers. Third, the sample countries belong to the transition economies group of countries undergoing structural changes moving from a command economy to a market economy. As such, they belong to developing economies. The existing literature indicates that the impact of FDI and institutions on growth within those countries is different from their impacts on the growth of developed, well-established market economies. While a broader list of transition economies may provide specific results due to heterogeneity, the Western Balkan countries share many similarities that could provide meaningful insight into relationships under investigation.

3. DATA AND METHODOLOGY

3.1 Model and Methods Used

Numerous estimation techniques have been used in the literature, from the pooled OLS (POLS), the random effect (RE), the fixed effects (FE), to the instrumental variable (IV) estimator, and the generalized methods of moments (GMM) method. The GMM method is suitable for models with a long (N) and a short (T). However, our sample consists of a short (N) and a relatively long (T) as we have a panel consisting of only 5 countries and covering 20 years. Hence, we cannot use the GMM technique.

The RE method assumes that each country in our sample has its error term. For this method to work, these individual error terms are not to be correlated with our explanatory variables. If this assumption is not valid, the RE estimation results would be inconsistent and biased. In contrast, the FE method, also known as the least squares dummy variable (LSDV),

assumes different constants for each country in the sample (Asteriou et al., 2005; Flannery & Hankins, 2013).

However, many panel data suffer from cross-sectional or ‘spatial’ dependence, as Driscoll and Kraay (1998) claimed. This is especially true for macroeconomic studies with a non-random selection of groups (states, countries, or industries) over time. These groups are ‘subject to both observable and unobservable common disturbances.’ Failing to tackle the issue of spatial dependence, standard techniques would produce consistent parameters but with inconsistent standard errors (Driscoll & Kraay, 1998; Hoechle, 2007). In other words, for standard errors in panel data studies to be valid, cross-sectional individuals should be uncorrelated (Vogelsang, 2012). Transforming the orthogonality conditions addresses issues of spatial and temporal dependence. Even though the spatial correlation consistent standard error estimator requires a large T , it is found to provide superior results even in finite-samples with short T compared to traditional techniques that do not cater to spatial dependence (Driscoll & Kraay, 1998).

For this purpose, we use the STATA command ‘xtscc’ developed by Hoechle (2007). It provides POLS and FE (within) estimates with Driscoll and Kraay’s (1998) standard errors. The Hausman test (Hausman, 1978) is used to choose between POLS and FE models. However, to get a robust Hausman test in the case of spatial and temporal dependence, we follow Hoechle (2007), who fits the auxiliary regression suggested by Wooldridge (2002) with Driscoll and Kraay’s standard errors. The null hypothesis of no FE, i.e., that $E(\alpha + \varepsilon_{it}|X_{it}) = 0$ is tested. A significant p-value ($p < 0.05$) of the F stat from the test of $\gamma = 0$ rejects the null and supports FE. Otherwise, we should rely on the POLS estimator (see Hoechle, 2007).

Thus, in line with Azam and Ahmed (2015), we use the following model to estimate the impact of FDI and institutional development on economic growth:

$$Y_{it} = \alpha + \beta FDI_{it} + \delta ID_{it} + \theta X_{it} + \varepsilon_{it} \quad (1)$$

where for country i (the cross-sectional dimension) at time t (the time dimension), Y_{it} is the annual real per capita GDP growth rate, FDI_{it} represents FDI inflows, ID_{it} is a measure of institutional development, X_{it} is a vector of all control variables, and ε_{it} is a random error term that

captures all other variables. A similar model has been used by (Hayat, 2019; Trojette, 2016; Van Bon, 2019). Estimation using model (1) above will show the effects of the FDI and institutional development on economic growth in our sample countries.

Furthermore, to see whether the FDI-growth relationship depends on institutional development, we introduce an interaction term to equation (1) as presented in equation (2) below:

$$GDP_{it} = \alpha + \beta FDI_{it} + \delta ID_{it} + \vartheta(FDI_{it} \times ID_{it}) + \theta X_{it} + \varepsilon_{it} \quad (2)$$

where $FDI_{it} \times ID_{it}$ represents the interaction variable. Other terms are as defined earlier.

Having an interaction term in our dynamic panel data model will help us evaluate the impact of the lagged value of growth, FDI, institutional development, and our control variables on growth. At the same time, it will help us evaluate the impact of institutional development on the FDI-growth nexus. Finally, in line with Hayat (2019), we transform all variables in natural logarithm form except GDP, FDI, and institutional quality variables.

3.2 Data

To investigate the relationship between FDI and institutional development on one and economic growth on the other side, the study utilizes few panel data techniques on the Western Balkan countries – Albania, Bosnia and Herzegovina, Montenegro, North Macedonia, and Serbia.³ These economies are relatively small, developing, and transitioning from planned/command to market economy.

In this regard, the study will use annual time series data of the selected macroeconomic indicators. All data are sourced from the World Bank's database and cover the period of 2000-2019, making it a total of 20 years.⁴ As we are covering 20 years and 5 countries (cross-sectional units), there should be 100 observations in total (20 x 5). However, as

³ Although Croatia belongs to the Western Balkans, we excluded it from the sample as she joined the EU on 1 July 2013. On the other hand, there are sufficient data for Kosovo and thus we excluded Kosovo from the study as well.

⁴ We opt for this period due to the fact that majority of the Western Balkan countries went through turbulent times during the '90s and it took some years for these countries to get their economies back on track.

several countries reported no data, each variable's total number of observations may not be the same. However, we are dealing with a strongly balanced panel.

Following the existing literature, this study uses the real per capita GDP growth (GDP) to measure economic growth. Several studies use different FDI proxies. Still, the most common proxy for FDI is net FDI inflows as a percentage of GDP. Institutional development is measured either by overall institutional quality (control of corruption, political stability, and the rule of law) from the Heritage Foundation (Procházka & Čermáková, 2015) or by institutional development variable provided by the World Governance Indicators (WGI) developed by Kaufmann et al. (2010). Kaufmann et al. (2010) mention six indicators of institutional quality, namely: estimates of control of corruption (CCE), government effectiveness (GEE), political stability (PSE), regulatory quality (RQE), the rule of law (RLE), and voice and accountability (VAE). These indicators are measured on a scale from -2.5 to $+2.5$, where the largest scale implies superior institutional quality and vice versa.

Following Buchanan et al. (2012), we consider all those indicators individually to test their impact on growth and FDI-growth relationship. We cannot use them jointly in a single equation as these indicators are highly correlated (Globerman & Shapiro, 2002; Buchanan et al., 2012). For this reason and in line with Knack and Keefer (1995), Globerman and Shapiro (2002), Buchanan et al. (2012), and Sani et al. (2019), we use the principal component analysis (PCA) to construct the institutional quality (IQ) index based on those indicators.

As for control variables, we use several macroeconomic variables to control their impacts on economic growth as the literature points out their significance in determining economic growth. In particular, we use gross capital formation (GCF) representing investment (Ibrahim et al., 2017), trade openness (TO), the labor force (LF) as measured by the total number of the labor force, and inflation (I) (Beck et al., 2014; Bist, 2018; Ibrahim et al., 2017; Sabir et al., 2019; Swamy & Dharani, 2019; Trojette, 2016).

Table 1 presents the descriptive statistics of the variables used in this study. A significant variation of the real GDP per capita growth is evident in Table 1, with mean and standard deviation being 3.7 percent and 2.7 percent, respectively. The lowest negative GDP per capita growth of -5.99 percent is recorded in Montenegro and the highest, 9.31 percent, in

Albania. The same is true for FDI and institutional development as measured by the Heritage Foundation. The FDI ranges from 0.54 percent in North Macedonia to 37.27 percent of GDP in Montenegro. Institutional development is lowest in Bosnia and Herzegovina and highest in North Macedonia. A great deal of variation is detected in the case of inflation that ranges from a minimum of -2.76 percent to a maximum of 86.83 percent. To take the logarithm, we add a constant number 3 to the inflation rate. As described earlier, all institutional quality variables are in the -2.5 and 2.5 range.

Table 1: Descriptive Statistics

Variable	Sign	Obs	Mean	Std. Dev.	Min	Max
GDP per capita growth (annual %)	GDP	100	3.7	2.703	-5.997	9.311
FDI - net inflows (% of GDP)	FDI	88	7.047	5.595	.536	37.272
Institutional development	ID	99	58.069	7.45	36.6	71.3
Institutional quality index	IQ	100	-.687	.212	-1.382	-.303
Control of corruption: estimate	CCE	100	-.404	.236	-1.177	.023
Government effectiveness: estimate	GEE	100	-.152	.575	-.96	2.766
Political stability: estimate	PSE	100	-.247	.428	-1.643	.816
Regulatory quality: estimate	RQE	100	-.018	.325	-.856	.885
Rule of law: estimate	RLE	100	-.349	.294	-1.272	.335
Voice and accountability: estimate	VAE	100	.032	.187	-.638	.336
Gross capital formation (% of GDP)	GCF	100	24.388	6.15	9.165	41.177
Trade (% of GDP)	TO	100	90.523	19.101	22.492	138.827
Labor force - total	LF	100	1,406,622.2	993,922.84	231,387	3,354,615
Inflation - GDP deflator (annual %)	INF	100	6.281	12.533	-2.758	86.826

4. ANALYSIS OF RESULTS

Table 2 provides the estimated results based on Eq (1) using the pooled ordinary least square (POLS) and the fixed-effects (FE) estimators with Driscoll-Kraay standard errors and various indicators for institutional development. In particular, models (1) and (2) are using institutional development (ID) proxy based on the Heritage Foundation data; models (3) and (4) rely on the institutional quality (IQ) index constructed applying PSA on six institutional quality indicators developed by Kaufmann et al. (2010). Furthermore, each of these six indicators is used

individually. Hence, control of corruption (CCE), government effectiveness (GEE), political stability (PSE), regulatory quality (RQE), rule of law (RLE), and voice and accountability (VAE) and used in models (5) and (6), (7) and (8), (9) and (10), (11) and (12), (13) and (14), and (15) and (16), respectively.

As pointed out in the previous section, we use the Hausman test, as suggested by Hoechle (2007), to determine whether we should rely on FE or POLS results. Based on this test, FE estimation results are preferred except when ID is used in model (1), where we should rely on results provided by the POLS estimator. Furthermore, the R² results from Table 2 reveal that our models explain from 71.4 percent to 78.5 percent variation in economic growth.

In general, our results indicate that FDI has a significantly negative impact on economic growth in the selected Western Balkan countries. These results align with results reported by Anetor (2020) and partially with those of Lutz and Talavera (2004). As for institutional development, the results are inconclusive and even conflicting depending on a proxy used. ID, a proxy from the Heritage Foundation, reveals a significantly negative impact of institutional development on economic growth. Having in mind widespread corruption and overall (under)development of institutions in our sample countries, this result comes as no surprise and support arguments provided by Easterly (1999), Sonin (2003), Nigar (2015), Hakimi and Hamdi (2017) and Minović et al. (2021). In other models, our proxies for institutional development are either positive or negative but insignificant in all relevant models, the finding in line with those of Agbloyor et al. (2016).⁵

As for control variables, GCF is found to have a significantly positive impact on growth in all models, which is not the case with other variables (Anetor, 2020). In models (1) and (12), INF has a negative and significant impact (Anetor, 2020), while the significantly positive effect of TO is found only in the model (12) (Nigar, 2015). Finally, LF has an insignificant impact on growth with positive and negative signs (Nigar, 2015).

In short, based on the estimation results from Table 2, we can conclude

⁵ Significantly negative impact is found in the case of regulatory quality estimate (RQE) using POLS in model (11). However, based on the Hausman test, we should rely here on FE estimation results from model (12).

that FDI decreases economic growth significantly when it comes to the Western Balkan countries. However, based on the majority results, we find no direct impact of institutional development proxies on growth. This could be attributed to deficient levels of institutional development (and overwhelming corruption) within the sample countries. It is pointed in previous studies that they need to reach certain levels to affect growth after all (see Jude & Leveuge, 2015; Trojette, 2016).

The FDI and Economic Growth in the Western Balkans:The Role of Institutions
Table 2: FDI-Institutions-Growth nexus: GDP per capita as the dependent variable

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
	POLS	FE	POLS	FE	POLS	FE	POLS	FE	POLS	FE	POLS	FE	POLS	FE	POLS	FE
FDI	-0.085** (0.030)	-0.138** (0.048)	-0.059 (0.034)	-0.143** (0.051)	-0.059 (0.034)	-0.143** (0.051)	-0.045 (0.043)	-0.141** (0.043)	-0.143 (0.071)	-0.141* (0.057)	-0.095* (0.040)	-0.143** (0.049)	-0.060 (0.036)	-0.136* (0.051)	-0.088 (0.047)	-0.136* (0.050)
ID		-0.177** (0.045)														
IQ			1.322 (1.203)	2.566 (2.034)												
CCE					1.188 (1.081)	2.306 (1.828)										
GEE							-1.043 (0.714)	3.318 (1.579)								
PSE									1.826 (1.015)	0.243 (0.748)						
RQE											-4.444** (1.445)	-3.089 (1.816)				
RLE													-0.250 (2.429)	0.292 (1.810)		
VAE															2.130 (1.407)	-0.375 (1.132)
GCF	5.475** (1.558)	3.719** (0.823)	3.737* (1.642)	3.902** (1.023)	3.737* (1.642)	3.902** (1.023)	3.580* (1.519)	4.504*** (0.975)	2.940* (1.132)	3.548** (1.097)	5.484** (1.557)	3.485** (0.971)	3.367** (1.191)	3.471** (0.953)	3.568* (1.522)	3.323** (0.960)
TO	-1.436 (0.692)	1.769 (1.440)	-0.889 (0.986)	1.170 (0.794)	-0.889 (0.986)	1.170 (0.794)	0.048 (1.195)	0.672 (1.360)	-0.372 (0.911)	1.765 (1.640)	0.250 (0.925)	2.866* (1.263)	-0.011 (2.079)	2.090 (1.440)	-0.110 (1.116)	2.297 (1.274)
LF	-0.016	2.587	0.384	-1.910	0.384	-1.910	0.301	-0.228	0.311	3.364	0.101	6.117	0.297	3.417	0.233	3.416

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
	POLS	FE	POLS	FE	POLS	FE	POLS	FE	POLS	FE	POLS	FE	POLS	FE	POLS	FE
INF	(0.282)	(5.252)	(0.392)	(8.363)	(0.392)	(8.363)	(0.351)	(4.821)	(0.364)	(5.337)	(0.221)	(6.279)	(0.341)	(5.067)	(0.333)	(5.427)
	-0.428*	-0.394*	-0.396	-0.321	-0.396	-0.321	-0.280	-0.339	-0.196	-0.364	-0.368*	-0.387*	-0.356	-0.364	-0.297	-0.391
	(0.169)	(0.174)	(0.190)	(0.174)	(0.190)	(0.174)	(0.214)	(0.199)	(0.242)	(0.175)	(0.140)	(0.180)	(0.209)	(0.194)	(0.143)	(0.197)
Constant	4.744	-48.978	-	16.578	-	15.747	-	-6.967	-	-62.811	-	-104.432	-	-62.080	-	-62.580
	(8.077)	(70.975)	-	(115.810)	-	(115.227)	-	(64.665)	-	(70.486)	-	(86.251)	-	(67.195)	-	(73.120)
Year Dummy	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Obs.	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88
No. of groups	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
R ²	0.771	0.778	0.716	0.778	0.716	0.783	0.720	0.785	0.739	0.778	0.772	0.784	0.714	0.778	0.722	0.778
F-stat.	138.350	3930.461	121.206	5411.237	121.206	2569.580	143.064	7480.445	91.247	1629.249	17.603	7489.395	263.605	448.203	111.860	6346.370
F-stat. <i>p</i> -val.	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.006)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Hausman	-	1.872	-	14.277	-	14.004	-	6.275	-	27.484	-	10.490	-	28.228	-	27.265
Hausman <i>p</i> -val.	-	(0.282)	-	(0.012)	-	(0.012)	-	(0.050)	-	(0.003)	-	(0.020)	-	(0.003)	-	(0.003)

Note: Regression with Driscoll-Kraay standard errors. GDP - GDP per capita growth (annual %); FDI - Foreign direct investment, net inflows (% of GDP); ID - Institutional development; IQ - Institutional quality; CCE - Control of corruption: estimate; GEE - Government effectiveness: estimate; PSE - Political stability: estimate; RQE - Regulatory quality: estimate; RLE - Rule of law: estimate; VAE - Voice and accountability: estimate; GCF - Log of Gross capital formation (% of GDP); TO - Log of Trade (% of GDP); LF - Log of Labor force - total; Log of Inflation - GDP deflator (annual %). Standard errors in parentheses. Significance level *** p<0.01, ** p<0.05, * p<0.10.

Table 3: FDI-Institutions-Growth nexus: interaction models

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
	POLS	FE	POLS	FE	POLS	FE	POLS	FE	POLS	FE	POLS	FE	POLS	FE	POLS	FE
FDI	-0.650 (0.408)	-0.126 (0.309)	0.109 (0.400)	-0.229 (0.287)	0.016 (0.180)	-0.183 (0.136)	0.000 (0.072)	-0.138 (0.072)	-0.122 (0.083)	-0.116 (0.061)	-0.071 (0.043)	-0.125* (0.050)	-0.071 (0.058)	-0.197** (0.044)	-0.136 (0.109)	-0.157 (0.076)
ID	-0.225*** (0.043)	-0.038 (0.055)														
FDIxID	0.010 (0.007)	-0.000 (0.005)														
IQ			-0.193 (3.194)	3.055 (3.278)												
FDIxIQ			0.289 (0.687)	-0.142 (0.478)												
CCE					-0.173 (2.871)	2.745 (2.946)										
FDIxCCE					0.260 (0.617)	-0.128 (0.430)										
GEE							-2.757 (2.271)	3.229 (2.427)								
FDIxGEE							0.360 (0.374)	0.018 (0.256)								
PSE									2.545** (0.832)	1.091 (0.852)						
FDIxPSE									-0.103 (0.104)	-0.113 (0.107)						
RQE											-6.050** (1.886)	-4.328 (2.695)				
FDIxRQE											0.307 (0.234)	0.145 (0.176)				
RLE													0.456 (4.720)	4.019 (3.555)		
FDIxRLE													-0.073 (0.377)	-0.319 (0.236)		

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
	POLS	FE	POLS	FE	POLS	FE	POLS	FE	POLS	FE	POLS	FE	POLS	FE	POLS	FE
VAE																
FDIXVAE																
GCF	5.648** (1.481)	3.699** (1.033)	3.931* (1.624)	3.910** (1.038)	3.931* (1.624)	3.910** (1.038)	4.086* (1.521)	4.546** (1.153)	2.855* (1.194)	3.722** (1.176)	5.624** (1.508)	3.827** (1.144)	3.440** (1.225)	3.629** (0.924)	3.563* (1.427)	3.168** (0.937)
TO	-1.062 (0.763)	1.786 (1.398)	-0.985 (1.102)	1.224 (0.864)	-0.985 (1.102)	1.224 (0.864)	0.085 (1.219)	0.634 (1.657)	-0.086 (0.832)	1.836 (1.483)	0.840 (0.714)	2.760* (1.237)	-0.006 (2.055)	2.663 (1.484)	-0.428 (1.163)	2.241 (1.339)
LF	0.105 (0.300)	2.597 (5.425)	0.516 (0.550)	-1.449 (7.434)	0.516 (0.550)	-1.449 (7.434)	0.564 (0.423)	-0.264 (4.462)	0.216 (0.332)	1.257 (6.557)	0.276 (0.243)	7.029 (6.165)	0.287 (0.345)	3.079 (4.459)	0.274 (0.374)	4.192 (7.036)
INF	-0.274 (0.215)	-0.396* (0.184)	-0.420* (0.194)	-0.337* (0.140)	-0.420* (0.194)	-0.337* (0.140)	-0.208 (0.256)	-0.335 (0.178)	-0.298 (0.257)	-0.431** (0.148)	-0.239 (0.144)	-0.359 (0.174)	-0.392 (0.303)	-0.453* (0.195)	-0.235 (0.202)	-0.379 (0.191)
Constant	-	-48.209 (74.839)	-	10.309 (102.828)	-	9.320 (102.000)	-	-6.461 (59.685)	-	-31.807 (87.739)	-	-116.266 (84.715)	-	-58.455 (61.054)	-	-72.579 (93.574)
Year Dummy	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Obs.	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88
No. of groups	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
R ²	0.777	0.778	0.721	0.783	0.721	0.783	0.736	0.785	0.747	0.788	0.782	0.786	0.714	0.793	0.728	0.779
F-stat.	61.283	5399.392	94.365	3273.533	94.365	3273.529	120.158	2048.126	852.773	4119.241	200.439	401.769	444.186	1813.803	242.516	2876.669
F-stat. p-val.	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Hausman	-	1.762	-	23.027	-	23.430	-	4.973	-	27.719	-	13.839	-	22.009	-	20.136
Hausman p-val.-		(0.302)	-	(0.005)	-	(0.005)	-	(0.073)	-	(0.003)	-	(0.012)	-	(0.005)	-	(0.006)

Note: Regression with Driscoll-Kraay standard errors. GDP - GDP per capita growth (annual %); FDI - Foreign direct investment, net inflows (% of GDP); ID - Institutional development; FDIxID - FDI & ID interaction term; IQ - Institutional quality; FDIxIQ - FDI & IQ interaction term; CCE - Control of corruption; estimate; FDIxCCE - FDI & CCE interaction term; GEE - Government effectiveness; estimate; FDIxGEE - FDI & GEE interaction term; PSE - Political stability; estimate; FDIxPSE - FDI & PSE interaction term; RQE - Regulatory quality; estimate; FDIxRQE - FDI & RQE interaction term; RLE - Rule of law; estimate; FDIxRLE - FDI & RLE interaction term; VAE - Voice and accountability; estimate; FDIxVAE - FDI & VAE interaction term; GCF - Log of Gross capital formation (% of GDP); TO - Log of Trade (% of GDP); LF - Log of Labor force - total; Log of Inflation - GDP deflator (annual %). Standard errors in parentheses. Significance level *** p<0.01, ** p<0.05, * p<0.10

Now, we turn to **Table 3** that provides results for *Eq (2)* that investigates the impact of FDI and institutions on growth and whether the FDI-growth relationship depends on levels of institutional development. Based on the Hausman tests, the results based on FE estimations are preferred except in models (1) and (7), where we should rely on POLS.

In general, introducing interaction terms in our models makes the majority of our main variables insignificant. For instance, FDI has a significantly negative impact, in line with our previous results, only in models (12) and (14). In other models, we find it both positive and negative but insignificant (Carkovic & Levine, 2002; Lyroudi et al., 2004; Angelopoulou & Liargovas, 2014; Estrin & Uvalić, 2016). Similarly, the majority of institutional development coefficients are insignificant. The significantly negative impact of institutions on growth is confirmed only in the model (1). However, the results indicate no significant effect of institution on FDI-growth relationship as interaction terms are statistically insignificant. Similar results are reported by Agbloyor et al. (2016), Asamoah et al. (2019), and Trojette (2016). It seems that both FDI and institutions need to be developed further to affect economic growth significantly. As pointed by Jude & Levieuge (2015) and Trojette (2016), institutional development should reach a threshold to affect either growth or FDI-growth relationship.

5. CONCLUSION

This study revisited the FDI-growth and institution-growth relationships, focusing on five Western Balkan economies – Albania, Bosnia and Herzegovina, Montenegro, North Macedonia, and Serbia. Moving from the command to market economies, these countries underwent significant economic, political, and social changes that led to structural and institutional changes.

Focusing on the 2000-2019 period and utilizing the Driscoll-Kraay standard errors regression, this study shows that FDI inflows have a significantly negative impact on growth. The effect of institutional development, on the other hand, is inconclusive. While the overall institutional development proxy developed by the Heritage Foundation reveals the same impact on growth as FDI, the other proxies are predominantly insignificant. Furthermore, the interaction model indicates that the effect of FDI is negative but insignificant, while the results for institutional development remain the same. Nevertheless, all interaction

terms are insignificant, showing that neither FDI nor institutional development impacts economic growth. Hence, the overall (under)development of institutions and pervasive corruption in our sample countries could be the main reasons for the insignificant impact of the institution on growth directly or indirectly via the FDI-growth relationship.

Policymakers within the Western Balkan region, thus, should focus on improving the overall quality of institutions on one side and implementation of effective anti-corruption policies that would curb corruption on the other. Furthermore, the policymakers should find out the reasons behind the negative impact of the existing FDI on economic growth to reverse the situation. At the same time, the EU policymakers should put more pressure on the regional governments to develop and implement effective structural changes that would promote institutional development and restrain corruption activities. Without joint efforts by the domestic and EU policymakers, the Western Balkan region will still be lagging behind the EU member states and continue to attract less and less FDI inflows for its development projects.

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**Determinants of FDI Inflow in BRICS Countries:
Role of Globalization and Corruption Control**

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ABSTRACT

This study investigates the determinants of FDI inflows in BRICS countries – the fastest-growing and the most resource-full group of developing countries in the world. Data from the five BRICS countries were analysed using the fixed effect, ARDL, and Dumitrescu and Hurlin Granger causality tests. Alongside multiple models, robustness was checked using additional proxies for corruption, stability, and openness. ARDL offered the benefits of testing both short- and long-run interactions. Globalization, corruption control, market size, and economic growth exhibit strong positive influence on FDI inflow. Financial development (credit to GDP ratio) negatively influences FDI inflow. Corruption exhibits a ‘U-shaped’ relationship with FDI inflows. When combined using a moderation effect, globalization and corruption control exerts a better strategic impact on FDI inflow than their stand-alone impact. MNEs will prefer a country as their next destination that carries a ‘regionally integrated’ open economic policy, bigger local market size, and clear policies to mitigate risk attached to corruption and excessive domestic credit. Grounded on the globalization-growth literature, our findings on the globalization and FDI inflow nexus is noble find for the developing countries. Contrary to extant ambiguous findings, we offer clear evidence that FDIs can influence financial market development policies in developing economies. We propose a two-layer strategic FDI decision frame for MNEs that can help profile international investment.

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ملخص

تبحث هذه الدراسة في محددات تدفقات الاستثمار الأجنبي المباشر في بلدان البريكس (البرازيل وروسيا والهند والصين وجنوب أفريقيا)- المجموعة الأسرع نمواً والأكثر تشييعاً بالموارد من البلدان النامية في العالم. وتم تحليل البيانات من دول البريكس الخمسة باستخدام التأثير الثابت والانحدار الذاتي للإبطاء الموزع واختبارات السببية لدوميتريسكو وهولدين غرانجر. وإلى جانب نماذج متعددة، تم التحقق من المتانة باستخدام عوامل تمثيلية إضافية للفساد والاستقرار والانفتاح. الانحدار الذاتي للإبطاء الموزع عرض فوائده اختبار التفاعلات قصيرة وطويلة المدى. وبينما تُظهر العولمة والسيطرة على الفساد وحجم السوق والنمو الاقتصادي تأثيراً إيجابياً قوياً على تدفق الاستثمار الأجنبي المباشر الوارد، تؤثر التنمية المالية (نسبة الائتمان إلى الناتج المحلي الإجمالي) سلباً عليه. ويظهر الفساد علاقة "على شكل حرف U" مع تدفقات الاستثمار الأجنبي المباشر الواردة. وعند الجمع بين استخدام تأثير المباشر من تأثيرهما المستقل. وستفضل الشركات متعددة الجنسيات كوجهة تالية الدولة التي تطبق سياسة اقتصادية مفتوحة "متكاملة إقليمياً"، وحجم سوق محلي أكبر، وسياسات واضحة للتخفيف من المخاطر المرتبطة بالفساد والائتمان المحلي المفرط. واستناداً إلى أدبيات العولمة والنمو، فإن النتائج التي توصلنا إليها حول العلاقة بين العولمة وتدفقات الاستثمار الأجنبي المباشر هي أنها صندوق تمويل للبلدان النامية. وعلى عكس النتائج الغامضة القائمة، فإننا نقدم أدلة واضحة على أن الاستثمار الأجنبي المباشر يمكن أن يؤثر على سياسات تطوير الأسواق المالية في الاقتصادات النامية. ونقترح إطار قرار استراتيجي من طبقتين بشأن الاستثمار الأجنبي المباشر للشركات متعددة الجنسيات من شأنه أن يساعد في تحديد معالم الاستثمار الدولي.

ABSTRAITE

Cette étude examine les déterminants des entrées d'IDE dans les pays BRICS - le groupe de pays en développement à la croissance la plus rapide et aux ressources les plus abondantes au monde. Les données des cinq pays BRICS ont été analysées à l'aide des tests de causalité à effet fixe, ARDL, et Dumitrescu et Hurlin Granger. Outre les modèles multiples, la robustesse a été vérifiée en utilisant des indicateurs supplémentaires pour la corruption, la stabilité et l'ouverture. L'ARDL offre l'avantage de tester les interactions à court et à long terme. La mondialisation, le contrôle de la corruption, la taille du marché et la croissance économique ont une forte influence positive sur les entrées d'IDE. Le développement financier (ratio crédit/PIB) influence négativement les entrées d'IDE. La corruption présente une relation en forme de "U" avec les entrées d'IDE. Lorsqu'ils sont combinés à l'aide d'un effet de modération, la

mondialisation et le contrôle de la corruption exercent un meilleur impact stratégique sur les entrées d'IDE que leur impact autonome. Les entreprises multinationales préféreront comme prochaine destination un pays doté d'une politique économique ouverte "intégrée au niveau régional", d'un marché local de plus grande taille et de politiques claires pour atténuer les risques liés à la corruption et à un crédit intérieur excessif. Fondées sur la littérature relative à la mondialisation et à la croissance, nos conclusions sur le lien entre la mondialisation et les flux d'IDE sont nobles pour les pays en développement. Contrairement aux résultats ambigus existants, nous offrons des preuves claires que les IDE peuvent influencer les politiques de développement des marchés financiers dans les économies en développement. Nous proposons un cadre de décision stratégique d'IDE à deux niveaux pour les multinationales qui peut aider à profiler l'investissement international.

Keywords: KOF Globalization index; Corruption; BRICS; FDI inflow; Strategic FDI; Granger causality.

JEL Classification: F21; F68; D73; C23.

1. Introduction

Globalization-growth hypothesis states that openness promote international business (Nunnenkamp, 2002; Dreher, 2006; Zahongo, 2017). Also, growth-FDI hypothesis indicates that higher economic growth is an important factor that MNEs analyse before making a FDI decision (Izadi, Rashid and Izadi, 2021). Regional integration for cooperation, such as the BRICS, intends to achieve cooperation among member countries to boost trade, engage in foreign direct investment (FDI), risk sharing, and sustain growth (Kose et al., 2009). Due to diverse risks related to the degree of expected globalization, such as the corruption, inferior economic growth and competitive advantage, Multinational Companies (MNEs) attempt to achieve strategic or targeted globalization (Goldberg and Klein, 1997), which has given birth to BRICS-like pockets of integration. Therefore, to reduce the search cost for next destination, MNEs will rely on 'strategic' motive by staying around large consumer markets and by balancing risk of the host country (i.e., political, social, and economic risks) (Demirbag, Glaister and Sengupta, 2020; Buckley et al., 2020; Narula and Dunning, 2010). While globalization-growth nexus influences FDI, more profoundly so in the developed and industrialized countries, the relationship between globalization and FDI is rarely studied for the strategically integrated

countries, such as the BRICS. This study aims to investigate the influence of globalization, corruption control, among other determinants, on the FDI inflow in BRICS countries.

Foreign Direct Investment (FDI) is an important driving force of economic growth in emerging economies. FDI brings along new technologies, capitals, skills, and knowledge that stimulate domestic market growth (Izadi, Rashid and Izadi, 2021; Saini and Singhania, 2018; Tsaurai, 2018). FDI is often more resilient than other forms of private capital flows, especially during financial crisis, as evidenced by the reversal of investment during Latin American crisis of the 1980s, Mexican crisis of 1994-95, and Asian financial crisis of 1997-98 (Dadush, Dasgupta and Ratha, 2000). In spite of a global reduction of FDI inflows, UNCTAD reports that countries in BRICS – Brazil, Russia, India, China, and South Africa – have experienced growth in FDI inflow (refer to Figure A1 and Figure A2 in appendix). BRICS countries are collectively the most resourceful developing countries with the largest domestic markets. BRICS countries are directly and indirectly part of the China-led Belt and Road Initiative, which clearly forwards a ‘strategic’ view of FDI.

Since the inception of the World Trade Organization, pockets of regional and strategic partnerships have gained significant attention in several blocks of countries (Asongu, Akpan, and Isihak, 2018). These countries either share a common cultural language or are regionally integrated. MNEs feel comfortable with a regional FDI policy not only to balance their cost and convenience, but also to understand their risk mitigating capacity in the host country (Demirbag, Glaister and Sengupta, 2020; Buckley et al., 2020). A mixed bag of factors that influence FDIs in BRICS include openness, proximity to the market and customers, and improvement of institutional quality through control of corruption. Much of these developments in BRICS are derived from the growth of Chinese and Indian influence on trade and investment (Gusarova, 2019). Despite having relatively large markets, lower labor cost, and massive reserves of natural resources, BRICS countries often face criticisms on policies related to limited openness, extreme nationalization, lack of corruption control and instable regional political stability (Nistor, 2015).

Past results on the determinants of FDI inflows in developing and emerging economies are mixed. Despite numerous positives of FDI flowing into developing countries, increased competition, resource

fragmentation, and institutional complexities are some of the common risk factors that MNEs must factor in while investing in developing countries (Hassan, Rashid and Castro, 2016; Rashid, Looi, and Wong, 2017). Janicki and Wunnava (2004) study the determinants of inward FDI for eight transitional Central and East European economies. Asiedu (2002) found market size, country risk, labour cost and trade openness as determinants of FDI flowing into Sub-Saharan African (SSA) countries. Asiedu (2002) reported that trade openness has a positive impact, whereas infrastructure and high return on investment show no significant impact on FDI in selected SSA countries. Hassan et al. (2016) found FDI negatively related to interest rates, and strong bi-directional positive causality between investor sentiment and FDI inflow. Rashid et al. (2017) found that GDP, trade openness, and political stability positively affected FDI inflows while inflation rate negatively impacted FDI inflows in Asia Pacific countries. Other factors influencing FDI include stock market development (Tsaurai, 2018); market size, and (low) labor cost (Khamphengvong, Xia and Srithilat, 2018); and economic growth (Saini and Singhania, 2018).

This study considers data on five BRICS countries for the period of 2000-2015. Alongside traditional determinants of FDI inflow, such as the economic growth, market size, financial development, and political stability, we have employed KOF Globalization Index, several proxies for corruption control and openness for robustness test. Empirical analyses were conducted using fixed effect, EGLS, ARDL and Granger causality models. Our results indicate that countries with higher rate of globalization, better corruption control, large domestic markets and higher economic growth will receive more FDI, in the short- as well as long-run. Globalization and market size also Granger caused FDI inflow.

We compare our findings against two groups of FDI literature. First, we consider a group of general FDI papers on BRICS. While Ranjan and Agrawal (2011), Vijayakumar, Sridharan and Rao (2010) and Jadhav (2012) study the most common determinants of FDI inflow in BRICS, we add on the globalization-FDI nexus on BRICS. Our results present that if globalization and corruption control can be coupled together, countries that are equally open and less corrupted will see a significant growth in FDI inflows. Our results also suggest that large domestic credit as a proxy for financial development may dishearten foreign investors. Second, our findings draw attention to another group of papers on globalization and

growth literature. We extend the impact of globalization on FDI with similar positive and causal impacts, as observed in existing studies on globalization and growth nexus (Salahuddin et al., 2019; Zahonogo, 2017). Contrary to the existing literature, the results from the Granger causality tests found that Globalization and Market Size Granger caused FDI inflow. We also found that FDI Granger caused financial development. While adding to the body of the most recent financial development-FDI nexus literature (See Tsaurai, 2018), the causal relationship between FDI and financial development indicate that FDI inflow may increase the demand of bank-led financial development, which may in turn hurt foreign investment in the long-run. Therefore, our findings strongly support the strategic nature of foreign investment in BRICS, when compared to most common resource-seeking view of FDI. Our results are robust across proxy variables and methods.

Next, chapter 2 discusses the past literature, theories, and relevant hypotheses to be tested. Chapter 3 explains the methodology and data. Chapter 4 presents the results. Chapter 5 discusses findings and concludes the study with implications for theory and policy making.

2. Past Studies and Hypotheses

2.1 FDI in BRICS countries

Among the developing economies, BRICS countries (Brazil, Russia, India, China, and South Africa) stand as the most significant emerging markets due to their fast-growing economies, large populations and increasing industrialized markets (refer to Table A1 in appendix). In 2015, share of FDI in BRICS was 33% of the FDI in all developing economies. Following sections give a brief update on the FDIs in BRICS countries.

2.1.1 China:

China moved to the second position, after United States, in terms of the top recipient of FDIs between 2018-2019. In 2015, China reported an inflow of USD 135 billion. China's massive domestic market, at 1.3 billion customers strong, coupled with a booming economy and inexpensive labor force allows it to be an attractive destination for FDI. However, there are also problems that hinder foreign investment such as

unregulated intellectual property rights, lack of transparency and corruption.

2.1.2 Brazil:

Brazil, as the largest emerging market in Latin America showed significant increase in FDI inflow from USD 49 billion in 2015 to USD 67 billion in 2017; the second largest leap amongst its BRICS counterparts, after China. The country appeals to international investors due to its large domestic market, rapid growth of economy, diversified economic structure and strategic hub among other South American countries. However, factors such as an extremely complicated tax system, strict labor laws and red tape make the country less competitive when compared to other developing countries.

2.1.3 India:

India is the third largest FDI recipient among BRICS countries. The country has received an average of USD 40 billion a year between 2015 to 2018. India is also known for its skilled, English-speaking and inexpensive labor, and above-average middle class earning families. India has placed restrictions on FDIs in several areas which deters investors from an otherwise huge opportunity in the retail sector.

2.1.4 Russia:

Before sanctions imposed by the U.S. and its allies, Russia stood its ground as one of the largest FDI recipients worldwide back in 2013 with over USD 70 billion in foreign investment. However, its flow of FDI declined between 2016 (of USD 37 billion) and 2018 (of USD 13 billion). Russia makes for an otherwise attractive place of investment; amidst an unstable political climate and complicated accounting legislations which only hinder foreign investment. Various economic reforms and tax deductions have been initiated with the intent to attract foreign investment.

2.1.5 South Africa:

Despite criticism for harsh labor laws, high crime rates, and increasing levels of corruption, South Africa has seen some significant progress in attracting foreign investment. The country reported USD 1.79 billion of

FDI in 2016, going up to USD 5.33 billion in 2018. South Africa has made significant strides towards the global Halal tourism industry – aiming to contend in its global projected value of USD 250 billion by the year 2021.

2.2 General Determinants of FDI

We summarize a long list of FDI determinants in three groups – a) openness, b) market size, growth, and development, and c) corruption and stability.

2.2.1 Openness:

Studies found positive influence of openness on FDI in global context (see Rashid et al., 2017 for discussion). Going one step further, the term globalization has attracted much attention since the last quarter of the 20th century due to competitive advantages of nations in financial markets, product and manufacturing supply chain, and labor market. While studies on the impact on globalization on economic growth is widely available, the same relationship between globalization and FDI is rare, particularly from the perspective of regional globalization that includes BRICS.

When studying globalization, researchers offer three dimensions to its influence. Firstly, starting with one of the oldest, Nunnenkamp (2002) forwards findings of the impact of globalization on FDI in 28 developing economies. While globalization has helped channel FDI through international trade, its impact on FDI is rarely studied, when compared to the extensive list of market-driven traditional factors. Even with globalization's questionable impact, Goldberg and Klein (1997) found hope for “negotiated (regional) globalization” in smaller sets of countries; particularly while considering the bilateral exchange rate between firms in United States, Japan and Southeast Asia. Secondly, due to the increased importance of regional globalization, Narula and Dunning (2010) proposed that the motives of FDIs are changing from merely “resource-seeking” to “strategic”, led by the industrial demand for FDIs. According to their study, in the era of mobile and knowledge-intensive asset creation, FDI-receiving economies must produce FDI-driven development strategies in order to attract quality and sustainable direct investments.

Thirdly, globalization may influence FDI through economic growth or market size. There exists wide assembly of literature on relationship

between economic growth and FDI (see for reference Yu and Walsh, 2010; Eicher, Helpman and Lenkoski, 2012; Tang and Tan, 2014; Otchere, Soumaré and Yourougou, 2015) and economic growth and globalization (Dreher, 2006; Zahongo, 2017). Most studies find a positive connection between FDI and economic growth, and economic growth and globalization. Countries with larger internal markets, i.e., China and India in BRICS, and/or faster economic growth potentials are expected to derive the best out of globalization. Globalization is also found to benefit large industrial and developed nations in terms of increased risk sharing and financial development when compared to their developing counterparts (Kose et al., 2009). In order to reach a robust impact of globalization on FDI in the BRICS countries, we hypothesize that:

H1: Higher degree of openness (i.e., overall globalization) carries a positive impact on FDI in BRICS countries.

2.2.2 Market size, growth and development:

MNEs prioritize countries with higher economic growth while choosing their next destination (Demirbag et al., 2020). GDP growth has been one of the important determinants of FDI inflow (Kirchner, 2012). Results of GDP growth rate on BRICS countries are mixed. Ranjan and Agrawal (2011) reported a positive impact whilst taking industrial production as a proxy for economic growth, Vijayakumar et al. (2010) reported an insignificant relationship between growth and FDI. Looking at the rising importance of economic growth in emerging economies, we hypothesize that:

H2: Higher GDP growth has a positive impact on FDI in BRICS.

A large market size is essential to exploit economies of scale and efficient utilization of resources. Past studies find a strong correlation between GDP size and the FDI inflows (Ang, 2008; Hassan et al., 2014). Market size is a reliable positive determinant of FDI inflows in BRICS countries (Ranjan and Agrawal, 2011; Vijayakumar et al., 2010; Jadhav, 2012). Three proxies are used to measure size: GDP per capita, GDP in absolute form, and FDI to GDP ratio. The third one is preferred considering the population bias in the first and second proxies. Observing the robust positive impact of market size on FDI inflows, the study hypothesizes that:

H₃: Market size will have a positive impact on FDI inflow in BRICS countries.

Financial development, taking domestic credit over GDP as a proxy, is a measure of bank-led financing support for MNCs in the host market. Essentially, a higher ratio, keeping other things constant, will attract both FDI and portfolio investors. The connection between financial development and FDI is explained from two dimensions: direct connection and indirect connection through economic growth. King and Levine (1993) and Levine and Zervos (1998) found support for the positive connection between economic growth and financial development, while Agarwal and Mohtadi (2004) discussed evidence for a positive connection between bank lending and FDI. Contrary to existing belief of a positive connection, Ramirez (2018) found a negative relationship between stock index return and FDI while analysing a set of developing countries. Pindzo and Vjetrov (2013) considered stock market development in Central Eastern European countries and found a positive connection with FDI inflow. Also, higher credit may signal riskiness (Yong et al., 2012). On the other hand, establishing a lower risk point is necessary for the MNEs to invest in host country (Balan, 2019). Despite strong domestic credit market growth in China, India and South Africa, the financial development of BRICS countries has not been studied in-depth. With the view to fill up this link, the study hypothesized that:

H₄: Higher financial development attracts more FDI inflows in BRICS countries.

2.2.3 Corruption and quality:

Quality institutions play an important role in attracting FDI by creating an impression that corruption, to a higher degree, is controlled. Campos, Lien and Pradhan (1999) study the influence of corruption on investment in developing countries by pooling samples from the East Asian countries. Their analyses reveal that highly corrupted countries with high predictable rate of bribery witnessed fewer negative impacts on new investment than countries perceived to be more highly corrupted with relatively lower degree of bribe predictability. While studies on corruption control in BRICS countries are limited, Jadhav (2012) investigated governance quality and corruption control in BRICS countries with mixed results on governance quality, as some components

positively influenced FDI while others proved insignificant. His results on corruption control found an insignificant connection to FDI. Given the importance of and limited research on corruption for BRICS economies, this study hypothesizes that:

H₅: Higher level of corruption control (lower level of corruption) increases (decreases) FDI flowing into BRICS countries.

3. Data and Methodology

3.1 Data

BRICS include five countries – Brazil, Russia, India, China, and South Africa. Table 1 shows brief descriptions, sources, and measurements of the variables used in the study. All amounts are presented in United States Dollars. FDI inflows (in natural log) is the dependent variable. This study has considered a data frame that is longer than recent studies on BRICS countries. The range, from 2000 to 2015, is considered due to incomplete data for Russia and South Africa, and limited data on globalization index. Hence, the dataset includes (sixteen years and five countries) eighty year-country observations. The study excluded recent few years of available data ranging from 2016-2018 as the global decrease in net FDI inflow may distort the overall findings of the study. Also, 2016-2018 is an extremely short period to be examined separately. Most data were collected from the database of the World Bank and Worldwide Development Indicators. The Corruption Perception Index data was collected from the Transparency International. Globalization data was collected from KOF index of globalization. Trade Openness, Political Stability, and Corruption Perception Index were used to check robustness of the results. Following section further emphasizes on globalization index and corruption control variables.

3.1.1 KOF Globalization index:

KOF Swiss Economic Institute manages KOF globalization index (GLOB). GLOB is a multi-dimensional index comprising of economic, social, and political globalization. The index was first published in 2002 by Dreher (2006) and re-examined by Dreher, Gaston and Martens (2008). The index is defined as a “process” that connects countries and cultures beyond borders through integration of national economies,

governance practices, and social systems. The items considered in the index are listed in Table A2 in appendix. The index reports value ranging from ‘1’ to ‘100’; ‘100’ representing the most globalized country. Economic globalization represents economic openness of a country, which includes trade and investment connectivity and restrictions among countries. Political globalization considers the relationship among countries in terms of membership in international association and operating overseas missions and embassies. Social globalization presents the degree of social integration, migrant and foreign population, interconnectivity and even having a branch (per capita) of McDonald’s or Ikea.

3.1.2 Corruption control:

World Bank publishes corruption control as a perception index that represents the “capture” of private interests using public power (Kaufmann, Kraay and Mastruzzi, 2010). The scores are presented in the form of a standard normal distribution, ranging from -2.5 to +2.5. We took Corruption Perception Index (CPI) as a proxy for robustness check. CPI is published by the Transparency International as an index based on the perception of the business community and country experts on public sector corruption. Using mean and standard deviations from the year 2012 as the benchmark, CPI produces standard normal scores ranging from ‘0’ to ‘100’, where ‘0’ represents countries with the highest level of “perceived” corruption and ‘100’ represents countries with the lowest level of “perceived” corruption.

Grounded on the panel data methods, the basic testable model is given in equation (1). The model includes five determinants of net FDI inflow. Notations for the variables in equation (1) can be found in Table 1. In equation (1), a_{it} presents the intercept term, while μ_{it} is used for the error term. CPI, TROP and POST will be used to test for robustness (Table 1). Expected signs for the CPI is negative, for trade openness is positive, and for political stability is positive.

$$NFDI_{it} = a_{it} + \beta_1 GLOB_{it} + \beta_2 GDPG_{it} + \beta_3 SIZE_{it} + \beta_4 FIND_{it} + \beta_5 COCO_{it} + \mu_{it} \quad (1)$$

Table 1: Descriptions of the variables

Notation	Meaning	Definition/ measurement	Source
NFDI	Net inflow of FDI	Natural Log of the foreign direct investments' net inflows.	World Bank
GLOB	Overall KOF Globalization index	Natural log of the Overall KOF globalization index based on Dreher (2006) – a combined openness using social, economic, and political globalization indices.	KOF Swiss Economic Institute
GDPG	GDP growth	Annual growth of real GDP.	World Bank
SIZE	Market size	FDI net inflow over GDP.	Word Bank
FIND	Financial development	Domestic credit over GDP.	World Bank
COCO	Corruption control	Perception of the extent to which public power is exercised for private gain.	Worldwide Governance Indicators
POST	Political stability	Perception of the likelihood that the government will be destabilized or overthrown by unconstitutional or violent means.	Worldwide Governance Indicators
TROP	Trade openness	Sum of exports and imports over GDP	World Bank
COPI	Corruption perception index	Natural log of the aggregate quantitative perception of corruption in public sector.	Transparency International

Notes: POST, TROP, and COPI will be used for robustness test.

3.2 Empirical analyses

Table 2 reports the descriptive statistics and Table 3 shows the correlation matrix. Graphical representation of the variables for selected years is presented in Figure A3 in appendix. Testing on the selection of the basic panel model (fixed versus random effect models) was performed using the Hausman test. The panel in this study has longer time series

component and smaller cross-section components. Similar panels may suffer from serial-correlation problem (Kim, 2010; Baltagi and Kao, 2000). To resolve these issues, several Panel ARDL tests were conducted (Pesaran, Shin and Smith, 1999). Regular Fixed Effect Models are adjusted using Estimated GLS (EGLS) models that helps to avoid serial-correlation problem. In addition, ARDL models offer opportunities to explain both short- and long-run relationships between the determinants and FDI inflows. For a general case of $NFDI_{it}$ as the dependent variable for the cross-section 'i' for 'i' = 1, 2, ... N, and time 't' where 't' = 1, 2, ... T, following is our ARDL model (in equation 2) for the five independent variables with K x 1 vector:

$$\begin{aligned}
 NFDI_{it} = & \sum_Z^P \vartheta_{it} NFDI_{i,t-Z} + \sum_Z^P \theta_{it} GLOB_{i,t-Z} + \sum_Z^P \theta_{it} SIZE_{i,t-Z} \\
 & + \sum_Z^P \theta_{it} GDPG_{i,t-Z} + \sum_Z^P \theta_{it} FIND_{i,t-Z} \\
 & + \sum_Z^P \theta_{it} COCO_{i,t-Z} + \varepsilon_{it}
 \end{aligned} \tag{2}$$

Where, $\varepsilon_{it} = \delta_i P_t + \omega_{it}$, which also represents the random error for cross-section 'i'. P_t is used to present the vector of observed factors. NFDI is the net FDI inflow, GLOB is the overall globalization, SIZE is the market size, GDPG is the growth of GDP, FIND is the financial development, and COCO stands for corruption control. Results for fixed effect and ARDL models are presented in Table 4.1 and 4.2.

To add an in-depth emphasis on globalization and FDI, we examined the data for causality. Recent studies on FDI – economic growth nexus considered Granger causality on vector autoregressive (VAR) or vector error correction (VEC) models (Sothan, 2017). We tested panel Granger causality offering individual coefficient. As China differentiated itself from the rest of the countries on the aspect of inward FDI, we tested for cross-section specific coefficient using Dumitrescu and Hurlin (2012) test. Also, unique data structure in BRICS case, with relatively fewer cross-section compared to longer time-series ($T > N$) and the possibility of cross-section slope heterogeneity, matches the prerequisites of D-H

tests (Akbas, 2013). Essentially, Granger causality is built upon bivariate regression, which will report the causality in a pair of two variables (Granger, 1969). Usual pre-tests on panel unit roots and lag-length selection were conducted. Results on Granger causality are presented in Table 5.

Table 2: Descriptive statistics

Items	NFDI	GLOB	GDPG	FIND	COCO	SIZE	COPI	POST	TROP
Mean	49.04	60.00	5.72	100.74	-0.32	2.50	1.53	-0.57	46.37
Max	290.92	70.30	14.19	196.93	0.61	6.00	1.70	0.37	72.86
Min	0.62	44.41	-7.82	20.81	-1.08	0.20	1.32	-1.52	22.10
Std. Dev.	65.72	6.76	3.54	53.94	0.44	1.30	0.10	0.50	13.75

Notes: NFDI = Net FDI Inflows, GLOB = Overall KOF Globalization Index, GDPG = GDP Growth, FIND = Financial Development, COCO = Corruption Control, SIZE = Market Size, COPI = Corruption Perception Index, POST = Political Stability, TROP = Trade Openness. Figures are calculated before transforming data.

Table 3: Correlation matrix

Items	NFDI	GLOB	GDPG	FIND	COCO	SIZE	COPI	POST	TROP
NFDI	1.000	0.045	0.342	-0.113	-0.447	0.741	-0.182	-0.024	-0.159
GLOB		1.000	-0.230	0.539	-0.127	0.236	-0.039	0.301	0.440
GDPG			1.000	0.243	-0.262	0.202	-0.165	-0.322	0.235
FIND				1.000	-0.314	-0.013	-0.160	-0.256	0.964
COCO					1.000	-0.129	0.869	0.662	-0.194
SIZE						1.000	0.002	0.225	-0.036
COPI							1.000	0.712	-0.014
POST								1.000	-0.190
TROP									1.000

Notes: NFDI = Net FDI Inflows, GLOB = Overall KOF Globalization Index, GDPG = GDP Growth, FIND = Financial Development, COCO = Corruption Control, SIZE = Market Size, COPI = Corruption Perception Index, POST = Political Stability, TROP = Trade Openness.

4. Results

4.1 General and descriptive findings (Table 2, 3 and Figure A3)

While the average FDI inflow stayed at USD 49 billion, average maximum FDI inflow reached USD 291 billion. China received the highest amount of FDI among BRICS countries. Average GDP growth rate was 5.73%. The highest average of financial development (percentage of domestic credit to GDP) reached 197%. The negative average value of corruption control (COCO) or alternatively positive average value of corruption perception index (COPI) establishes that average countries in BRICS have experienced higher level of corruption. The average FDI inflow was 2.5% of the GDP, with the maximum average reaching 6%. Across the board, BRICS suffered from political instability. Average export and import combined was 46% of GDP, while the highest average was 73%. Comparison of trade openness and market size indicates that most BRICS countries' internal market activities, including production, consumption, and export, are powerful factors for MNCs to consider when investing in these countries. Overall, BRICS countries have received above average FDI inflows compared to other developing countries. These countries are characterized by higher levels of trading activities, above average globalization scores albeit with higher degrees of corruption and political instability. The correlation matrix (Table 3) presents that Political Stability (POST) is highly correlated with Corruption Control (COCO) and Corruption Perception Index (COPI). Also, Trade Openness (TROP) is strongly positively connected to Financial Development (FIND). Hence, these variables were carefully utilized in the final testing to avoid multi-collinearity problem.

4.2 Choice of model, panel unit root and lag-length selection

Table 4.1 and 4.2 offer nine models (FE (1) through FE (9) using fixed effect estimations and four models (ARDL (1) through ARDL (4) using ARDL estimations. ARDL models show long- and short-run estimations and the possibility of error correction. In order to choose between Random and Fixed Effect models, Hausman test was conducted. The null hypothesis for the test was that the random effects were efficient. The result reports a Chi-square value of 39.334 ($p = 0.000$), which rejects the null hypothesis indicating a preference for fixed effect over the random effect models. Fixed effect model imposes a time independent effect for

each cross-section that may correlate with variables, thus helping to control unobserved heterogeneity correlated to variables and are constant over time.

Results for panel unit root and lag-length selection are given in the appendix Table A3 and Table A4. Following Pesaran (2015), Augmented Dicky Fuller (ADF) and Phillips-Perron (PP) test results are summarised. We have also added results on Levin-Lin-Chu t test. Null hypothesis of these tests was that the series is non-stationary. Our results exhibit mixed results for NFDI and GLOB, even where the ADF and PP tests find all variables to be stationary upon initial differentiation. Due to difference in order of integration, ARDL was used. Results of the lag-length selection to help with the Granger causality tests are presented in appendix Table A4. While Akaike Information Criteria (AIC) supported up to two lags, we proceeded with Schwarz Information Criteria (SIC) and Hannan-Quinn Information Criteria (HQ) supporting one lag at maximum.

4.3 Most consistent determinants of FDI inflow

Based on fixed effect and ARDL tests, Globalization (GLOB) and Market Size (SIZE) are the two most consistent and positive determinant of FDI inflow in BRICS. Economic Growth (GDPG) also influences FDI inflow positively, albeit less consistently than globalization and size; like the Corruption Perception Index (COP). While the expected sign for COP was positive, only one ARDL model, out of the four, found a significant relationship. Notwithstanding, Corruption Control (COCO) and Financial Development (FIND) have shown consistent negative influence on FDI inflows. Political stability (POST) and Trade openness (TROP) are found to be insignificant. Since the correlation between these two variables proved to be higher with some key variables of the study, we have excluded them from further analysis. The signs from the three factors - GLOB, SIZE and COCO - are consistent with the initial estimations. Notably, countries with higher degrees of globalization, corruption control, and large domestic markets will attract more FDIs. Interestingly, higher domestic credit, which indicates excessive domestic financial risk, has significantly reduced FDI inflows to BRICS countries. Higher adjusted R^2 in all the FE models indicates a robust model fit.

4.4 Moderation of corruption and globalization

Both proxies of corruption – COPI and COCO – have shown significant optimality, indicating the possibility of a ‘U’ shaped relationship between corruption and FDI inflows. While economies with a higher degree of perceived corruption may be able to attract some FDI initially, this will eventually dry up in the absence of sustainable corruption controlling mechanisms. Globalization interacts positively with corruption control on FDI inflow. Countries scoring high on globalization and corruption control will see growth in FDI inflow. Hence, the degree of openness and corruption control strategies may appear advantageous to uphold image of the country. Our results also suggest that a strategic move of openness and corruption control works better than their stand-alone impact.

4.5 Short-term interactions using ARDL and error correction

Error correction is significant and possible, at least with two ARDL models. Size and corruption control (COCO) are the two significant determinants of FDI inflow in the short run. Financial development (FIND) appeared positive, with very weak significance. This positive sign with FIND indicates that larger domestic credit may attract some FDI in the short run. Overall, short-run interactions are less consistent when compared to the long-run estimations.

4.6 Granger Causality

Results on Dumitrescu and Hurlin (D-H) Granger causality is presented in Table 5. The null hypothesis states that variable ‘A’ does not homogeneously Granger cause variable ‘B’. Results indicate that there exists strong unidirectional Granger causality running from Globalization and Size towards FDI inflow. FDI inflows Granger caused Financial Development.

Table 4.1: Determinants of FDI inflows in BRICS countries: Long-term estimations

Variables	FE (1)	FE (2)	FE (3)	FE (4)	FE (5)	FE (6)	FE (7)	FE (8)	FE (9)	ARDL (1)	ARDL (2)	ARDL (3)	ARDL (4)
GLOBAL		0.33***	0.36***	0.41***	0.37***	0.36***				0.80***	0.42***	0.59***	0.67***
COCO	-1.85***	-1.05***		-0.51						0.43		1.90***	
FIND	0.25	-0.07***	-0.77***	-0.08***	-0.05**	-0.07***	-0.01	-0.03**	-0.01	-0.35***	-0.11***	-0.13***	-0.19***
SIZE	57.58***	49.80***	45.34***			45.39***	55.32***	60.89***	53.28***	79.21***	17.92*		
GDPG	-0.01			-0.01	-0.03							0.17***	0.24***
COPI			0.01		0.037						0.08**		-0.02
POST	0.34												
TROP	-0.001												
Constant	21.65***	4.25*	2.35	1.15	1.90	2.64	21.23***	22.01***	18.24***	-5.54	-0.65	-3.31***	-5.87***
Moderation terms													
COCO*COCO						0.70***							
COPI*COPI							0.001***						
GLOBAL*COCO								-0.04***					
GLOBAL*COPI									0.002***				
Adj. R ²	0.86	0.93	0.92	0.79	0.86	0.92	0.76	0.86	0.84				
Obs.	79	70	70	70	70	70	79	70	70	65	65	65	65

Notes: Refer to Table 4.2.

Table 4.2: Determinants of FDI inflows in BRICS countries: Short-term estimations

Variables	ARDL (1)	ARDL (2)	ARDL (3)	ARDL (4)
Error correction	-0.29	-0.23	-0.38***	-0.44***
ΔCOCO	-0.89		1.18*	
ΔFIND	0.05	0.004	-0.0005	0.04*
ΔSIZE	30.87**	36.19***		
ΔGLOB	-0.33	-0.09		-0.02
ΔGDPG			-0.08	-0.10
ΔCOPI		-0.02*		-0.01
Adj. R ²				
Obs.	65	65	65	65

Notes (Table 4.1 and 4.2): Notes: NFDI = Net FDI Inflows, GLOB = Overall KOF Globalization Index, GDPG = GDP Growth, FIND = Financial Development, COCO = Corruption Control, SIZE = Market Size, COPI = Corruption Perception Index, POST = Political Stability, TROP = Trade Openness. Figures are beta coefficients. FE = Fixed Effect. FE models are White GLS Weights and White Covariance adjusted. Dependent Variable for ARDL model is ΔNFDI . ARDL model lag is 1, automatically selected using Akaike Information Criteria (AIC).

Table 5: D-H Granger causality

Alternate Hypothesis	W-Stat.	Zbar-Stat.	Prob.
GLOB ...> NFDI	5.88	4.78***	0.00
NFDI ...> GLOB	0.33	-0.95	0.34
SIZE ...> NFDI	3.63	2.73***	0.01
NFDI ...> SIZE	1.72	0.59	0.56
GDPG ...> NFDI	1.80	0.67	0.50
NFDI ...> GDPG	2.52	1.48	0.14
FIND ...> NFDI	1.26	0.06	0.95
NFDI ...> FIND	3.46	2.51***	0.01
COCO ...> NFDI	0.85	-0.39	0.70
NFDI ...> COCO	1.95	0.84	0.40

Note: *** = Significant at 1%.

Null hypothesis = Variable A does not homogeneously cause Variable B.

5. Discussions and implications

5.1 Regional and strategic cooperation:

Openness is particularly rewarding to countries with greater domestic demand and more effective corruption control. While the connection between FDI and globalization is rare in extant studies, an indirect connection is being established through economic growth and corruption control (Salahuddin et al., 2019; Zahonogo, 2017). Globalization is found to Granger cause economic growth, which is long-term in nature. Our findings suggest that the relationship between globalization and FDI is strong, positive, and long-term in nature. Hence, being globalized undoubtedly helps in attracting new investment. While globalization with BRICS may place regulators at a dilemma, due to their China-led or India-driven policies, many countries may eventually exact benefits from FDI and trade cooperation from these giants (Gusarova, 2019). For instance, China has been working on its strategic global cooperation through the Belt and Road initiative. Consequently, FDI involving BRICS countries are going to be more strategic than resource-seeking.

Nonetheless, simply opening an economy may not bring in foreign investors, if the countries do not introduce healthier economic policy reforms, renewed commitments to staving-off corruption, and business-friendly policies (Demirbag et al., 2020). A preference towards strategy-led FDI theories over the resource-led FDI theories may help attract more foreign companies. One such strategy may include selecting investments in countries with allying national interests and expected synergies which in-turn may lead to greater bi- and multi-lateral industrialization. To cite few examples, Brazil is full of natural resources, but still struggles due to political instability. Slow growth of FDI inflow in South Africa reminds us of the country's higher crime rate, despite government initiative to attract global investments. These anecdotes support that strong strategic cooperation among partner countries might be needed to achieve sustainable FDI inflow. The success of other regional blocs, such as the ASEAN and OECD, might be considered for further study and surprising insights.

5.2 New corruption control channel between globalization and FDI inflow:

We have discussed three possible connections between globalization and FDI inflow from extant studies: 1) international competition, 2) strategic FDI, and 3) market size and economic growth. This study finds that globalization can lead to higher FDI inflow through a corruption control channel. Similar channels are explained in poverty and economic growth studies (Salahuddin et al., 2019). In the long-run, only countries with better corruption control can hope to benefit from increased globalization.

5.3 Credit-driven financial development signals high risk in the long run:

Due to market complexities, volatile investor sentiment, limited access to financing from the mother company, a higher dependency on the bank credit market in BRICS countries remains strong. While existing studies find stock market development as positively connected to FDI (Tsauroi, 2018), our results establish that FDI inflow Granger causes financial development. This result provides evidence of bank credit preference of MNCs. On the contrary, BRICS countries with higher domestic credit, reaching up to 196% of GDP, indicate pocket of financial risks. Therefore, the key message from the MNCs is to diversify the financial sector by investing more in stock market. With this prerequisite fulfilled, increase in FDI inflow will help build the financial market in the host country.

5.4 A strategic FDI decision frame:

BRICS countries apparently offer the largest consumer markets for foreign goods. Hence, following the market-seeking FDI theory, market size and growth factors, which are mostly endogenous to the host country, will be at the centre of the FDI decision frame (Dunning, 1980). Except globalization, all other factors, such as the corruption control, financial development, are endogenous to the host country (Buckley et al., 2020). Due to stronger influence of the country level exogenous variable, such as the globalization index, FDI decision in BRICS goes beyond market-seeking to strategic. It is important to note that retracting investment from these countries will be expensive to any MNE. We propose the following strategic decision frame to effectively manage FDI in BRICS or in similar countries. Based on Figure 1, MNEs will choose countries first based on

the variables in the primary layer and then will move to the secondary layer.

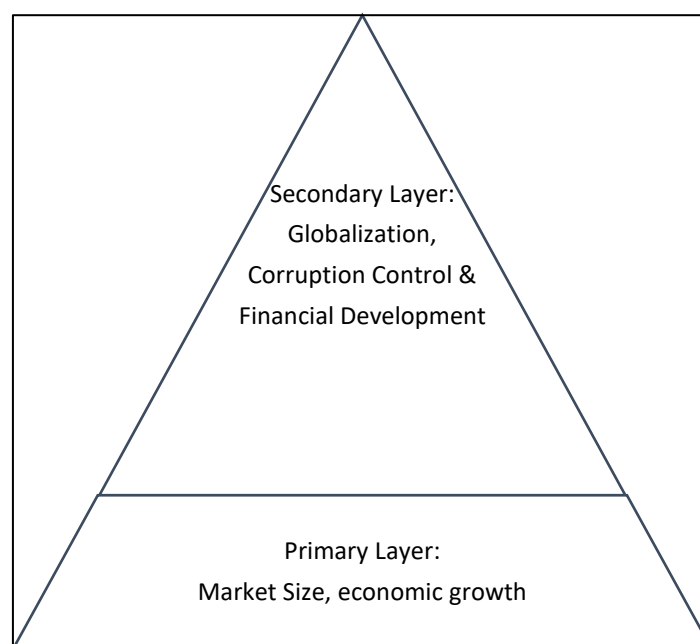


Figure 1: Strategic FDI decision frame.

Source: Proposed by the authors.

5.5 Future studies

Globalization is an important determinant of economic growth and FDI. Future studies may consider extending the study by using globalization for other regional blocs. Also, the three individual components of globalization - economic, political, and social, can be considered as independent indices.

6. Conclusion

This study investigates determinants of FDI inflows in BRICS countries, with emphasis given to regional globalization and corruption control in the BRICS' portfolio of countries. BRICS countries collectively receive more FDIs than any other developing country blocs in recent years, asking for renewed queries on their success and challenges. This study considers FDI inflows in all five BRICS countries over a period of sixteen years

between 2000 to 2015. Thirteen Fixed Effect and ARDL models were tested. We have also tested for Dumitrescu and Hurlin Granger causality. The findings suggest that economies with higher levels of (overall) globalization, better corruption control, larger market size and better economic growth attract more FDI in the short- as well as long-run. Financial development, however, had a mixed relation: with a long-term negative relationship and weak yet positive relationship in the short run. Globalization and market size Granger caused FDI inflow. The results contain strong implications for other developing countries with large domestic market size that are suffering from lower degree of openness and corruption control. Our study suggests two layers of FDI decision criteria. First layer includes basic requirements such as the economic growth and market size. When passed, the countries will then be checked for openness, financial development, and corruption control. In other words, countries will attract more foreign investment if they can ensure effective globalization, corruption control, and diversified financial sector that strikes a balance between domestic credit and stock market.

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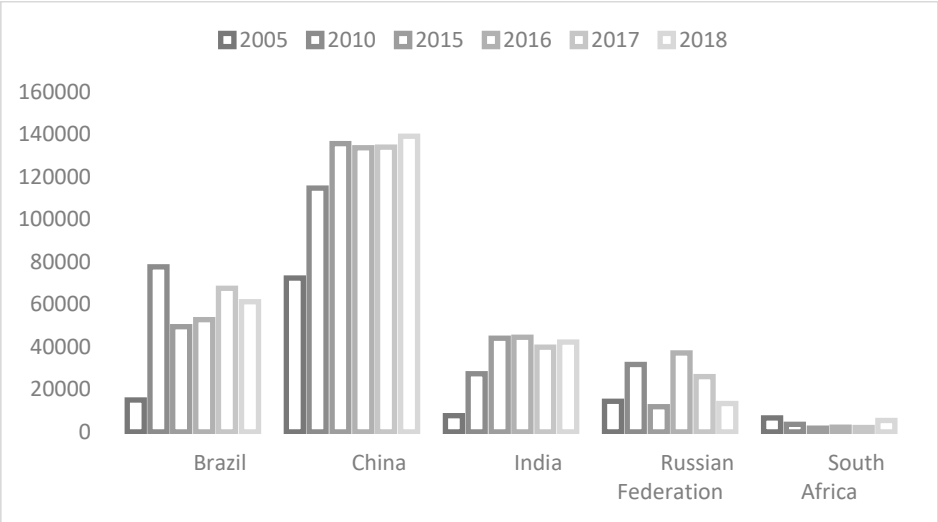
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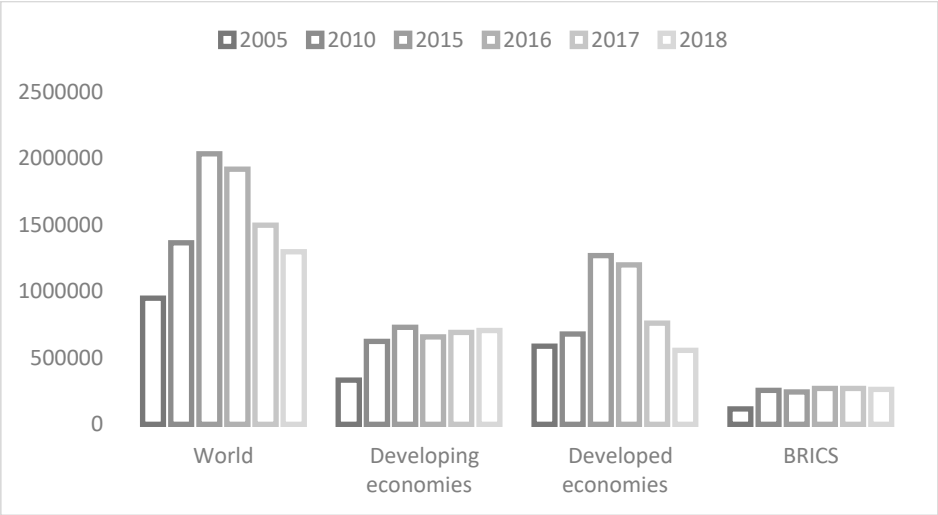
Appendix:

Figure A1: FDI inflows (USD Million) in BRICS countries; selected years



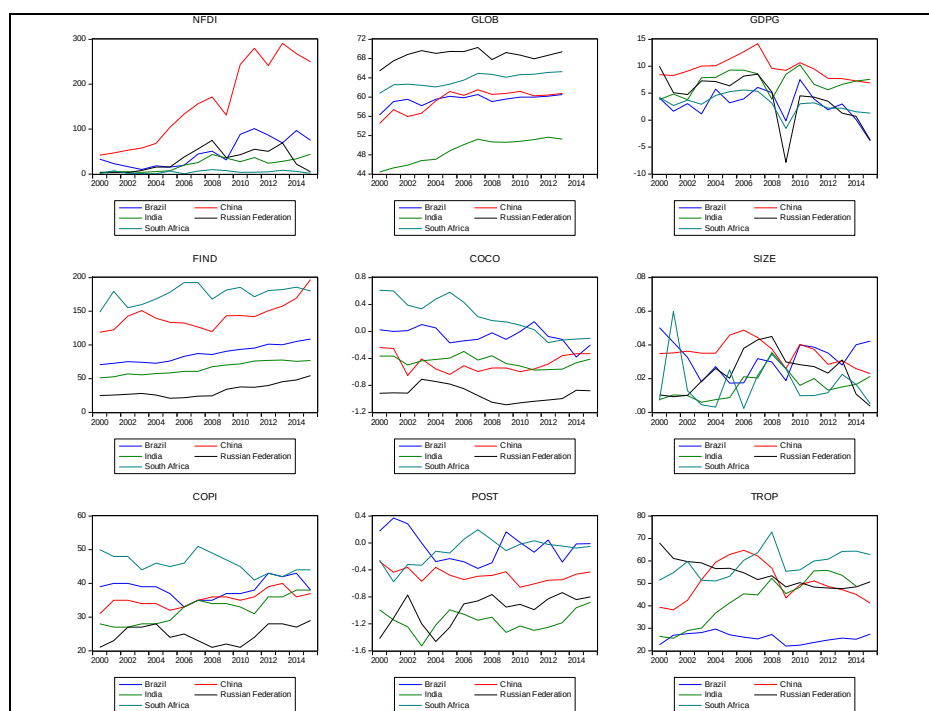
Source: UNCTAD (2018)

Figure A2: FDI inflows in the world, BRICS, developing and developed economies; selected years



Source: UNCTAD (2018)

Figure A3: Graphical representation of the testable variables (before transformation)



Notes: FDI in converted to Billion USD.

Table A1: Land area and population of BRICS in 2018

Country	Land area (sq. km)	% World land area	Population	% World Population	Density (pop. per sq. km)
Brazil	8,515,770	6%	209,469,333	3%	24.60
Russia	17,098,250	13%	144,478,050	2%	8.45
India	3,287,259	2%	1,352,617,330	18%	411.47
China	9,562,910	7%	1,392,730,000	19%	145.64
South Africa	1,219,090	1%	57,779,620	1%	47.40
BRICS Total	39,683,279	30%	3,157,074,333	42%	79.56

Source: World Bank, 2018

Table A2: Three components of KOF Globalization index

Social	Economic	Political
Personal contacts • Outgoing telephone traffic • International tourism connectivity • Migrants and residents as a percentage of total population • International letters per capita. Information flow • Internet host per 1000 people. • Internet users per 1000 people. • Cable connection per 1000 people. • Newspaper circulation value as % of GDP. • Radios (channels and connectivity) per 1000 people. Cultural/ social proximity • Number of McDonald's restaurants. • Number of Ikeas per capita. • Trade in books as % of GDP.	Economic value transfer (% of GDP) • General trade volume • FDI flows • FDI stock • FPI • Payment to foreign nationals Restrictions • Hidden import barriers • Tariff rate • Taxes on international trade as a % of current revenues. • Restrictions on capital account.	• (No.) Embassies in country • Membership of international organization • Participation in UN security missions.

Source: KOF Globalization Index Website

Table A3: Panel unit root test

Variable	Level	ADF - Fisher Chi-square	PP - Fisher Chi-square	Levin, Lin & Chu t*
NFDI	Level	2.49	1.83	2.57***
	1st Diff	64.78***	66.42***	-8.04***
GLOB	Level	0.64	0.37	3.56***
	1st Diff	70.58***	75.24***	-8.46***
SIZE	Level	12.23	13.14	-1.27
	1st Diff	72.21***	88.27***	-8.43***
GDPG	Level	15.15	17.61	-1.33
	1st Diff	77.49***	103.14***	-8.95***
FIND	Level	6.55	6.20	-0.24
	1st Diff	55.49***	70.31***	-7.15***
COCO	Level	13.85	14.35	-1.35
	1st Diff	59.57***	72.8***	-7.57***

Notes: Automatic selection of maximum lags based on AIC. Newey-West automatic bandwidth selection and Bartlett kernel. Null hypothesis: Unit root (assumes individual unit root process). *** = significant at 1%. Probabilities for Fisher tests are based on an asymptotic Chi-square distribution.

Table A4: Lag-length selection

Lag	AIC	SC	HQ
0	-2.595	-2.386	-2.513
1	-13.222	-11.756*	-12.648*
2	-13.435*	-10.713	-12.370

Notes: AIC: Akaike information criterion; SC: Schwarz information criterion; HQ: Hannan-Quinn information criterion



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