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Foreign direct investment in the G-20: to what extent do institutions matter?

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Abstract

Purpose – This study aims to identify to what extent the economic factor effect is more salient in shaping inward foreign direct investment (IFDI) than are institutional factors in G-20 inflow patterns.

Design/methodology/approach – Technique for Order Preference by Similarity to Ideal Solution (TOPSIS) method was applied using the World Bank Governance and Development Indicators, followed by a panel data technique over the period 2005-2015 to estimate the connections between the different dimensions of economics, institutions and IFDI in the G-20.

Findings – Results showed that countries with better economic performance contrasting with the governance indicators are more effective at attracting IFDI. However, the correlation between FDI intensity and governance indicators has been found relatively weak, which may suggest a more controversial role of institutions as determinants of IFDI.

Research limitations/implications – This quantitative approach uses a country-level set of variables; therefore, the authors suggest the development of more firm-level analysis of the impact of institutions. Also, the limitation of the TOPSIS method itself is based on heuristic assumptions.

Practical implications – The main findings point to a relatively low impact of institutions on IFDI. The authors suggest that the global financial crisis has changed the rationale of decision-making by multinational companies.

Originality/value – The originality of the present study was to apply a multi criteria decision-making technique on FDI's analysis combined with institutional data.

Keywords TOPSIS, Institutions, Foreign direct investment

Paper type Research paper

1. Introduction

Foreign direct investment (FDI) is a category of cross-border investment which aims to establish a lasting interest in an enterprise, with the direct investor owning at least 10 per cent of the voting power (Organization for Economic Co-operation and Development, 2016). It is less volatile than

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portfolio investments and is characterized by a long-term perspective, but a cyclical one, given the profitability expectations related to the company's performance (Amal, 2016).

The statistics on FDI track three distinct metrics:

(1) direct investment positions (stocks of investment), which provides information on the total stock of investment made abroad and received from abroad for a given reference date;

(2) direct investment income, which provides information on the earnings of direct investors and of the direct investment enterprises; and

(3) direct investment financial transactions, which shows the net inward and outward investments, with assets and liabilities presented separately by instrument (equity, debt) for any given reference period (Organization for Economic Co-operation and Development, 2008).

Global FDI flows have been on an upward trend since 2012 and increased by 25 per cent in 2015 to US$1.73tn. This was the highest level recorded since 2007 and the start of the financial crisis, although remaining below the pre-crisis high of US$2.09tn in 2007 (Organization for Economic Co-operation and Development, 2016).

The lack of sufficient regulatory mechanisms and a policy of clear macroeconomic coordination among the world's largest economies were the causes of the 2008 crisis, which was peculiar in that it occurred not in developing countries, but in the central developed countries. This crisis triggered a process of transformation in the mechanisms of global governance: the loss of legitimacy of the G-8, the broadening of the substantive discussions for the G-20 and the reinforcement and capitalization of the international monetary fund (Ramos *et al.*, 2012).

In this sense, the G-20 aims to promote an open and constructive discussion between industrial and emerging countries on key issues related to global economic stability. The forum was created as a response to the financial crises in the 1990s and is made up of the finance ministers and central banks of 19 key countries plus the European Union. It represents 90 per cent of world GDP and 80 per cent of world trade (including intra-EU trade) and two-thirds of the world's population, receiving 52 per cent of global FDI (Organization for Economic Co-operation and Development, 2016).

The main FDI protagonists, multinational enterprises (MNEs), are companies that are committed to FDI, and to some extent, control value-added activities in more than one country, internalizing some intermediate products (Dunning and Lundan, 2008).

From the theoretical point of view, the eclectic paradigm (ownership, location and internalization [OLI]) has been the dominant approach to test the determinants of FDI and international activities of MNEs (Dunning, 2000).

As a means to understand the FDI determinants, Dunning (1993) proposed four main motives:

(1) *market seeking* (find new customers);

(2) *efficiency seeking* (lower costs of performing activities);

(3) *resource seeking* (access resources not readily available at home); and

(4) *strategic asset seeking* (obtain tangible or intangible assets that might be critical to the long-term strategy).

On the other hand, Peng *et al.* (2008) suggest that the strategic choices of MNEs are not only driven by industry-specific conditions and the capabilities of the firm but also reflect the formal and informal restrictions on certain institutional structures confronted by managers,

i.e. the institutional environment also influences the company's strategy, both in national and international business, independently of a country's development level.

Dahlquist and Robertsson (2001) and Dahlquist *et al.* (2003) have also demonstrated the role of the quality of domestic institutions as contributors to cross-country differences in the way investors hold or do not hold various countries' assets.

The institutional environment is composed of political institutions (the national structure of policymaking and the judicial system), economic factors (structure of the domestic market and the conditions of access to the international factors of production) and socio-cultural factors (informal rules, customs, traditions, religion and other important aspects). All these elements encompass the institutional environment of a particular country (Mudambi *et al.*, 2002).

Although the institutional environment has been widely discussed between scholars and policymakers, there is no consensus over the quality of the national institutional environment (Kauffmann *et al.*, 2011).

Scott (1987) suggests that a country's institutional environment is composed of three pillars: normative, regulative and cognitive. The first refers to the patterns of behavior accepted by the society; the regulative pillar refers to the quality of the laws; and the cognitive considers values and social and cultural structures. These three pillars allow the measurement of the quality of the countries' institutional environments.

Kauffmann *et al.* (2011) suggest six dimensions involving traditions and institutions, through which the authority of a given country is exercised. These are Voice and Accountability (VA), Political Stability and Absence of Violence (PSV), Government Effectiveness (GE), Regulatory Quality (RQ), Rule of Law (RL) and Control of Corruption (CC), which encompass the World Bank Governance Indicators.

To identify to what extent the economic factor effect is more salient in shaping inward FDI (IFDI) than institutional factors in the G-20 inflow patterns, a decision theory technique was applied to this study, followed by a panel data analysis. The decision theory has been developed since the 1930s from different schools and trends of thought to support the decision-making process. The decision by multi criteria decision-making (MCDM) consists of a set of techniques to assist in making complex problem decisions, contributing to the identification of priorities (Jannuzzi *et al.*, 2009). The technique applied to this study was TOPSIS, *Technique for Order Preference by Similarity to Ideal Solution*, developed by Hwang and Yoon (1981) to determine the solution nearest to the ideal and farthest from the least-optimal solution.

The TOPSIS method was applied to the World Bank Governance and Development indicators. A comparison between the FDI flows before and after the 2008 financial crisis is also made to identify FDI patterns.

This study is justified because the competitiveness of companies and countries has become increasingly important and depends on investments which consider the political institutions and economic situation of countries, which can make capital returns more or less significant. This study also aims to collaborate by understanding the "seeking motives", contrasted with the role of institutions, through the application of the MCDM decision technique.

2. The foreign direct investment, multinational enterprise theories and motives

The problematization of MNE studies started with the publication of Hymer's (1976) doctoral thesis on American FDI flows, thus establishing the concept of "transferable internal advantage" to overcome barriers in the local market. The theory of international capital movements predicts that capital will move internationally because of the differences

in interest rates among countries, although it could not properly explain FDI itself, where the investor seeks to control the foreign enterprise.

Hymer (1976) suggested that direct investment is a kind of capital associated with the international operations of firms, and that flows of direct investments are determined by the extent of international operations. Additionally, the amount of capital associated with international operations depends largely on their extent and imperfections in the capital market. In other words, the international movement of capital is motivated by the desire to achieve control and not by differences in the interest rates.

Although Hymer's thesis is considered as an economic approach; he also pointed out some behavioral aspects. The nationality of a firm is of utmost importance, for it affects the way it behaves and the treatment it receives. The firm's, and managers', legal nationality may affect the firm's behavior.

Vernon (1966) also contributed to the understanding of international capital movements, considering the type of industry and product cycle. Competitive advantage is addressed here in terms of less developed countries and their possibility of attracting investments in the production of standardized products. Three different phases are related here: location of new products, the maturing product and the standardized product.

The location phase considers that in the early stages of introduction of a new product, producers are usually confronted with a number of critical and transitory conditions. The price elasticity of demand for the output of individual firms is comparatively low, followed by the high degree of production differentiation or the existence of monopoly in the early stages. Also, an effective communication between customers and suppliers is higher at this stage. According to Vernon (1966), considering these aspects there is low probability of a company moving its activities to a foreign country. While this author provided a general approach of the MNE's emergence based on the product cycle life, Aharoni (1966) considered the company as a part of other systems, such as industry, community and cultural environment, and argued that there must be a symbiosis between these elements. Because of lack of market knowledge, companies show little interest in foreign investment, particularly in relation to less-developed countries. However, as long as the organization gains experience with its external operations, the company will increase its expansion abroad.

While all these approaches have attempted to highlight the determinants of FDI, several scholars have provided a more general framework for how companies can make the decision to internationalize through FDI. The internalization theory, also known as the MNE theory, suggests that some transactions should occur within the company to improve performance, considering market imperfections. When markets are "internalized" across borders, the MNE emerges (Buckley and Casson, 1999).

The internalization benefits arise from five different market imperfections:

(1) when resource coordination requires a long period;

(2) when the market demands different pricing policies;

(3) when the market removes the monopoly, weakening the contract between the parties;

(4) when there are inequities between buyer and seller on evaluation of a product that involves the incorporation of intangible components; and

(5) when internalization is a means of avoiding government intervention.

Although this approach has been considered a dominant paradigm for explaining the activities of MNEs, there are some critiques of this theory, as pointed out by Dunning (2000): it does not consider other reasons that could lead a company to generate additional value

that are not directly related to the cost factor, it does not suggest the ideal way for a company to organize its foreign operations and it ignores the fact that the opportunities for new types of alliances lead to internalization without necessarily controlling stock. Based on the limitations of the internalization theory, and in an attempt to establish a more integrated approach to explain the determinants of FDI and the activities of MNEs, the Eclectic Paradigm (Dunning, 1979) – OLI – proposed a broader explanation for the international movements of companies, which should be based on various aspects of economic theory and not only in FDI.

Rather than a paradigm, it encompasses various explanations of the activities of enterprises engaging in cross-border value-adding activities (Dunning, 2000). In its original form, the eclectic paradigm states that the extension, figure and pattern of international production are determined by the configuration of three sets of advantages:

(1) those resulting from the exclusive possession of or access to certain assets (ownership);

(2) those arising from production (internalization); and

(3) those that are the result of geographical diversification or multinationality (location).

Later on, Dunning (1988) indicated possible extensions to the eclectic paradigm under a systemic approach, consistent with the dynamics and development of international production. The four main motives are, as noted by Dunning (1993):

(1) *market seeking* (import substituting);

(2) *resource seeking* (supply oriented);

(3) *efficiency seeking* (rationalized investment); and

(4) *strategic asset seeking* (long-term strategic objectives).

However, in addition to traditional economic approaches, some scholars of international business (Mudambi *et al.*, 2002; Bevan and Estrin, 2004; and Peng *et al.*, 2009) have studied the influence of the institutional environment in companies' strategies, in both national and international scope.

While the industry-based view (Porter, 1980, 1989) states that the degree of competitiveness of an industry determines organizational performance and (Rumelt *et al.*, 1991; Prahalad and Bettis, 1986, and Barney, 1991) suggests that specific capabilities determine superior organizational performance, the institutional view argues that institutional forces also influence the organization's results. The business environment influences the company's strategy, in both national and international business, regardless of a country's level of development (Peng *et al.*, 2008). The institutional view considers institutions as independent variables in strategic vision, by focusing on the dynamic interaction between institutions and organizations, as both executives and companies rationally pursue their interests and make strategic choices within the formal and informal restrictions on a given institutional segment (Peng *et al.*, 2009).

While the traditional approaches of international business have focused on one aspect or another of the FDI determinants, changes in the global economy have challenged scholars to seek mechanisms to integrate the different approaches and establish new motives for FDI. Thus, to the extent that the world economy is becoming increasingly interdependent, the search for strategic assets tends to increase, which will lead to a convergence among

countries as companies advance their own advantages through mergers and acquisitions or strategic alliances (Dunning and Narula, 1996).

Over the past three decades, numerous MNEs have developed new attitudes and strategies toward their international activities. Expansion in one sector is constantly followed by a contraction in another, and new organizational forms are constantly being revisited to advance the environmental, social and technological sectors. Increasingly, the MNE tends to control a value chain that fits the exogenous factors and their own strategies (Dunning and Lundan, 2008).

Van Tulder (2015) proposes three clusters of internationalization motives that can be linked to Peng *et al.*'s (2009) strategy tripod: resource-based view with intrinsic motives, industry-based view with mixed motives and institution-based view with extrinsic motives. The intrinsic motives are related to the international management itself and the "four main motives". The mixed motives involve competitiveness and positioning in the sector, and the extrinsic motives are related to the escape motives and international economics.

Considering the foreign expansion of a firm is driven by the expectations of managers, Cuervo-Cazurra *et al.* (2015) separated two types of managerial expectations:

(1) economics-driven exploitation and exploration of resources; and

(2) a psychology-driven search or avoidance of environmental conditions.

So, based on the behavioral economics, Cuervo-Cazurra *et al.* (2015) proposed another four motives for expanding abroad:

(1) *sell more* (exploiting, obtaining better host country conditions);

(2) *buy better* (exploiting, avoiding poor home conditions);

(3) *upgrade* (exploring new resources); and

(4) *escape* (explores and avoids poor home country conditions).

The authors explain that these motives were built on behavioral economics, as it places the manager as the "main economic actor and decision-maker" (Cuervo-Cazurra *et al.*, 2015, p. 29).

Panamond (2015) proposed that the traditional framework of FDI motives should be revised to include the perspective of emerging markets multinationals, as they are often integrated into global value chains as suppliers or exporters because of their cost-based advantages. This reflects the weak position of MNEs from emerging markets, in manufacturing of standardized activities, and at low end of value creation in the global chain.

On the other hand, Giroud and Mirza (2015) argue that the classic FDI motives suffice to explain the MNEs' choices, although they still require some adaptation in the face of the complexity of international business (IB) activities. In this sense, the MNE cannot be located at the center of the global value chain, but as a network with power dispersed in a multi-polar world.

So, considering the literature review, we can draw two main hypotheses. The first hypothesis is related to the role of institutions. As institutions provide the general framework of doing business, and managing uncertainties, countries that have improved the institutional environment through better governance quality may reduce the transaction costs of the value-added activities of MNEs (Dahlquist and Robertsson, 2001; Dahlquist *et al.*, 2003; Mudambi *et al.*, 2002; Peng *et al.*, 2009; Kauffmann *et al.*, 2011). Thus, we suggest that:

H1. Countries that perform better in the Worldwide Governance Indicators are more effective in attracting IFDI.

On the other hand, because the question of institutions is not limited to emerging economies, we suggest that countries, no matter their level of development, are more likely to record a

higher intensity of IFDI when they can substantially increase the quality of their governance system. The G-20 is not a homogeneous group but represents the largest block of countries that receive FDI and demonstrates that economic and institutional changes can record different performances and paths. Therefore, we also suggest the following hypothesis:

H2. FDI intensity in the G-20 is positively related to the Worldwide Governance Indicators.

3. Methodology

MCDM can be understood as a method combining possible solutions grouped into several criteria, reflecting the particular preferences of the decision-maker. Although it is not possible to know exactly when research on MCDM began, it was during the 1970s that major developments took place because of the evolution of mathematical programming (Köksalan *et al.*, 2013). However, it was the economist Vilfredo Pareto (1848-1923) who introduced the concept of efficiency (Pareto optimality), one of the key concepts of economics that was transferred in a direct way to MCDM. Therefore, the Pareto optimality is a necessary condition to ensure the rationality of the possible solutions generated (Köksalan *et al.*, 2013).

Based on the Pareto's efficiency assumption, and along with the development of the MCDM field of study, different approaches have emphasized the means of supporting the decision-making process (Roy and Vanderpooten, 1995), which includes two forms of decision modeling preference: the functional model (Keeney and Raifa, 1976), which has been used in the multi-attribute utility theory and the relational model, which is presented in the form of fuzzy relations.

Additionally, Roy and Vanderpooten (1996) propose a classification for the different methods of multi-criteria analysis:

- a category that groups the methods of synthesis and reduction in a single criterion, without accepting comparability between the alternatives;
- another category that summarizes the methods, focusing on synthesis which leads to a sort of classification; and
- the last category, grouping methods with local iterative discernment.

However, Pardalos *et al.* (2013) propose four different categories:

(1) multi-objective mathematical programming;
(2) multi-attribute utility theory;
(3) the classification of relationships approaches; and
(4) preference disintegrating approach.

We can therefore assume that the MCDM is the act of making decisions regarding the presence of multiple and conflicting criteria about issues that occur around us. The TOPSIS method proposed by Hwang and Yoon (1981), and the focus of the present study, is based on the proposition that the best alternative should be the least distance from the ideal solution, which is the reference point. In this method, the Euclidean distance is used to define the least distance. After the normalization and the allocation of weights, the method proposes two types of references: positive and negative. The positive reference corresponds to the highest reference over the alternatives and the negative corresponds to the farthest reference. The Euclidean distance is then calculated based on these reference points (Brauers and Zavadskas, 2006).

The method assumes that each attribute in the decision matrix increases or monotonically decreases the utility: that is, the more spacious the attribute becomes, the greater the preference for the best option, reducing the preference for the worst criterion. Furthermore, all the criteria set in a non-numerical form should be measured using the most appropriate level. Whereas each criterion cannot be assumed to be of equal importance, a number of weights should be assigned by the decision-maker. Hwang and Yoon (1981) propose the following econometric model:

3.1 First step

Construction of a normalized decision matrix. This process transforms the various dimensions of the attributes into non-dimensional attributes, allowing comparison between them. This can be achieved by the division of each criteria by the total vector resulting of the criteria:

$$A = \begin{bmatrix} v_{11} & \cdots & v_{1n} \\ \vdots & \ddots & \vdots \\ v_{m1} & \cdots & v_{mn} \end{bmatrix}$$

3.2 Second step

Construction of the decision matrix with weights. Different weights, w = (w1, w2,. . ..wj), are assigned by the decision-maker and are calculated by multiplying each column of the matrix associated with the weight.

3.3 Third step

Calculation of optimal solutions A + positive (benefits) and negative ideal solutions A− (costs), as follows:

$$A^{+} = \left(p_1^{+}, p_2^{+}, \ldots, \; p_m^{+}\right)e \quad A^{-} = \left(p_1^{-}, p_2^{-}, \ldots, p_m^{-}\right),$$

where:

$$p_j^{+} = \left\{\mathrm{Max}_i P_{ij},\ j \in J_1; \mathrm{Min}_i P_{ij},\ j \in J_2\right\}$$

$$p_j^{-} = \left\{\mathrm{Min}_i p_{ij},\ j \in J_1; \mathrm{Max}_i p_{ij},\ j \in J_2\right\},$$

Where, J_1 and J_2 represent the criteria of benefit and cost, respectively.

3.4 Fourth step

The calculation of distances. The separation between each alternative can be measured by the Euclidean distance (n) between the benefits (+) and (−). The calculation of the Euclidean distances between the benefits is obtained by:

$$d^{+} = \sqrt{\sum_{j=1}^{n} w_j \left(p_j^{+} - p_{ij}\right)^2},$$

with i = 1, . . . , m; and

$$d^{-} = \sqrt{\sum_{j=1}^{n} w_j \left(p_j^{-} - p_{ij}\right)^2},$$

with i = 1, . . . , m.

where, the values of w_i are the importance grade of each question. In the present study, the weighting was assigned with values of w_i = 1.

3.5 Fifth step

Calculation of the relative proximity of the optimal solution, which can be defined as:

$$\xi_i = \frac{d_i^{-}}{d_i^{+} + d_i^{-}}$$

3.6 Sixth step

Ranking the order of preference. A number of alternatives can be ordered, according to the order descendent on C1*. The TOPSIS model of this study was developed from data in an Excel spreadsheet.

To identify the extent to which institutions play a key role in determining FDI inflows of the G-20 countries, the TOPSIS method was applied using the World Bank Governance and Development Indicators. Additionally, a panel data technique was used over the period 2005-2015 to estimate the connections between the different dimensions of economics, institutions and IFDI in the G-20. The use of TOPSIS has different advantages. First, we can establish which of the indicators or variables can provide the best option for the understanding of FDI flows among the G-20 countries. Second, by assuming that all variables cannot be assumed to be of equal importance, we will be able to determine a number of weights that should be assigned to each of the variables of our model. On the other hand, the panel data technique adds to the picture, by crossing time series (2006-2014) and cross-sections (countries of the G-20).

In Table I, we show the variables of our model and the methods applied in this study.

Additionally, for the present study, we collected data for 19 of the G-20 countries (excluding the European Union as a whole). The countries that compose our sample are Argentina, Australia, Brazil, Canada, China, France, Germany, India, Indonesia, Italy, Japan,

Indicators	Variables	Method
Worldwide Governance Indicators – WGI	VA, PSV, GE, RQ, RL and CC	TOPSIS
Worldwide Development Indicators – WDI	GDP growth, Merchandise Trade (% of GDP), R&D Expenditure, High-technology Exports (% of manufactured exports)	TOPSIS
Worldwide Development Indicators – WDI	FDI-net inflows, GDP at market prices, GDP per capita	
Descriptive statistics	Worldwide Development Indicators – WDI	
Dependent variable: FDI Intensive (FDI/GDP)	Panel data	
Independent variables: VA; PSV, GE, RQ, RL and CC		

Source: World Bank (2015)

Table I.
Indicators, variables and methods

Mexico, Russia, South Africa, Saudi Arabia, South Korea, Turkey, the USA and the UK. Together, the G-20 represents 90 per cent of world GDP, attracting 52 per cent of global FDI.

4. Analysis and results

The outward and inward direct investment position of a country is systematically related to its economic development relative to the rest of the world. The investment development path suggests that countries tend to go through five main stages of development. These can be usefully classified according to the propensity of those countries to be outward and/or inward direct investors. It is important to note that this propensity rests on the extent and pattern of the competitive or ownership-specific (O) advantages of the indigenous firms of the countries concerned, relative to those of firms in other countries (Dunning and Narula, 1996).

Host country determinants affect FDI motivations, such as large populations, individual incomes and growth of GDP (*market-seeking*) and costs of production (*resource-seeking*), as well as promotion and facilitating efforts through investment policies (Giroud and Mirza, 2015).

We will distinguish between two main periods: before the financial crisis, covering the years from 2006 to 2008 and a period after the crisis, covering the years from 2012 to 2014, for which we gather full data. This time cut is motivated by looking at the role of the financial crisis in shaping world FDI distribution flows and the changes in the determinants of the global distribution of FDI.

Table II shows that China is ranked highest among the G-20 countries for FDI net inflows, with US$289bn received in 2014, a slight decrease compared to 2013 when it received US$290bn. Since 1992, China has attracted more FDI than any other emerging economy, ranking second only behind the USA as a global destination for such investment.

Countries	FDI net inflows (BoP, current US$)/Thousand			
	Σ 2006-2007-2008	2012	2013	2014
China	153,685,511	241,213,868	290,928,431	289,097,181
The USA	322,362,333	232,001,000	287,162,000	131,829,000
Brazil	38,224,663	76,110,663	80,842,997	96,895,163
Canada	80,798,810	39,296,986	70,753,172	57,168,153
Australia	40,050,405	57,616,867	54,554,049	46,333,457
The UK	222,201,836	46,750,711	35,015,209	45,456,617
India	29,554,379	23,995,685	28,153,031	33,871,408
Indonesia	7,053,712	21,200,779	23,281,742	26,349,226
Mexico	27,337,981	19,491,663	44,885,843	24,154,174
Russia	56,083,7848	50,587,555	69,218,899	22,890,510
Italy	23,183,195	34,812	19,530,575	13,726,783
Turkey	20,694,333	13,282,000	12,457,000	12,765,000
South Korea	9,725,433	9,495,900	12,766,600	9,898,500
Japan	16,217,653	546,963	7,412,011	9,069,845
Germany	56,403,827	54,659,879	59,014,769	8,389,632
Saudi Arabia	27,369,091	12,182,373	8,864,693	8,011,787
France	76,908,621	41,496,628	33,551,369	7,956,554
Argentina	7,245,350	15,323,934	8,916,662	6,055,283
South Africa	5,698,362	4,626,029	8,232,519	5,740,651

Note: We distinguish between two main periods: P1 (2006, 2007, 2008) and P2 (2012, 2013, 2014)
Source: World Bank, 2016

Table II.
FDI Inflows for the G-20 (19) countries

This inward investment is making a major contribution to the development of China's economy, in terms of technology, expertise and external trade (Kobrin *et al.*, 2001).

The predominant motive for companies investing in China has been to gain access to the domestic market – *market seeking* or *sell more* (exploiting, obtaining better host country conditions) (Cuervo-Cazurra *et al.*, 2015). Although based on a low average per capita income (Table III), this market had the incomparable combination of a large population and rapid economic growth, thus promising profits in the longer term.

As a general analysis, if we consider the average of net FDI inflows in the period P1 (2006, 2007, 2008, and pre-global financial crisis) compared to 2014, only four countries significantly recovered the investment flows through a significant increase in the rate of IFDI: Indonesia (267 per cent), Brazil (153 per cent), China (88 per cent) and Australia (15 per cent). The USA, although it receives the second-highest FDI inflows, did not reach the pre-financial crisis average, recording a decrease of approximately 61 per cent, followed by Canada, the UK, Russia, Italy, Turkey, Japan, Germany, Saudi Arabia and France – developed countries predominating.

In terms of economic performance of the G-20, we also found differences among the countries. As Table III shows, if we consider only the seven highest GDPs in the period after the financial crisis of 2008 (P2), China and Brazil – both developing countries – have been the only locales that recorded a positive increase in FDI inflow.

To address the institutional changes in the G-20, we set up a TOPSIS for the institutional indicators, which we captured by using the governance indicators published by the World Bank. Governance consists of the traditions and institutions, by which authority in a country is exercised, including the process by which governments are selected, monitored and replaced (World Bank, 2016).

Countries	GDP at Market Prices – USD		GDP Per capita – USD	
	Σ P1	Σ P2	Σ P1	Σ P2
The USA	14,350,701,667	16,783,403,667	47,633	53,022
China	169,126,321	9,435,685,831	2,732	6,949
Japan	4,520,760,883	5,158,500,306	35,325	40,502
Germany	3,398,255,146	3,717,741,253	41,321	45,795
The UK	2,783,729,336	2,777,220,846	45,386	43,295
France	2,637,196,693	2,773,619,121	41,186	42,068
Brazil	1,400,183,075	2,447,689,266	7,254	11,985
Italy	2,179,830,458	2,116,444,060	37,267	35,163
Russia	1,316,827,565	1,985,244,946	9,219	13,767
India	1,137,304,336	1,914,033,523	963	1,495
Canada	1,437,081,028	1,819,022,141	43,657	51,759
Australia	884,830,619	1,518,701,423	42,224	65,760
South Korea	1,045,565,222	1,312,931,722	21,498	26,141
Mexico	1,036,560,299	1,245,987,792	9,155	10,067
Indonesia	435,671,963	905,628,948	1,873	3,605
Turkey	636,130,907	803,511,707	9,140	10,712
Saudi Arabia	437,553,814	744,041,067	16,737	24,645
Argentina	331,922,008	585,473,982	8,293	13,770
South Africa	285,941,280	371,257,004	5,875	6,989

Table III.
GDP at market prices and GDP per capita (USD) for the G-20 (19) countries

Note: We distinguish between two main periods: Period P1 (2006, 2007, 2008) and period P2 (2012, 2013, 2014)
Source: World Bank, 2016

The Worldwide Governance Indicators (WGI) aggregate individual governance indicators for 215 economies over the period 1996-2014, for six dimensions of governance: VA, PSV, GE, RQ, RL and CC. For the present study, the period 2012-2014 was considered.

By applying the TOPSIS as proposed by Hwang and Yoon (1981), a ranking considering the best ideal solution is presented in Table IV.

According to the TOPSIS method on the WGI indicators, Canada and Australia represent the best governance environment from the G-20 countries, while China, Indonesia, India, Argentina and Russia represent the highest distance from the ideal solution, thus not showing an effective governance environment.

The importance of formal institutions on safeguarding and policing intellectual property rights (IPR) had been largely recognized between scholars, and the importance of IPR protection is likely to vary strongly between industries particularly the high-technology sectors (Dunning and Lundan, 2008).

Table V shows the total score for the economic indicators considered for the period P2, after the global financial crisis (2012, 2013 and 2014). China, India and Indonesia present the highest GDP growth in this period, coinciding with of 88, 12 and 267 per cent of FDI inflows, respectively.

The general ranking shows China, South Korea, Australia, Canada and France as the five countries presenting the highest scores based on the given variables. South Korea presented the highest rate of R&D expenditure and high-technology exports.

Based on the TOPSIS assessments of the data, we could find no evidence for *H1* and could establish no connections between changes in the institutional environment in the host country and the attraction of IFDI. However, we consider that the TOPSIS, despite providing important insight on the classification and ranking of the variables, provides no

	Ranking						
Countries	VA	PSV	GE	RQ	RL	CC	TSG
Canada	1	1	1	2	2	2	1
Australia	2	2	2	1	1	1	1
Germany	3	4	3	4	4	3	2
The UK	4	7	5	3	3	4	3
Japan	7	3	4	6	7	5	4
The USA	6	5	6	5	5	7	5
France	5	8	7	7	6	6	6
South Korea	9	9	8	8	8	8	7
Italy	8	6	9	9	9	11	8
South Africa	10	11	11	12	11	12	9
Turkey	16	19	10	11	12	9	10
Brazil	11	12	15	14	14	13	11
Saudi Arabia	19	13	14	13	10	10	12
Mexico	14	16	12	10	17	16	13
China	18	15	13	16	15	14	14
Indonesia	15	14	16	15	16	18	15
India	12	18	17	18	13	17	16
Argentina	13	10	19	19	19	15	16
Russian Federation	17	17	18	17	18	19	17

Notes: VA: Voice and Accountability; PSV: Political Stability No Violence; GE: Government Effectiveness; RQ: Regulatory Quality; RL: Rule of Law; Corruption Control; Total Score Governance
Source: Research Data

Table IV. Governance indicators TOPSIS ranking

conclusive outcome of how the variables affect IFDI. To overcome this limitation, we ran a panel data analysis to estimate the effects of the institutional variables on IFDI in the G-20 countries.

4.1 Model estimates

To test *H2*, we used a panel data technique. This technique, according to Raj and Baltagi (1992), combines cross-sections with time series and permits evaluation of the relationship between several variables by following the same individuals (countries) throughout a period. The advantage of the method is to allow a level of specification that helps by identifying the economic model that may offer tighter control over individual heterogeneity. Furthermore, cross-sectional time series models are used for cases in which a number of observations need to be monitored over various periods (Fávero *et al.*, 2009).

Our dependent variable is FDI-Intensity (FDIINT) and is measured by the inflows of FDI related to the GDP of each host country.

Our independent variables are the six variables that compose the world governance indicators of the World Bank (per Kauffmann *et al.*, 2011):

(1) Voice and Accountability (VA);

(2) Political Stability No Violence (PSV);

(3) Government Effectiveness (GE);

(4) Regulatory Quality (RQ);

(5) Rule of Law (RL); and

(6) Corruption Control (CC) and Total Score Governance.

Countries	Ranking				
	GDP	MTO	R&D	HE	TSED
China	1	5	7	2	1
South Korea	7	12	1	1	2
Australia	6	2	5	11	3
Canada	10	4	8	10	4
France	18	6	6	3	5
Japan	16	11	2	6	6
Germany	17	7	3	9	7
The USA	9	19	4	5	8
Indonesia	3	9	10	16	9
India	2	8	15	14	10
Brazil	14	3	12	12	11
The UK	13	18	9	4	12
México	8	13	19	7	13
Russian Federation	12	14	13	8	13
Argentina	15	1	18	13	13
Saudi Arabia	4	15	16	19	14
Turkey	5	17	14	18	14
Italy	19	10	11	15	15
South Africa	11	16	17	17	16

Table V.
Economic development TOPSIS ranking

Notes: GDP: GDP growth; MT: Merchandise Trade Openness; R&D: R&D Expenditure; HE: High Technology exports; TSED: Total Score Economic Development
Source: Research Data

The authors attributed scores between −2.5 and +2.5, with higher scores indicating higher levels of governance quality.

Before estimating the model, we tested the model to select the most suitable technique for the panel data: fixed or random effect. We first used the Breusch–Pagan test, which showed a significance lower than 5 per cent ($\chi^2 = 33.31$; Sig = 0.000). We also used the Hausman test ($\chi^2 = 17.02$), which recorded a significance superior to 0.05 (0.0092). The results of both the tests suggest the choice of the fixed-effects model as the most effective estimator.

The model estimate is shown in Table VI.

According to Table VI, the explanatory power of the model can be observed in the coefficient of determination (R^2), which indicates the proportion of the variance in the dependent variable that is predictable from the independent variable (R^2 between = 0.0791), indicating that the independent variables can explain ± 7.91 per cent of the performance represented by the FDI Intensity. Also, the prob > F = 0.038 is < 0.05, indicating that the model is statistically significant in explaining the effects of institutions on the IFDI distribution among the G-20.

While the independent variables (VA, GE, RL and CC) have been found not statistically significant, the PSV has been found positively correlated with IFDI and is statistically significant at 5 per cent. Regulatory quality is also positively correlated with IFDI, but only statistically significant at 10 per cent.

So, the model indicates an overall lower correlation between FDI Intensity and the World Governance Indicators, leading us to reject hypothesis *H2*.

Additionally, this result is positively related to Table II, which shows that only four countries had significantly recovered the investment flows since the economic crisis: Indonesia (267 per cent), Brazil (153 per cent), China (88 per cent), and Australia (15 per cent), although they did not necessarily score highly on the TOPSIS government indicators (Indonesia, 15°; Brazil, 11°; China, 14°; with Australia the exception at 2°).

5. Conclusion

FDI is an important element of economic integration, providing the means for long-lasting links between economies. It represents an important vehicle for local enterprise

Variables	Coefficient	Model* t	$p > (t)$
Constant	0.9010389	0.85	0.397
VA	2.610859	1.62	0.107
PSV	*1.595484*	*2.22*	*0.028* (*)
GE	0.8040263	0.75	0.454
RQ	*1.97653*	*1.76*	*0.080*(***)
RL	−2.546543	−1.84	0.068
CC	−4.4543944	−0.48	0.629
Observations	209		
Groups	10		
Prob > F	0.038		
R^2 within	0.0708		
R^2 between	0.0791		
R^2 overall	0.0226		
$p > \chi^2$	0.0000		

Notes: *Significant to 0.05; ***significant at 10%
Source: Research Data

Table VI.
Panel data regression with fixed-effects model

development, encouraging the transfer of technology and know-how between economies (Organization for Economic Co-operation and Development, 2008).

According to the OECD Benchmark definition, FDI is a category of cross-border investment which has the objective of establishing a lasting interest in an enterprise. The "lasting interest" is evidenced when the direct investor owns at least 10 per cent of the voting power of the direct investment (Organization for Economic Co-operation and Development, 2008, p. 16).

Additionally, Peng *et al.* (2008) suggested that the business environment influences the company's strategy, and both executives and companies rationally pursue their interests and make strategic choices within the formal and informal restrictions on certain institutional segments (Peng *et al.*, 2009). Institutionalism in the economic tradition stresses the role of formal and informal institutions in reducing uncertainty and opportunistic behavior, and lowering transaction costs (North, 1986).

Thus, the objective of this work is to identify to identify the extent to which the economic factor effect is more salient in shaping IFDI than institutional factors in G-20 inflow patterns, through the application of the TOPSIS method on the World Bank Governance and Development indicators followed by a panel data analysis. A comparison between the FDI flows before and after the 2008 financial crisis was also made to identify FDI patterns.

The study was based on the World Bank Development Indicators, past and current FDI inflows for the G-20 (before and after the global financial crisis: P1 & P2), as well as the six governance dimensions: VA, PSV, GE, RQ, RL and CC.

Results showed that China held the top ranking of FDI net inflows for the G-20 countries, with US$289bn received in 2014. China has attracted more FDI than any other emerging economy since 1992 as a global destination for such investment, ranking just behind USA. The predominant motive for companies investing in China has been to gain access to the domestic market – *market seeking* or *sell more* – exploiting, obtaining better host country conditions (Cuervo-Cazurra *et al.*, 2015). Although based on a low average per capita income (Table III), this market had the incomparable combination of a large population and rapid economic growth, pointing to high expected profits in the longer term (Boisot and Child, 1996).

Only four countries had considerably recovered investment flows from the period before the financial crisis, recording significant increase rates: Indonesia (267 per cent), Brazil (153 per cent), China (88 per cent) and Australia (15 per cent). Among other G-20 countries, the USA had still not recovered to the pre-financial crisis period average, with a decrease of approximately 61 per cent (although it continues to receive the second-highest FDI inflows). Next were Canada, the UK, Russia, Italy, Turkey, Japan, Germany, Saudi Arabia and France, with developed countries predominating.

As for the WGI, the TOPSIS ranked Canada and Australia as having the best governance environment among G-20 countries, while China, Indonesia, India, Argentina and Russia situated at the greatest distance from the ideal solution and thus not presenting an effective governance environment.

Van Hoorn and Maseland (2016) state that institutional research offers little solid insight on how institutions matter for IB. In this sense, Indonesia, Brazil and China maintained positive investment flows in contrast with the government indicators ranking of 15, 11 and 14, respectively, which led us to reject *H1*.

Additionally, the longitudinal regression showed little correlation with the government indicators over the dependent variable, FDI Intensity. Only the variable PSV (Political Stability No Violence) presented significance on this model. This result may lead us to the conclusion that certain host country determinants, such as large populations, individual incomes and growing

GDP (Giroud and Mirza, 2015), are more important determinants for FDI patterns than are governance indicators, leading us to assert that institutions have less influence on FDI decisions.

The institutional perspective has evolved significantly in the past three decades, particularly its applications in the international business field. The main objective of the present study was to investigate the determinants of FDI, and particularly the effect of institutions on FDI before and after the global financial crisis. This implies that the effectiveness or quality of the institutional framework has a direct bearing on the performance of countries and organizations. However, it seems that the effects of institutions can change over the time. Under certain circumstances, they may lose their power in providing a best prediction of the geographic distribution of FDI among countries.

Our main findings point to a relatively low impact of institutions on IFDI. We suggest that the global financial crisis has changed the rationale of decision-making by multinational companies. Where institutional stability is key to a large extent, economic factors may have performed a higher impact in shaping the patterns of FDI in the period of global financial crisis.

This, on the other hand, does not suggest that institutions do not matter. They continue to provide a powerful predictor of the behavior of firms when operating globally. However, their effects may be moderated by the economic dimensions and performance of the host countries.

For future studies, a qualitative study should be carried out with MNE executives to obtain a deeper understanding of how the role of institutions can change in the period of global crisis. It is important to note that the role of institutions reflects to some extent the perception of managers and decision-makers of multinational companies. This process of seizing the changing role of institutions will depend on how firms will balance their strategies in different economic contexts. Therefore, we suggest the development of more firm-level analysis of the impact of institutions in a dynamic and changing world.

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