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Prospects of foreign direct investments in technology transfer

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Abstract: The authors investigated the impact of foreign direct investment on economically developed and developing countries, and also on transition economy countries as far as technology transfer is concerned. The results show a significant foreign direct investment influence on the economic growth of developing countries and transition economy countries. The present paper examines inflows of inward Foreign Direct Investment (FDI) during 2005-2016. There has been research conducted on the determinants of FDI inflows for developed and developing countries, but little has been done concerning this issue especially in the case of transition economies. The authors consider the possibilities the FDI inflows from investor-countries in the area of innovation and technology transfer in the years 2010-2015. In this case, Asia deserves attention. FDI allows technology transfer from developed countries to further extract surplus from the developing countries and transition countries.

Keywords: foreign direct investment, technology transfer, developed economies, developing economies, transition economies

JEL codes: O14, Z32

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1. Introduction

Foreign direct investment (FDI) is presumed to play an important role in transferring technology from home country into a host country. Technology transfer (TT) refers to any process by which a party in one country gains access to technical information of a foreign party and successfully absorbs it into its production process.

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The importance of TT for economic development is widely recognized in the income gap between developed and developing countries (Parente and Prescott, 1994). To narrow the technological gap, developing countries must adopt new technologies at a faster rate than it is forming. Both market forces and government policies have an important role to play in accomplishing this formidable task.

At the heart of TT is the exchange of information and knowledge. Technology may be codified (e.g., in blueprints) or uncodified (e.g., know-how of engineers). It may be embodied in products or people, or disembodied in ideas or services. TT often occurs between unrelated partners in market-based transactions. However, information also flows internationally between related parties on a non-market basis, within the boundaries of firms and joint ventures. Given the multi-faceted nature of technology transfer, there exist numerous channels through which technology flows across international boundaries. One major channel is trade in goods and services. All exports bear some potential for transmitting technological information. Trade in capital goods and technological inputs can directly improve productivity by being integrated into production processes. Another major channel of TT is direct trade in knowledge via technology licensing, which may occur within firms, among joint ventures, or between unrelated firms. The focus of this article is the channel of foreign direct investment (FDI).

The international investment has been shaped to take on an important new dimension in recent years with the expansion of FDI from developed, developing and transition economies. The rapid economic growth, high commodity prices and liberalization have been feeding a boom in outward investment from these groups of economies, reaching together $193 billion in 2011, the highest level ever recorded, and corresponding to 16% of world outflows; ten years ago that share was only 7%. This rise is of particular relevance to low-income countries since most of the outflow investment remains within developing and transition economies.

FDI growth in economies in transition is often regarded as being motivated by the process of economic liberalization, and the elimination of entry barriers to FDI. Transition economies now absorb more than half of global FDI, 29% of which comes from exchange between these countries. Outward FDI from these countries has also reached high records with most of the investment directed to other economies in transition. On the other hand, FDI inflows to developed countries continued to decline. Thus, the role of transition economies, not only as a recipient, but also as a source of FDI, is growing (UNCTAD, 2011).

Yet, among these economies in transition, the region of the Commonwealth of Independent States (CIS) has experienced a boom in (FDI) in recent years only. The magnitude of capital inflows resembles the FDI that poured into CEE countries in the late 1990s, which contributed to a major growth in the productivity of local industries and services there.

The bulk of South-South FDI is intraregional in the nature, there are some indications that Transnational Corporations (TNCs) based in developing countries and transition economies are increasingly venturing beyond their neighbouring regions and have begun to invest in each other, including technology transfer. For example, natural-resource-based TNCs in transition economies are expanding their presence in Africa. However, technology and other firm-specific advantages are the key to further growth of investment between these groups of economies amid intensified competition in FDI in general, and in the oil and mining sector in particular, where the bulk of investment between these two groups of economies is taking place.

The main purpose of this article is to describe the general patterns of the FDI relationship between developed, developing countries and transition economies; review the theoretical framework on the determinants of FDI conducive to outward technology transfer, and, finally, to outline directions for future research.

2. Literature review

According to the research results, conducted on FDI, there is not one single theory of FDI, but a range of different theoretical assumptions, approaches, and models; moreover, sub-theories of FDI are not mutually exclusive, and each of them requires components of the others, and is incomplete if taken separately (Faeth, 2009). To investigate FDI in the context of transition economies, first we need to answer several questions: including: What is a developed and a developing economy? What is an economy in transition?

The classification of countries is based on the economic status, such as GDP, GNP, per capita income, industrialization, the standard of living, etc. The term ‘developed countries’ refers to a sovereign state, whose economy has highly progressed and possesses great technological infrastructure as compared to other nations.

The countries with low industrialization and low human development index are termed as ‘developing countries’. Developed countries provide a free, healthy and secure atmosphere to

live, whereas developing countries lack in these attributes.

The notion of 'economy in transition' covers a wide variety of different transition states experiencing rapidly changing conditions. These countries can be divided into three groups (however, they are not homogeneous within each group, and had different conditions at the beginning of their transition): (1) Central and Eastern European (former communist bloc) countries, (2) rent-seeking countries of Africa and the Middle East, (3) emerging countries (China, India, and some countries of Latin America). The common characteristics of these countries are the collapse of a whole economic system, abandonment of centralized planning and a common trade space, the recognition of private property, opening up to Western economies. However, insufficient level of political and economic transformation towards democracy and the free market, and stronger regional ties within some groups of transition countries make them remain separated from the rest of the world.

Let us first consider country classifications. For analytical purposes, *World Economic Situation and Prospects* (WESP) classify all countries of the world into one of three broad categories: developed economies, economies in transition and developing economies. The composition of these groupings, specified in Tables 1, 2 and 3, is intended to reflect basic economic country conditions (www.1).

Table 1. Developed economies

Europe			**Other countries**	**Major developed economies (G7)**
European Union	**New EU member States**	**Other Europe**		
EU-15	Bulgaria	Iceland	Australia	Canada
Austria	Croatia	Norway	Canada	Japan
Belgium	Cyprus	Switzerland	Japan	France
Denmark	Czech Republic		New Zealand	Germany
Finland	Estonia		United States	Italy
France	Hungary			United Kingdom
Germany	Latvia			United States
Greece	Lithuania			
Ireland	Malta			
Italy	Poland			
Luxembourg	Romania			
Netherlands	Slovakia			
Portugal	Slovenia			
Spain				
Sweden				
United Kingdom				

Source: (www.1).

Several countries (in particular the economies in transition) have characteristics that could place them in more than one category; however, for the purpose of this analysis, the groupings have been made mutually exclusive. Within each broad category, some subgroups are defined based either on geographical location or on ad hoc criteria, such as the subgroup of "major developed economies", which is based on the membership of the Group of Seven.

Table 2. Developing economies by region[a]

Africa		**Asia**	**Latin America and the Caribbean**
North Africa	**Southern Africa**	**East Asia**	**Caribbean**
Algeria Egypt Libya[b] Mauritania Morocco Sudan Tunisia	Angola Botswana Lesotho Malawi Mauritius Mozambique Namibia South Africa Zambia Zimbabwe	Brunei Darussalam China Hong Kong SAR[c] Indonesia Malaysia Myanmar Papua New Guinea Philippines Republic of Korea Singapore Taiwan Province of China Thailand Viet Nam	Barbados Cuba Dominican Republic Guyana Haiti Jamaica Trinidad and Tobago
Central Africa	**West Africa**	**South Asia**	**Mexico and Central America**
Cameroon Central African Republic Chad Congo Equatorial Guinea Gabon Sao Tome and Prinicipe	Benin Burkina Faso Cabo Verde Côte d'Ivoire Gambia Ghana Guinea Guinea-Bissau Liberia Mali Niger Nigeria Senegal Sierra Leone Togo	Bangladesh India Iran Nepal Pakistan Sri Lanka	Costa Rica El Salvador Guatemala Honduras Mexico Nicaragua Panama
East Africa		**Western Asia**	**South America**
Burundi Comoros Democratic Republic of the Congo Djibouti Eritrea Ethiopia Kenya Madagascar		Bahrain Iraq Israel Jordan Kuwait Lebanon Oman Qatar Saudi Arabia	Argentina Bolivia Brazil Chile Colombia Ecuador Paraguay Peru Uruguay

Rwanda Somalia Uganda United Republic of Tanzania		Syrian Arab Republic Turkey United Arab Emirates Yemen	Venezuela

a Economies systematically monitored by the Global Economic Monitoring Unit of DPAD.

b The name of the Libyan Arab Jamahiriya was officially changed to Libya on 16 September 2011.

c Special Administrative Region of China

Source: (www.1).

Table 3. Economies in transition

South-Eastern Europe		**Commonwealth of Independent States and Georgia[a]**	
Albania Bosnia and Herzegovina Montenegro Serbia The former Yugoslav Republic of Macedonia		Armenia Azerbaijan Belarus Georgia[a] Kazakhstan Kyrgyzstan	Republic of Moldova Russian Federation Tajikistan Turkmenistan Ukraine Uzbekistan

a Georgia officially left the Commonwealth of Independent States on 18 August 2009. However, its performance is discussed in the context of this group of countries for reasons of geographic proximity and similarities in economic structure.

Source: (www.1).

The main difference between transition economies and economically advanced countries consists in less-developed market institutions, unstable economic and political situations and hence a high level of uncertainty, demonstrating a potential risk for business, which plays an important role in risk management for (Multinational Corporations) MNCs doing business in transitional economies.

Consistent with Coase (1937), Hymer (1960) offered an alternative, a microeconomic analysis of MNCs based on industrial organization theory, which relates MNCs' motives for FDI as to extend their activity abroad and transfer intermediate products, such as knowledge and technology over the world. Actually, he was the first to identify the MNC as a business entity for international production rather than international trade in an imperfect market. Also, his theory highlights such important factors for transition economies as product differentiation, managerial

expertise, new technology or patents, government intervention, information asymmetry, culture differences and business ethics (Caves, 1996).

Based on the hypothesis of comparative advantage of factor endowments, which suggests that differences in endowments and initial conditions between countries explain the geographical pattern of inward FDI, Vernon (1966) introduced the theory of international product life cycle. However, his model simplifies FDI as a substitute for trade, and cannot explain the investment activities of transition countries in advanced economies. Aggregate Variables as Determinants of FDI. This theory is based on empirical findings, rather than on any existing theory of FDI. While testing MNCs' incentives to invest abroad, Scaperlanda and Mauer (1969) found evidence of an impact of GNP size on FDI in Europe. Other researchers also disclosed the significant role of market size, market growth, distance between the investor and host countries, cultural and language similarities, and diverse trade barriers as main determinants of FDI (Goldberg, 1972; Davidson, 1980; Lunn, 1980). Many investigations of FDI in transition economies are based on this approach. In the context of CEE countries, Altomonte (1998) showed that the bigger the size of the market and its potential demand, the higher the probability of attracting foreign investment; the distance between the home and the host country also influences MNCs' FDI decisions. Using an empirical model of bilateral FDI flows between the EU and CEE countries, Brenton, Di Mauro and Liicke (1998) found that income growth and business-friendly government policies were the key determinants of FDI to the region. The results of Lyroudi, Papanastasiou and Vamvakidis (2003) for transition countries for 1995-1998 indicate that FDI does not exhibit any significant relationship with economic growth, which can be explained by the fact that all the transition countries had a similar crisis, situation characterized by low economic growth then. Cukrowski and Mogilevsky (2001) claim that poor transition economies attract fewer investors.
According to the theory of Internalization of FDI, transactions are made within an institution if the transaction costs on the free market are higher than the internal costs (Dunning, 1988). For a firm, through an advantage taken from the host country, it should be more profitable to produce in the host country than to produce in the home country and export it (such as existence of raw materials, low wages, special taxes or tariffs – Location). In addition, realizing FDI project should be more profitable than selling, leasing or licensing the skills (advantages by producing through a partnership arrangement such as licensing or a joint venture – Internalization). In the context of transition countries, Dunning was the first to consider structure of resources, market

size and government polices as the determinants of the location of FDI. He also argues that the patterns of FDI are not constant, but differ according to these determinants.

The theoretical explanations of FDI largely stem from international trade that is based on the theory of comparative advantage and differences in factors endowments between countries. Multinational companies are usually attracted to a particular country by the comparative advantage that the country or region offers. FDI refers to long-term participation by a country in another country and this involves participation in management (Zhang, 2001), joint-venture, transfer of technology, and expertise. There are two types of FDI as indicated by Damooei and Tavakoli (2006), that is, inward foreign direct investment and outward foreign direct investment, resulting in a net FDI inflow (positive or negative). For an investment to be regarded as an FDI, the parent firm needs to have at least 10% of the ordinary shares of its foreign affiliates, but the investing firm may also qualify for an FDI if it holds the voting power in a business enterprise operating in a foreign country (Sharma and Gani, 2004).

Technology transfer is achieved by a country through:

- licensing agreements and outright purchase;
- purchasing foreign capital goods;
- FDI inflows;
- turnkey projects;
- various forms of international technical assistance (Osano and Koine, 2016).

During its development process, Japan relied heavily on licensing, turnkey projects, and the reverse engineering of imported goods, while in the case of Korea, they relied on machinery imports and turnkey projects (Kakazu, 1990).

It is acknowledged that technology upgrading constitutes a critical element of the development process. In this regard, the Association of Southeast Asian Nations (ASEAN) member countries placed a strong emphasis on attracting DFI flows as a means of promoting technology transfer (Montes, 1997).

It is argued that technology transfer through FDI has the effect of stimulating competing firms in the domestic market to carry out technological upgrading. Employees can also learn the technology while working for the firm, and some of them may start their own ventures, using the acquired technology (Chia, 1997). For industry, in long term, it is a cost-efficient opportunity to

get the latest knowledge and the best solutions for their technological problems (Voytovych, 2017).

In their respective positions towards DFI and technological upgrading, ASEAN economies have exhibited a diversity strongly conditioned by their economic situation and policy experience (Chia, 1993). ASEAN economies consistently sought multinational production technology for the purpose of modernizing their manufacturing sector with economies undertaking an import-substitution strategy seeking external investments in the "mainline" development industries, such as textile production and automobile assembly, eventually switching to export-promotion stances, seeking multinational enterprises (MNEs) serving global markets; provision of investment incentives and assistance for upgrading of labour skills; and undertaking policies, including lower tariffs or duty-free importation and tax deductions for various categories of costs, to assist companies relocating their production in reducing variable production costs, especially in the sourcing of inputs (Montes, 1997).

A study examining national R&D projects for technological learning in Korea showed that R&D plays an important role in indigenous technology capabilities (TCs) building in not only searching for appropriate technology, but also absorbing, adapting, and "innovating" the technology (Lee, 2004).

FDI flows to Kenya reached a record level of $1.4 billion in 2015, which was given impetus by renewed investor interest and confidence in the country's business climate and booming domestic consumer market. Kenya has become a favoured business hub, not only for oil and gas exploration, but also for manufacturing exports, as well as consumer goods and services. To enhance its investment climate, Kenya has moved to abolish restrictions on foreign shareholding in listed companies, permitting full foreign control, as competition for capital heats up amongst Africa's top capital markets (UNCTAD, 2016).

Thus, FDI is the dominant channel through which firms serve customers in foreign markets. While much of FDI occurs between industrial countries, developing countries are becoming increasingly important host countries for FDI. Approximately 33% of the global stock of FDI today is in developing countries (UNCTAD, 2017). FDI is growing in importance as a channel of TT. Multinational activity occurs primarily in industries that are characterized by a high ratio of R&D to sales as well as by large shares of professional, scientific and technical workers (Markusen, 1995). An important consequence of FDI is that shifting production to a

developing country can reduce technology adoption costs for indigenous local firms. The degree to which imitation costs are lowered by FDI might be higher for process than for product technologies.

3. Material and methods

The paper used secondary sources of information, such as data of the World investment report United Nations Conference on Trade and Development (UNCTAD), State Statistics Service of EU, business reports, and industry newsletters and publications. The present paper examines the factors (determinants) of inward Foreign Direct Investment during 2005-2016. A comparative method was applied for the analysis of collected data and materials.

In this article, we used the source of data which were prepared by the Development Policy and Analysis Division (DPAD) of the Department of Economic and Social Affairs of the United Nations Secretariat (UN/DESA). We also relied on information obtained from the Statistics Division and the Population Division of UN/DESA, as well as from the five United Nations regional commissions, the United Nations Conference on Trade and Development (UNCTAD), the United Nations World Tourism Organization (UNWTO), the International Monetary Fund (IMF), the World Bank, the Organization for Economic Cooperation and Development (OECD), and national and private sources.

4. Research results

Many countries and continents (especially developing) now see attracting FDI as an important element in their strategy for economic development. This is most probably because FDI is seen as an amalgamation of capital, technology, marketing and management. FDI is particularly important for developing countries, since it provides access to resources that would otherwise be unavailable to these countries. Moreover, the advantages of foreign direct investment are extremely positive for a country or region (Genet A., et al., 2005):

• Technology transfer: improvements in access to excellent technology,

• Employment: creating new and sustainable jobs,

• Capital: investors bringing in capital to Ethiopia while investing in a new factory or company,

• Revenue benefits: widening local tax bases and contributing to government revenues,

• Higher local investments: increasing domestic investments as local companies gain access to distribution channels or become suppliers,

• Improved exports: FDI is often export-oriented, using their access to overseas marketing and distribution networks,

• Improved labour skills: more training, knowledge transfer,

• Increased competition and competitiveness: improving overall economic growth by increasing competition; raising quality levels and delivery reliability. As a result of these benefits of FDI, many developing countries are now actively seeking foreign investment by taking measures that include economic and political reforms designed to improve their investment environment. According to Dunning, four main motives can be identified that are prompting firms to undertake FDI (Dunning, 1993):

• **Resource-seeking FDI:** The availability of abundant or cheap production factors in a developing country is a motivation for transnational corporation (TNC) presence in that country. Natural resources are a type of production factors that traditionally have attracted greatest interest among foreign investors. Especially, in the first wave of globalization, colonial powers invested in their colonies to extract natural resources and they subsequently used them in their own countries. Natural resource-seeking is still the main FDI motive for TNCs operating in sectors, such as mining, mineral extraction and operating in large-scale agricultural business. Countries with an abundance of relevant natural resources, especially, the least developed countries, are potential investment regions for investors seeking natural resources in TNCs. TNCs may seek natural resources for three reasons: to meet the needs of its own downstream refining or manufacturing activities, to sell the minerals directly in host, domestic or international markets, or to secure the strategic requirements of energy or other minerals for its home country (as formulated by the country's government) (OECD, 2008; UNCTAD, 2011). Human resource-seeking motive for FDI arises due to the potential of obtaining cheap labour. Human resource-seeking FDI depends on the relative pricing of labour with a given level of qualifications. Besides natural resource seeking, the availability of skilled inexpensive labour in developing countries is becoming an increasingly important motivation among foreign investors. On the other hand, since TNCs generally respond to rising wage pressures at home by shifting labour-intensive

production processes to developing countries, this type of FDI is also related to the efficiency-seeking approach.

• **Market-seeking FDI:** Especially in the manufacturing sectors of developing countries, where import-substitution and related policies hinder direct export from the home countries, market-seeking FDI is an important motive to access host country markets for processed goods. However, many developing countries have liberalized their import regime after the 1980s and this liberalization policy enabled TNCs to choose between exporting and undertaking FDI. The opening of service industries to FDI is the reason behind the existence of the market-seeking FDI motive today. Some other reasons of market-seeking FDI are transport costs, differences in consumer tastes and the total magnitude of the host economy.

• **Efficiency-seeking FDI:** TNCs invest in developing countries to boost efficiency beyond the simple reallocation of labour-intensive production. Key factors for efficiency seeking investment include labour costs, skills and availability, and access to international markets. Efficiency-seeking FDI is often made with the specific objective of accessing low-cost labour for labour-intensive production or taking advantage of relatively abundant supplies of educated and skilled workers. Efficiency-seeking FDI is motivated by creating new sources of competitiveness for firms and strengthening existing ones whereas market-seeking FDI aims at penetrating the local markets of host countries. Investment related to efficiency-seeking may be seen in different forms. One form is that firms in developing countries undertake to supply TNCs with fully manufactured products that will bear the TNCs' brand names. Another form is that foreign enterprises try to provide products adapted to local tastes and quality requirements. The composition of this form of FDI may be either Greenfield investment. This kind of FDI mostly goes to large or economically advanced developing countries.

• **Strategic asset-seeking FDI:** FDI is a means to acquire strategic assets, such as technology, marketing, and management expertise available in a host country. Companies investing abroad with the purpose of acquiring strategic assets aim at a competitive edge, as well as a degree of monopoly just at the beginning. Strategic asset-seeking FDI is popular among medium income and fast-growing industrializing countries as they seek to establish a speedy presence in the innovative and dynamic markets of the advanced countries (Dunning, 1993). Developing countries may make themselves more attractive to such FDI by investing in human resources and infrastructure. (OECD, 2008).

Nowadays, virtually all countries are actively seeking to attract FDI, because of the expected favourable effect on income generation from capital inflows, advanced technology, management skills and market know-how. It would be useful to review the key determinants and factors of FDI. The review of host country determinants is closely linked with the role of national policies and, especially, the liberalization of policies, a key factor in globalization, as FDI determinants. Location-specific determinants have a crucial influence on a host country's inflow of FDI. The relative importance of different location-specific determinants depends on at least three aspects of investment: the motive for investment (e.g., resources, market or efficiency-seeking), the type of investment (e.g., services or manufacturing), and the size of the investors (small and medium MNEs or large MNEs).

Ones of the most important traditional FDI determinants, that is cost of transfer between locations, the quality of infrastructure, the ease of doing business and the availability of skills have become even more important (UNCTAD, 2011). Traditional economic determinants, such as natural resources and national market size for manufacturing products sheltered from international competition by high tariffs or quotas, still play an important role in attracting FDI by a number of developing and developed countries as well as economies in transition (e.g., China, Australia and Kazakhstan) (UNECE 2017). The economic determinants related to large markets, trade barriers and non-tradable services are still at work and account for a large share of worldwide FDI flows. Although FDI remains strongly driven by its traditional determinants, the relative importance of different location determinants for competitiveness-enhancing FDI is shifting. While low-cost labour remains a location advantage, the increasingly sought-after advantages are competitive combinations of wages, skills and productivity.

There are different channels to transfer international technology to the recipient country for the purpose of meeting goals. The main channels are formal or market-mediated channels and informal or non-market-mediated channels (Maskus E. et al. 2003; Wie Thee kian, 2005).

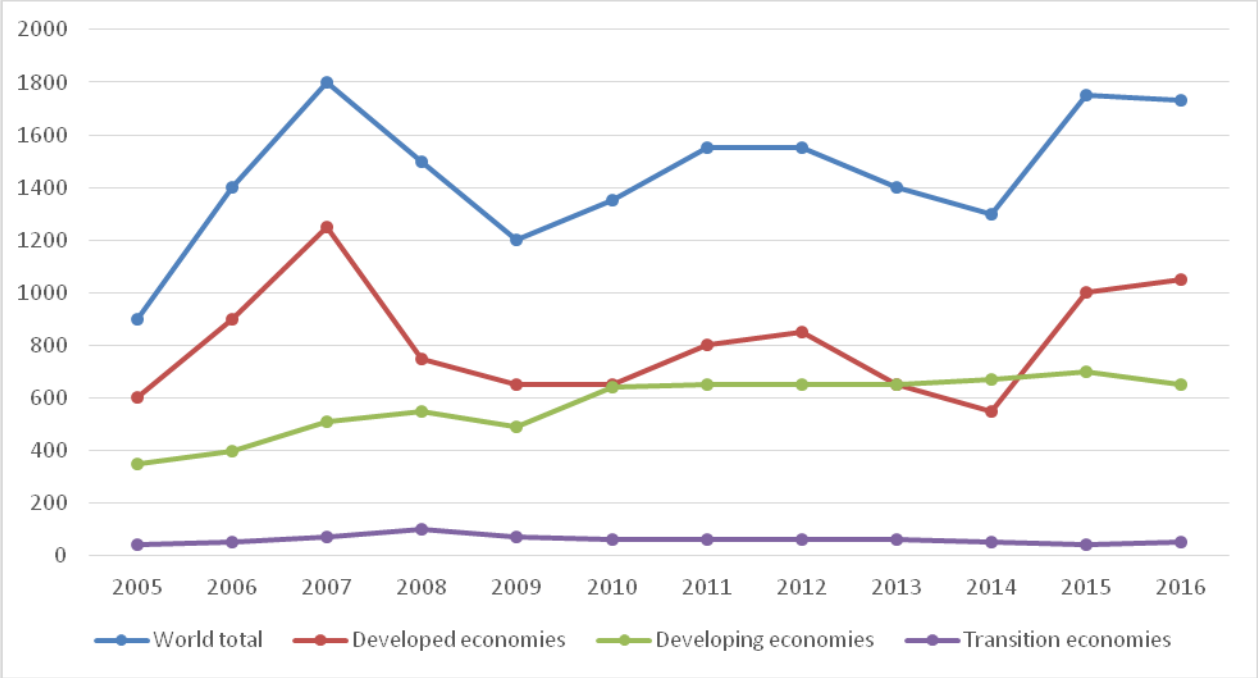
We stopped on a Formal or Market-mediated channels. This is foreign direct investment. FDI through multinational enterprises (MNEs), in principle MNEs are expected to deploy technology to their subsidiaries in recipient countries that is newer or more productive than the existing technology in the firm.

FDI has turned out to be one of the main drivers of globalization. The growing importance of FDI is reflected by a continuous increase in its flows in the world economy, which

has already dominated that of trade. The moderate recovery of global FDI in developed economies flows expected in 2017 reflected accelerating economic growth in all major countries regions, a strong performance of stock markets and a rebound in world trade volume. The improving macroeconomic outlook has had a direct positive effect on the capacity of MNEs to invest. The 2017 UNCTAD Business Survey indeed indicates renewed optimism about FDI prospects (UNCTAD, 2017).

Following a surge in foreign investment in 2015, global FDI flows fell 2 %, to $1.75 trillion (World Investment Report, 2017), amid weak economic growth. A fall in inflows to developing economies was partly offset by modest growth in developed countries and a sizeable increase in transition economies. As a result, developed economies accounted for a growing share of global FDI inflows in 2016, absorbing 59 % of the total (Figure 1).

Figure 1. FDI inflows, global and by group of economies, 2005–2016 (Billions of dollars and percent)



Source: World Investment Report, 2017.

In Figure 1, we can see a sharp decline in FDI in developed and developing economies since the end of 2007. A modest recovery in global FDI flows was forecast for 2017, although flows were expected to remain well below their peak of 2007. A combined upturn of economic

growth in major regions and improved corporate profits were expected to boost business confidence, and consequently MNEs' appetite to invest. A cyclical uptick in manufacturing and trade was supposed to result in a faster growth in developed countries, while a likely strengthening of commodity prices should underpin a recovery in developing economies in 2017. As a result, global FDI flows were expected to increase by about 5 % in 2017 to almost $1.8 trillion. However, elevated geopolitical risks and policy uncertainty for investors could have an impact on the scale and contours of the FDI recovery in 2017.

Developing economies were likely to see a 10 % increase in inflows in 2017, not yet fully returning to the 2015 level, while flows to developed economies are expected to hold steady. Global foreign direct investment (FDI) inflows declined by 2 % overall in 2016 to $1,746 billion, down from $1,774 billion in 2015, but with variance among country groups and regions (Table 4).

Table 4. FDI inflows and FDI outflows by region, 2014–2016 (Billions of dollars and percent)

Group of economies/region	FDI inflows			FDI outflows		
	2014	2015	2016	2014	2015	2016
World	**1 324**	**1 774**	**1 746**	**1 253**	**1 594**	**1 452**
Developed economies	**563**	**984**	**1 032**	**708**	**1 173**	**1 044**
Europe	272	566	533	221	666	515
North America and other countries	231	390	425	353	370	365
Developing economies	**704**	**752**	**646**	**473**	**389**	**383**
Africa	71	61	59	28	18	18
Asia	460	524	443	412	339	363
East Asia	257	318	260	289	237	291
South-East Asia	130	127	101	89	56	35
South Asia	41	51	54	12	8	6
West Asia	31	28	28	23	38	31
Latin America and the Caribbean	170	165	142	31	31	1
Transition economies South-Eastern Europe Commonwealth of Independent States and Georgia	**57**	**38**	**68**	**73**	**32**	**25**
Structurally weak, vulnerable and small	**68**	**64**	**58**	**26**	**14**	**10**

economies*						
LDCs	41	44	38	18	9	12
LLDCs	28	25	24	6	5	-2
SIDS	6	4	4	0.3	0.7	0.2
Memorandum: percentage share in world FDI flows						
Developed economies	**42.6**	**55.5**	**59.1**	**56.5**	**73.6**	**71.9**
Europe	20.6	31.9	30.5	17.7	41.8	35.4
North America other countries	17.4	22.0	24.3	28.1	23.2	25.2
Developing economies	**53.2**	**42.4**	**37.0**	**37.7**	**24.4**	**26.4**
Africa	5.4	3.5	3.4	2.3	1.1	1.3
Asia	34.8	29.5	25.3	32.9	21.2	25.0
East Asia	19.4	17.9	14.9	23.0	14.9	20.1
South-East Asia	9.9	7.1	5.8	7.1	3.5	2.4
South Asia	3.1	2.9	3.1	1.0	0.5	0.4
West Asia	2.3	1.6	1.6	1.8	2.4	2.1
Latin America and the Caribbean	12.8	9.3	8.1	2.5	2.0	0.1
Transition economies South-Eastern Europe Commonwealth of Independent States and Georgia	**4.3**	**2.1**	**3.9**	**5.8**	**2.0**	**1.7**
Structurally weak, vulnerable and small economies*	**5.1**	**3.6**	**3.3**	**2.1**	**0.9**	**0.7**
LDCs	3.1	2.5	2.2	1.5	0.6	0.8
LLDCs	2.1	1.4	1.4	0.5	0.3	-0.1
SIDS	0.4	0.2	0.2	0.03	0.04	0.01

Note: LDCs = least developed countries, LLDCs = landlocked developing countries, SIDS = small island developing states.

*Without double counting of the same countries that are part of multiple groups

Source: UNCTAD 2017, FDI/MNE database (www.unctad.org/fdistatistics)

Flows to developed economies increased by 5 % to $1,032 billion. The decline of FDI flows to Europe (by 6 % to $533 billion) was more than offset by a modest growth in flows to North America (+9 % to $425 billion) and by investment more than doubling in other developed economies. FDI to developing economies experienced a decline of 14 %, to $646 billion. Flows to developing Asia contracted by 15 % to $443 billion, and those to Latin America and the Caribbean – excluding Caribbean offshore financial centres – fell further, by 14 % to $142 billion. With inflows declining by 3 % to $59 billion, Africa's share in global FDI decreased

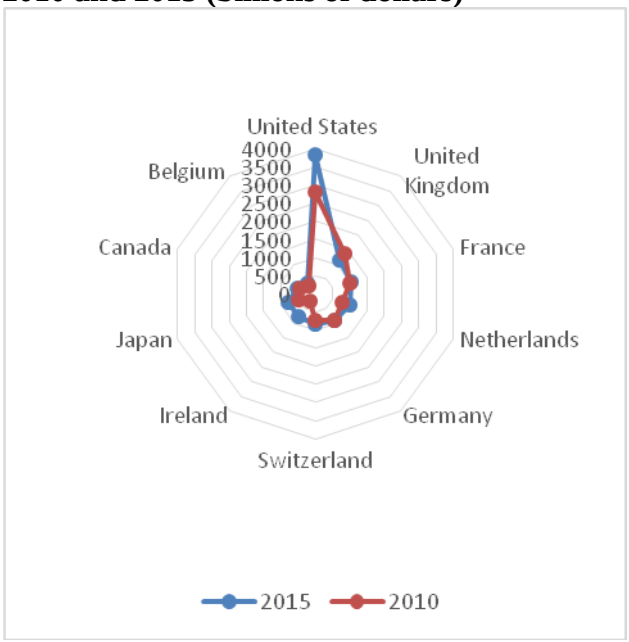
marginally from 3.5 % to 3.4 %. Flows to transition economies rebounded by 81 % to $68 billion.

Outward FDI outflows from developed economies declined by 11 % to $1 trillion, while still accounting for more than 70 % of global FDI. The decline was sharper in Europe (-23 % to $515 billion), after the surge of 2015. Investments by North American multinational enterprises (MNEs) held steady at $365 billion. Overall outflows from developing economies were almost flat at $383 billion. After a lull in 2015, developing Asia saw its outward investments recover by 7 % to $363 billion, thanks to record outflows from China. Outward FDI from transition economies, in contrast, declined by 22 % to $25 billion – their lowest level since 2005 – as outflows from Kazakhstan turned negative.

FDI flows to structurally weak, vulnerable and small economies declined, but at different speeds: flows to the least developed countries (LDCs) retreated strongly (by 13 % to $38 billion); flows to landlocked developing countries (LLDCs) fell only marginally (by 2 % to $24 billion), while flows to small island developing states (SIDS) shrank by 6 % to $3.5 billion.

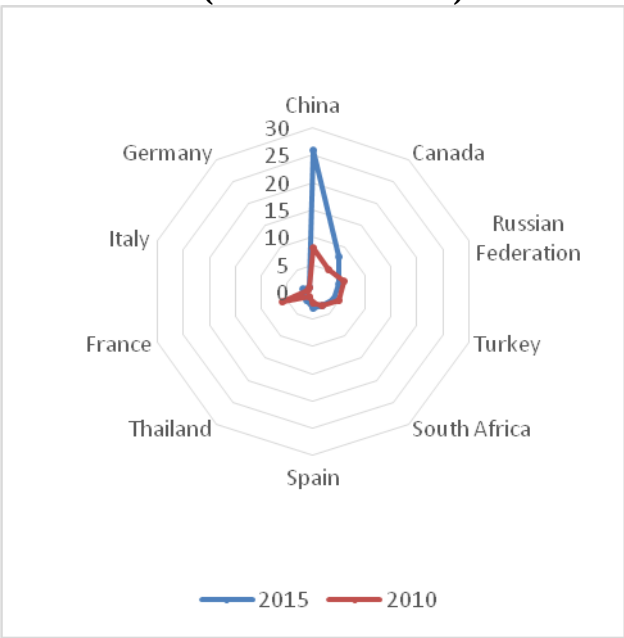
Next to consider are the possibilities of the investor economies in the area of innovation and technology transfer by FDI stock in the years 2010-2015 (Figures 2, 3, 4, 5, 6, 7).

Figure 2. Top 10 investor economies by FDI stock to countries with developed economies, 2010 and 2015 (billions of dollars)



Source: UNCTAD 2017, FDI/MNE database (www.unctad.org/fdistatistics)

Figure 3. Top 10 investor economies by FDI stock to countries with developing economies, 2010 and 2015 (Billions of dollars)

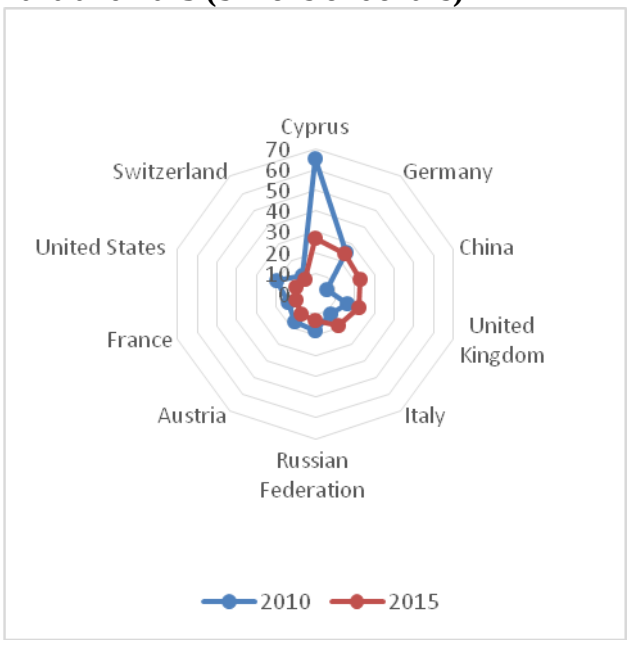


Source: UNCTAD 2017, FDI/MNE database (www.unctad.org/fdistatistics)

Figure 2 shows that the inflows of FDI from country-investors to countries with developed economies were dynamic. The main investors were the United States and the United Kingdom. In addition, FDI flows to developed economies rose by 5%, exceeding the $1 trillion mark for the first time since 2007. Inflows declined in 19 of the 32 European economies, resulting in a 6% fall in aggregate inflows, to $533 billion. Two opposite trends contributed to this pattern: the completions of cross-border M&A megadeals, which add to the equity component of FDI, and significant declines in intercompany loans.

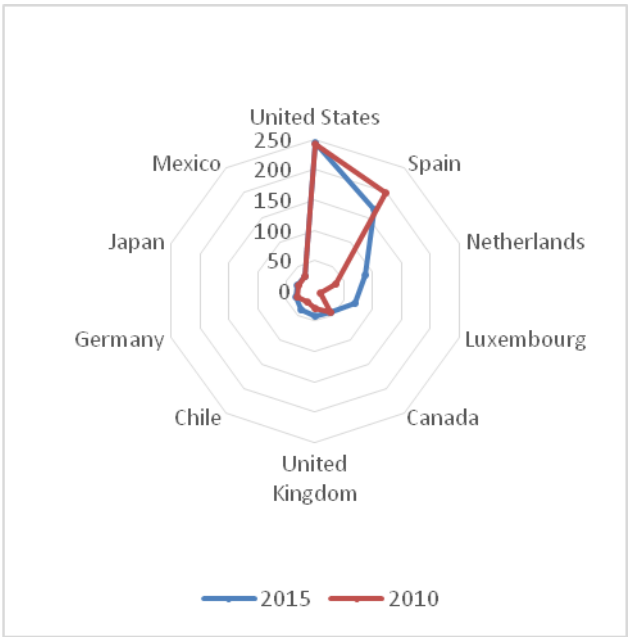
Inflows of FDI from country-investors to countries with developing economies were the fastest growing in comparison with those in 2010. The key investors were China, Canada and Russian Federation. Unfortunately, FDI in host economies (the Bahamas, Maldives and Mauritius) are decreasing. Some, like Jamaica and Mauritius, have had some success in attracting more diversified FDI projects in technology transfer, though. FDI flows and remittances have nonetheless been the major sources of development of finance. Prospects for attracting more FDI remain dim. A stagnation of foreign investments, particularly from developed economies, amplifies the importance of South-based investors.

Figure 4. Top 10 investor economies by FDI stock to countries with transition economies, 2010 and 2015 (billions of dollars)



Source: UNCTAD 2017, FDI/MNE database (www.unctad.org/fdistatistics)

Figure 5. Top 10 investor economies by FDI stock to Latin America and the Caribbean, 2010 and 2015 (billions of dollars)



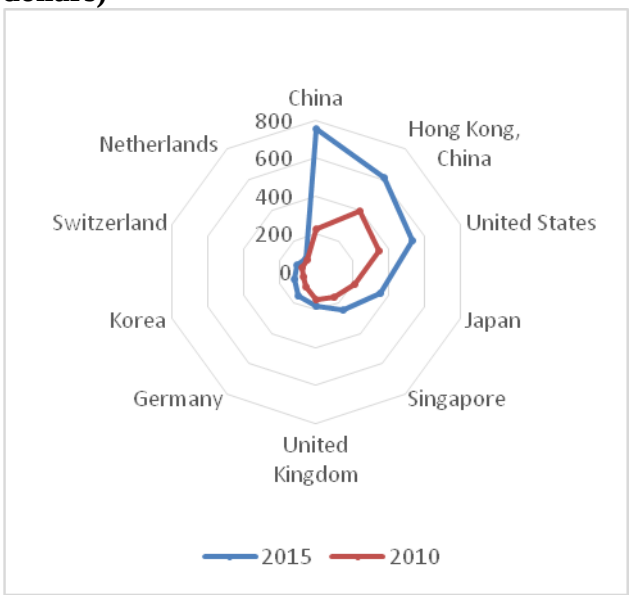
Source: UNCTAD 2017, FDI/MNE database (www.unctad.org/fdistatistics)

FDI grew in transition economies, especially in Kazakhstan, and inflows rose for the fourth consecutive year in Ethiopia, whereas the FDI flowing to Mongolia turned negative. Although FDI continues to focus on innovation in the areas of electricity, gas, and water distribution, investment is shifting towards economic activities, such as infrastructure and manufacturing, helping to mitigate these countries' geographical disadvantage. Investors from developing economies, particularly China, continue to account for an increasing share of FDI. The main countries-investor are Cyprus, Germany and China to develop countries with transition economies.

The United States and Spain have always invested intensively in Latin America and the Caribbean. However, the years 2016-2017 projected a downward trend in FDI flows to Latin America and the Caribbean, with inflows falling by 14% to $142 billion, with all subregions registering declines.

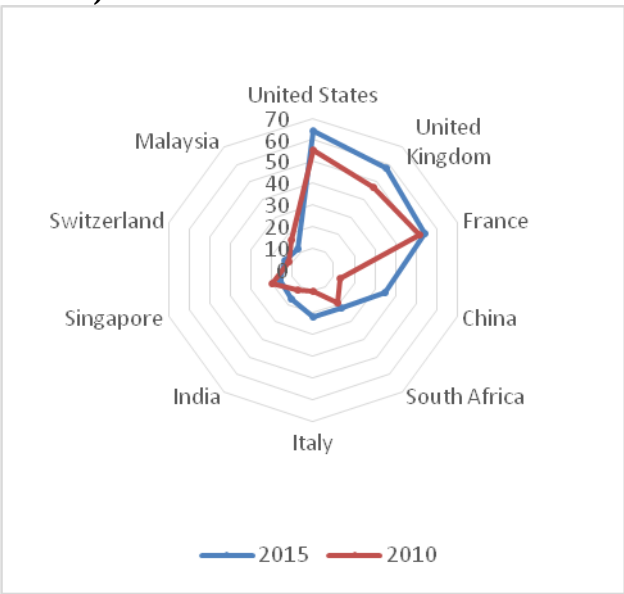
Economic recession, coupled with weak commodity prices and higher currency volatility, weighed heavily on flows to South America, which declined by 14% to $101 billion. In Central America, inflows also contracted (-14% to $38 billion) as gross fixed capital formation and export trade volumes decelerated during the year. FDI flows to the Caribbean, excluding financial centres, likewise dipped (-9% to $3 billion), though with significant variation at the country level.

Figure 6. Top 10 investor economies by FDI stock to Asia, 2010 and 2015 (billions of dollars)



Source: UNCTAD 2017, FDI/MNE database (www.unctad.org/fdistatistics).

Figure 7. Top 10 investor economies by FDI stock to Africa, 2010 and 2015 (billions of dollars)



Source: UNCTAD 2017, FDI/MNE database (www.unctad.org/fdistatistics).

Following a record high in 2015, combined FDI flows to developing Asia and Africa contracted by 15% to $443 billion in 2016. The decline in inflows to the region was relatively widespread, with three of the four subregions recording reductions. However, the reasons for this decline varied by subregion. In East Asia, stable flows into China were not enough to offset the decline of FDI to Hong Kong (China), following one-off large restructuring in 2015. In South-East Asia, several ASEAN member countries saw their inflows decline owing to uncertainties in the world economy. In West Asia, weak oil prices and political uncertainty continued to weigh on FDI inflows. Only South Asia escaped the sharp decline, thanks to stable flows to India and a rise in flows to Pakistan. Yet, developing Asia remained the second largest FDI recipient in the world, with China, Hong Kong (China), Singapore and India ranking among the top 10 FDI host economies. FDI outflows from developing Asia rose by 7% to $363 billion, mainly because of surging FDI outflows from China. An improved economic outlook in ASEAN and China is likely to lift investor confidence and help boost FDI inflows in 2017 and beyond.

Developed economies are responsible for much of the transfer of advanced technology. They are considered to be powerful and effective means in disseminating technology from developed to developing countries and they are often seen as the only source of new and

innovative technologies that are usually not available in the underdeveloped markets (OECD, 2008). Technological progress plays a crucial role in the economic growth and can also stimulate economic development and industrialization (UNECE, 2017). For example, in Western Europe, the share of alternative energy in the overall energy balance is 30-40%, in Ukraine – is only 5-6%. But energy independence and stability play an important role in the economic health of the state. Moreover, according to the estimates of the Cabinet of Ministers, Ukraine in the foreseeable future can become not only self-sufficient in energy, but also a major exporter (www.3).

That is why various international instruments assign obligations to developed countries to carry out technology transfer to developing countries having low technology and innovative capabilities. So, Article 66.2 of the Agreement on trade-related aspects of intellectual property rights (TRIPS Agreement) imposes some obligations on developed countries to create incentive for enterprises and institutions in their territory with the aim to increase transfer of technologies (www.2).

The prospects for FDI in transition economies are moderately optimistic for 2018 and beyond. Innovation projects were nonetheless announced in the food, coal and automotive production industries, as well as in construction and transport. Jackco Technology Group (United States), for instance, announced a synthetic liquid fuel project in Uzbekistan valued at more than $1 billion, and a German affiliate of Sumitomo (Japan) producing electronic wire harnesses announced the construction of a $457-million worth factory in one of the free economic zones of the Republic of Moldova. New projects were initiated from traditional home countries, such as France, Germany, the United Kingdom and the United States, but also from new investors, especially China and Turkey. Lagging countries need not only to obtain foreign technology but also transfer knowledge and know-how, to use it to its fullest potential.

With respect to the contribution of FDI, an important conclusion of this analysis is that host countries are better off facilitating processes. In other words, a developing country should perhaps be less concerned about being able to produce goods on its own and more concerned about developing a competitive network of suppliers that can serve (and gain from) firms. It is in this mutually beneficial exchange that the most productive intervention might lie. Of course, if both sides were indeed willing participants, intervention required would be “light” as opposed to “heavy”. Furthermore, it would not be targeted in nature. Instead, it would ensure that local

businesses have access to adequate infrastructure and skilled workers and their expansion or downsizing decisions are not hampered by burdensome regulations.

5. Conclusions

This study examines the effect of FDI in developed economies, developing countries and transition economy countries regarding technology transfer. The results showed that there has not been enough inflow of FDI in developing and transition economies for technology transfer.

It is contended that FDI not only provides the countries with much needed capital for domestic investment, but also creates employment opportunities and helps transfer of managerial skills and technology, all of which contribute to economic development. Thus, there is recognition for the need to foster a favourable climate for attracting FDI in order to contribute economic development. Indeed, the world market for such investment is highly competitive.

Prospects for the directions of FDI in developed, developing and transition economies:

• FDI inflows to Africa are forecast to increase slightly trough announced Greenfield FDI projects followed by natural gas, infrastructure, renewable energy, chemicals and automotive. Advances in regional and interregional cooperation, through the signing of economic partnership agreements with the EU by regional economic communities and the negotiations towards the Tripartite Free Trade Agreement should encourage stronger FDI. However, a slump in economic growth could harm investment prospects in 2018.

• FDI inflows to developing Asia are expected to increase by 15% in 2018, to $515 billion, as an improved economic (China, Hong Kong, etc.) outlook in major Asian economies is likely to boost investor confidence. In major recipients, such as China, India and Indonesia, renewed policy efforts to attract FDI could contribute to an increase of inflows in 2018.

• Prospects for FDI in Latin America and the Caribbean in 2017 remain muted, as macroeconomic and policy uncertainties persist. Flows are forecast to fall by about 10%, to some $130 billion. Investment in the region's extractive industries will likely to be modest as operators continue to hold back on capital expenditures. Investment in the region, especially in Central America, is also likely to be affected by uncertainties about economic policy in the United States.

• FDI flows to transition economies are forecast to rise moderately in 2018, to about $80 billion, supported by the bottoming out of the economic downturn, higher oil prices and privatization plans. However, they may be hindered by geopolitical problems.

• FDI flows to developed countries are expected to hold steady.

The developing economies should use FDI to share their innovation and technology resources in order to enhance their own innovation capability. Currently, internationalization of foreign multinational R&D is a new trend, many multinational enterprises set up R&D institutions abroad in order to encourage the localization. Through the introduction of multinational R&D institutions, the host country should incorporate multinational R&D resources effectively into a national innovation system, make full use of their superior technology resources and spill-over effect, and encourage cooperation in R&D. This would effectively help the developing and transition economies to enhance indigenous technology innovation capability.

The future research includes development of a framework for effective transfer of technology through FDI.

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Perspektywy bezpośrednich inwestycji zagranicznych w transferze technologii

Streszczenie

Zbadano wpływ bezpośrednich inwestycji zagranicznych w krajach rozwiniętych gospodarczo, rozwijających się oraz kraje o gospodarce przejściowej w sferze transferu technologii. Wyniki wskazują na znaczący wpływ bezpośrednich inwestycji zagranicznych na wzrost gospodarczy w krajach rozwijających. Niniejszy artykuł analizuje wpływy bezpośrednich inwestycji zagranicznych (FDI) w latach 2005-2016. Przeprowadzono badania nad determinantami napływów BIZ do krajów rozwiniętych i rozwijających się, ale niewiele zrobiono w tej kwestii, szczególnie dla gospodarek przechodzących transformację. Rozważono możliwości napływu bezpośrednich inwestycji zagranicznych z krajów-inwestorów w obszarze transferu innowacji i technologii w latach 2010-2015. W tym przypadku Azja zasługuje na uwagę. Bezpośrednie inwestycje zagraniczne umożliwiają transfer technologii w krajach rozwiniętych w celu dalszego wydobywania nadwyżek z krajów rozwijających się i krajów transformujących się.

Słowa kluczowe: bezpośrednie inwestycje zagraniczne, transfer technologii, rozwinięte gospodarki, rozwijające się gospodarki, kraje przejściowe.