Role of Home Country Determinants in Outward Foreign Direct Investment

Minakshee Das

In the last few decades there has been a rapid increase in capital flows across countries because of liberalization, deregulation and market opening mechanisms. This paper investigates the home country determinants of outward capital flows during the period 1996 - 2016 for four main country groupings;viz., advanced, emerging-market, developing and transition economies. The empirical analysis is based on Dunning's Investment Development Path (IDP) paradigm, according to which a country's capital flows (inward and outward) are tied to its economic development relative to that of the rest of the world. The results support the IDP theory, but also highlight the importance of other factors, such as economic development, inward capital flows, trade, innovations and telecommunications affecting the capital outflows.

Introduction

Data compiled by the United Nations Conference on Trade and Development (UNCTAD)[1] reveals that the emerging-market and developing economies which were previously mere recipients of foreign direct investment (FDI) have become the forerunners in investing abroad in recent years. The bulk of FDI outflows over the past four decades have originated from advanced economies (Fig. 1). However, since 2001the pace of outflows from advanced economies has slowed sharply (Table 1). At the same time, from a rather low base, FDI outflows from emerging-market and developing economies have increased steadily and the pace has exceeded that of outflows from advanced economies. Since 2011, all the country groups (advanced, emerging-market, developing and transition economies) haveexperienced negative annual growth in FDI outflows.

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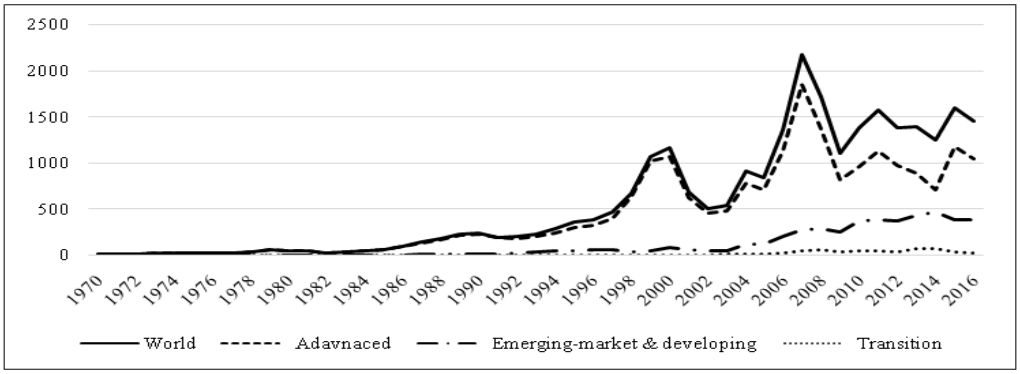
[1] http://unctadstat.unctad.org/wds/ReportFolders/reportFolders.aspx

Fig. 1Trends in Outward FDIFrom Main Country Groups (billion US$ at current prices)



Source: Authors' compilation fromUNCTAD.

Table 1 AverageAnnual Growth of Outward FDI from Main Country Groups (in %)

Year	1970-1980	1981-1990	1991-2000	2001-2010	2011-2016
World	13.9	16.6	19.3	7.3	-0.8
Advanced	13.3	16.3	19.0	4.4	-0.7
Emerging-market & developing	52.3	25.7	23.2	20.2	-0.1
Transition	-	-	-	34.9	-7.6

Source: Authors' compilation from UNCTAD.

The growing participation of emerging-market and developing economies in FDI inflows and outflows can be attributed to the gradual liberalization of the capital accounts, deregulation and market opening mechanisms. This transformation is explained by Dunning's "investment development path (IDP)" paradigm which stipulates that there is a close association between capital flows of a country and its level of economic development (Dunning, 1981).The basic theoretical approach of the IDP theory is that with increasing economic growth and development, a country's net outward investment (NOI, which is defined as the difference between outward direct investment stock and inward direct investment stock) undergoes different stages of progression, from the initial onewhere the country is a receiver of capital inflows, to a matured one where the country becomes a both receiver and investor of capital flows.

This paper fills two gaps in the extant state of knowledge. First, the original IDP framework is tested and later the framework is expanded by incorporating major institutional and macroeconomic factors that enhance outward FDI (OFDI) from four major country groupings, namely: advanced, emerging-market, developing and transition economies. Secondly, policy implications are very important and will be discussed methodically because large amounts of OFDI may lead to a heavy flight of capital which can affect the home country adversely.

The Investment Development Path (IDP) Theory

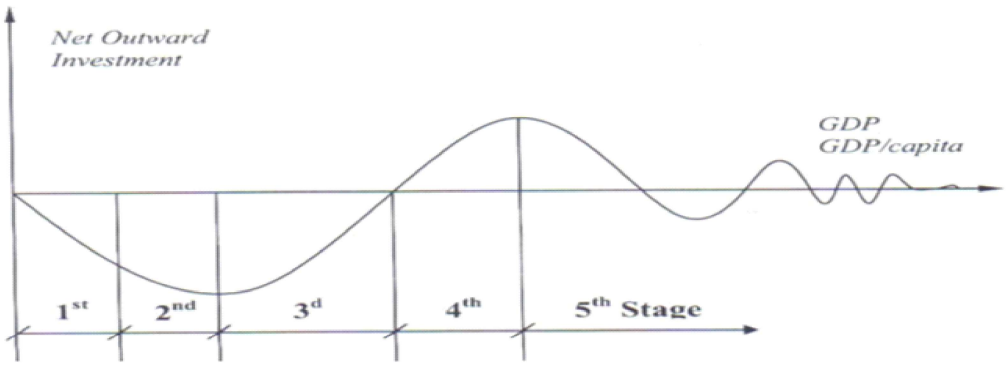
The IDP theory which was introduced by Dunning (1981) and further refined by Dunning (1986, 1988, 1993, 1997), Dunning and Narula (1998), and Duran and Ubeda (2001, 2005) describes the behavior of a country's investment position by relating it to the country's level of economic development, which is usually proxied by Gross Domestic Product (GDP) per capita.The IDP theory postulates economic development as a succession of structural changes and contends that such economic and social transformations have a systematic relationship with the behavior of international capital flows.

The IDP theory postulates economic development as a succession of structural changes.

The theory takes a dynamic and intertemporal approach within Dunning's (1977, 1998) eclectic paradigm of international production or the Ownership-Locational-Internalization (OLI) paradigm. The ownership (O) advantages include a firm's superiority over its competitors in terms of marketing practices or on the technological front. Basically, such firms have a competitive advantage on their patents, licenses and in their access to raw materials and/or markets. The locational (L) advantages relate to the factors that increases the host country's attractiveness for FDI: for instance, geographical proximity, labor force skill levels, lower wages relative to productivity and better infrastructure. Finally, the internalization (I) advantages relate to the production activities undertaken by the firm itself rather than licensing/franchising them to another party.

The relationship between inward FDI (IFDI) and OFDI and stages of economic development is presented in diagrammatic form in Fig. 2 and in tabular form in Table 2.

Fig. 2 Graphical Representation of The IDP Theory



Source: Dunning & Narula (1996)
Note: Only for illustrative purposes. Not drawn to scale.

Table 2 Inward &Outward Direct Investment and Different Stages of Economic Development

	Stage I	Stage II	Stage III	Stage IV
Inward investment				
Ownership (foreign)	Substantial	Substantial	Declining and/ or more specialized	Declining and/ or more specialized
Internalization	Substantial	Probably declining	Probably increasing	Substantial
Locational (domestic)	Few	Increasing	Declining	Declining
Outward investment				
Ownership (domestic)	Virtually none	Few	Increasing	Increasing
Internalization	Not applicable	Few and specialized	Still limited	Increasing
Locational (foreign)	Not applicable	Beginning to emerge	Increasing	Increasing

Source: Dunning (1981)

Thus, the crux of IDP theory is that the shape and position of the IDP varies widely across individual countries as a result of specific economic structures (market size, availability of natural resources), the type of FDI undertaken and government policies.In other words, individual countries show their own sub-patterns of inward and outward investment, depending on, among others, the way in which economic activities are organized (Narula, 1996). Hence, it is very important to realize that the IDP of individual countries may be unique.

Literature Overview

Most of the empirical studies have given greater emphasis on the advanced economies, their graphical interpretation and to the conventional econometric IDP model. The qualitative and quantitative studies, particularly in the context of emerging-markets, developing and transition economies remain sparse. A comparison of their findings has received limited attention.

Some of the quantitative works on both the conventional and augmented IDP theory are summarized in Table 3.

Equation (1) was the first econometric model introduced by Dunning (1981). He analyzed 67 developed and developing countries' NOI covering the period 1967 - 1975. NOI is the net outward investment position measured by the difference of annual per capita outward and inward FDI stocks. GDP is the gross domestic product measured in real terms. and ì is a regression error term.

$$NOI_i = \alpha + \beta GDP_t + \gamma GDP_t^2 + \mu_i \text{.....(1)}$$

Dunning (1981) found that GDP and squared-GDP were respectively, negatively and positively related to NOI,and both the explanatory variables were statistically significant. This suggests a U or J-shape relationship between a country's economic development and its net outward position.

Distinctive Nature &Criticism of IDP Theory

The IDP paradigm has its shortcomings. Dunning & Narula (1996) acknowledged that patterns of IDP have changed since 1980s. Cantwell & Narula (2003) noted that firms of some countries proceed directly to OFDI by skipping the exporting phase. In effect, some IDP stages may be skipped, specially by *leapfrogging globals*[7]. For instance, Kuada& Sorensen (2000) found that Ghana has gone through the development stages without engaging in international activities. Erkilek (2003) argues that Turkey engaged in a lot of OFDI flows not because of L-advantages but due to political and economic factors. He noted that economic liberalization stimulated OFDI, as a result of which some of the stages of IDP paradigm may be skipped. This is known as accelerated IDP, and is usually found in cases of leapfrogging globals, where firms are anxious to escape the structures of local markets(Svetlicic, 2003). Das (2013) and Stoain (2013) argue that the IDP theory takes for granted that the underlying economic forces work in a certain pattern, and that inclusion of institutional factors would increase the explanatory power of the IDP theory.

Firms of some countries proceed directly to OFDI by skipping the exporting phase.

[7]*Leapfrogging globals* means economies that has leapfrogged/jumped along the development path and have originated more OFDI than the path would have predicted

The World Investment Report (2006) compiled by UNCTAD used the IDP theory to analyze the emergence of MNEs from developing and transition economies. Though the empirical evidence supported the IDP paradigm, there were some incongruities as well. Many developing countries, such as Brazil, China, India, Mexico, South Africa and Turkey, which are home to leading MNEs and are investing significant amounts of FDI overseas, are actually at stages I and II of the IDP; and they have therefore begun outward FDI earlier than might be expected on the basis of the IDP.

New Approach to IDP Model

Duran &Ubeda (2001) pointed out some methodological flaws in the traditional IDP model, and proposed a new approach, summarized in Table 4.

Firstly, Duran &Ubeda (2001) noted that NOI (OFDI stock minus IFDI stock) fails to be the best indicator to analyze the effect of structural changes on IFDI and OFDI. For instance, in both the first stage of IDP (very small amount on IFDI and zero amount of OFDI) and fifth stage of IDP (with high level of both IFDI and OFDI), NOI is close to zero. Additionally, an increase in NOI, usually interpreted as increased competitiveness of the economy, can also be due to a disinvestment process in the country (i.e. significant decrease of IFDI stock) in response to a deterioration of its investment environment. While doing statistical analysis, the above-mentioned problems can be taken care by using stocks of both IFDI and OFDI in both absolute and relative terms.

Table 3 Summary of Selected Empirical Studies

Year	Author(s)	Sample size		Dependent variable				Independent variable/s			Control variables	Method of estimation
		Countries	Time period	NOI		OFDI		GDP per capita				
				Flow	Stock	Flow	Stock	Quadratic	Polynomial	Logarithmic		
1981	Dunning	67(developed & developing)	1967-1975		√			√				OLS
1986	Dunning	25(developing)	1967-1978		√			√				OLS
1993	Tolentino	30	[1960-1975]									
			[1976-1984]	√				√				
			[1960-1984]									OLS
1994	Dunning & Narula	US-Japan-ese FDI	[1945-1990]		√			√				OLS
1996	Narula	40(developing)	1975-1988		√			√				OLS
1996	Dunning & Narula	88(developed & developing)	1980-1992		√			√				OLS
1998	Buckley & Castro	Portugal	1943-1996		√			√	√			OLS
2001	Duran & Ubeda	74	1965-1995		√			√			√	Principal component analysis (PCA)
2001	Bellak	Austria	1990-1999		√				√			OLS
2002	Alvarez	Spain	1973-1999	√				√				OLS
2003	Barry et. al.	Irish-US FDI	1980-1999	√				√				OLS
2004	Boudier-Bensebaa	CIS[2]& CEEC[3]	1990-2002		√				√			FE
2006	Vavilov	44	1970-2002		√			√	√			OLS

2007	Fonseca et. al.	Portugal + 25 other countries	1990-2005		√			√	√			FE
2008	Sathye	India	1991-2005	√				√				OLS
2008	Tolentino	China & India	1980-2006			√				√	√	Vector autoregressive (VAR) model
2009	Kayam & Hisarciklilar	16 OECD[4] Countries	1970-2005		√							FE
2011	Verma & Brennan	India	1991-2006		√			√				Augmented Dickey-Fuller unit root test
2013	Stoian	20 CEEC	1996-2010			√						RE[5]
2015	Amann & Virmani	India	1980-2010				√			√		Augmented Dickey-Fuller (ADF) test
2016	Fonseca et. Al	Portugal	1960-2011					√	√			FE
2017	Emine	MINT[6]	1990-2013		√			√	√			FE

Source: Authors' compilation

[2]CIS represents the Commonwealth of Independent States
[3]CEEC represents the Central & Eastern European Countries
[4]OECD represents the Organization for Economic Co-operation and Development
[5]RE is random effect
[6]MINT represents the emerging economies, namely- Mexico, Indonesia, Nigeria and Turkey

Table 4 New Methodological Approach to IDP

Traditional Approach	New Approach
The NOI is an incomplete indicator	Use inward and outward FDI stocks (in both relative and absolute terms)
GDP per capita is an incomplete indicator of the level of development of an economy	Include structural variable in the model used to reflect: • Degree of economic development • Peculiarities of countries • Nature of international trade
The econometric models used are not adequate tools to test the IDP (Dunning & Narula, 1996)	Use multivariate analysis: • Factor analysis • Cluster analysis • Non-parametric test

Source: Duran &Ubeda (2001)

Secondly, GDP per capita by itself is an inadequate variable to explain a country's level of economic development because the economic structures and foreign investment structures of countries can be significantly different at the same level of GDP per capita. In order to deal with this problem and capture the country specific peculiarities in addition to the level of economic development, Duran & Ubeda (2001) proposed the idea of adding more structural variables, like gross capital formation per capita, gross enrolment ratio in secondary school and universities, number of scientists and engineers in R&D or health expenditure. They also stated that apart from economic development, foreign investors also study the political stability, endowments (human capital & natural resources) and infrastructure before entering the market.

Thirdly, the quadratic specification in Equation 1 suggested by Dunning (1981) was not enough to assess IDP empirically. Narula (1996) argues that the relationship between GDP and NOI shows different forms if the sample of countries varies[8] and problem of heteroscedasticity arises, as developing countries show a greater variance of errors. Given the drawbacks of the econometric model, an alternative multivariate analysis was proposed that combined three complementary tools:(i) a factor analysis to test if there is (or not) a relationship between the variables that explain the degree of economic development and IFDI and OFDI stocks, which is the essence of IDP; (ii) a cluster analysis to country groups along the different stages of IDP based on their structural similarities; and (iii) a non-parametric test to show statistically that the differences in the volume of inward, outward and NOI stocks at different stages are consistent with the theory (Duran & Ubeda, 2001).

[8] Dunning & Narula (1996) find a J shaped relationship in their quadratic equations, in which the relationship between GDP per capita and NOI per capita has a positive sign, while Tolentino (1993) obtains an inverted J form, that is the relationship between the variable and NOI has a negative sign (indicate for both authors what the squared GDP term's sign was).

Therefore, the above review of literature shows that the findings on the validity of the IDP paradigm are mixed, with the results varying with the sample composition and sample periods. Also, the shortcomings in the original model calls for a new methodological approach which uses OFDI (stock) instead of NOI and includes more control variables that increase the explanatory power of the structural development of an economy. Given the paucity of studies in the advanced, emerging-market, developing and transition economies context, this paper provides further insights into the wide set of explanatory variables enhancing OFDI.

Data Description &Econometric Approach

This study uses annual data for a sample of more than 100 countries grouped into: advanced, emerging-market, developing and transition economies to check the validity of IDP theory and also to understand the home country determinants of OFDI. The analysis covers the time period 1996 -2016, chosen primarily on the basis of data availability. In line with the conceptual framework, the dependent variableis measured in two alternative ways: $NOI_{STOCK\text{-}PC}$ and $OFDI_{FLOW\text{-}PC.}$

In the empirical estimation with $NOI_{STOCK\text{-}PC}$ as the dependent variable three different equations are estimated: (i) in line with the original IDP equation, the independent variables are only linear and quadratic form of GDP_{PC}.(ii) the quartic and quintic form of $GDP_{PC}$are added (stepwise) to the original equation to check if it is consistent with the multiple turning points shown in the graphical representation of the IDP theory in Fig. 2; (iii) additional explanatory variables such as exports, R&D expenditure, infrastructure, real exchange rate and governance are added to the regression equation.In line with the new approach to IDP theory, $OFDI_{FLOW\text{-}PC}$is also included as the dependent variable and estimate the following regression equation:

$$OFDI_{(FLOW\text{-}PC)}=\alpha+\beta_1 GDP_{PC}+\beta_2 GDP^2_{PC}+ \beta_3 GDP^3_{PC}+ \beta_4 GDP^4_{PC}+ \beta_5 GDP^5_{PC}+ \beta_6 IFDI_{STOCK\text{-}PC}+ \beta_7 EXP+ \beta_8 R\&D+ \beta_9 INFRA+\beta_{10} REER_{(t-1)} +\beta_{11} GOV+\mu \quad (2)$$

Drawing on extant literature, the dependent variable of equation 2 is measured in flows which is in line with several papers in the literature. This is so, because stocks can suffer from discrepancies between original book and market value as the value of firms and FDI stocks change (Contessi & Weinberger, 2009). This makes their inter-temporal comparison problematic.The primary focus is on the variables which have been mostly identified in the existing literature as relevant home country determinants of OFDI. These variables are considered to increase the explanatory power of OFDI.

Countries in the IDP Path: aUnivariate Illustration

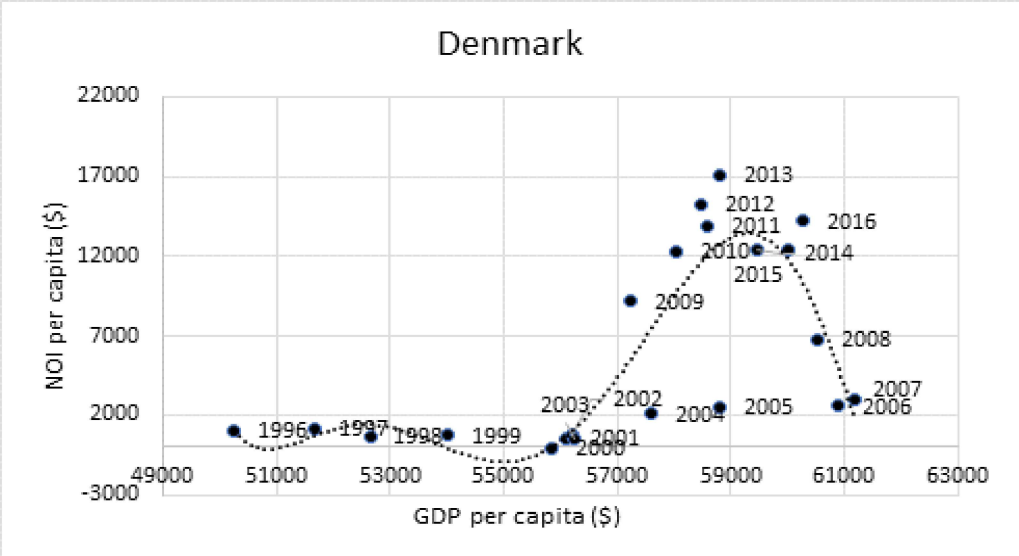
Following Fonseca et al. (2007), it is illustrated here whether the cross-country pattern and individual country

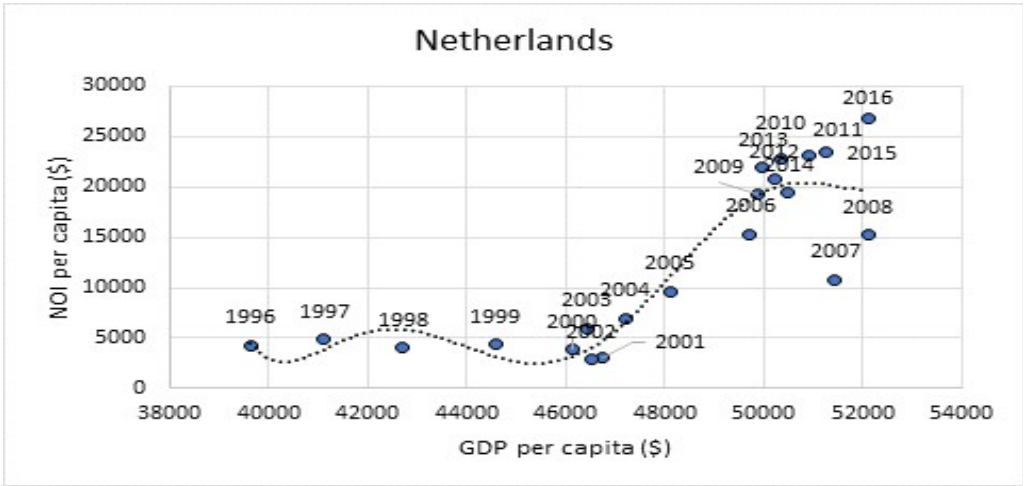
Table 5 Variable Description, The Sources &Expected Sign

Variable code	Description	Source	Expected sign
Dependent variable			
$NOI_{STOCK-PC}$ (Equation 1)	$OFDI_{STOCK-PC}$ - $IFDI_{STOCK-PC}$	UNCTAD	
$OFDI_{FLOW-PC}$	OFDI flow (USD current price per capita)	UNCTAD	
Explanatory variables			
GDP_{PC}	GDP per capita (constant 2010 USD)	World Bank	+/-
$(GDP_{PC})^2$	Squared- GDP per capita (constant 2010 USD)	World Bank	+
$(GDP_{PC})^3$	Cubic- GDP per capita (constant 2010 US$)	World Bank	-
$(GDP_{PC})^4$	Quartic- GDP per capita (constant 2010 US$)	World Bank	+
$(GDP_{PC})^5$	Quintic- GDP per capita (constant 2010 US$)	World Bank	+/-
$IFDI_{STOCK-PC}$	IFDI stock per capita (USD current)	UNCTAD	+
EXP	Exports of goods and services (% of GDP)	World Bank	+
R&D	Research and development expenditure (% of GDP)	World Bank	+
INFRA	Fixed telephone subscription (per 100 person)	World Bank	+
$REER_{(t-1)}$	Real effective exchange rate index (2010=100)	IMF	+/- (?)
GOV	Estimate gives the country's score on the aggregate indicator, in units of a standard normal distribution, i.e. ranging from approximately -2.5 to 2.5.	World Bank	+/- (?)

developments in NOI per capita behave according to the IDP theory. This is done by scatter plots for an aggregate sample of 40 selected countries for 2016 and for selected individual countries over time. The dots in the scatter plots shown in Fig. 3 to 6 are pairs of NOI and GDP values. For each scatter plot, a polynomial trend line was fitted to identify the various stages of the IDP path shown in Fig 2.

Fig. 3 Graphical Interpretation of IDP Model: Advanced Economies




Netherlands
NOI per capita ($)
GDP per capita ($)
30000
25000
20000
15000
10000
5000
0
38000
40000
42000
44000
46000
48000
50000
52000
54000
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
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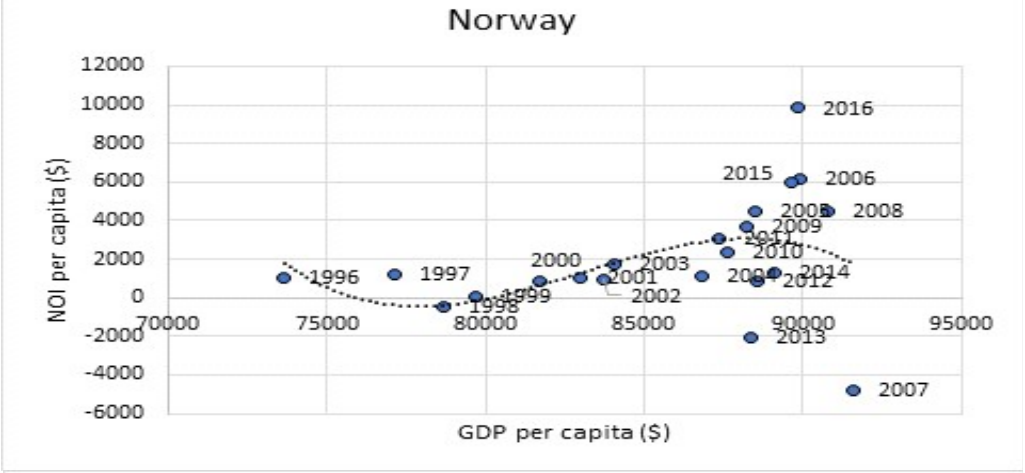
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016


Norway
NOI per capita ($)
GDP per capita ($)
12000
10000
8000
6000
4000
2000
0
-2000
-4000
-6000
70000
75000
80000
85000
90000
95000
1996
1997
1998
1999
2000
2001
2002
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2004
2005
2006
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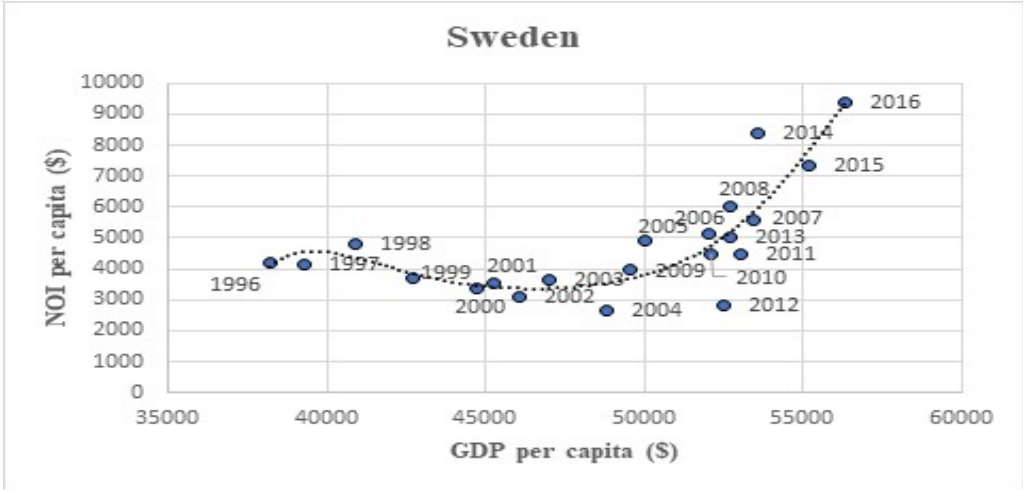
2015
2016


Sweden
NOI per capita ($)
GDP per capita ($)
10000
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
35000
40000
45000
50000
55000
60000
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
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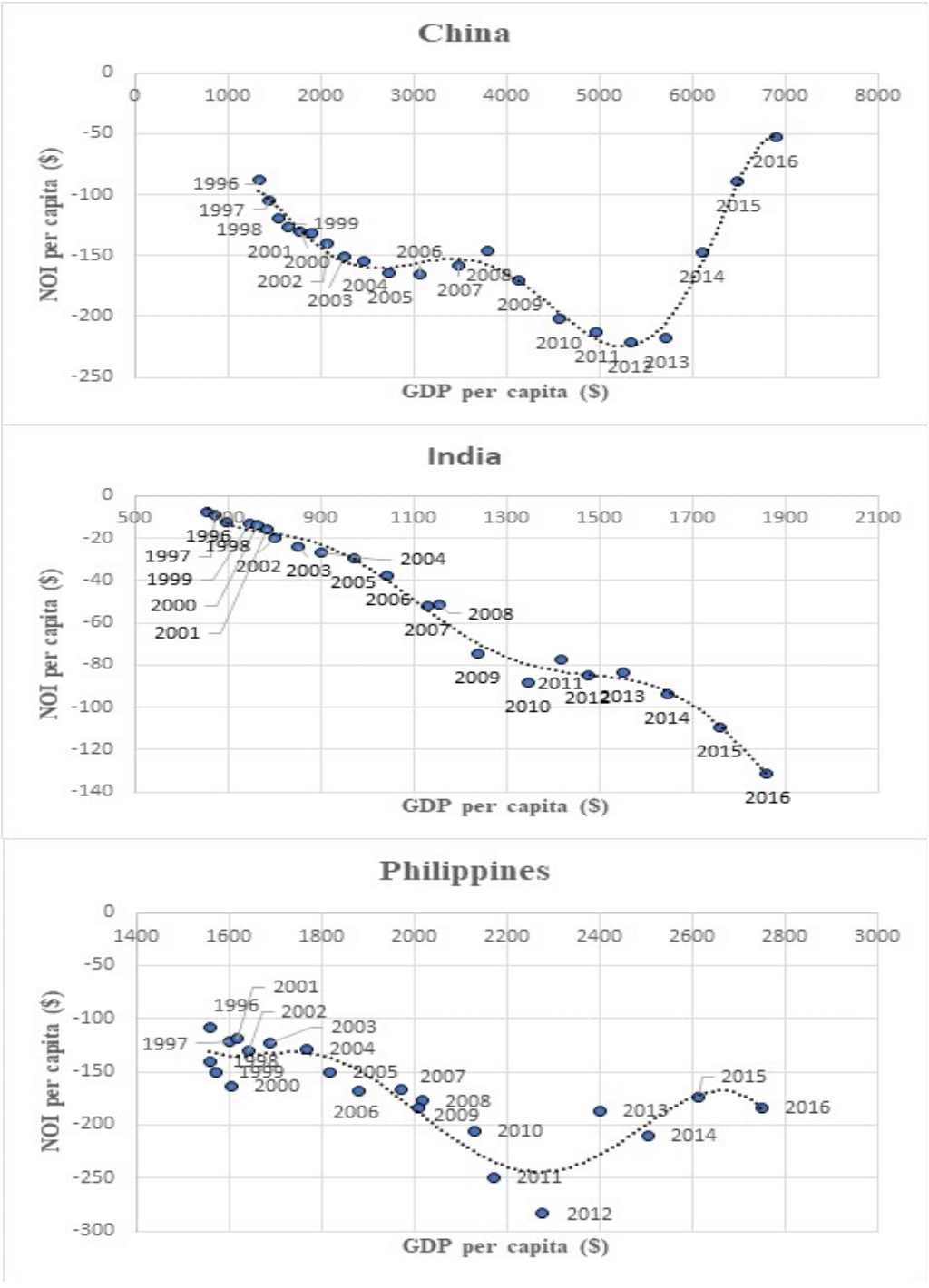
2011
2012
2013
2014
2015
2016

Fig. 4 Graphical Interpretation of IDP Model: Emerging-market Economies



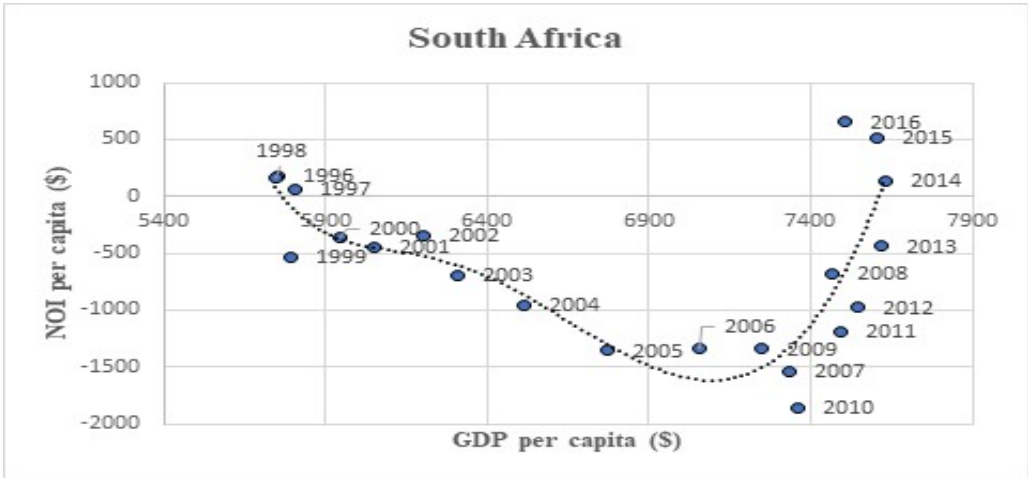
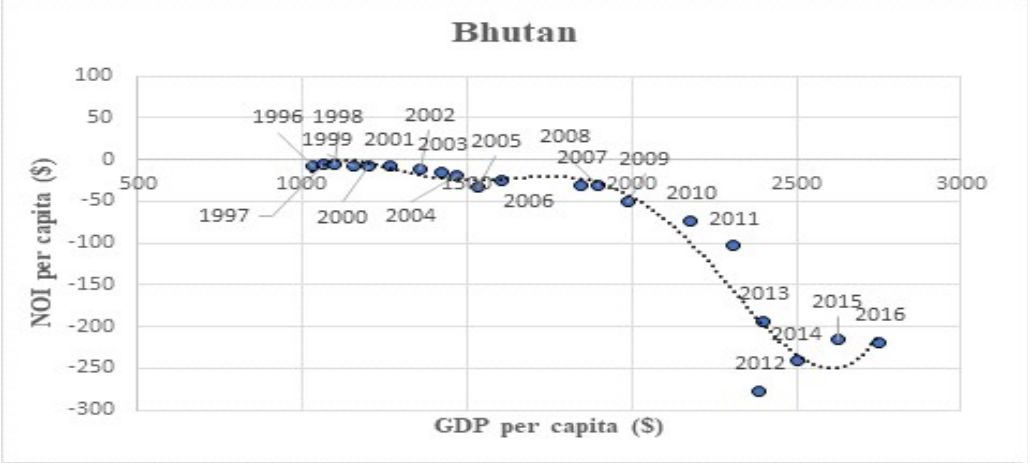


Fig. 5 Graphical Interpretation of IDP Model: Developing Economies



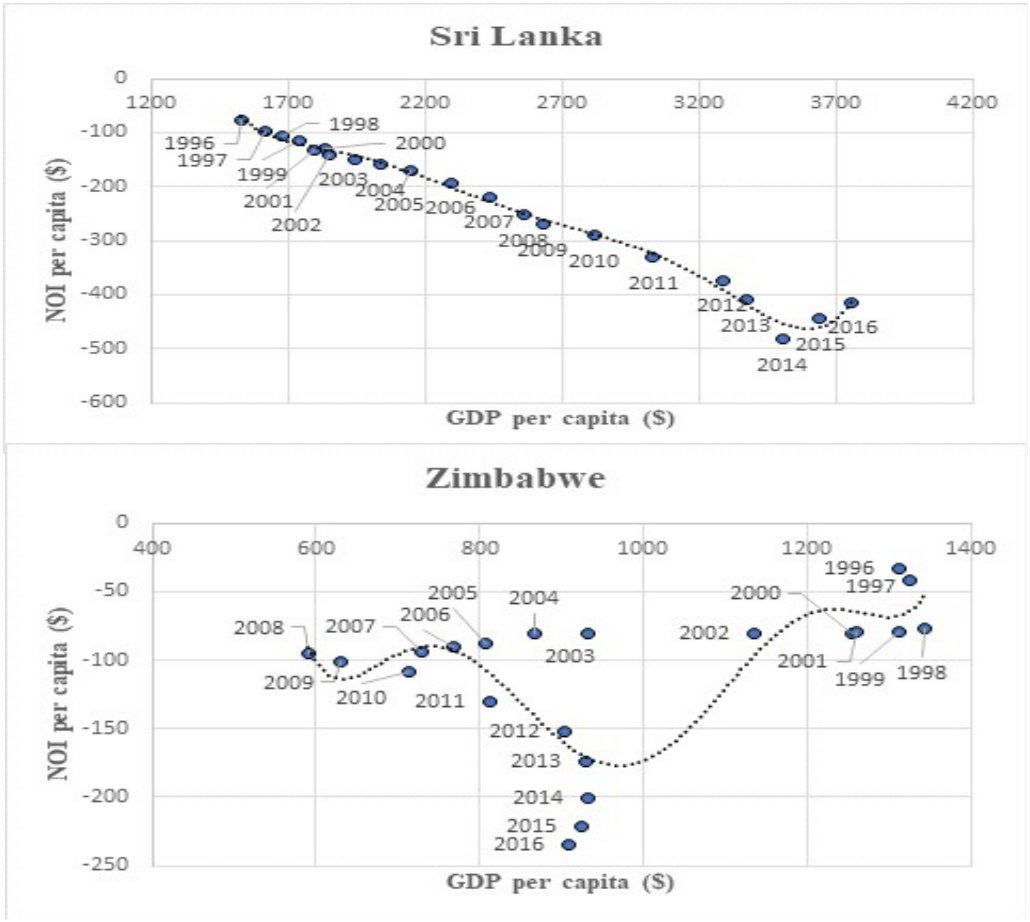
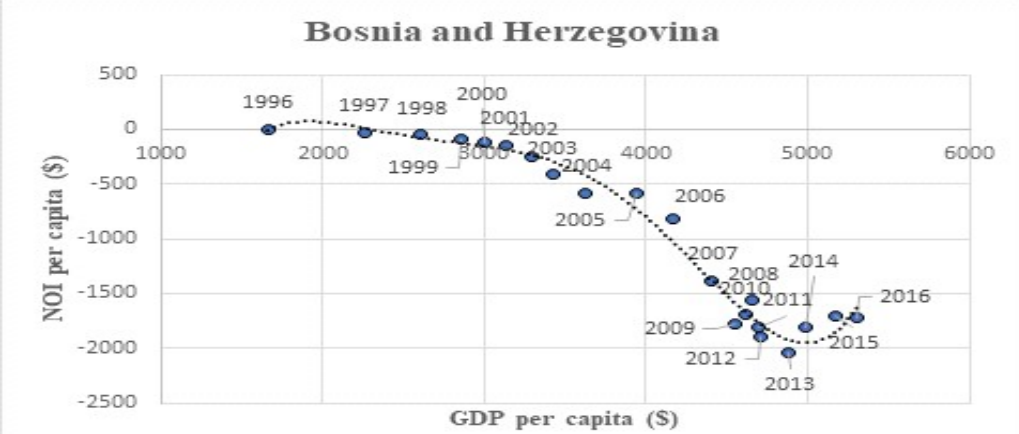


Fig. 6 Graphical Interpretation of IDP Model: Transition Economies


Bosnia and Herzegovina
NOI per capita ($)
GDP per capita ($)
500
0
-500
-1000
-1500
-2000
-2500
1000
2000
3000
4000
5000
6000
1996
1997
1998
2000
2001
2002
2003
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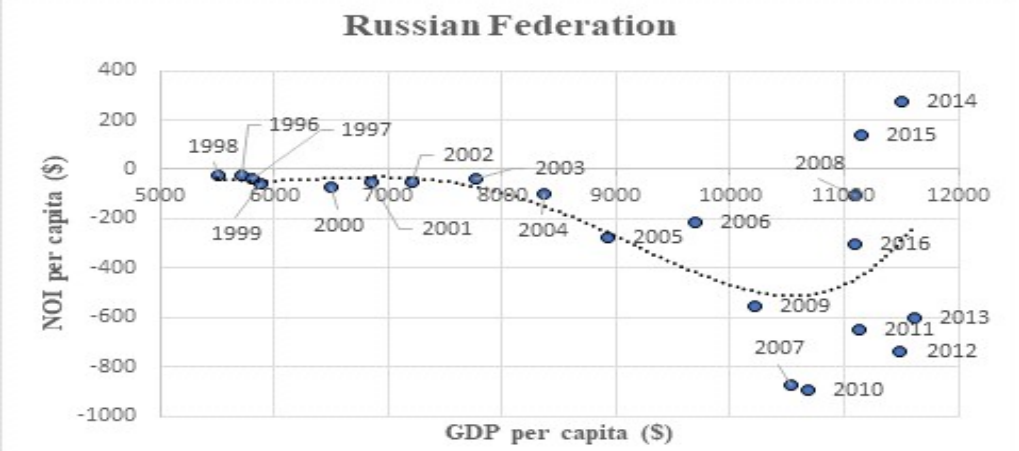
2004
2006
2005
2007
2008
2014
2010
2011
2016
2009
2015
2012
2013


Russian Federation
NOI per capita ($)
GDP per capita ($)
400
200
0
-200
-400
-600
-800
-1000
5000
6000
7000
8000
9000
10000
11000
12000
1998
1996
1997
2002
2003
2014
2015
2008
1999
2000
2001
2004
2005
2006
2016
2009
2013
2011
2007
2012
2010


Ukraine
NOI per capita ($)
GDP per capita ($)
200
0
-200
-400
-600
-800
-1000
-1200
-1400
1400
1900
2400
2900
3400
3900
1998
1997
2000
2002
1999
1996
2001
2003
2004
2005
2006
2009
2007
2015
2014
2008
2016
2010
2011
2013
2012

For the aggregate sample of 40 (Fig. 7), selected countries for 2016, a quartic polynomial provides the best fit to the data and the pattern is broadly consistent with the IDP theory (Fig. 2). However, a better insight is obtained from the NOI-GDP scatter plots for individual countries. The plots show that the developed countries are in the fourth or fifth stage of the IDP. In particular, Denmark, the United Kingdom and Norway are in the fifth stage of the IDP, while Germany, Japan, Netherlands and Sweden, are in the fourth stage. Among emerging-market countries, it appears that Malaysia has entered the fourth stage. However, several emerging market countries are at various points in the third stage of the IDP (Fig. 8). China and South Africa are at an advanced position in the third stage, while Brazil, Russia and Thailand are at the early third stage. In contrast, India, Kenya, Ghana and Sri Lanka are in the second stage. It should be noted that the GDP per capita values corresponding to the various stages and the turning points of the IDP are not similar across countries.

Fig. 7 Graphical Interpretation of IDP Model for Select Countries for 2016

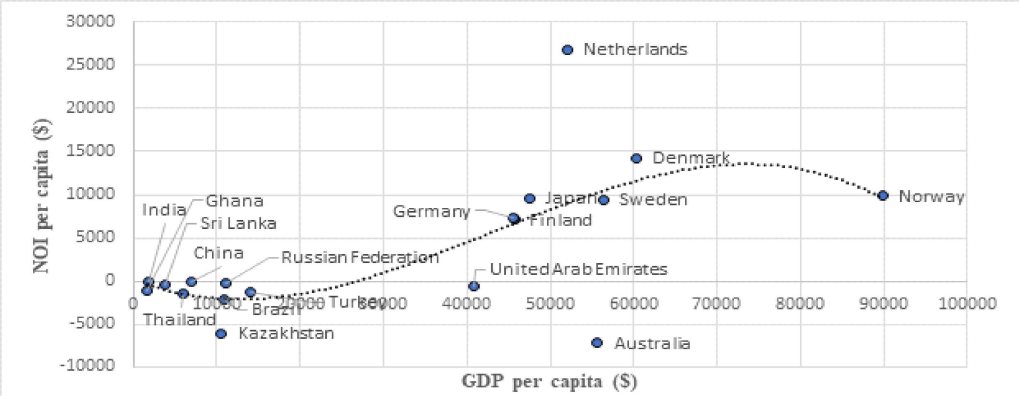
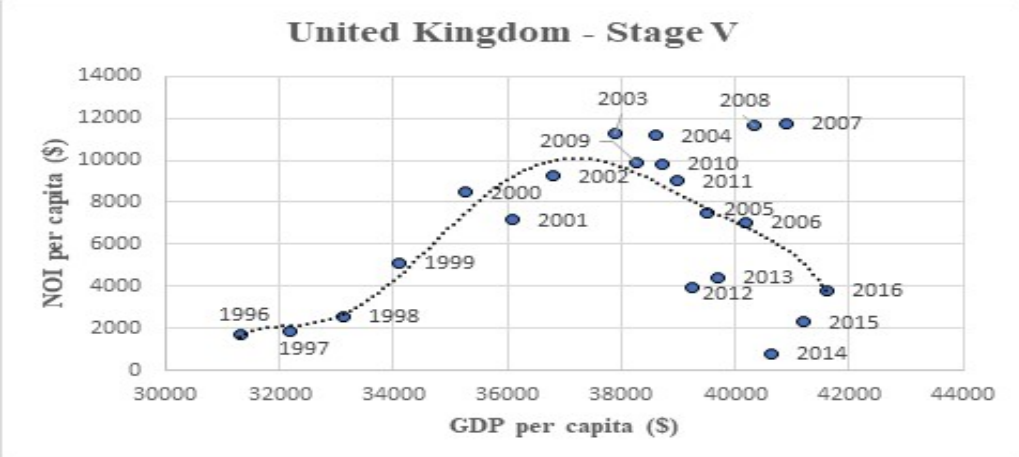
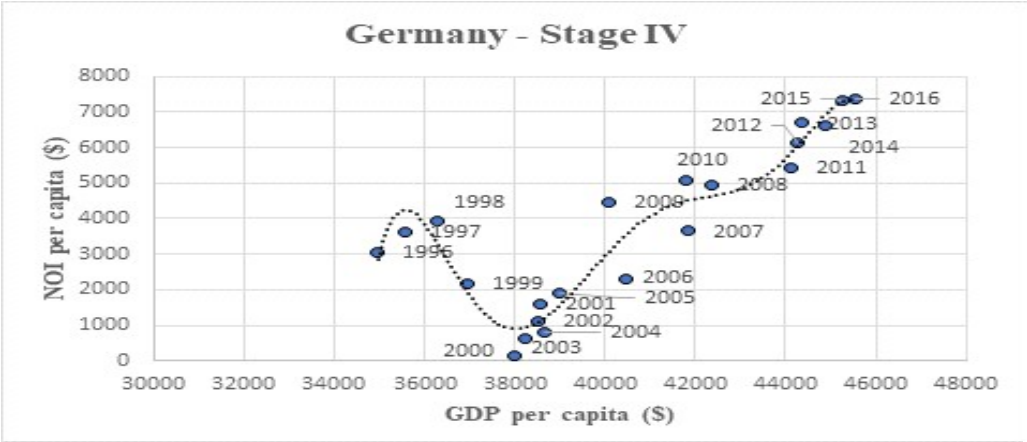
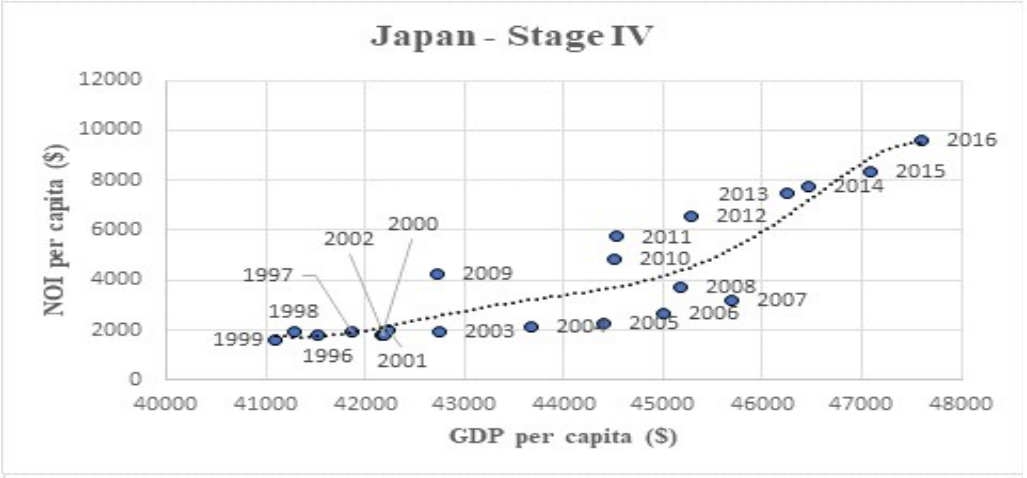
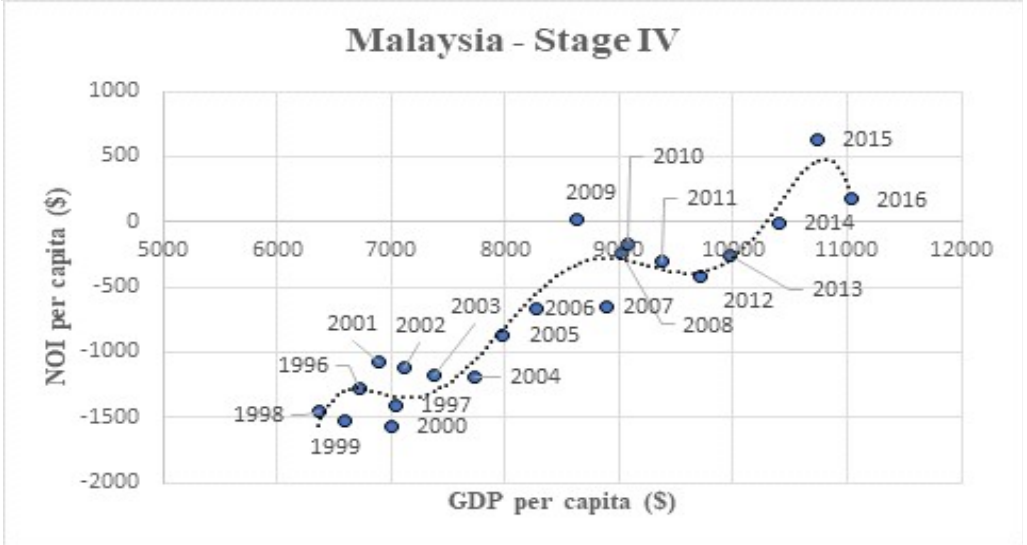


Fig. 8 Graphical Interpretation of IDP Model with Their Stages

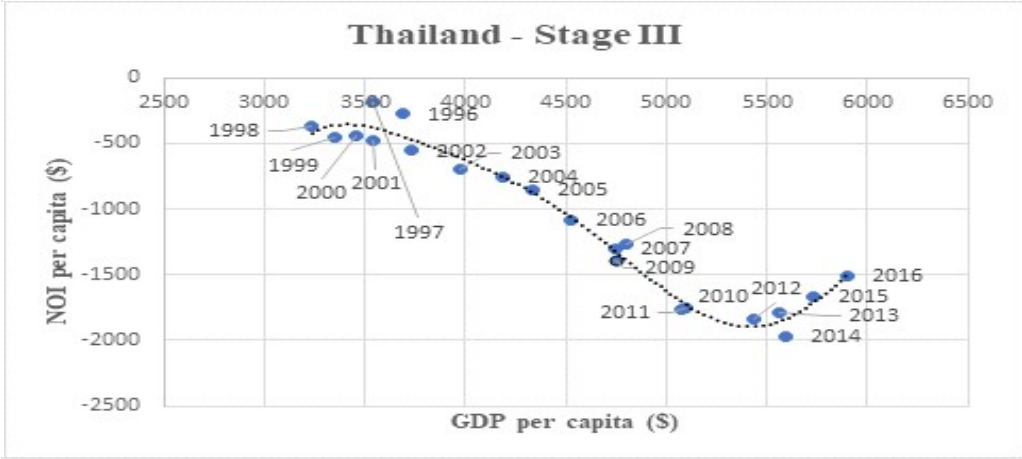


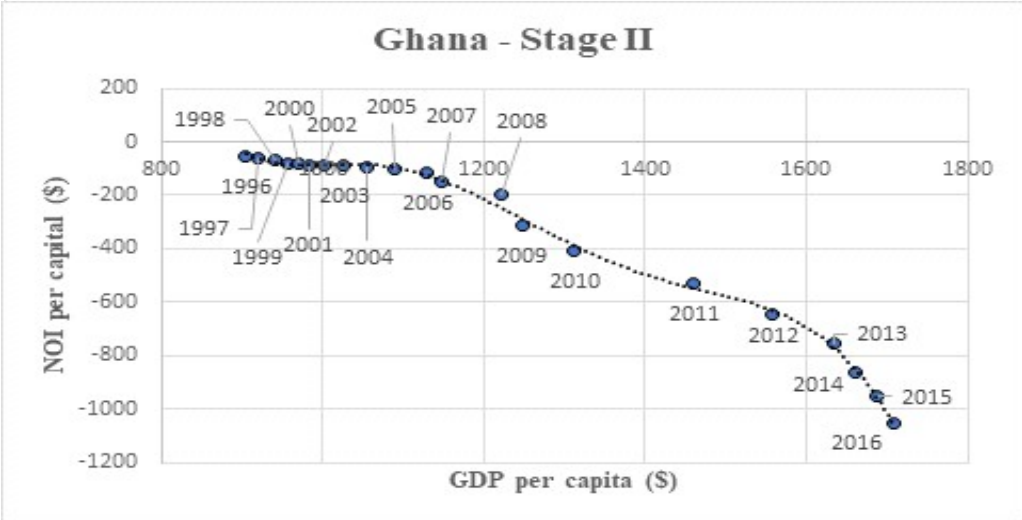

Germany - Stage IV
NOI per capita ($)
GDP per capita ($)
8000
7000
6000
5000
4000
3000
2000
1000
0
30000
32000
34000
36000
38000
40000
42000
44000
46000
48000
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016


Japan - Stage IV
NOI per capita ($)
GDP per capita ($)
12000
10000
8000
6000
4000
2000
0
40000
41000
42000
43000
44000
45000
46000
47000
48000
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016


Malaysia - Stage IV
NOI per capita ($)
GDP per capita ($)
1000
500
0
-500
-1000
-1500
-2000
5000
6000
7000
8000
9000
10000
11000
12000
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016


Brazil - Stage III
NOI per capita ($)
GDP per capita ($)
500
0
-500
-1000
-1500
-2000
-2500
-3000
7000
8000
9000
10000
11000
12000
13000
1996
1997
2004
1999
1998
2000
2001
2002
2005
2006
2003
2007
2008
2009
2015
2013
2011
2014
2016
2012
2010


Thailand - Stage III
NOI per capita ($)
GDP per capita ($)
0
-500
-1000
-1500
-2000
-2500
2500
3000
3500
4000
4500
5000
5500
6000
6500
1998
1996
1999
2000
2001
2002
2003
2004
2005
1997
2006
2008
2007
2009
2016
2010
2012
2015
2011
2013
2014


Ghana - Stage II
NOI per capital ($)
GDP per capita ($)
200
0
-200
-400
-600
-800
-1000
-1200
800
1200
1400
1600
1800
1998
2000
2002
2005
2007
2008
1996
2003
2006
1997
1999
2001
2004
2009
2010
2011
2012
2013
2014
2015
2016

Estimations of Traditional IDP Theory

Table 6, columns 1 to 4 (Group A) show the regression results for the IDP equation with only the GDP variable and its different forms. The results support the polynomial version of the IDP theory. The regression for the original Dunning specification in which GDP_{PC} appears in quadratic form is not statistically significant. When the equation is estimated in a quartic function, the goodness of fit is best, with all the terms being statistically significant. The signs of the coefficients indicate an initial U-shaped relationship (a negative linear term and positive squared term) as proposed by Dunning (1981) followed by an inverted U-shaped relationship (a negative cubic term and a positive quartic term) between NOI and GDP_{PC} This is consistent with the pattern of the IDP path shown in Fig. 2 above.

Developing economies have a lower NOI compared to all the other country groups.

When the equations are estimated with country group dummies ¾ advanced, emerging-markets and developing economies (considering transition economies as the omitted country group), the results with respect to the relationship between IDP and GDP_{PC} are similar to those without the country-group dummies (Table 6, Group B, columns 1 to 4). However, the coefficient on developing economies is statistically significant and has a negative sign, suggesting that ceteris paribus developing economies have a lower NOI compared to all the other country groups.

Table 7 discusses the relationship between $NOI_{STOCK\text{-}PC}$ and GDP_{PC} of various country groups by estimating the original quadratic specification of IDP theory and also equations with higher order polynomials (i.e., the cubic, quartic and quintic forms of GDP_{PC}). In the case of advanced countries, the cubic specification performs best and supports the traditional IDP proposition of Dunning (1981). For emerging-market (column 3) and developing (column 6) economies, the quadratic regression specification supports the IDP theory with a negative significant coefficient on GDP_{PC} and a positive significant coefficient on squared GDP_{PC}. The turning point where NOI is at its maximum with regard to GDP_{PC} takes place at $15,096 (constant 2010 US$) for emerging-market economies and $27,513 (constant 2010 US$) for developing economies.

These results basically suggest that the IDP paths are different for the different country groupings.

However, when higher order terms are included in the equation, all the terms upto cubic form are statistically significant for transition economies, up to quartic for emerging-market countries, upto quintic for developing economies. These results basically suggest that the IDP paths are different for the different country groupings. This is also confirmed by pair-wise Chow tests for the cubic specification.

Table 6.IDP Theory: Full Sample Dependent Variable: $NOI_{STOCK-PC}$

	Group A: Full sample without country dummy[1]				Group B: Full sample with country dummy[2]			
	1	2	3	4	1	2	3	4
GDP_{PC}	-0.0544	-0.310***	-0.557***	-0.304***	-0.0556	-0.355***	-0.633***	-0.365***
	(0.0391)	(0.0594)	(0.0912)	(0.11)	(0.0478)	(0.0595)	(0.0848)	(0.114)
$(GDP_{PC})^2$	$8.51e^{-7}$	$9.60e^{-6}$***	$2.30e^{-5}$***	$1.98e^{-6}$	$8.49e^{-7}$	$1.03e^{-5}$***	$2.49e^{-5}$***	$2.34e^{-6}$
	($8.12e^{-7}$)	($2.09e^{-6}$)	($4.89e^{-6}$)	($1.05e^{-5}$)	($8.84e^{-7}$)	($2.13e^{-6}$)	($5.07e^{-6}$)	($1.09e^{-5}$)
$(GDP_{PC})^3$		$-6.46e^{-11}$***	$-2.77e^{-10}$***	$2.90e^{-10}$		$-6.75e^{-11}$***	$-2.97e^{-10}$***	$3.09e^{-10}$
		($1.83e^{-11}$)	($7.86e^{-11}$)	($3.29e^{-10}$)		($1.87e^{-11}$)	($8.25e^{-11}$)	($3.34e^{-10}$)
$(GDP_{PC})^4$			$9.80e^{-16}$***	$-4.84e^{-15}$			$1.05e^{-15}$ ***	$-5.13e^{-15}$
			($3.30e^{-16}$)	($3.80e^{-15}$)			($3.47e^{-16}$)	($3.83e^{-15}$)
$(GDP_{PC})^5$				$1.97e^{-20}$				$2.09e^{-20}$
				($1.38e^{-20}$)				($1.39e^{-20}$)
Country groups								
Advanced					-21.07	510.2	735.3	974.1**
					(565.6)	(523.4)	(471.9)	(447.2)
Emerging-market				-506.6**	-239.1	286.5	15.58	
					(245.1)	(282.8)	(325.7)	(293)
Developing				-98.9	-512.5***	-459.3**	-465.6**	
					(205.7)	(186.4)	(189.6)	(190.1)
Constant	-565.2***	183.1	725.5***	300.3*	-394.9	697.3***	1,172***	768.1***
	(122.2)	(141.6)	(183.1)	(169.2)	(255.7)	(195.4)	(201.6)	(221.6)
N	7,491	7,491	7,491	7,491	7,491	7,491	7,491	7,491
R-squared	0.002	0.019	0.026	0.03	0.003	0.02	0.028	0.031
F-ratio	1.77	1.89	1.12	1.69	5.80	5.99	5.89	5.16
	(0.07)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)

[1]Full-sample without any country group dummy
[2]Full-sample with omitted country group as the transition economies
Figures in parentheses are robust standard errors
***, **. * are significant respectively to p<0.01, p<0.05, p<0.1
N= number of observations
e=10

Table 7. IDP Theory: Various Country Groups Dependent Variable: $NOI_{STOCK-PC}$

	Advanced		Emerging-market			Developing			Transition		
	1	2	3	4	5	6	7	8	9	10	
GDP_{PC}	0.306**	-0.785***	-0.241***	-0.157***	0.0534	-0.313***	-0.449***	-0.258***	-0.468***	0.561***	
	(0.119)	(0.249)	(0.0402)	(0.0355)	(0.108)	(0.0261)	(0.0313)	(0.0578)	(0.0924)	(0.213)	
$(GDP_{PC})^2$	-2.39e^{-6}	2.60e^{-5}***	2.22e^{-6}***	-7.79e^{-7}	-1.50e^{-5}*	5.69e^{-6}***	1.46e^{-5}***	-1.76e^{-5}	1.67e^{-5}	-0.000231***	
	(1.81e^{-6})	(7.62e^{-6})	(3.09e^{-7})	(2.13e^{-6})	(7.77e^{-6})	(6.08e^{-7})	(1.48e^{-6})	(1.12e^{-5})	(1.10e^{-5})	(5.97e^{-5})	
$(GDP_{PC})^3$		-1.94e^{-10}***		2.36e^{-11}	2.95e^{-10}**		-1.18e^{-10}***	1.50e-09***		1.53e-08***	
		(6.23e^{-11})		(1.86e^{-11})	(1.33e^{-10})		(3.09e^{-7})	(5.62e^{-10})		(3.88e^{-9})	
$(GDP_{PC})^4$					-1.49e^{-15}**			-1.18e^{-10}***			
					(6.53e^{-15})			(1.81e^{-6})			
$(GDP_{PC})^5$								-1.94e^{-10}***			
								(1.81e^{-6})			
Constant	-7,543***	2,749	680.5***	316.4***	-294.7	164.0***	377.2***	195.6***	545.5***	-398.0**	
	(1,646)	(1,863)	(238.5)	(111.1)	(276.3)	(43.44)	(43)	(47.66)	(119.9)	(166.2)	
N	1,589	1,589	1,435	1,435	1,435	4,134	4,134	4,134	407	407	
R-squared	0.015	0.041	0.12	0.125	0.136	0.197	0.218	0.224	0.313	0.372	
F-ratio	47.28	43.02	29.70	29.11	28.90	80.27	82.45	80.11	47.02	45.06	
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	

Figures in parentheses are robust standard errors
***, **, * are significant respectively to p<0.01, p<0.05, p<0.1
N= number of observations
e=10

Although the above specifications presented in Table 6 and 7 provide a good fit to the data, the rationale for choosing one specification over the other/s is not apparent, and it becomes difficult to evaluate the parameter estimates and determine the IDP stages of country groups with such models. Not only are there differences in the IDP stages between country groups, there may be heterogeneity within country groups. These complexities are not easily captured in cross-country regression analysis. Therefore, following the literature (Campa &Guilen, 1996; Lecraw, 1996 and Duran &Ubeda, 2001) in Tables 7 and 8, are presented the results of the equation having several control variables in addition to GDP_{PC}.

In Table 8, columns 1 and 2 indicate that, for the sample as a whole, the pow-

ered terms of GDP_{PC} become statistically insignificant in the presence of control variables. It shows that economic development (GDP_{PC}), trade (EXP), telecommunication (INFRA) and strength of home currency (REER) are statistically significant and have a negative impact on NOI which is in line with expectations as summarized in Table 4. While innovation (R&D) is positively related to NOI, and it is also statistically significant and in line with the findings of Duran &Ubeda (2001).

When country group dummies are added to the estimated regression, it was found that emerging-market and developing economies have a significant positive impact on NOI while advanced economies have a significant negative impact, relative to transition economies.

Now the separate regression estimations of individual country groups (Table 8, columns 3-6) are considered. In case of all the country groups except developing, GDP_{PC} is negative in linear form and positive for the quadratic form,which is in line with the a priori IDP theory of an initial decline and subsequent increase of NOI's relationship to GDP_{PC}. Moreover, in case of advanced, emerging-market and transition economies the cubic and quartic form of GDP_{PC} is negative and positive respectively with all variables being statistically significant which states that after an initial fall NOI fluctuates around zero. The control variable trade (EXP) is negatively and significantly related to NOI only in case of advanced and emerging-market economies which was not expected. This may be due to the case that knowledge acquired by the domestic firms by the direct and spillover effect from IFDI is used to establish operation/trade activities domestically (that enhances exports) rather than invest abroad (OFDI). Technological advancement (R&D) helps to improve the NOI in case of advanced and transition economies. This may be due to these country groups being good at technology innovations that allows them with a greater level of internalization through outward investment. Unexpectedly, a good telecommunication connection (INFRA) has a negative impact on both these country groups. But in case of developing economies,INFRA has a positive impact on NOI. The home currency strength (REER) of emerging-market and transition economies enhances NOI but corruption (GOV) has a negative impact on them. The appreciation of home country currency of these country groups (emerging-market and transition economies) lowers the capital requirements of foreign investments in domestic currency units, making it easier to raise capital than in the case of a depreciating currency.

New Approach to IDP Theory: Determinants of OFDI

In this approach, the dependent variable is $OFDI_{FLOW\text{-}PC,}$ whereas, in the original IDP approach and in the regression results presented above, the dependent variable was $NOI_{STOCK\text{-}PC}$ (which is defined as the difference between OFDI and IFDI stocks).

Table 8 IDP Theory WithControl Variables: OLS Dependent variable: $NOI_{STOCK-PC}$

	Full-sample[1]	Full-sample[2]	Advanced	Emerging-market	Developing	Transition
	1	2	3	4	5	6
GDP_{PC}	-0.343*	-0.223	-1.985***	-1.322***	-0.0828	-1.144**
	(0.205)	(0.241)	(0.736)	(0.403)	(0.207)	(0.472)
$(GDP_{PC})^2$	$1.59e^{-10}$	$1.34e^{-5}$	$7.95e^{-5}$**	0.000137***	-0.000129***	0.000472***
	($1.35e^{-5}$)	($1.47e^{-5}$)	($3.38e^{-5}$)	($3.97e^{-5}$)	($2.66e^{-5}$)	(0.000178)
$(GDP_{PC})^3$	$-1.44e^{-10}$	$-1.28e^{-10}$	$-1.12e^{-9}$*	$-3.74e^{-9}$***	$8.19e^{-9}$***	$-8.02e^{-8}$***
	($2.95e^{-10}$)	($3.12e^{-10}$)	($5.89e^{-10}$)	($1.14e^{-9}$)	($1.35e^{-9}$)	
($2.51e^{-8}$)						
$(GDP_{PC})^4$	$2.36e^{-11}$	$2.36e^{-11}$	$1.46e^{-5}$*	1.53e-08***	$-1.18e^{-10}$***	1.53e-08***
	($1.86e^{-11}$)	($1.86e^{-11}$)	($1.48e^{-6}$)	($3.88e^{-9}$)	($3.09e^{-7}$)	($3.88e^{-9}$)
EXP	-161.4***	-175.7***	-474.2***	-82.21***	-5.312	0.608
	(39.08)	(43.43)	(127.4)	(11.81)	(5.823)	(3.461)
R&D	1,888***	2,062***	2,453***	-934.8	140.4	1,334***
	(469.4)	(488.5)	(756.3)	(592.2)	(521.2)	(272.7)
INFRA	-132.4**	-86.89*	-447.9***	-15.77	93.90***	-19.77*
	(62.35)	(49.74)	(134.5)	(22.25)	(24.16)	(10.27)
$REER_{(t-1)}$	-0.656*	-0.604*	-0.576	0.322**	0.063	0.108*
	(0.365)	(0.361)	(0.69)	(0.133)	(0.0566)	(0.0586)
GOV	-15.98	137.8	2,145	-1,947***	-16.84	-448.9**
	(544.1)	(618.2)	(1,644)	(335.3)	(124.7)	(226.8)
Country groups						
Advanced		-3,148**				
		(1,569)				
Emerging-market		1,420*				
		(794.2)				
Developing		1,855**				
		(796.9)				
Constant	8,533***	6,969***	43,984***	3,822***	-202.4	-227.9
	(2,684)	(2,443)	(11,917)	(1,022)	(372.9)	(461.5)
N	1,431	1,431	612	451	301	200
R-squared	0.142	0.149	0.283	0.582	0.714	0.482
F-ratio	90.05	89.90	49.90	55.90	85.01	42.33
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)

[1]Full-sample without any country group dummy
[2]Full-sample with omitted country group as the transition economies
Figures in parentheses are robust standard errors
***, **. * are significant respectively to p<0.01, p<0.05, p<0.1
N= number of observations
e=10

Table 9, column 1 reports the estimations of full sample where economic development (GDP_{PC}), capital inflows (IFDI), trade (EXP), innovations (R&D) and telecommunication (INFRA) contributes positively towards OFDI. However, GOV (corruption) has a negative impact on OFDI. Now, when the country

dummies¾ advanced, emerging-market and developing (considering transition economies as the omitted group) are added (column 2), all of them have negative coefficients but only the coefficient of advanced economies is statistically significant. This suggests that other things remaining the same, $OFDI_{FLOW\text{-}PC}$ is smaller for advanced countries.

Now each country groups are analyzed separately (columns 3 to 6), where it is clear that OFDI from advanced, emerging-market economies and developing countries is a function of the home country's level of economic development (GDP_{PC}). However, the functional form of the relationship is different for the three country groups. Economic development is followed by ownership advantages where the domestic firms can exploit when investing abroad. This ownership advantages-embedded in the level of economic development of the home country includes-higher capital availability, high productivity, specialized know-how and research and development, leading to increased ability to invest abroad. Therefore, this finding is statistically significant and have the expected sign which in tune with the proposition of the IDP theory. Surprisingly, $OFDI_{FLOW\text{-}PC}$ is not significantly related to GDP_{PC} for transitional economies.

OFDI flows are associated with higher IFDIfor all the country groups. This may be due to the spillovers from IFDI: the local firms who have developed ownership advantages are now exploiting through investing abroad.

The findings on the relationship of OFDI flows with exports are mixed. The coefficient of EXP is positive and significant for emerging market economies, in line with expectations. However, the coefficient is not significant for advance economies and developing countries and, contrary to the expected sign, OFDI is negatively and significantly related with EXP.

The depreciation of real effective exchange rate (REER) of emerging-market economies decrease OFDI.

Also, technological development (R&D) yields results as expected where R&D of emerging-market and developing economies positively inspire OFDI. Moreover, a good telephone connectivity (INFRA) contributes positively to OFDI in case of advanced economies. As expected, the depreciation of real effective exchange rate (REER) of emerging-market economies decrease OFDI. Interestingly, in case of developing economies, the corruption index (GOV) is negatively related to OFDI.

Now we look at the determinants of OFDI during the phase of major economic crises (Table 10). The motivation is that at times of crises there is declining investor confidence. Not only does capital inflows shrink but also capital outflows increase. Investors shift money to safe havens at times of crises. At the time of Asian crisis (1997 - 1998), the developing and transition economies had a negative impact on OFDI. This is not surprising given the term "Asian crisis" and there was a spillover effect on

Table 9 Determinants of OFDI: Full Sample Dependent variable: $OFDI_{FLOW-PC}$

	1	2	3	4	5	6
	Full-sample[1]	Full-sample[2]	Advanced	Emerging-market	Developing	Transition
GDP_{PC}	0.168***	0.169***	0.213***	0.212**	0.172	0.342
	(0.0292)	(0.0316)	(0.0783)	($1.08e^{-1}$)	($2.17e^{-1}$)	($3.23e^{-1}$)
$(GDP_{PC})^2$	$-1.01e^{-5}$***	$-9.56e^{-6}$***	$-9.66e^{-6}$**	$-1.76e^{-6}$	$4.04e^{-5}$	0.000342
	($1.87e^{-6}$)	($1.97e^{-5}$)	($4.20e^{-6}$)	($1.24e^{-6}$)	($4.93e^{-5}$)	(0.00138)
$(GDP_{PC})^3$	$2.49e^{-10}$***	$2.26e^{-10}$***	$2.06e^{-10}$**	$4.41e^{-10}$	$-9.78e^{-9}$**	$-1.03e^{-7}$
	($4.96e^{-11}$)	($5.13e^{-11}$)	($9.64e^{-11}$)	($5.27e^{-10}$)	($4.60e^{-9}$)	($2.60e^{-7}$)
$(GDP_{PC})^4$	$-2.58e^{-15}$***	$-2.27e^{-15}$***	$-1.98e^{-15}$**	$-3.65e^{-15}$	$-8.99e^{-18}$***	$1.03e^{-18}$
	($5.54e^{-16}$)	($5.63e^{-16}$)	($9.68e^{-16}$)	($9.23e^{-15}$)	($2.38e^{-18}$)	($2.22e^{-11}$)
$(GDP_{PC})^5$	$9.35e^{-21}$***	$8.07e^{-21}$***	$6.89e^{-21}$**	$6.05e^{-21}$	$-8.99e^{-18}$***	$-3.48e^{-16}$
	($2.17e^{-21}$)	($2.18e^{-21}$)	($3.51e^{-21}$)	($5.60e^{-20}$)	($2.38e^{-18}$)	($7.00e^{-16}$)
$IFDI_{STOCK\_PC}$	0.0976***	0.102***	0.0757**	0.0831**	0.247***	0.121**
	(0.0226)	(0.0224)	(0.0303)	(0.0409)	(0.0563)	(0.0536)
EXP	1.926*	0.822	-1.601	7.747***	5.849	-29.26***
	(1.089)	(1.156)	(2.214)	(2.261)	(6.34)	(8.719)
R&D	103.3*	132.1**	-43.13	270.1*	2,300***	108.4
	(56.07)	(57.49)	(63.09)	(160)	(399.9)	(305.5)
INFRA	7.349**	10.56***	13.19**	-3.649	29.86	9.136
	(3.614)	(3.879)	(5.14)	(8.232)	(21.01)	(17.41)
$REER_{(t-1)}$	-0.0116	-0.00938	0.00192	-0.0654*	0.00949	-0.0334
	(0.021)	(0.0208)	(0.0282)	(0.0394)	(0.0487)	(0.0592)
GOV	-116.9*	-73.82	-125.7	23.55	-669.0***	12.85
	(60.72)	(63.95)	(96.98)	(113.3)	(176.9)	(315)
Country groups						
Advanced		-401.2***				
		(123)				
Emerging		-19.98				
		(115)				
Developing		-159.8				
		(143.6)				
Constant	1,149***	1,231***	441.8	1,439***	-708.5***	709.4
	(138.6)	(179.2)	(475.3)	(308.3)	(271.5)	(2,668)
N	1,176	1,176	574	401	187	139
R-squared	0.118	0.13	0.1	0.113	0.408	0.378
F-ratio	89.66	90.21	50.21	59.74	89.56	47.56
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)

[1]Full-sample without any country group dummy
[2]Full-sample with omitted country group as the transition economies
Figures in parentheses are robust standard errors
***, **. * are significant respectively to p<0.01, p<0.05, p<0.1
N= number of observations
e=10

transition economies. Also, transition economies were affected severely during the Dotcom Bubble (2001). But, in case of Global Financial crisis (2007 - 2008), emerging-market and transition economies has a positive impact on OFDI. This kind of relationship postulates the well-known 'fire-sale' phenomenon. As a region is affected by a shock, it becomes attractive to the investors due to the asset-cheapening effects of the crisis (due to lower prices of domestic currency terms and a depreciating exchange rate). Hence, at this phase wealthy countries enhance OFDI to the crisis-stricken countries (which increases their IFDI). Moreover, it is noted that transition economies invested abroad immensely during the Sovereign debt crisis (2011 - 2012).

Table 10 Determinants of OFDI: Evidence From The Phase of Economic Crises Dependent Variable: $OFDI_{FLOW\text{-}PC}$

	1	2	3	4	5	6
	Full-sample[1]	Full-sample[2]	Advanced	Emerging	Developing	Transition
GDP_{PC}	0.154***	0.151***	0.191**	0.214**	0.152	-0.572
	(0.0302)	(0.0323)	(0.0802)	($1.08e^{-1}$)	($2.22e^{-1}$)	(3.24e)
$(GDP_{PC})^2$	$-9.23e^{-6}$***	$-8.50e^{-6}$***	$-8.51e^{-6}$**	$-1.92e^{-5}$	$4.50e^{-5}$	0.000581
	($1.92e^{-6}$)	($2.01e^{-6}$)	($4.30e^{-6}$)	($1.25e^{-5}$)	($4.98e^{-5}$)	(0.00138)
$(GDP_{PC})^3$	$2.28e^{-10}$***	$2.00e^{-10}$***	$1.79e^{-10}$*	$5.44e^{-10}$	$-1.02e^{-8}$***	$-1.29e^{-7}$
	($5.09e^{-11}$)	($5.23e^{-11}$)	($9.91e^{-11}$)	($5.33e^{-11}$)	($4.60e^{-9}$)	($2.62e^{-7}$)
$(GDP_{PC})^4$	$-2.35e^{-15}$***	$-2.00e^{-15}$***	$-1.70e^{-15}$*	$-5.86e^{-15}$	$5.82e^{-15}$***	$1.14e^{-11}$
	($5.67e^{-16}$)	($5.74e^{-16}$)	($9.98e^{-16}$)	($9.34e^{-15}$)	($1.77e^{-13}$)	($2.25e^{-11}$)
$(GDP_{PC})^5$	$8.51e^{-21}$***	$7.04e^{-21}$***	$5.91e^{-21}$	$2.11e^{-20}$	$-9.22e^{-18}$***	$-3.59e^{-16}$
	($2.22e^{-21}$)	($2.22e^{-21}$)	($3.62e^{-21}$)	($5.67e^{-20}$)	($2.36e^{-18}$)	($7.12e^{-16}$)
$IFDI_{STOCK\text{-}PC}$	0.0980***	0.102***	0.0751**	0.0846**	0.244***	0.125**
	(0.0225)	(0.0223)	(0.0304)	(0.0405)	(0.0548)	(0.0513)
EXP	1.708	0.586	-2.052	7.618***	5.38	-28.24***
	(1.116)	(1.177)	(2.292)	(2.245)	(6.387)	(8.261)
R&D	95.39*	122.0**	-47.08	266.3	2,203***	485.1
	(56.2)	(57.58)	(63.89)	(161.7)	(402.4)	(323.8)
INFRA	8.529**	11.88***	14.23***	-3.022	27.14	-5.273
	(3.642)	(3.922)	(5.243)	(8.289)	(20.73)	(18.81)
$REER_{(t-1)}$	-0.0062	-0.00402	0.0088	-0.0617	0.0215	0.0231
	(0.0223)	(0.022)	(0.031)	(0.0416)	(0.0512)	(0.0595)
GOV	-97.7	-51.97	-102.5	30.79	-595.7***	81.51
	(61.96)	(65.59)	(99.33)	(114.2)	(177.9)	(329.3)
Major economic crisis						
Asian crisis	-135.6	-149.2	-83.22	44.71	-605.5**	-618.5*
(1997-1998)	(119.9)	(118.6)	(153.2)	(218.9)	(241.4)	(354.6)
Dotcom Bubble	-65.16	-68.94	143.4	-312.7	-50.13	-799.3*
(2001)	(165.2)	(166.7)	(197.9)	(331.7)	(310.9)	(419)
Global Financial crisis	127.5	131.3	115	382.1**	-304.2	741.7***
(2007-2008)	(91.72)	(89.98)	(121.9)	(159.7)	(215.7)	(210.7)

Sovereign crisis (2011-2012)	151.3 (122.2)	158.5 (121.1)	184.5 (182)	127.2 (205.6)	104.1 (265.4)	682.5*** (255)
Country groups						
Advanced		-396.7*** (122.9)				
Emerging		-3.613 (114.1)				
Developing		-166.3 (143.2)				
Constant	1,165*** (142.8)	1,253*** (182.2)	513.1 (479)	1,411*** (313.8)	-533.5* (290.7)	1,819 (2,708)
N	1,176	1,176	574	401	187	139
R-squared	0.122	0.134	0.104	0.127	0.427	0.457
F-ratio	90.90 (0.00)	85.32 (0.00)	49.21 (0.00)	56.71 (0.00)	86.45 (0.00)	43.47 (0.00)

[1]Full-sample without any country group dummy
[2]Full-sample with omitted country group as the transition economies
Figures in parentheses are robust standard errors
***, **. * are significant respectively to p<0.01, p<0.05, p<0.1
N= number of observations
e=10

Comparison of Factors of OFDI AmongVarious Country Groups

This section compares the factors that enhance OFDI between two country groups, namely- advanced and emerging-market economies, advanced and developing economies and emerging-market and developing economies. This is done in two alternative ways: first,we test for the equality of all the coefficients for both the country groups by conducting Chow test for equality of coefficients (Equation 3).

$$\frac{\{RSS_{A\&B} - (RSS_A + RSS_B)\}/K}{(RSS_A + RSS_B)/(N_A + N_B - 2K)} \quad \ldots\ldots\ldots (3)$$

Where, A and B are different group of countries that are to be compared. K is the number of independent variables including the constant term, N is the number of observations and RSS is the residual sum of squares. Second, we estimate a regression equation for the combined sample of both the country groups with the same explanatory variables but with the addition of a set of intercept and slope dummy variables representing the products of each of the independent variables and the dummy variable for one group of countries. In this specification, the focus is on the interaction terms to determine which of the particular variables are different between the two country groups.

Advanced &Emerging-market Economies

Now we test for the equality of all the coefficients for advanced and emerging-market economies by conducting Chow test for equality of coefficients (this is the test of homogeneity of the FDI equations for advanced and emerging-market economies). The Chow test yields an F-ratio of 0.229 (critical value:

$F_{0.01}$ = 2.77).It is clear that the OFDI equation for the two country groups are not significantly different at 1% level.

The second method estimates a regression equation for the combined sample of advanced and emerging-market economies with the same explanatory variables but with the addition of a set of intercept and slope dummy variables representing the products of each of the independent variables and the dummy variable for advanced economies. In this specification, the focus is on the interaction terms to determine which of the particular variables are different be-

Table 11 Contrasting Determinants of OFDI For Advanced &Emerging-market Economies
Dependent variable: $OFDI_{FLOW-PC}$

	1	2	3	4
	Advanced & emerging-market	Advanced	Emerging	Interaction with advanced
GDP_{PC}	0.0591	0.213***	0.212*	-0.153
	(0.0397)	(0.0781)	(0.112)	(0.138)
$(GDP_{PC})^2$	$-3.86e^{-6}$	$-9.66e^{-6}$**	$-1.76e^{-5}$	$2.57e^{-5}$*
	($2.49e^{-6}$)	($4.35e^{-6}$)	($1.27e^{-5}$)	($1.38e^{-5}$)
$(GDP_{PC})^3$	$1.03e^{-10}$	$2.06e^{-10}$**	$4.41e^{-10}$	$-9.55e^{-10}$
	($6.54e^{-10}$)	($1.03e^{-10}$)	($5.55e^{-10}$)	($5.82e^{-10}$)
$(GDP_{PC})^4$	$-1.11e^{-15}$	$-1.98e^{-15}$*	$-3.65e^{-15}$	$1.37e^{-14}$
	($7.26e^{-16}$)	($1.07e^{-15}$)	($1.00e^{-14}$)	($1.04e^{-14}$)
$(GDP_{PC})^5$	$4.03e^{-21}$	$6.89e^{-21}$*	$6.05e^{-21}$	$-6.93e^{-20}$
	($2.84e^{-21}$)	($3.97e^{-21}$)	($6.29e^{-20}$)	($6.46e^{-20}$)
$IFDI_{STOCK-PC}$	0.0704***	0.0757***	0.0831**	0.00165
	(0.0249)	(0.0293)	(0.0399)	(0.051)
EXP	2.214*	-1.601	7.747***	-9.896***
	(1.21)	(2.022)	(2.433)	(3.108)
R&D	50.15	-43.13	270.1*	-272.2
	(59.09)	(65.77)	(161.5)	(168)
INFRA	8.900**	13.19***	-3.649	18.74*
	(3.946)	(5.032)	(8.395)	(10.39)
$REER_{(t-1)}$	-0.0205	0.00192	-0.0654*	0.0658
	(0.0231)	(0.0268)	(0.039)	(0.0486)
GOV	-68.32	-125.7	23.55	-172.2
	(69.81)	(94.88)	(102.8)	(139.5)
Constant	1,772***	441.8	1,439***	1,288***
	(214.5)	(449.7)	(340.2)	(323.6)
N	902	574	401	902
R-squared	0.051	0.1	0.113	0.122
F-ratio	4.35	5.69	4.50	5.29
	(0.00)	(0.00)	(0.00)	(0.00)
RSS	$1.1608e^{9}$	626219514	531231121	$1.0272e^{9}$

Figures in parentheses are robust standard errors
***, **. * are significant respectively to p<0.01, p<0.05, p<0.1
N= number of observations
e=10

tween the two country groups (columns 3& 4). In case of emerging-market economies, economic development (GDP_{PC}), capital inflows (IFDI), exports of goods and services (EXP) and innovations (R&D) are better factors for OFDI when compared to advanced economies. While, in case of advanced economies, a good telephone connectivity (INFRA) play a better role compared to the factors of emerging-market economies.

Advanced &Developing Economies

Table 12 gives a view of the differences in factors of OFDI between advanced and developing economies. Both these economies' economic development (GDP_{PC}), capital inflows (IFDI) and physical infrastructure (INFRA) help in boosting OFDI.While looking at the differences in factors of OFDI, the Chow test yields an F-ratio of 5.807 (critical value: $F_{0.01}$ = 2.77): according to which the FDI equation for the two country groups are significantly different at the 1% level.

Good governance yields a negative impact on advanced economies but a positive impact on developing economies.

The interaction terms (column 4) shows that in case of advanced economies, IFDI and R&D negatively affects OFDI. On the contrary, these two variables help the developing economies to invest abroad. Moreover, good governance yields a negative impact on advanced economies but a positive impact on developing economies.

Emerging-market Developing Economies

Table 13, column 1 gives a view of the emerging-market and developing economies where the factors- GDP_{PC}, IFDI, EXP and R&D are statistically significant and has a positive coefficient (impact). These findings suggest that OFDI is encouraged by economic development, capital inflows, globalization and innovation in case of both the emerging market and developing economies. Now, looking at the significant difference in the coefficients on the other explanatory variables between emerging-market and developing countries, the Chow test yields an F-ratio of 3.257 (critical value: $F_{0.01}$ = 2.77) which implies that the FDI equation for the two country groups are significantly different at 1% level.When comparing the interaction terms of emerging-market (column 4), capital inflows (IFDI) and research advancement (R&D) has a negative influence on OFDI compared to developing economies. However, these factors have a positive impact in case of developing economies. Moreover, economic development of developing economies helps in boosting OFDI. However, corruption (GOV) has a negative impact on developing economies but a positive impact on emerging-market economies.

Conclusion

OFDI has increased in the last two decades, and especially emerging-market and developing economies have been the forerunners in investing abroad, mainly due to the gradual liberalization of capital account. This paper sheds

Table 12Contrasting Determinants of OFDI for Advanced &DevelopingEconomies Dependent variable: $OFDI_{FLOW-PC}$

	1	2	3	4
	Advanced &developing	Advanced	Developing	Interaction with advanced
GDP_{PC}	0.138***	0.213***	0.172	0.0418
	(0.04)	(0.0781)	(0.228)	(0.249)
$(GDP_{PC})^2$	$-6.48e^{-6}$***	$-9.66e^{-6}$**	$4.04e^{-5}$	$-5.01e^{-5}$
	$(2.50e^{-6})$	$(4.35e^{-6})$	$(5.82e^{-5})$	$(6.07e^{-5})$
$(GDP_{PC})^3$	$1.46e^{-10}$**	$2.06e^{-10}$**	$-9.78e^{-9}$	9.98e-9
	$(6.59e^{-11})$	$(1.03e^{-10})$	$(6.29e^{-9})$	$(6.54e^{-9})$
$(GDP_{PC})^4$	$-1.47e^{-13}$**	$-1.98e^{-15}$*	$5.65e^{-13}$**	$-5.67e^{-13}$*
	$(7.35e^{-16})$	$(1.07e^{-15})$	$(2.80e^{-13})$	$(2.91e^{-13})$
$(GDP_{PC})^5$	$5.27e^{-21}$*	$6.89e^{-21}$*	$-8.99e^{-18}$**	$9.00e^{-18}$**
	$(2.89e^{-21})$	$(3.97e^{-21})$	$(4.04e^{-18})$	$(4.20e^{-18})$
$IFDI_{STOCK-PC}$	0.110***	0.0757***	0.247***	-0.172***
	(0.0259)	(0.0293)	(0.0492)	(0.0588)
EXP	0.0433	-1.601	5.849	-7.45
	(1.946)	(2.022)	(6.047)	(6.594)
R&D	1.841	-43.13	2,300***	-2,343***
	(64.5)	(65.77)	(395.5)	(416.1)
INFRA	9.997**	13.19***	29.86*	-16.67
	(4.65)	(5.032)	(17.12)	(18.47)
$REER_{(t-1)}$	-0.00552	0.00192	0.00949	-0.00757
	(0.0239)	(0.0268)	(0.0474)	(0.0559)
GOV	-166.9**	-125.7	-669.0***	543.2***
	(80.65)	(94.88)	(165.9)	(196.3)
Constant	1,006***	441.8	-708.5**	-708.5**
	(171.8)	(449.7)	(342.3)	(355.7)
N	761	574	187	761
R-squared	0.168	0.1	0.408	0.24
F-ratio	13.78	5.69	10.96	10.13
	(0.00)	(0.00)	(0.00)	(0.00)
RSS	878641158	626219514	176521338	802740818

Figures in parentheses are robust standard errors
***, **. * are significant respectively to p<0.01, p<0.05, p<0.1
N= number of observations
e=10

light on to what extent does the IDP theory explain OFDI across a very large set of countries, grouped by:advanced, emerging-market, developing and transition countries over a time period that spans the Asian Crisis, the Dotcom Bubble, the Global Financial Crisis and

The sensitivity of OFDI to the various variables are different for advanced, emerging-market, developing and transition countries.

Table 13 Contrasting Determinants of OFDI for Emerging-market and Developing Economies
Dependent variable: $OFDI_{FLOW-PC}$

	1	2	3	4
	Emerging-market & developing	Emerging-market	Developing	Interaction with emerging-market
GDP_{PC}	0.277***	0.203***	0.493***	-0.289
	(0.0483)	(0.0622)	(0.178)	(0.205)
$(GDP_{PC})^2$	$-2.02e^{-5}$***	$-1.65e^{-5}$***	$-7.07e^{-5}$**	$5.42e^{-5}$
	$(3.83e^{-6})$	$(4.68e^{-6})$	$(3.03e^{-5})$	$(3.37e^{-5})$
$(GDP_{PC})^3$	$4.68e^{-10}$***	$3.89e^{-10}$***	$3.63e^{-9}$**	$-3.24e^{-9}$
	$(1.03e^{-10})$	$(1.21e^{-10})$	$(1.83e^{-9})$	$(2.03e^{-9})$
$(GDP_{PC})^4$	$-3.26e^{-15}$***	$-2.69e^{-15}$***	$-5.53e^{-14}$*	$5.26e^{-14}$
	$(8.32e^{-16})$	$(9.57e^{-16})$	$(3.08e^{-14})$	$(3.40e^{-14})$
$IFDI_{STOCK-PC}$	0.124***	0.0831**	0.240***	-0.157**
	(0.0319)	(0.0399)	(0.0496)	(0.0669)
EXP	6.819***	7.760***	5.72	2.04
	(2.055)	(2.426)	(6.114)	(7.148)
R&D	482.2***	268.0*	2,313***	-2,045***
	(133.5)	(159.9)	(399.8)	(467.8)
INFRA	-4.153	-3.536	27.84	-31.37
	(7.252)	(8.302)	(17.29)	(20.7)
$REER_{(t-1)}$	-0.0422	-0.0654*	0.0184	-0.0838
	(0.0311)	(0.039)	(0.0477)	(0.0647)
GOV	-115.7	22.65	-596.3***	619.0***
	(82.46)	(102.3)	(164.5)	(206.7)
Constant	782.2***	1,455***	-852.6**	-852.6**
	(197.4)	(294.2)	(339.8)	(375.5)
N	588	401	187	588
R-squared	0.179	0.113	0.391	0.232
F-ratio	12.60	4.96	11.31	8.16
	(0.00)	(0.00)	(0.00)	(0.00)
RSS	762152951	531243756	181512318	712756086

Figures in parentheses are robust standard errors
***, **. * are significant respectively to p<0.01, p<0.05, p<0.1
N= Number of observations
e=10

the Sovereign Debt Crisis. The original IDP model is replaced by considering OFDI as the dependent variable and employing a wide range of independent variables to the dynamic panel model so that explanatory power increases. Though the results are in line with the IDP paradigm but the sensitivity of OFDI to the various variables are different for advanced, emerging-market, developing and transition countries. The results indicate that the explanatory power of the control variables has changed over time, though the patterns are not uniform across the four country groups.

Implications for Theory

Econometric estimations find support for the original IDP theory, only in case of emerging-market and developing economies as the linear term of GDP_{PC} entered in linear form is negative and positive in quadratic form which gives a U or J-shape of the NOI. Moreover, when the original model is extended by adding the cubic and quartic form of GDP_{PC}, only the advanced and developing economies support the theory (U-shape of NOI). On the contrary, the transition economies rejected the theory by producing an inverted U-shape of NOI.

When the additional control variables are introduced,trade openness (EXP) fails to enhance OFDI in case of advanced and emerging-market economies. However, technological advancement (R&D) is positive and statistically significant to emerging-market and transition economies. While INFRA has a positive impact on developing economies but negatively related to advanced and transition economies. REER has a positive impact on emerging-market and transition economies but negative relation when it comes to GOV.

Also, due to the flaws in IDP theory, ODFI is considered as dependent variable. Even in these specifications the macroeconomic and institutional control variables increase the explanatory power of drivers of OFDI. Therefore, the above result supports the view that GDP_{PC}alone is an incomplete measure for examining to what extent does the IDP theory explain NOI. Thus, other supplementary factors that contribute to economic development should be included in order to increase the explanatory power of OFDI.

Implications for Policy Makers

It is quite evident that OFDI brings many benefits, like- competitiveness, job creation and economic growth, to the home country for which OFDI should be encouraged. Policy makers should work upon improving of GDP_{PC} by implementing extensive economic and institutional reforms- small and large-scale privatization, trade and price liberalization (to encourage IFDI and EXP), banking reforms and interest rate liberalization, enterprise restructuring, competition policy, securities markets and non-bank financial institutions and also the technological level (R&D) of home country. However, development in the above-mentioned sectors will improve the absorptive capacity of home country and also attract IFDI as well. In effect, competitiveness is increased of the home country firms and their ability to invest abroad (OFDI). Policy makers should be careful while designing the policies. This is so because large amounts of OFDI may lead to heavy capital out-flows and can bring complications in the balance of payments, employment, growth and to the economy as whole.

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References

Alvarez, M. (2002),Espana y la Senda de Desarollo de la Inversion Directa: una Aproximacion. Institutd'Economia de Barcelona, WP 11

Buckley, P.& Castro, F. (1998), "The Investment Development Path: The Case of Portugal", *Transnational Corporations*, 7(1): 1–15.

Cantwell, J & Narula, R (Eds) (2003), International Business and The Eclectic Paradigm: Developing the OLI Framework, Routledge Studies in International Business and the World Economy, Routledge, London.

Damijan, J.P., J. Konings, & S. Polanec (2014),"Import Churning and Export Performance of Multi-Product Firms". The World Economy, 37(11): 1483–506.

Das, K. C. (2013). "Home Country Determinants of Outward FDI from Developing Countries", *Margin: The Journal of Applied Economic Research,* 7(1): 93-116.

Dunning, J. (1997),Resolving Some Paradoxes of the Emerging Global Economy: Small Nations as Trailblazers,Center for International Management and Development - University of Antwerp, Discussion Paper E33

Dunning, J. H. (1977),"Trade, Location of Economic Activity and the MNE: A Search for an Eclectic Approach", in B. Ohlin, P. O. Hesselborn, & P. M. Wijkman, The International Allocation of Economic Activity, London: Macmillan.

Dunning, J.H. (1981), "Explaining the International Direct Investment Position of Countries: Towards a Dynamic or Developmental Approach", *WeltwirtschaftlichesArchiv,* 119(1): 30- 64.

Dunning, J.H. (1986), "The Investment Development Cycle Revisited", *Weltwirts chaftlichesArchiv,* 122(4): 667-77.

Dunning, J.H. (1988), Explaining International Production, London: George Allen and Unwin

Dunning, J.H. (1993), Multinational Enterprises and the Global Economy,Workingham, Addison-Wesley

Dunning, J.H., Kim, C.S. & Lin, J.D. (2001), "Incorporating Trade into The Industrial Development Path", *Oxford Development Studies*, 29 (2): 145-54.

Dunning, J.H.,& Narula, R. (1998), Foreign Direct Investment and Governments, The Investment Development Path Revisited: Some Emerging Issues, Routledge, London,

Duran, J.J. &Ubeda, F. (2005), "The Investment Development Path of Newly Developing Countries", International Journal of the Economics of Business,12 (1): 123-37.

Fonseca, M., Mendonça, A.&Passos, J. (2007), The Investment Development Path Hypothesis: Evidence from the Portuguese Case – A Panel Data Analysis, Working Paper No. 21, Technical University of Lisbon, Lisbon.

Hattari, R. &Rajan, R.S. (2010),"India as a Source of Outward Foreign Direct Investment", *Oxford Development Studies,* 38(4): 497–518.

Kuada & Sorensen (2000), "Internationalization of Companies from Developing Countries", *JIBS Book Review,* 36 (21): 112-139

Kyrkilis, D. &Pantelidis, P. (2003),"Macroeconomic Determinants of Outward Foreign Direct Investment",*International Journal of Social Economics,* 30(7): 827–36.

Lecraw, D. J. (1996),"Indonesia: The Critical Role of Government", in J.H. Dunning and R. Narula(Eds.), Foreign Direct Investment and Governments, Routledge, London, 316—47.

Li, X. (2011),"Sources of External Technology, Absorptive Capacity, and Innovation Capacity in Chinese State-owned High-tech Enterprises",*World Development,* 39(7): 1240–48.

Narula, R. (1996), Multinational Investment and Economic Structure: Globalization and Competitiveness, Routledge, London.

Sathye, S. (2008), "Investment Development Path Theory and the Case of India", *International Review of Business Research Papers*, 4(1): 299-309.

Stoian, C. (2013), "Extending Dunning's Investment Development Path: The Role of Home Country Institutional Determinants in Explaining Outward Foreign Direct Investment", *International Business Review,* 22: 615-37.

Tolentino, P. (1993), Technological Innovation and Third World Multinationals, London, Routledge

Tolentino, P. (2008), The Determinants of the Outward Foreign Direct Investment of China and India: Whither the Home Country? Working Paper Series No. 2008-049, United Nations University, UNU-Merit, The Netherlands.

Vavilov (2006), Investment Development Path in Petroleum Exporters, University of Paris I Panthéon - Sorbonne

Verma, R. & Brennan, L. (2011), "The Investment Development Path Theory: Evidence from India", *International Journal of Emerging Markets,* 6(1): 74-89.

Appendix List of Country Groupings

Advanced countries			
1.	America		Canada, United States
2.	Asia		Israel, Japan
3.	Europe		Austria, Belgium, Cyprus, Denmark, Estonia, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Nether lands, Norway, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland, United Kingdom
4.	Oceania		Australia, New Zealand
Emerging-market economies			
1.	Africa		Egypt, Nigeria & South Africa
2.	America		Argentina, Brazil, Chile, Colombia, Ecuador, Mexico, Peru, Uruguay, Venezuela
3.	Asia		China, Korea, India, Indonesia, Malaysia, Philippines, Singapore, Thailand
4.	Middle-East		Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, Turkey, United Arab Emirates
5.	Europe		Bulgaria, Croatia, Czech Republic, Hungary, Poland, Romania, Russian Federation
Developing countries			
1.	Africa	Eastern Africa	Burundi, Djibouti, Ethiopia, Kenya, Madagascar, Malawi, Mauritius, Mozambique, Rwanda, Somalia, Uganda, United Republic of, Tanzania, Zambia, Zimbabwe
		Middle Africa	Angola, Cameroon, Central African Republic, Chad, Congo, Dem. Rep. of the Congo, Gabon
		Northern Africa	Algeria**,** Libya**,** Morocco, Sudan**,** Tunisia
		South Africa	Botswana, Lesotho, Namibia
		Western Africa	Benin, Burkina Faso, Cabo Verde, Côte d'Ivoire, Gambia, Ghana, Guinea, Guinea-Bissau, Liberia, Mali, Mauritania, Senegal, Sierra Leone & Togo
2.	America	Caribbean	Antigua and Barbuda, Barbados, Cuba, Dominica, Dominican Republic, Grenada, Haiti, Jamaica, Trinidad and Tobago
		Central America	Belize, Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua
3.	Asia	Eastern	Mongolia
		Southern	Afghanistan, Bangladesh, Bhutan, Iran (Islamic Republic of), Maldives, Nepal, Pakistan, Sri Lanka
		South-Eastern	Cambodia, Lao People's Dem. Rep., Myanmar, Viet Nam
		Western Asia	Iraq, Jordan, Lebanon, Yemen
4.	Oceania		Fiji, Guam, Kiribati, Papua New Guinea, Samoa, Solomon Islands, Tonga, Tuvalu,

Transition economies Albania, Armenia, Azerbaijan, Bosnia & Herzegovina, Georgia, Kazakhstan, Kyrgyzstan, Montenegro, Moldova, Serbia, Tajikistan, Macedonia, Turkmenistan, Ukraine, Uzbekistan

Sample includes developed countries, emerging market economies, developing countries and transition economies. Groupings follow the classification by UNCTAD. However, countries classified as emerging market economies have been removed from developing country group if they also appear there.