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Wanida Wadecharoen

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(SESRIC)**

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EDITORIAL NOTE

I am honoured to present you with this Special Issue of the Journal of Economic Cooperation and Development - December 2015 - on the theme 'Economic Integration, Trade and Investment'. The slowing demand from advanced economies accentuates the need for various countries to rebalance its sources of growth more toward domestic and regional demand. Cross-border trade flows and investment bolstered most of the countries' economic integration. Therefore, by opening a window to various scholars, researchers and academics within and outside the OIC region to continue demonstrating an increased interest in sharing the results of their studies with the readers of our Journal, SESRIC is proud to share the valuable information in these articles to provide all with a chance to keep up with the pace of the changes occurring in the world economy.

This issue contains six noteworthy articles which accord a detailed analysis of small and medium enterprises (SMEs) and international joint ventures, convergence of growth rates, private and public investment, rebalancing exports through expansions, corruption in international trade and effects of regional economic integration on factor flows.

The first article analyses the trend of Japanese investment inflow is increasing in Thailand as recipient country year after year. It demonstrates how MO and RMO were identified as the success factors contributing to IJV operation by particularly focusing on the means to explore and push out partner synergy and finally by helping transfer to knowledge from one to another.

The second article focuses on the unsuccessful attempts by policy makers in West Africa to launch a second common currency, the Eco, over the past decade and contributes to the debate by establishing the extent of convergence and synchronisation of business cycles within the West African Monetary Zone (WAMZ).

The third article highlights the importance of FDI in the Less Developed Countries to find out and to verify the interactions and transmission mechanism between FDI, private direct investment and public direct investment in Nigeria.

The fourth article examines the impact of common economic factors on intra-ASEAN bilateral exports through estimations of panel data using a gravity model by comparing the determinants of two-way bilateral exports

within the pioneer ASEAN member economies from that of the pioneer-newer ASEAN economies, to provide insights on the specific channels and trading relationships relevant for boosting intra-regional exports.

The fifth article provides evidence that corruption negatively influences trade flows and that control of corruption improves trade potentialities by using a gravity trade model to examine the effect of corruption on bilateral trade for a sample of 37 countries representing two regions: the Middle East and North Africa and the European Union during the period 2002 - 2012.

The sixth and last article touches upon the recent empirical studies which suggest that regional economic integration provides important stimulus not only to trade, but also to FDI and labour flows. This article also analyses the effect of Economic Integration – in particular, the European Union and its effect on these factor flows. It attempts to identify whether being a part of the European Union aids or deters factor mobility.

Amb. Musa KULAKLIKAYA
Editor-in-chief

The Japanese and Local Partner Relationship on Small and Medium Enterprises (SMEs) and International Joint Ventures (IJVs) Performance in Thailand Industrial Sectors

Wanida Wadecharoen¹

The trend of Japanese investment inflow is increasing in Thailand as recipient country year after year. Thailand's economic sustainability could be enhanced by the introduction of Japanese-Thai SME IJV in the industrial sector. This investment from Japan is using Thailand as the base location for their offshore production, and at least 80 percent of their productivity is export oriented. Despite the Thai partner as the host country, the company could not enhance their firm's competitive advantage as much as they expect before engaging in IJV. This is caused by a large difference of the firm's investment size in which one of them is dominated by the other. Hence, no wonder '*why Japanese and Thai partners are lacking in dependency*'. MO and RMO were identified as the success factors contributing to IJV operation. . Particularly, RMO enables them to explore and push out partner synergy and finally cause them to transfer to knowledge from one to another. A total of 441 cases were distributed to Japanese-Thai SME IJVs general manager through survey method, and 145 cases were returned. The result of the study shows the linkage between MO, RMO and SME IJV performance. This will be discussed in more detail in this study.

1. Introduction

Small and Medium enterprises (SMEs) are the major sources of national businesses which have driven Thailand's economy dramatically. This fact is confirmed by the actual number of SMEs relatively close to 3 million (2,924,912) enterprises or 95 percent of the national business units. Moreover, SMEs are contributing to national GDP up to 42 percent and directly generated national employment up to 78 percent (OSMEP: 2011). Hence, SME is one of national strategic

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economic tools to boost up Thailand's economic sustainability. In doing so, one of the imperative factors supporting this phenomenon is the International Joint Venture (IJV) whereby its performance as the mode of internationalization is used by foreign investors to enter in ASEAN region and Thailand in particular (Julian & O'Cass, 2005).

The largest of the foreign direct investment (FDI) inflow comes from Japan and continue to increase from 1,362 million USD in 2009 before reaching to 4,561 in 2011 (Wadeecharoen, Kanjanavanikul, Lertnaisat & Teekasap, 2012:c). The large amount of Japanese FDI mainly engaged in Thailand manufacturing as it is presented in the form of SME IJV. This is because IJV could be the best alternative for foreign investors to enter Thailand as required by Thai government with a minimum foreign capital of at least 10 percent (BOI: 2011). By the use of IJV mode, local partners can acquire better access to advance technology, marketing distribution management in order to meet a higher quality performance (Mohamad, Ramayah & Hathaivaseawong, 2010). In reality, the question here is, '*Does the foreign firm willing to share such knowledge and transfer the core technology with their local partner?*'. This point may become a critical issue of partners' disputation and finally cause to the termination of partners relationship (Millington & Bayliss, 1999).

Thailand has be standing as a well foreign investment recipient country among ASEAN member countries particularly from Japanese investment inflows (Wadeecharoen et al, 2012:c). Japanese investors are performing as a major player to sustain Thailand economy holistically. The trend of Japanese IJV projects and its investment is increasing year after year. Particularly in 2011, Japanese IJV has boosted up to 480 projects, from 138 projects or 29 percent-in 2010. Moreover, the number of Japanese IJV reaches nearly 300 projects in the first 6 months of year 2012; this involved 60 percent compared to year 2011 (refers to table 1).

Table 1: Japanese IJV Projects Submitted to BOI

	2007	2008	2009	2010	2011	2012 (Jan-June)
No. of projects	330	324	343	342	480	291
Total Investment	146,323	106,155	58,905	100,305	158,968	160,281
Total Registered Capital	32,060	24,148	5,168	7,677	31,745	15,511
- Japanese	23,360	22,192	3,557	6,167	28,450	14,493
- Thai	6,344	1,477	879	1,017	2,542	965

Note: 1) Japanese investment projects refers to projects with Japanese capital of at least 10%
International Affairs Bureau, BOI
As of July 9, 2012

Japanese IJV used Thailand as the location for their offshore production and at least 80 percent of their productivity is export orientated (Kanjavanikul, Wadecharoen & Teekasap, 2011). However, the local Thai IJV partners could not enhance their firm's competitive advantage as expected. The possible reason explaining this event is the size of Japanese-Thai IJV partners which is largely different (refers to table 1). Contrasting between the Japanese and the Thai registered capital, Japanese partner is 15 times larger as compare with the local Thai partner in 2008, and 11 times larger in 2011.

The trend of the Japanese registered capital kept moving higher as compare to the Thai local partner (refers to table 1). Thus, technology transfer from the Japanese partner to the local Thai partner seems to become difficult due to the lack of partner dependency (Wadecharoen, Kanjavanikul, Pattana & Teekasap, 2012). Moreover, the success factors of IJV are still unpredictable and fragmented in the literature (Wadecharoen & Nik Mat, 2011:2010(a):2009; Robson, Leonidou & Katsikeas, 2002). Finding the right partner is becoming a primary successful step of IJV in Thailand. The first step in selecting the right partner is *'the firm investment size'* where most of IJV firms are engaged in. Hence, the sample size in this study is focus on SME IJV size as defined by Wadecharoen, Kanjavanikul, Lertnaisat & Teekasap, (2012:a) who proposed the concept of *'SME IJV in the project which required at least 10 percent of foreign capital and a total foreign investment size which is less than 500 million Baht'* (refers to table 2). The study focuses on the Japanese SME IJV in manufacture setting where most of the Japanese investments are engaged in metal &

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machinery production followed by electric & electronic sectors (refers to table 3). Based on this evidence, Japanese –Thai SME IJV is taking a part of Thailand's economic development, therefore survival of a long-term partner- relationship is required for Thailand to maintain its national competitive advantage. Thus, this study will examine the success factors contributing to Japanese – Thai SME IJV partner-relationship quality by using relational factors.

Table 2: Japanese IJV Projects Classified by Investment Size

Investment Size	2007		2008		2009		2010		2011		2012 (Jan-June)	
	No.	Million Baht	No.	Million Baht	No.	Million Baht	No.	Million Baht	No.	Million Baht	No.	Million Baht
¹ Total Japanese IJV	330	164,323	324	106,155	243	58,905	342	100,305	484	87,474	291	106,281
<50	126	2,314	136	2,613	97	1,869	131	2,606	205	4,214	104	1,972
50-99	52	3,741	43	3,094	48	3,478	72	5,173	78	5,723	37	2,606
100-499	100	24,404	105	26,706	74	18,850	105	27,307	141	33,833	105	25,717
500-900	29	18,908	20	13,088	13	8,726	18	12,495	31	20,708	24	16,117
>1,000	23	114,957	10	60,654	11	25,981	16	52,725	29	94,490	21	59,868
² Japanese SME IJV <500	278	30,459	284	32,413	219	24,197	308	35,086	424	43,770	246	30,295
Total Registered Capital		32,060		24,148		5,168		7,677		31,745		15,511
- Japanese		23,360		22,192		3,557		6,167		28,450		14,493
- Thai		6,344		1,477		879		1,017		2,542		965
⁽¹⁻²⁾ % of Japanese SME IJV	84%	19%	88%	32%	90%	41%	90%	35%	88%	50%	85%	29%

Source: Author's calculation based on data provided by Board of Investment (BOI) Thailand: 2013

Table 3: Japanese Investment Projects Approved by BOI classified by Sector

Sector	2007		2008		2009		2010		2011		2012 (Jan-June)	
	No.	Million Baht	No.	Million Baht	No.	Million Baht	No.	Million Baht	No.	Million Baht	No.	Million Baht
Agriculture	12	5,499	14	4,800	12	10,167	15	4,323	14	8,102	8	1,999
Mineral& Ceramics	10	17,355	15	8,441	6	2,814	6	1,222	21	14,944	10	16,134
Light Industrial	11	2,147	10	3,417	8	1,234	7	662	13	4,045	8	2,005
Metal & Machinery	118	77,092	120	64,189	98	19,756	137	29,891	234	66,851	117	38,457
Electric & Electronic	59	32,111	49	14,271	38	15,874	69	46,383	83	36,886	55	29,263
Chemicals & Paper Services	44	18,683	39	7,258	23	5,174	49	8,695	51	25,745	38	13,413
	76	11,456	77	3,779	58	3,886	59	9,130	68	2,395	55	5,009
Total	330	164,323	324	106,155	243	58,905	342	100,305	484	158,978	291	106,281

Source: Author's calculation based on data provided by Board of Investment (BOI) Thailand: 2013

2. Literature Review

The Definition of SME

The concept of SME is defined according to *the number of employees and fixed capital*. Although, the definition differs in different countries such as in USA, *the annual receipt is used* to defined SME in those particular trade sectors such as general & heavy construction, special trade contractor and agricultural industries, while in Singapore *fixed asset* is being used (refers to table 4).

Table 4: The definitions of SME in Asian Pacific Economic Cooperation (APEC)

Country	Sector	Employment	Other Measures
Japan*	Manufacturing	Less than 300 employees	¥ 300 million assets
	Wholesaling	Less than 100 employees	¥ 100 million assets
	Retailing-Service	Less than 50 employees	¥ 100 million assets
Malaysia	Varies (for SMI)	Less than 75 employees (Different for Bumiputra Enterprises)	Less than RM 2.5 million
Thailand**	Production	Less than 200 employees	Less than THB 200 million
	Service	Less than 200 employees	Less than THB 200 million
	Wholesale	Less than 50 employees	Less than THB 100 million
	Retail	Less than 30 employees	Less than THB 60 million
Singapore	Manufacturing		Less than \$12 million fixed assets
	Service	Less than 100 employees	
USA***	Manufacturing	Less than 500 employees	
	Wholesaling	Less than 100 employees	
	Retailing-Service		\$ 7 million of annual receipts for most retail and service industries
	General & heavy construction		\$ 33.5 million of annual receipts for most general & heavy construct industries
	Special trade contractor		\$ 14 million of receipts for all special trade contractors
	Agricultural industries		\$ 0.75 million of receipts for most Agricultural industries

Source: (Wadecharoen, Kanjanavanikul, Lertnaisat & Teekasap, 2012:a)

Comparing between Japan* and Thailand SME's definition (refers to table 4) it is important to determine the appropriate concept of SME IJV in Thailand. Since Japan SME in manufacturing sector has less than 300 employees and a fixed capital of less than ¥ 300 million, in contrast, Thailand SME has less than 200 employees and a fixed capital of less than THB 200 million. The two perspectives (employees/fixed capital) are generally used as the standard measurement to identify SME in Japan and Thailand. Comparing between Japan and Thai SME, Thai SME has fixed capital asset more than Japan's SME up to 76 million THB, while the employment of Japan SME has 100 employees more than Thai SME. Additionally, USA SME in manufacturing sectors focus only on employment dimension which has employees less than 500. In another view, USA SME in general and heavy construction sectors have fixed annual receipt of 33.5 millionUSD (see detail in Table 4).

The Definition SME IJV

As far as SME is concerned, it refers to an enterprise which has a number of employees that is less than 200 and fixed capital of less than 200 million baht, excluding land and properties (SME Bank, 2010). However, the character of SME in IJV setting has not been recorded in the literature. In fact, a certain number of IJV reported in multinational companies directory may involved only middle and larger enterprises while small enterprises seem to be unreported in the literature (Wadecharoen et al., 2012:c)

According to the statement above, this study proposed a new merge of SME IJV whereby SME IJV firm refers to business projects joining between foreign and local partners with a required minimum of 10 percent foreign capital (International Affairs Bureau., BOI, 2012). Consequently , this study is putting a new line of SME IJV concept adapted from appropriate researchers in the caption below:

“Small and Medium Enterprise (SMEs) International Joint Venture (IJV) refers to IJV projects with a required minimum of 10 percent foreign capital and total investment size that is less than 500 million baht” (Wadecharoen et al., 2012:a)

SME IJV Performance Measurement

Measuring the performance of IJV firms is a complicated and fragmented process due to the multiple partners engaged in IJV. Since several measurements have been used in IJV, such financial indicators indicated by company profitability, sale growth and cost position (Lecraw, 1983; Ding, 1977; Tomlinson, 1970; Venkatraman & Ramanujam, 1986), objective measurement is measured by IJV survival and non-survival from the time of its formation (Geringer, 1990; Killing, 1983; Stopford & Wells, 1972; Franko, 1971) and IJV duration or longevity (Kogut, 1988, Harrigan, 1986). Anyway, financial and objective measures can evaluate only a single dimension of IJV performance whereby IJV precise goal is focus on the company's profitability (Venkatraman & Ramanujam, 1986). These measurements have failed to capture the real extent of IJV goal when profitability isn't the most important objective (Blodgett, 1987; Killing, 1983). In summary, financial and objective measurement methods are inadequately taken into consideration of SME IJV performance where poor profitability, liquidation or instability may not indicate a poor performance of SME IJV especially if the IJV's expectation are not met or has exceeded its objectives (Anderson, 1990).

Accordingly, subjective approach will be adapted in this study in order to depict the real extent of Japanese-Thai SME IJV performance in Thailand industries. The performance measurement constructs were developed from Thuy & Quang, (2005) and Cullen, John, Johnson, Jean, Sakino & Tamoaki, (1995). Their research constructs were tested in Vietnamese IJV setting and Japanese IJV with several local partners where their businesses were conducted in England. The constructs have shown very high reliability according to Cronbach alpha of 0.90 in Thuy & Quang, (2005) and 0.88 in Cullen et al., (1995). Development of this study instrument will be justified as the appropriate device used in Japanese- Thai SME IJV in industrial sectors and will be tested in the research model empirically.

Relationship Marketing Orientation (RMO)

The components of RMO consist of bonding, empathy, reciprocity, and trust as originally proposed by Callaghan, McPhail & Yau, (1995). The actual concept of RMO is explained by the citation below;

“The RMO centers on the creation and maintenance of relationship between two parties of exchange, the supplier as an individual and the customer as an individual through the possession of the desire to be mutually empathic, reciprocal, trusting and to form bonds. (Challaghan, McPhail, & Yau, 1995)

Market Orientation and Performance

Market Orientation (MO) is the organizational culture that most effectively and efficiently creates the necessary behaviors for the creation of superior value for buyers, and thus continuous superior performance for the business market orientation which consists of three behavioral components: customer orientation, competitor orientation, inter-functional coordination and two decision criteria: long-term focus and profitability (Narver & Slater, 1990). Farrelly, Oczkowski & Kharabsheh, (2008) examine the relationship between market orientation and IJV performance in Malaysian manufacturing and service sectors. Their result has proven that market orientation has positive, significant impact on sales growth, customer retention, new product success and overall IJV business performance. In Thailand, market orientation has been found to be positively and significantly related to IJV satisfaction and overall economic performance in cross industry sectors such as agricultural, metal-working electrical and chemical industries (Julian & O’Cass, 2008; 2005; 2004; 2002). Thus, the following hypothesis is formulated regarding this relationship:

H1: Market Orientation (MO) has positive influence on SME IJV performance.

Market Orientation and RMO

This study defines market orientation (MO) as composite factors suggested by Narver & Slater, (1990) and relationship marketing orientation (RMO) as a composite factors as suggested by Yau et al, (2000). Only one study conducted in IJV setting by Racela & Chaikittisilpa and Thourungroje, (2007) found strong positive significant support for the relationship between composite MO and cooperation (RMO) among exporters in Thailand exporting firms. Other studies found positive and significant relationship between market orientation and relationship marketing orientation RMO as a single dimension in non-IJV settings such as MO with trust (Farrelly & Quester, 2003; Siguaw, Simpson & Baker, 1998), commitment (Castro, Armario & Rio, 2005; Caruana, 1997; Jaworski & Kohli, 1993; Farrelly & Quester, 2003), cooperation (Racela et al, 2007; Siguaw, Simpson & Baker, 1998) while there is only one study that has found positive relationship but no significant support between distributor's MO and commitment to the suppliers (Siguaw, Simpson & Baker, 1998). Thus, the relationship between MO and dimension of RM is still fragmented with inconsistent finding results. This gives a strong reason for this study to carry out further investigation on linkage between MO and RMO as a composite factor. Thus, the following hypothesis is formulated with regards to this relationship:

H2: Market Orientation (MO) has positive influence on Relationship Marketing Orientation (RMO).

Relationship Marketing Orientation and Performance

The relationship marketing orientations (RMO) have been empirically tested mostly in non-IJV setting. Those studies conducted in the non-IJV setting reveal equivocal finding in that several studies have found a positive and significant relationship between RMO and business performance (Chattananon & Trimetsoontorn, 2009; Gorden, Pires & Stanton, 2008; Sin, Tse, Chan, Heung & Yim, 2006; Sin, Tse, Yau, Chow & Lee, 2005; Sin, Tse, Yau, Lee & Chow, 2002; Skarmas, Katsikeas & Schlegelmilch, 2002) while some studies have found insignificant positive relationship in manufacturing sectors (Sin et al, 2005; Siguaw, Simpson & Baker, 1998). Other previous studies also support positive impact of single dimension RMO with performance in

IJV setting such as trust (Chattananon & Trimetsoontorn, 2009; Lin & Wang, 2008; Ng, Lau & Nyam, 2007), commitment (Julian & O'Cass, 2002; Demirbag & Mirza, 2000; Cullen et al., 1995), cooperation (Luo & Park, 2004; Peach, 2001; Tiessen & Linton, 2000). Thus, the following hypothesis is formulated:

H3: Relationship Marketing Orientation (RMO) has a positive influence on SME IJV performance.

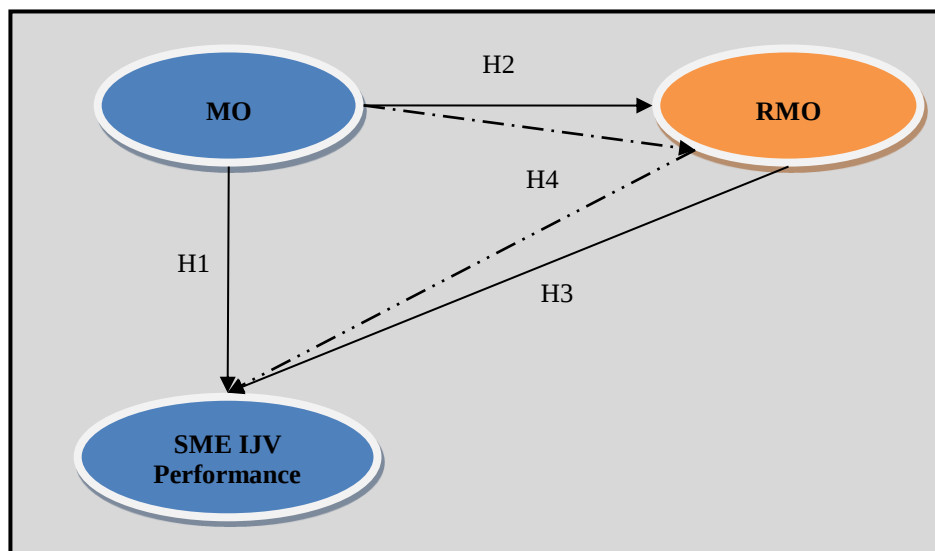
Market Orientation, RMO and Performance

The mediating effect of RMO has been suggested by Zyl and Helm (2007) who explored the conceptual model link between entrepreneurial leadership with performance of South Africa's small tourism companies with MO and RMO as mediators. RMO represented by cooperation has been investigated as a middle intervening variable, but it has not been empirically tested as a mediator between MO and IJV performance of textile exporting firms in Thailand (Racela et al, 2007).

H4: The relationship of Marketing Orientation (RMO) has a mediating effect on the relationship between Market Orientation (MO) and SME IJV performance.

3. Research Model

This study represents the research model of partner- relationship by highlighting the significant effect of RMO consisting of '*bounding, empathy, reciprocity and trust*' and SME IJV performance, since RMO is determined to have a direct and indirect positive impact on SME IJV performance. Hence, this study intends to test the quality of relationship of IJV partners by hypothesizing the linkage of relationship into 4 hypotheses as exhibited in figure 1 below;

Figure 1: Research Model of Partner Relationship

4. Research Methodology

Sampling and Research Setting

Proportionate stratified random sampling was used in this study. (see Table 5). The sample of the study was taken from identified groups or subgroups. Such identified group of the study were SME IJVs in industrial sub-sectors (Black, 1999). This method was used with 441 SME IJV where these companies were having a number of employees of less than 200, foreign capital at least 10 percent and a total investment of less than 500 million Bath. The list of the companies' name was from Thailand Company Information (2010-2011) and Factory Directory in Thailand (2011). The IJV general manager (IJV GM) or IJV managing director (IJV MD) was selected as the research respondent, because he/she is the key person who knows about IJV management and considered as information gatekeepers (Julian, 2008; Julian & O'Cass, 2005: 2004: 2002). Previous research provides support for relying on the IJV general manager for reliable data (Geringer & Hebert, 1991; Child, Yan & Lu 1997).

Table 5: Proportionate stratified random sampling methods and Responses
Composition by Industrial sectors

Industrial Sectors	Listed Number	Percentage (%)	Sampling Size	Respondent	Percent (%) of Respondent
1. Oil & Gas	2	15	7	1	1
2. Light Industry	9	67	35	17	11
3. Heavy Industry	35	255	155	58	38
4. Manufacturing	32	245	145	52	34
5. Food Industry	11	85	45	11	7
6. Construction	4	32	20	8	5
7. Agriculture Industry	3	26	16	2	1
8. Transportation	2	21	12	4	2
9. Telecommunication	2	12	6	1	1
Total	100	758	441	154	100

Research Instrument

The instrument developed for this study is adopted from past prominent studies in the area of IJV setting. The SME IJV performance measured 6 items adapted from Cullen et al, (1995) and Thuy & Quang, (2005). The cronbach alpha is 0.90. The RMO 12 had items adapted from Yau et al., (2000). The cronbach alphas of each four components ranged from 0.764 to 0.908. The MO 12 items were adapted from Narver & Slater, (1990). The cronbach alpha is 0.88.

Data collection

The research information data was gathered from both Japanese and Thailand representatives of SME IJV firms. 441 Questionnaires were sent to 441 Japanese-Thai SME IJV companies whose address was listed by Thailand Company Information (2010-2011) and Factory Directory in Thailand (2011). A research questionnaire was provided both in English and Thai subtitle language, a cover letter explaining about the research project, and also a letter encouraging respondent to take an active participation with ensured privacy and confidentiality of their responses. After two weeks, a non-responding companies were followed-up by phone call to remind them to fulfill the questionnaire.

Then a couple weeks later, a total of 154 responded cases were returned, approximately 35 percent of respondent rate was received.

Analysis method

A total of 154 responded cases were returned and computed into SPSS data set for the data analysis. A descriptive analysis method was used to explore the respondent's composition followed by reliability analysis to test the reliability of each variable constructed. The reliability results of three variables constructed have shown cronbach's Alpha above .80 (refers to Table 6) which is a highly accepted (Nunnally, 1978). Finally, these 154 responded cases were analyzed through AMOS to test the result of the research model and hypothesis respectively.

Table 6: Reliability of Research Variables

Research Variables	No. of Items	Cronbach's Alpha
1. Market Orientation (MO)	12	.948
2. Relationship Orientation (RMO)	12	.910
3. SME IJV Business Performance (BP)	6	.862

The data collected, a total 154 respondents are from 65 Thai representatives and 89 Japanese partner representatives of SME IJVs showed the results. (refers to Table 7). A total of 65 Thai and 89 Japanese responses originated from different IJVs. This is because of some difficulty in obtaining the data from both sides of IJVs. Since IJV board of directors were appointed by IJV GM to monitor IJV daily operation, IJV GM from both sides are in cooperation and interaction regarding information to those content of both partners. Thus, both partners' sides are represented as one IJV unit, and the data collected from each side were consider as one.

Table 7: Partner Representative

Partner Representative	Japanese-Thai SME IJV	Percentage (%) of Representative
Thai Partner	65	42
Foreign Partner	89	58
Total	154	100

The majority of Japanese-Thai SME IJVs are engaged in heavy industry (38%) followed by manufacturing sector (34%), light industry (11%) and food industry (11%) (refers to Table 8). These companies are having a minimum of Japanese capital of at least 10percent and maximum of 76 percent plus (refers to Table 8). Over 80 percent of these IJVs firm have been operating business in Thailand for more than 10 years which indicated the confidence of Japanese investors towards Thailand's economy and its location advantage.

Table 8: Japanese SME IJV Capital

Japanese Capital	Respondent	Percent
10-15%	3	2
16-25%	2	1
26-50%	68	44
51-75%	41	27
76% plus	40	26
Total	154	100

Note: 1) Japanese investment projects refers to projects with Japanese capital of at lest 10%

Based on table 8, the Japanese capital of at least 10 percent as required by the Broad of Thailand Investment (BOI) is shown. IJV who has a Japanese capital over 76 percent may probably become a dominant partner while the Thai local partner has no authority to do any actions or can be called a 'sleeping partner' (Killing, 1983). In another view, IJV who has a Japanese capital ranging from 26 to 50 percent is probably sharing capital resources dependently and whose objective is to decrease the cost of production (Wadecharoen et al., 2012:b). Bases on this point of view, Japanese –Thai SME IJVs are truly integrating their own capital resources to pursue their common and private objectives. The majority of Japanese capital is ranging from 26 to 75 percent or an accumulated of 71 percent, while only 26 percent of IJV firms are having Japanese capital over 76 percent. This is sufficient to justify that both Japanese and Thai local partners are dependently coordinating with each other.

5. Results of the Study

Figure 1: Hypothesis Model

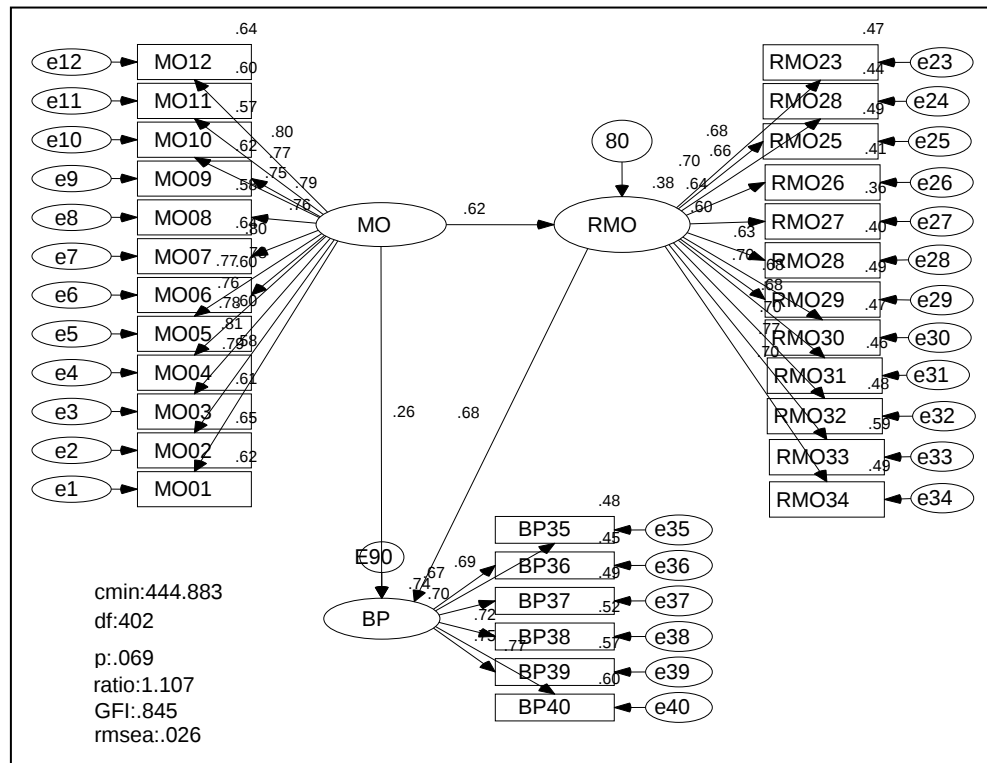


Table 9: Hypothesis Model (Goodness-Of-Fit indices)

Measures	Fit Indices	Threshold Values
Absolute Fit Level		
RMSEA	0.026	Less than 0.08
GFI	0.841	0.9 and Above
P-Value	0.069	P-Value $\geq$ 0.05
Increment Fit Level		
AGFI	0.821	0.90 and Above
CFI	0.984	0.90 and Above
TLI	0.982	0.90 and Above
NFI	0.854	0.90 and Above
Parsimonious Fit Level		
CMIN/df	1.107	Less than 2.0
SMC (R^2)	0.74	Bigger better

Structural equation modeling (SEM) is justified as the appropriate tool for combination of categorical and continuous latent variables. SEM was performed by AMOS in order to test the hypothesis and casual relationship between constructs. They are such moderating variables between MO and RMO with SME IJV performance, direct relationship between MO and SME IJV performance.

Table 9 exhibits the goodness of fit indices (GOF) of the hypothesis model with were consistent with CMIN/df = 1.107 SMC (R^2) = 0.74, AGFI = 0.821, CFI = 0.984, TLI = 0.982, NFI = 0.854, RMSEA = 0.026, GFI = 0.841, and P-Value = 0.069 (refers to table 9). These indicators revealed that the model fitted the data exceptionally, accepted the AGFI and NFI that was below 0.90 and the P-value is 0.069 which indicates a significance of the overall model at the level of 0.05.

Table 10 shows the statistical finding of the direct effect among market orientation (MO), relationship marketing orientation (RMO) and SME IJV business performance. From the results, H1; H2; H3 were accepted based on the C.R. values which was over than 1.96 (C.R.>1.96). The P-value level is below 0.10 which indicated the significant status of all hypotheses presented.

Table 10: Hypothesis Testing of Hypothesis Model (Direct Effect)

H	Exogenous		Endogenous	Std. Estimate	S.E.	C.R.	P-value	Status
H1	Marketing Orientation	→	SME IJV BP	.257	.067	3.233	.001	Sig.
H2	Marketing Orientation	→	RMO	.620	.073	6.141	***	Sig.
H3	RMO	→	SME IJV BP	.677	.136	5.847	***	Sig.

Table 11 shows relationship marketing orientation (RMO) having mediating relationship between MO with Japanese-Thai SME IJV business performance, thus, H4 is accepted.

Table 11: Hypothesis Testing of Hypothesis Model (Indirect and Total Effect)

	Exogenous		Mediated		Endogenous	Indirect Effects (Std) Estimate	Direct Effect (Std)	Total Effect	Mediating Hypothesis
H4	Market Orientation	→	RMO	→	SME IJV BP	.422	.257	.679	Mediating

6. Conclusion & Discussion

Since the trend of Japanese investment inflow is increasing in Thailand as recipient country year after year, these investment from Japan is using Thailand's location for their offshore production, and 80 percent of their productivity is export orientation (Kanjavanikul, Wadecharoen & Teekasap, 2011). Despite the fact that Thai partner as the host company could not enhance their firm's competitive advantage as much as they expect before they engaged in IJV. This is caused by a large difference of firm investment size in which one of them dominates the other. Hence, no wonder '*why Japanese and Thai partners are lacking in dependency*'. Size of firm is identified as the number one problem causing SME IJV partner stucked in knowledge transfer and finally may result to merger and acquisition. Thus, the analysis sampling of the study were 154 Japanese-Thai IJV and over 70 percent of sampling were falling between 26-75 percentage share. This is an indication that Japanese and Thai partners are dependent in some particular business functions.

To push out of partner knowledge transfer and cooperation, RMO needs to exist as the mediator or moderator of the relationship between IJV partners. This study is logically emphasized on Japanese-Thai partnering relationship in SME IJV in Thailand industrial sectors, by testing the effect of RMO both direct and indirect effect with SME IJV business performance. The result shows that RMO is mediating the relationship between MO and Japanese-Thai SME IJV across multi industrial sectors for instant heavy industry, manufacturing, light industry and so on (refers to table 7 and 10). As well as MO and RMO have direct positive relationship to Japanese-Thai SME IJV business performance (refers to table 10). Based on this finding it can be inferred and confirmed the significant importance of MO and RMO with SME IJV business performance. Since most of Japanese and Thai partners are similar in

terms of company's size in which they are sharing equality of capital investment, this makes IJV partners work independently , interact , share and exchange of all information resources related to those particular functions to fulfill all IJVs expected goal (Wadeecharoen et al., 2012:b). In this study it was found out that MO is becoming a dominant determinant of Japanese-Thai SME IJV performance in industrial sectors, this is similarly supported by several studies (Farrell, Oczkowski & Kharabsheh, 2008; Julian & O'Cass, 2008; 2005; 2004; 2002). When IJV partner (Japanese and Thai) are market orientated then they are able to outperform their competitors. This is because IJV partners understand their customers' needs through inter-functional coordination across all IJV organization departments and organization responsiveness which in turn enhances performance (Kohli & Jaworski, 1990). Similarity, RMO has found a positive relationship with Japanese-Thai SME IJV, since partners requiring long lasting bonds, empathy, being reciprocal and having a high degree of trust in order to create an excellent relationship between Japanese-Thai SME IJV.

In conclusion, to make Japanese-Thai SME IJV successful, IJV partners must be oriented with its customers in order to achieve IJV's mutual goals and objectives. Furthermore, IJV partnership quality is equally important as same as customer orientation . When partners having a high degree of bonding, empathy, reciprocity and trust then they will explore know how technology, advance management, logistic management, sharing and utilizing of partners resources for pursuit of IJV goal. The high degree of partner's RMO created by IJVs organization synergy which lead to higher business performance and hence contribute to the organization's competitive advantage. Thus, IJV could be justify as the tool for creating company's competitive advantage since the IJV was established from a minimum of two expert firms. For instant, Japanese firms are expert in knowhow technology and management skill while Thai local firms are well know for marketing channel, local employment requirement, local business connection, access to cheaper material sources and local business culture. , These partners' diversity will be contributing to higher performance of IJVs more than when it is done alone. Thus, partner orientation and partner relationship qualities are the important part contributing to IJV partner's synergy, creating organization's competitive advantage and making Japanese-Thai SME IJV in Thailand industrial successful in long-term business orientation.

Reference

Anderson, a. J. A. N. (1990). A Model of distributor firm and manufacture firm working partnerships. *Journal of Marketing*, 54 (January), 42-58.

Black, T. R. (1999). *Doing quantitative research in the social sciences: An integrated approach to research design, measurement, and statistics*. Thousand Oaks, CA:SAGE Publications, Inc. (p. 118)

Blodgett, L. L. (1987). Partner contributions as predictors of equity share in international joint ventures instability: Is it a problem?, *Columbia Journal of World Business*, Summer

Broad of Thailand Investment, Retrieved Jan 19, 2013, from www.boi.go.th

Callaghan, M. McPhail, J. & Yaue, O.H.M. (1995). *Dimensions of a relationship marketing orientation: an empirical exposition*. Proceedings of the Seventh Biannual Word Marketing Congress. Vol. VII-II, Melbourne, July, p.10-65.

Caruana, A. (1997). Market orientation and organizational performance in the Australian public sector. *International Journal of Public Sector Management*. Vol.10, No.4, p.294-303. Jaworski, B.J., & Kohli, A. (1993). Market Orientation: Antecedents and Consequences” *Journal of Marketing*, Vol.57, (July 1993), pp.53-70.

Castro, C.B., Armario, E.M., & Rio M.E.S.D. (2005). Consequences of market orientation for customers and employees. *European Journal of Marketing*. Vol.39, No.5/6

Challaghan, M. McPhail, J. & Yaue, O.H.M. (1995). *Dimensions of a relationship marketing orientation: an empirical exposition*. Proceedings of the Seventh Biannual Word Marketing Congress. Vol. VII-II, Melbourne, July, p.10-65.

Chattananon, A., & Trimetsoontorn, J. (2009). Relationship marketing a Thai case. *International Journal of Emerging Markets*. Vol.4, No.3.p.252-274

Cheungsuvadee, K. (2006). Business adaptation strategies used by small and medium retail and increasingly competitive environment: a study of Ubon Ratchathani, Thailand, Edith Cowan University (P 230).

Child, J., Yan., & Lu, Y. (1997). *Ownership and Control in Sino-Foreign Joint Ventures: San Commitment to IJVs: Psychological Consequences of Outcome and Investments in the IJV Construction Joint Venture*. *Journal of Managing in Engineering*. Vol.24, No.1.p. 45-59.

Cullen, John, B., Johnson, Jean, L., Sakino, & Tomoaki. (1995). Japanese and Local Partner Commitment to IJVs: Psychological Consequences of Outcome and Investments in the IJV Relationship. *Journal of International Business Studies*, 26(1).

Demirbag & Mirza, (2000). Factors affecting International Joint Venture success: an empirical analysis of foreign-local partner relationships and performance in Joint Venture in Turkey. *International Business Review*, 9:1-35.

Ding, D.Z. (1997). Control, Conflict, and Performance: A Study of U.S.-Chinese Joint Ventures. *Journal of International Marketing*. Vol.5, No.3, p.31-45

Farrelly, F. & Quester, P. (2003). The Effects of Market Orientation on Trust and Commitment: The case of the sponsorship business-to-business relationship. *European Journal of Marketing*, 37(3/4).

Farrelly, M.A., Oczkowski E., & Kharabsheh, R. (2008). Market orientation, learning orientation and organizational performance in international joint ventures. *Asia Pacific Journal of Marketing and Logistics*, Vol.20, No.3, p. 289-308.

Franko, L. G. (1971). *Joint Venture Survival in Multinational Corporations*: New York: Praeger.

Geringer, J. M. (1990). Strategic Determinants of Partner Selection Criteria in the International Joint Ventures. *Journal of International Business Studies*, 22(1), 41-62.

Geringer, J.M., & Hebert, L. (1991). Measuring Performance of International Joint Ventures. *Journal of International Studies*. 22 (2).p.249.

Gorden, T.L.O., Pires, G.D., & Stanton, J. (2008). The Relationship Marketing Orientation of Hong-Kong Financial Services Industry Managers and its Links to Business Performance. *Journal of Financial Services Marketing*, Vol.13,3.

Gordon, T.L.O., Pires G.D., & Stanton, J. (2008). The relationship marketing orientation of Hong-Kong financial services industry managers and its links to business performance *Journal of Financial Services Marketing*, 13, 3.14

Harrigan, K. R. (1986). *Managing for Joint Venture Success*: Lexington MA:Lexington Books.

Jaworski, B.J., & Kohli, A. (1993). Market Orientation: Antecedents and Consequences” *Journal of Marketing*, Vol.57, (July 1993), pp.53-70.

Julian, C., & O’Cass, A. (2002). The effect of firm and marketplace characteristics on International Joint Venture (IJV) marketing performance. *Asia Pacific Journal of Marketing and Logistics*,14 (1).

Julian, C., & O’Cass, A. (2004). The impact of firm and environment characteristics on International Joint Venture (IJV) marketing performance in Thailand. *Thunderbird International Business Review*, 46 (4), 359-380.

Julian, C., & O’Cass, C. (2005). *International Joint Venture performance in South East Asia*. MA: Edward Elgar.

Julian, C.C. (2008). Joint Venture Conflict: The Case of Thai International Joint Ventures”, *Journal of Asia-Pacific Business*, 9(1).

Kanjanavanikul, W., Wadecharoen, W., & Teekasap, S. (2011). The Effect of Marketing Determinant towards Small and Medium Enterprises (SMEs) International Joint Venture (IJVs) Performance in Thailand Manufacturing Sectors. *Proceeding of Asian Business & Management Conference AMBC 2011, Sponsored by and publication by*

the International Academic Forum, iafor 11-13 Nov, Ramada Osaka Hotel, Osaka, Japan.

Killing J.P. (1983). *Strategies for joint venture success*, New York: Praeger.7.

Killing, P.J. (1983). *Strategic for Joint Venture Success*, New York, NY: Praeger

Kogut, B. (1988). Joint Ventures: Theoretical and Empirical Perspectives. *Strategic Management Journal*, 9, 319-332.

Lecraw, J. D. (1983). Performance of Transnational Corporations in Less Developed Countries. *Journal of International Business Studies*, 14(1), 15-33.

Lin, X., Wang, C.L. (2008). Enforcement and performance: The role ownership, legalism and trust in International Joint Venture. *Journal of World Business* 43, 340-351

Lu, J., & Beamish, P. W. (2006). Partnering Strategies and Performance of SMEs' International Joint Ventures, *Journal of Business Venturing*, 21, 4, pp. 561–486.

Luo, Y., & Park S.H. (2004). Multiparty cooperation and performance in international equity Joint Ventures. *Journal of International Business Studies*. Vol.35, No.2,p. 142-160.

Naver, J.C., & Slater, S.F. (1990). The effect of a market orientation on business profitability. *Journal of Marketing*, Oct

Ng, P.W., Lau, C.M., & Nyaw, M.K. (2007). The effect of trust on International joint venture performance in China. *Journal of International Management*, 13, 430-448.

Nunnally, J.C. (1978), *Psychometric Theory*. 2nd edition, New York, McGraw-Hill Book Company

Pearch, R.J. (2001). Looking Inside The Joint Venture to Help Understand The Link Between Inter-Parent Cooperation and Performance. *Journal of Management Studies*. June. 38:4. p. 558-582.

Racela, O.C., Chaikittisilpa, C., & Thoumrungroje (2007). Market orientation, international business relationship and perceived export performance, *International Marketing Review*, Vol.24, No.2.

Saji, K.B., Jain, K., & Krishnamoorthy. S. (2005). Technology transfer through IJVs: determinants of transferor transferee relationship. *International Journal of Technology Transfer and Commercialization*, 4(2), pp. 148-161

Sharneas, D., Katsikeas, C.S., & Schlegelmilch, B.B. (2002). Drives of commitment and its impact on performance in cross-cultural buyer-seller relationships: The importer's perspective. *Journal of International Business Studies*. Vol. 33, No.4,p. 757-783.

Sharneas, D., Katsikeas, C.S., & Schlegelmilch, B.B. (2002). Drives of commitment and its impact on performance in cross-cultural buyer-seller relationships: The importer's perspective. *Journal of International Business Studies*. Vol. 33, No.4,p. 757-783.

Siguaw, J.A., Simpson, P.M. & Baker, T.L. (1998). Effects of Supplier Market Orientation on Distributor Market Orientation and the Channel Relationship: The Distributor Perspective, *The Journal of Marketing*, 62(3), pp. 99-111

Sin, L.Y.M., Tse, A.C.B., Chan, H., Heung V.C.S. & Yim, F.H.K. (2006). The effects of relationship marketing orientation on business performance in hotel industry. *Journal of Hospitality & Tourism Research*. Vol.30:470.

Sin, L.Y.M., Tse, A.C.B., Yau, O.H.M., Chow, R.P.M., & Lee, J.S.Y. (2005). Market Orientation, Relationship Marketing Orientation, and business performance: The moderating effects of economic ideology and industry type. *Journal of International Marketing*” Vol.13, No.1,p. 36-57.

Sin, L.Y.M., Tse, A.C.B., Yau, O.H.M., Lee, J.S.Y., & Chow, R. (2002). The effect of relationship marketing orientation on business performance in a service-oriented economy. *Journal of Service Marketing*. Vol.16. No.7,p.656-676.

Stopford, J.M., & Wells, L.T. (1972) *Managing the Multinational Enterprise*, New York: Basic Books.

Thuy, L. X. & Quang, T. (2005). Relational Capital and Performance of International Joint Ventures in Vietnam. *Asia pacific Business Review*,11(3), 389-410.

Tiessen, J.H., & Linton, J.D. (2000). The JV dilemma: cooperating and completing in Joint Venture. *Canadian Journal of Administrative Science*. Vol.17, No.3 (Sep 2000)

Tomlinson, J. W. C. (1970). *The Joint Venture Process in International Business: India and Pakistan*. Cambridge, Mass.: MIT Press.

Venkatraman & Ramanujam, V. (1986). Measurement of Business Performance in Strategy Research: A Comparison of Approaches. *The Academy of Management Review*, 11(4), pp. 801-814

Wadecharoen, W., & Nik, Mat, N. K. (2008). The Significance of Relationship Marketing Orientation on International Joint Venture (IJV) Performance in Thailand. *The Journal of American Academy of Business, Cambridge, June 11-14*.

Wadecharoen, W., & Nik, Mat, N. K. (2009). *The Mediating Effects of Relationship Marketing Orientation (RMO) on the Antecedents of International Joint Venture (IJV) Performance in Thailand*. Proceeding of Australian & New Zealand Marketing Conference (ANZMAC): Sustainable Management & Marketing Conference, 30 Nov–2 Dec 2009.

Wadecharoen, W., & Nik, Mat, N. K. (2010:a). *The Direct and Indirect Determinants of SME Performance in IJV Sector*. The SMEs in a Global Economy Conferences, Sponsored by Faculty of Business Management, (UiTM), Malaysia, Japan (University of Senshu) and China (Beijing Information, Science and Technology University), 15-17 Oct 2010.

Wadeecharoen, W., & Nik, Mat, N. K. (2010:b). The Applicable of Relational Marketing Orientation (RMO) to Explain IJV Performance in Thailand. *Proceeding of International Conference on Business and Economics Research (ICBER 2010), Malaysia Conference, Sponsored and publication by Thomson ISI, 26-28 Nov 2010.*

Wadeecharoen, W., & Nik, Mat, N. K. (2011). *The Significance Role of Relational Factors and the Intervening Effect of Relationship Marketing Orientation (RMO) toward inter-partner relationship: Case Study of International Joint Venture (IJV) Performance in Thailand.*

Proceeding of National Conference on Research through Sustainable Development, Benjamit National Conference, 31 May, 2011 Thonburi University, BKK Thailand.

Wadeecharoen, W., Kanjanavanikul, A., Pattana, W., & Teekasap, S. (2012:b). Sustainable of Small and Medium Business Enterprise (SMEs) in Asean Economic Community (AEC) Development and the Competitive Advantage of International Joint Venture (IJV) in Thailand ThaiTIMA: Annual Conference for Managing Technology & Innovation towards Business Resiliency, July 19-20, 2012.

Wadeecharoen, W., Kanjanavanikul, A., & Aunahabandid, P. (2011). The Determinant Factors of International Joint Venture (IJVs) in Thailand Small and Medium Enterprise (SMEs). *Proceeding of International Conference on Advancement of Development Administration, ICADA, 8-10 March, NIDA BKK, Thailand*

Wadeecharoen, W., Kanjanavanikul, A., & Teekasap, S. (2011). The Effect of Conflict Resolution and Culture Sensitivity through the lens of Relational Exchange Theory on the Performance of International Joint Venture (IJV) in Thailand: An Empirical Study of ASIAN Foreign Direct Investment (FDI). *Proceeding of Asian Business & Management*

Conference AMBC 2011, Sponsored by and publication by the International Academic Forum, iafor 11-13 Nov, Ramada Osaka Hotel, Osaka, Japan.

Wadeecharoen, W., Kanjanavanikul, A., & Teekasap, S. (2012:d). The Application of Relational Factors to Determine the Performance of International Joint Venture (IJVs) in Thailand Small and Medium Enterprise (SMEs): A Conceptual Framework for Further Research,

The Finance, Economic & Global Business Research Conference, St. James Royal Palm in Miami, FL in December 2012.

Wadeecharoen, W., Kanjanavanikul, A., Lertnaisat, R., & Teekasap, S. (2012:a). A Contribution of Small and Medium Enterprise (SMEs) International Joint Venture (IJV) to Sustain Thailand Economic Development. *Proceeding of International Conference on Business and Industrial Research*, Thai-Nichi Institute of Technology, Bangkok, Thailand, May 17-18, 2012.

Wadeecharoen, W., Kanjanavanikul, A., Lertnaisat, R., & Teekasap, S. (2012:c). An Examines of Thailand International Investment Position and The Role of Small and Medium Enterprises (SMEs) International Joint Venture (IJV) towards Thailand Economic Development.

Proceeding of International Conference on Contemporary Business and Management, ICOM 2012 Bangkok, December 10-12, 2012.

Yau, O.H.M., McFetridge, P.R., Chow, R.P.M., Lee, J.S.Y., Sin, L.Y.M., & Tse, A.C.B. (2000). Is Relationship Marketing for Everyone. *Europe Journal of Marketing*. Vol.34.No.9/10, p.1111-1127.

Zyl, H.J.C.V., & Helm, M. (2007). Exploring a conceptual model, based on the combined effects of entrepreneurial leadership, market orientation and relationship marketing orientation on South

Africa's small tourism business performance. *Journal of Business Management*. Vol. 38(2)

Convergence of Growth Rates in the West African Monetary Zone

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There have been a number of failed attempts by policy makers in West Africa to launch a second common currency, the Eco, over the past decade. This in turn has raised a number of questions about the sustainability of the proposed second monetary union within the Economic Community of West African States (ECOWAS). While most of the issues are self-inflicted, the main culprit is a lack of proper analysis of the underlying factors that ought to be considered before forging ahead with the proposed currency union. This paper contributes to the debate by establishing the extent of convergence and synchronisation of business cycles within the West African Monetary Zone (WAMZ). Both univariate and multivariate unobserved components models are employed to decompose the annual real GDP series of five countries into their cyclical and permanent components from 1970 to 2011. The results suggest dissimilarities in business cycles within the sub-region. This lack of synchronisation signifies that WAMZ countries advance different business cycle paths, which casts doubts on the equality of welfare distribution in the context of a single currency. In support of some earlier findings, we argue that the substantial divergence in the economic characteristics of member countries would result in significant costs associated with co-ordination of policies and stabilization of macroeconomic activity.

1. Introduction

Economic integration within the ECOWAS is marked by the Francophone-Anglophone divide: on the one hand is the West African Economic and Monetary Union, better known by its French acronym UEMOA (Union économique et monétaire ouest-africaine), a grouping of 8 West African states that uses the CFA Franc as a common currency³.

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³ The eight countries are Benin, Burkina Faso, Cote d'Ivoire, Mali, Niger, Senegal and Togo, all former French colonies, with Guinea-Bissau, the late entrant being the only former Portuguese colony in the group.

On the other hand is the West African Monetary Zone (WAMZ)⁴, a collection of 5 former British colonies and Guinea, intent on establishing a single currency, the Eco. The eventual goal is for the CFA Franc and Eco to merge, bringing into being a single monetary union in West Africa.

While UEMOA has made strides in achieving both customs and monetary union in West Africa, the results for the WAMZ remains mixed. Since the WAMZ's formation in 2000, policy makers had dreamt of a merged currency by the mid-2000s. However, this did not materialise on account of failure of member states to meet the convergence criteria⁵. The goal post was shifted to December, 2009 for the introduction of the Eco. This again fell flat. The last deadline for the Eco to come into force was December, 2013. This was horribly missed. And now, policy makers are looking to January 2015 where the Eco will start circulating, effectively bringing to an end the plethora of national currencies.

A look at recent economic data suggests that the January 2015 date may also be missed, and the Eco may not in fact be in circulation, going by the convergence criteria that member states are expected to meet. Using the primary convergence criteria, for instance, inflation has averaged 12.8%, 15% and 11.9% for Ghana, Guinea and Nigeria respectively from 2008 to 2011. With the exception of The Gambia which recorded single digit inflation of 4.7% over the same period, none of the members fulfilled this important criterion. A cursory look at the data also suggests that the WAMZ is a highly indebted region. Total debt outstanding as a percentage of GDP averaged 187.8% for Liberia, 47.2% for Ghana, and

⁴ The WAMZ countries are Ghana, Nigeria, Liberia, The Gambia, Sierra Leone and Guinea. Guinea is the only country that uses French.

⁵ The key macroeconomic convergence criteria include the attainment of single digit inflation; budget deficit/GDP ratio of not more than 4% (excluding grants); Central Bank financing of budget deficit not more than 10% of previous year's tax revenue; foreign exchange reserves of not less than three months of import cover. In addition to this is the requirement of attaining six secondary convergence indicators, improving the competitiveness of the economic environment, liberalising product and labour markets and rationalization and harmonization of the legal environment. The secondary indicators are zero level of domestic arrears; tax revenue to GDP ratio not less than 20%; government wage bill to tax revenue ratio not exceeding 35%; public sector investment to tax revenue ratio not below 20%; positive real interest rate, and nominal exchange rate movement to range within the band of +/-15%.

42.5% for Guinea, with Sierra Leone recording 35.5% over the period 2008 to 2011 where data is available. Nigeria stands out as the country with the lowest debt to GDP ratio of 2.7%. The high debt burden implies that a substantial amount of export receipts is spent on debt servicing, with debt service to exports ranging from 32.9% for The Gambia to 41.7% for Ghana⁶. Coupled with widening budget deficits, volatile exchange rates (the exchange rates of Ghana has come under intense pressure over the past couple of months, depreciating over 18% against major international currencies), and slow progress at harmonising trade and industrial policies, it may not be out of place for one to fault the January 2015 start for the Eco if the convergence criterion is anything to go by.

Although some amount of research work is emerging on the progress and performance of the WAMZ economies particularly with respect to the viability of the proposed second currency, they have tended to concentrate on the dynamics of exchange rates/or price level convergence. For instance, Debrun *et al.* (2005) examined the political economy questions of central bank independence and pressure exerted by the ruling elite on central banks to extract seigniorage. They argue that the inability of monetary authorities to pre-commit to price stability affect the incentives of fiscally heterogeneous countries to form a currency union. Alagidede *et al* (2008, 2012) examine price and output convergence, and Carmignani (2010) uncovers procyclicality in fiscal policy and advocates for counter cyclical measures to smooth the path of the cycles. Coleman (2010) looks at food and non-food price inflation and argues that there are significant asymmetries across states within the CFA Franc zone. And more recently, Asongu (2014) examined imbalances in macroeconomic adjustments in the WAMZ. In spite of these emerging contributions, a lot of gaps remain in the literature regarding the underlying mechanisms and processes that should help enliven the debate for a second common currency in West Africa. This paper looks at another dimension to this debate, convergence (divergence) of business cycles.

To a very large extent, asymmetry in business cycles and response to external shocks is a key variable worth considering for the WAMZ

⁶ The data cited in this section is sourced from the African Development Indicators of the World Bank, and the African Economic Outlook database.

integration. While a monetary union does not pledge the existence of harmonised cyclical dynamics among the members as the different economic structures in the countries may perhaps generate heterogeneous cyclical movements, policy makers ought to be aware of the welfare implications of income convergence over time. The purpose of the present paper is thus to ascertain the extent of convergence and synchronization in the WAMZ by employing the unobserved components modelling technique.

The paper makes two main contributions to the literature: methodological and policy. First, examining convergence and divergence in growth rates inevitably faces serious statistical difficulties. For example, the results may be very sensitive to the methods employed and years under consideration. We propose unobserved components models in the spirit of Harvey (1989, 1997), Harvey and Koopman (1992, 2000). We favour this model based approach as opposed to the model free procedures such as Hodrick–Prescott (HP) filter (Hodrick and Prescott, 1980) and the Beveridge–Nelson decomposition (Beveridge and Nelson, 1981) or Structural Vector Auto-Regressive models (SVAR). By fitting both univariate and multivariate unobserved components models, we are able to effectively obviate the uninterpretable difficulties inherent in band pass filters, and analyse the trend-cycle decomposition of the series under consideration, while at the same time treating the traditional model free procedures as a special case. The components thus estimated capture the salient features of the data that are useful in examining the short run cyclical behaviour of growth rates, and the long run permanent component of GDP among member states of the WAMZ. Moreover, it is easy to incorporate changing patterns and to introduce additional features such as interventions. Unobserved components models are thus able to avoid the detection of spurious cycles in the time series and are preferable for forecasting (see Harvey and Jaeger, 1993; Harvey and Trimbur, 2003).

Second, this study is imperative due to crucial inferences it casts for policy directions besides the paucity of evidence on synchronisation and convergence of business cycles in the WAMZ. The widespread notion that disparities in real per capita income levels would lead to considerable welfare inequalities across the countries serves as motivation to unravel the correlation between business cycles among WAMZ countries. Furthermore, in the context of common monetary

policy and single currency, the commonality of the business cycles of the participant countries is of foremost concern. To this end the extent of business cycle synchronisation has become a well-recognised gauge for the readiness of different countries which intend to relinquish their currencies and policies and accede to the common currency. In the words of Mundell (1961) and McKinnon (1963), the success of a merger of sovereign states stipulates that business cycles be synchronized and well-coordinated among member countries.

The rest of the paper is organised as follows: section 2 considers the dynamics of economic growth in WAMZ and the time series properties of per capita real GDP of the five countries under consideration. Section 3 specifies the univariate unobserved component estimation technique as well as its multivariate extensions. Section 4 presents the empirical analysis for various sub components of WAMZ members. We conclude and offer some thoughts on policy in the last section.

2. Trends and Convergence of Growth in the Wamz

2.1. Convergence of growth in the West African Monetary Zone

The West African Monetary Zone which Ghana and Nigeria consented to form in April 2000 as a second monetary union in the West African sub-region to fast track the ECOWAS agenda of integration has grown to cover four more countries – The Gambia, Guinea, Liberia and Sierra Leone. Five countries agreed to the formation of the WAMZ and signed the landmark treaty that gave birth to the WAMZ before Liberia acceded in February 2010. Nigeria and Ghana are two of the biggest economies in ECOWAS, accounting for over 80% of output. The Gambia accounts for approximately 0.2% (African Development Fund, 2008), and it is by far one of the smallest countries in continental Africa. Growth in the Zone has been buoyant in the most recent decade, averaging 7% between 2000 and 2011. Guinea is the only member that has French as the official language and formerly used the CFA franc. This heterogeneity in the economies presents an interesting dynamic for the creation of the single currency.

Table 1 shows trends in real GDP growth for selected years. The evidence is very mixed. Although there has been a common perception that it is difficult for the region to achieve sustained growth, growth

accelerations and decelerations have been equally frequent. However, more worryingly there have also been collapses that led to long-lasting economic contractions, which in most instances eroded the economic gains made in the days of high growth. Quite remarkably, economic growth has increased distinctly since the middle of the 1990s. A large number of countries in sub-Saharan Africa are enjoying high rates of per capita income growth, and the growth episodes are showing some signs of unusual persistence. For instance, between 1995 and 2007 the ECOWAS as a whole saw real GDP grow at an average rate of 5%, and real per capita GDP growth averaged about 2%. This is a remarkable turnaround from the ‘lost decade’ (1980 to 1990).

Assessment of individual countries depicts some interesting observations in Table 1. Liberia's economic growth has been so enviable to the point that it was once regarded as the “fastest growing economy in the world”. In 1997, Liberia recorded its all time highest GDP growth of 106.3%, and experienced the lowest growth rate of -51% in its history in 1990.

Nigeria, Africa's second largest economy, and powerhouse of the WAMZ, has Crude Petroleum and Natural Gas constituting about 13.5% of total GDP, although its contribution to GDP has been decreasing over the last few years. In 1970, Nigeria recorded its highest GDP growth of 25% following a devastating performance three years earlier.

Table 1: Growth rates of GDP for selected years

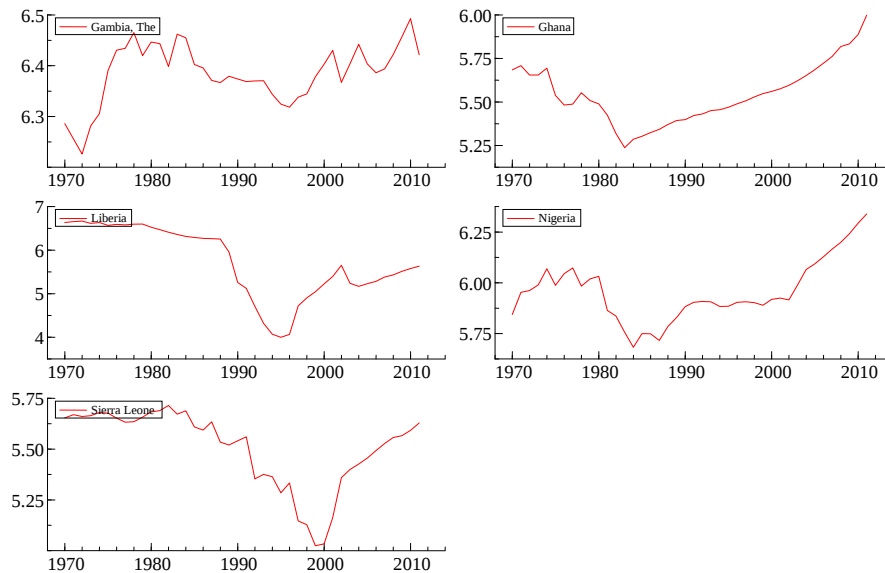
Country	1970	1975	1980	1985	1990	1995	2000	2005	2010	2011	High	Low
Gambia	6.2	12.4	6.3	-0.8	3.6	0.9	5.5	-0.9	6.5	-4.3	12.39	-4.60
Ghana	9.7	-12.4	0.5	5.1	3.3	4.1	3.7	5.9	8.0	14.4	7.8	-5.9
Liberia	6.7	-3.5	-4.1	-0.8	-51.0	-4.3	25.7	9.5	10.9	9.4	106.3	-51.0
Nigeria	25.0	-5.2	4.2	9.7	8.2	2.5	5.4	5.4	8.0	7.4	25.0	-15.7
Sierra Leone	8.6	1.7	4.8	-5.3	3.4	-8.0	3.8	7.2	4.9	6.0	16.4	-19.0
WAMZ Average	11.2	-1.4	2.3	1.6	-6.5	-1.0	8.8	5.4	7.7	6.6	20.3	-8.8

Source: World Development Indicators (2013)

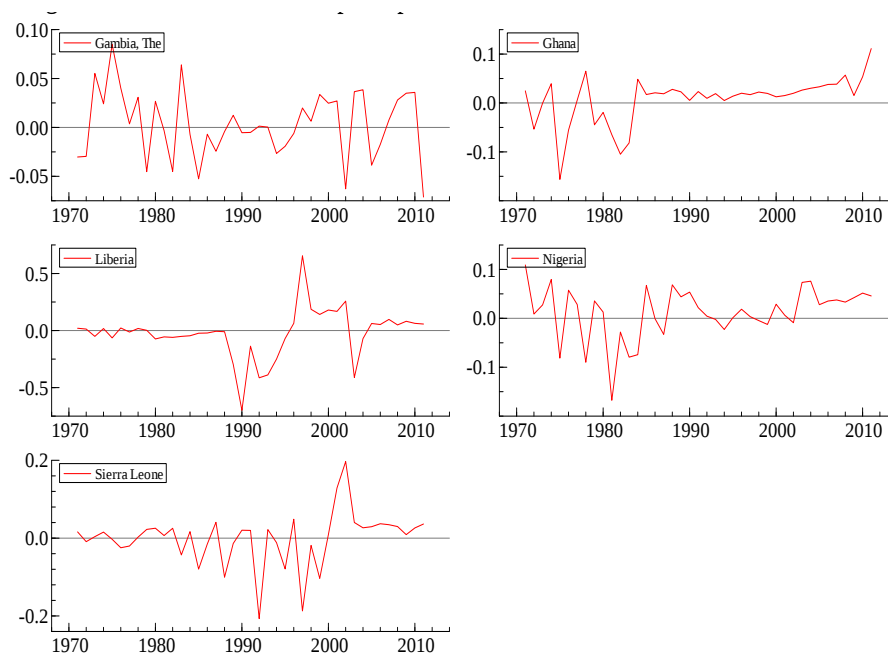
2.2. Time Series Properties of data

The data used in this study consists of annual real GDP per capita for five WAMZ member countries covering 1970 to 2011⁷. Figure 1 is a plot of the actual GDP per capita series in logarithm with its rates defined as the first differences presented in Figure 2. The figures show that most of the countries have experienced upward trends in real per capita income over the last two decades. This development has generally been attributed to the implementation of the Economic Recovery Programme and the Structural Adjustment Programme in most of these countries from the mid-1980s. Quite impressively, Ghana and Nigeria have not experienced negative growth rates since 1985. Even Sierra Leone that suffered a devastating decade-long civil war ended in 2002 has seen a steady real growth rate averaging 8.9% since 2000 compared to an average of 2.4% from 1970 until 2011. Only Gambia recorded negative growth in 2011.

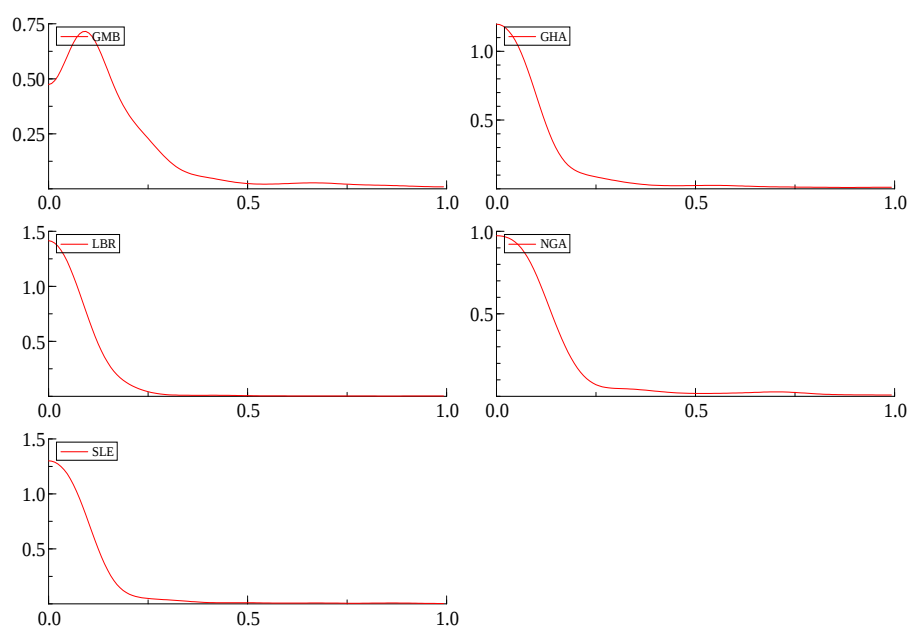
Figure 1: Annual GDP per capita (log levels)



⁷ The countries covered are The Gambia (GMB), Ghana (GHA), Liberia (LBR), Nigeria (NGA), and Sierra Leone (SLE). The data is extracted from the database of World Development Indicators published by the World Bank (2013). To be able to capture the differences in the economies, we use GDP per capita at constant 2000 US\$.

Figure 2: Growth rates of GDP per capita

In Figure 3 we present the spectral density for the actual series for each country. The spectra of the time series do provide much evidence of cyclical dynamics in the data. Overall, the spectra do conform to a particular shape with the exception of The Gambia that behaves a bit differently initially. Since they exhibit similar patterns, it may perhaps be argued that the series do share strong common dynamic features. They also show that cyclical dynamics in the series are apparent and do have common features. The spectra in most countries rise to a peak at low frequencies, and decline at high frequencies, with the spectral mass mostly concentrated in the business cycle frequency band. This depicts the distinct shape that King and Watson (1996) report for several US series.

Figure 3: Spectral density of annual real GDP per capita (Log levels)

The summary statistics for the series is shown in Table 2. The null of normality is not rejected for GHA, GMB, and NGA⁸. The standard deviation is very high for LBR. The coefficient of variation (or instability), which is the ratio of standard deviation to mean, indicates a generally low variability or high degree of stability in all the countries. The asymptotic test rejects the null hypothesis for only SLE.

⁸ The test reported is based on Doornik and Hansen (1994), who employ a small sample correction, and adapt the test for the multivariate case.

Table 2: Summary statistics for WAMZ Real GDP per Capita

	Min	Max	Mean	St dev	Stability	Skewness	Kurtosis	Asy. Test	Normal
GMB	6.23	6.49	6.38	0.06	0.01	-0.67	0.24	3.27 [0.19]	3.75 [0.15]
GHA	5.24	6.00	5.54	0.17	0.03	0.50	-0.11	1.74 [0.41]	2.15 [0.34]
LBR	4.00	6.67	5.72	0.81	0.14	-0.50	-0.83	2.97 [0.22]	6.57 [0.04]*
NGA	5.68	6.34	5.96	0.15	0.03	0.58	0.10	2.37 [0.30]	2.80 [0.25]
SLE	5.02	5.72	5.51	0.19	0.03	-1.10	0.21	8.51 [0.01]*	20.97 [0.00]**

Note: p-values for asymptotic and normality tests are reported in []. * and ** indicate significance at the 5% and 1% levels respectively

2.3. *Pair-wise Correlation of real GDP per capita*

According to a pair-wise linear correlation matrix of the actual data shown in Table 3, a strong positive relationship is found between Ghana and Nigeria, followed by Liberia and Sierra Leone. This may suggest strong macroeconomic ties between Ghana and Nigeria as well as synchronisation of macroeconomic policies in the two countries. Interestingly, apart from the positive relationship with Nigeria, Ghana seems to diverge from all the other countries. Although Nigeria's relationship with the other countries has been positive, it is only strongly correlated with Ghana. A similar finding holds for Sierra Leone. Aside the strong correlation with Liberia and a negative coefficient for Ghana, Sierra Leone is positively related to the other countries although in a weak manner. The Gambia, Nigeria and Sierra Leone seem more integrated albeit not very strong. In conclusion, we argue that evidence based on linear correlation is not strong among the countries.

Table 3: Linear correlation matrix

	GMB	GHA	LBR	NGA	SLE
GMB	1.00	-0.04	0.08	0.24	0.11
GHA		1.00	-0.07	0.88	-0.02
LBR			1.00	-0.07	0.75
NGA				1.00	0.09
SLE					1.00

3. Empirical Methodology

This study employs the univariate and multivariate forms of unobserved components modelling technique to characterise the dynamics of business cycle synchronisation using real per capita GDP of five WAMZ countries.

3.1. Univariate unobserved component model

The univariate model applied to decompose the time series of each country y_t , into trend μ_t , cycle ψ_t , and irregular ε_t components is represented by the following general form:

$$y_t = \mu_t + \psi_t + \varepsilon_t \quad (1)$$

In this study, the cycle component is characterized by two separate processes with different periods. We do so in order to account for shorter term dynamics with the first cycle (ψ_{1t}), while the second cycle (ψ_{2t}) explains the longer term cyclical movements.

$$y_t = \mu_t + \psi_{1t} + \psi_{2t} + \varepsilon_t \quad (2)$$

The unobserved trend equation is given by the following definition:

$$\mu_t = \mu_{t-1} + \beta_{t-1} + \eta_t \quad (3)$$

and

$$\beta_t = \beta_{t-1} + \zeta_t \quad (4)$$

where η_t and ζ_t stochastic errors normally IID distributed. An alternative specification of the trend is obtained by imposing restrictions on the variances of the parameters η_t and ζ_t . If both variances are set to zero, the trend becomes linear. The random walk with drift is obtained when $\sigma_\zeta^2 = 0$. The smooth integrated random walk can be obtained by setting $\sigma_\eta^2 = 0$. The cycle component is a stationary process. It is specified as the first component of the vector defined by:

$$\begin{bmatrix} \psi_t \\ \psi_t^* \end{bmatrix} = \rho \begin{bmatrix} \cos \lambda & \sin \lambda \\ -\sin \lambda & \cos \lambda \end{bmatrix} \begin{bmatrix} \psi_{t-1} \\ \psi_{t-1}^* \end{bmatrix} + \begin{bmatrix} k_t \\ k_t^* \end{bmatrix} \quad (5)$$

where k_t and k_t^* are IID sequences with variance σ_k^2 the parameter λ defines the average period of the cycle and the parameter ρ , $0 < \rho < 1$, is the damping factor, which determines the concentration of the power spectrum around the frequency λ . When λ is strictly smaller than 1, and, $0 < \rho < \pi$, the cycle ψ_t and the auxiliary process are stationary ARMA(2,1) processes with variance σ_k^2 . When λ approaches zero, the cycle collapses to an AR(1) process with an autoregressive coefficient equal to ρ . A particular component is said to be deterministic when its variance is equal to zero. In this way, the deterministic cycle component is a fixed sine-cosine wave. The first order cycles can be generalized to higher order cycles as shown by Harvey and Trimbur (2003). Smoother cyclical processes can be obtained by specifying $\psi_t = \psi_t^n$ where

$$\begin{bmatrix} \psi_{i,t} \\ \psi_{i,t}^* \end{bmatrix} = \rho \begin{bmatrix} \cos \lambda & \sin \lambda \\ -\sin \lambda & \cos \lambda \end{bmatrix} \begin{bmatrix} \psi_{i,t-1} \\ \psi_{i,t-1}^* \end{bmatrix} + \begin{bmatrix} \psi_{i-1,t-1} \\ \psi_{i-1,t-1}^* \end{bmatrix} \quad (6)$$

With

$$\begin{bmatrix} \psi_{1,t} \\ \psi_{1,t}^* \end{bmatrix} = \rho \begin{bmatrix} \cos \lambda & \sin \lambda \\ -\sin \lambda & \cos \lambda \end{bmatrix} \begin{bmatrix} \psi_{i,t-1} \\ \psi_{i,t-1}^* \end{bmatrix} + \begin{bmatrix} k_t \\ k_t^* \end{bmatrix} \quad (7)$$

for $i=2, \dots, n$, for $n=1$ the first order cycle is obtained

Harvey and Trimbur (2003) show with applications to real data, that the increase of the smoothness shift from order 1 to order 2 changes the extracted cycle slightly. In this paper, we will adopt an order 1 for the univariate model and an order 2 for the multivariate model. In fact, after some experimentation, we found that cycles of order 2 in the multivariate model give a reliable decomposition.

3.2. Multivariate unobserved component model

The univariate model can be generalized to the multivariate case. If we consider y_t as a vector $N \times 1$ of observable times series, the multivariate model can be applied to the N time series simultaneously. In this case, we have

$$y_t = \mu_t + \psi_t + \varepsilon_t \quad (8)$$

with the vector of trend given by:

$$\mu_t = \mu_{t-1} + \beta_{t-1} + \eta_t \quad (9)$$

and

$$\beta_t = \beta_{t-1} + \zeta_t \quad (10)$$

In this system, each component becomes a vector of the same dimensions as y_t . Hence, the trend μ_t and cycle ψ_t are stochastic $N \times 1$ vectors with η_t and ζ_t independent NID sequences, and the covariances are respectively $\Sigma_\eta, \Sigma_\zeta$. We adopt the similar cycle model introduced by Harvey and Koopman (1997):

$$\begin{bmatrix} \psi_t \\ \psi_t^* \end{bmatrix} = \rho \begin{bmatrix} \cos \lambda & \sin \lambda \\ -\sin \lambda & \cos \lambda \end{bmatrix} \otimes I_N \begin{bmatrix} \psi_{t-1} \\ \psi_{t-1}^* \end{bmatrix} + \begin{bmatrix} k_t \\ k_t^* \end{bmatrix} \quad (11)$$

with the covariance matrix of the shocks given by:

$$E \begin{pmatrix} k_t \\ k_t^* \end{pmatrix} \begin{bmatrix} k_t & k_t^* \end{bmatrix} = I_2 \otimes \Sigma_k \quad (12)$$

The similar cycle model imposes the same period and the same damping factor to all the cycles, which means that their spectral density has the same shape. Indeed, the cycles in the different series have similar properties, for instance their movements are concentrated around the same period. This specification is reasonable if the cyclical movements arise from a source such as an underlying business cycle and makes easier the separation of trend and cycle movements when several series are jointly estimated (Harvey, 2006).

4. Empirical Results and Analysis

In this section we carry out univariate as well as multivariate analysis of synchronisation in the WAMZ. Whereas the univariate analysis enables us to see similarity of the business cycles using the periods and damping factors, the multivariate approach facilitates investigation of whether common factors govern the stochastic components of each cycle in the WAMZ. If the cycles are more synchronized, then we can conclude that there is cyclical convergence.

4.1. Univariate decomposition of growth series

We decompose the national output series into trend, cycle and irregular components using a general form of the univariate unobserved component model that is not restricted to a uniform specification. The purpose is to take into account dynamics of the business cycle in each country. Coefficient of determination indicates well specified model with the exception of The Gambia that has R^2 of 0.23. We report the estimated variances of the disturbances associated with the trend, the two cycle processes and the irregular component in Table 4. For each cycle component, the estimated frequency λ , damping factor ρ , and the period $2\pi / \lambda$ (in years) is also reported.

The estimated length of business cycle for the WAMZ countries is in the region of 5 years. The Cycle 1 length of 5 years is close to the average of the estimates of the business cycle reported. This is consistent with the short term dynamics. Nigeria has the shortest Cycle 1 length of 3.9

years followed by Liberia with 4.8 years. Most of the cycles are highly volatile with the exclusion of Ghana and Nigeria. The volatility is indicated by the variance of the shocks that drive the cycles. Again, Liberia and Nigeria have Cycle 1 below 5 years whereas Sierra Leone has a Cycle 1 length of 5.4 years.

The lengths of Cycle 2 are also consistent with the dynamics of the medium term business cycle. The Gambia, Ghana and Nigeria have their Cycle 2 estimates below 10 years. The longest duration is exhibited by Liberia that is around 12.2 years followed by Sierra Leone that has 10.9 years. In all, we find an average duration of approximately 10 years.

Table 4: Univariate model ($Y = \text{Trend} + \text{Irregular} + \text{Cycle 1} + \text{Cycle 2} + \text{Interventions}$)

	$2\pi / \lambda_1$	ρ_1	λ_1	$2\pi / \lambda_2$	ρ_2	λ_2	N	Q	R^2
GMB	5.0	1.00	1.26	8.3	1.00	0.76	0.19	5.98	0.23
GHA	5.0	1.00	1.14	8.2	1.00	0.78	3.60	9.99	0.54
LBR	4.8	1.00	1.32	12.2	0.96	0.52	8.93	6.32	0.85
NGA	3.9	1.00	1.32	9.7	0.98	0.37	7.70	8.86	0.48
SLE	5.4	1.00	1.16	10.9	1.00	0.58	1.66	6.68	0.83

Note: Parameter estimates for each component are reported. ρ is the damping (discount) parameter and $2\pi / \lambda_1$ is the period of the cycle (in years). Diagnostic test statistics for the standardized one-step ahead prediction residuals are also reported: N is the Jarque-Bera normality test (distributed as χ^2 variable with two degrees of freedom (df) and 95 percent critical value 5.99), Q is the Ljung-Box portmanteau test statistics and R^2 is the goodness-of-fit statistic.

The damping (discount or persistence) factor ρ indicates how tightly clustered the random components are at the central frequency λ_0 . If ρ is close to 0, there is no clustering of the random components. Since ρ is 1, we conclude that the random components are tightly distributed at the central frequency λ_0 . This further illustrates that ρ controls the dispersion of the important components at λ_0 . The cycle process is nonstationary for all the countries because $\rho = 1$ for all Cycle 1 processes. In the case of Cycle 2, only Liberia and Nigeria have $\rho < 1$ but almost 1. The graph shows that the random components that make up the cyclical component are tightly distributed around the central frequency.

4.2. Cyclical dynamics of the West African Monetary Zone

The estimated Cycle-1 and Cycle-2 for the WAMZ sub-region is 7.9 years ($\rho=0.98$) and 11.8 years ($\rho=1.00$) respectively. Compared to the individual economies, the estimated Cycle 1 for the WAMZ is longer than all the countries. Similar to the Cycle-1, the estimated Cycle-2 length from the multivariate model also has a longer length than the average cycle of the individual WAMZ countries. However, Liberia has a longer Cycle 2 period than the WAMZ cycle. The length of Cycle-2 for the individual countries ranges from 8.2 years (for Ghana) to 12.2 years (for Liberia).

We consider the variance/correlation matrix reported in Tables 6 and 7 as a measure of degree of cyclical synchronisation or co-movement in the WAMZ for Cycle 1 and Cycle 2 respectively. Their respective graphics are also reported in Figures 4 and 5. From Table 6, the WAMZ is segregated rather than integrated. For example, the group seem sub-divided with Ghana, Nigeria and Liberia forming one synchronised group whereas Sierra Leone and The Gambia also form another synchronised group. Both The Gambia and Sierra Leone have strong negative correlations with the rest of the members. This result reflects strong short-term relationships within the WAMZ even though not among all members. The Gambia appears far apart from Ghana, Nigeria and Liberia in the short-term. Also, per the long term dynamics reported in Table 6, only Sierra Leone remains secluded in the long term. Fascinatingly, as The Gambia becomes synchronised with the other cluster its links with Sierra Leone turns opposite in the Cycle 2, notwithstanding the fairly strong Cycle 1 correlation between Sierra Leone and The Gambia. However, it appears that the negative correlation between them is not so strong.

Another interesting finding from the Cycle 2 movements is that, the strength of the correlation between Liberia *vis a vis* Ghana and Nigeria is reducing indicating a somewhat gradual drift from the union. As Ghana and Nigeria seem to bridge the gap with Sierra Leone, Liberia maintains a near perfect negative correlation. This is a bit interesting because if it happens this way it would suggest that all the five countries cannot have their cyclical dynamics converging at some point. The cyclical dynamics reported in Figure 4 confirms the behaviour of the unobserved

components. We confirm that two sub-groups emerge within the WAMZ. Ghana, Liberia and Nigeria belong to one side, as The Gambia and Sierra Leone seem more harmonised per the dynamics of the short cycle. The Cycle 2 depicts that only Sierra Leone fails to synchronise with the rest. The smooth cycles are shown in Figure 7 and 8.

Table 5: Multivariate Decomposition for the WAMZ⁹

	Level var	Slope var	Cycle1 var	Cycle2 var	Irregvar	N	Q	R ²
GMB	0.00	0.00	0.00	0.00	0.000234822	1.46	9.79	0.41
GHA	7.56521e-005	8.23259e-005	5.21438e-005	3.06732e-012	0.000412166	18.72	17.21	0.42
LBR	3.53904e-006	0.00294354	0.000401045	0.0120663	0.00260851	31.32	8.80	0.39
NGA	2.39720e-005	9.81422e-005	0.00	0.00	0.000362428	7.70	21.05	0.28
SLE	7.24698e-007	0.00	0.000430161	0.00	0.000408445	11.94	9.52	0.27

Note: The dependent variable, Y , contains all the 5 countries. Parameter estimates for each component are reported. Var denotes variances, ρ is the discount parameter and p is the period of the cycle (in years). Diagnostic test statistics for the standardized one-step ahead prediction residuals are also reported: N is the Jarque-Bera normality test (distributed as a χ^2 variable with two degrees of freedom (df) and 95percent critical value 5.99), Q is the Ljung-Box portmanteau test statistics and R squared is the goodness-of-fit statistic. Cycle 1 p is 7.9 years and damping factor 0.98. Cycle 2 p is 11.8 years and damping factor of 1.00.

Table 6: Cyclical variance/correlation matrix

Cycle-1 variance/correlation					
	GHA	LBR	NGA	SLE	GMB
GHA	0.00	0.97	0.97	-0.74	-0.99
LBR		0.00	0.99	-0.84	-0.99
NGA			0.00	-0.88	-0.96
SLE				0.00	0.71
GMB					0.00

Cycle-2 variance/correlation					
	GHA	LBR	NGA	SLE	GMB
GHA	0.00	0.74	0.95	-0.61	0.84
LBR		0.00	0.48	-0.99	0.26
NGA			0.00	-0.33	0.97
SLE				0.00	-0.10
GMB					0.00

⁹The estimation indicates the following significant outliers: GHA (1974), LBR (1990 & 2002), NGA (1978), GMB (1982). Breaks are also found in LBR (1997) and SLE (1992).

Figure 4: Dynamics of shorter cycles in the WAMZ

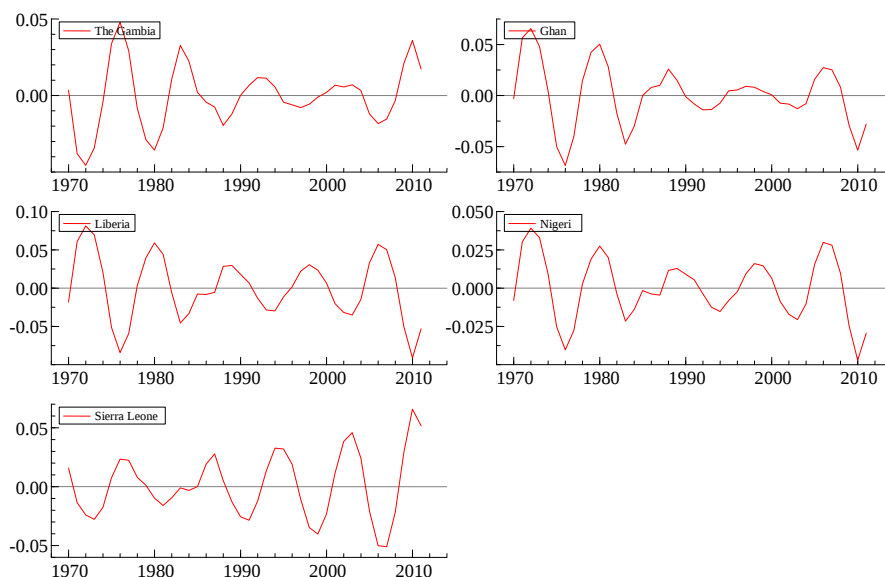


Figure 5: Dynamics of longer cycle in the WAMZ

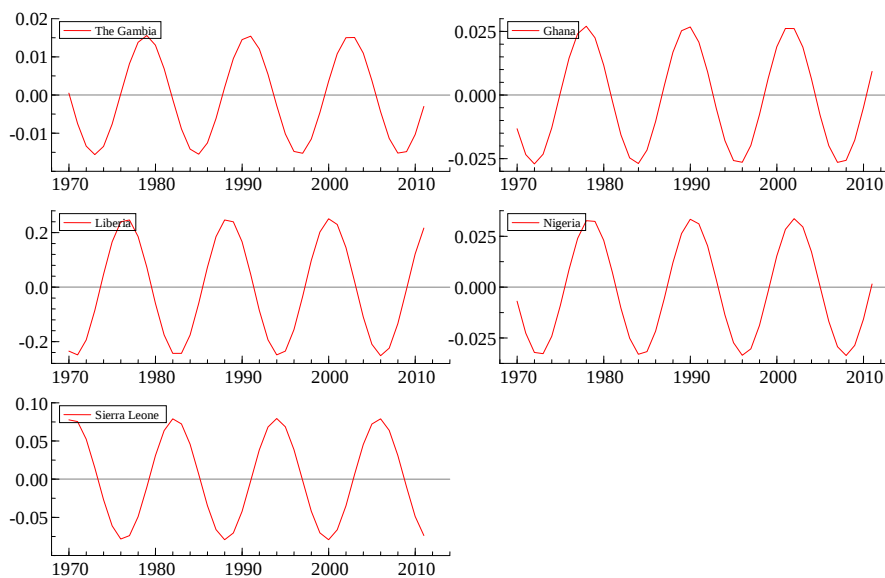


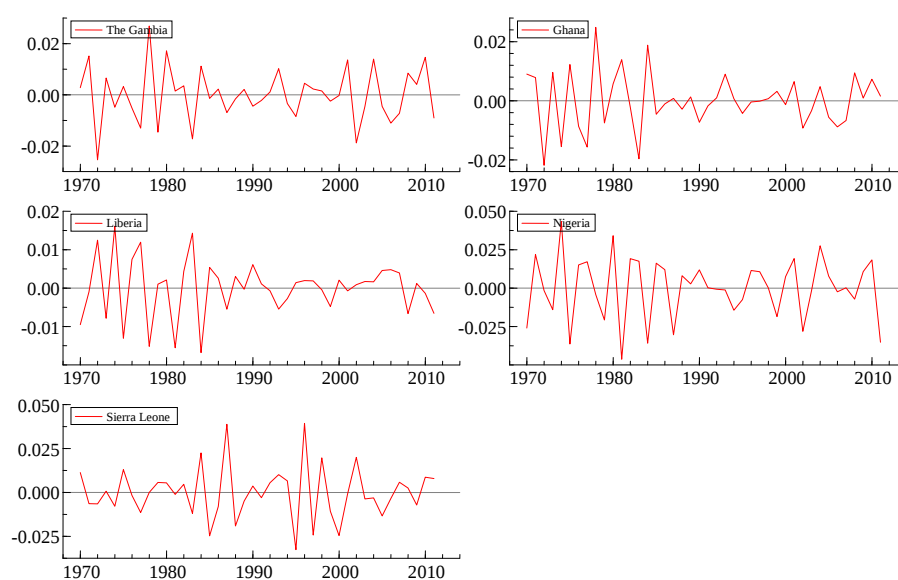
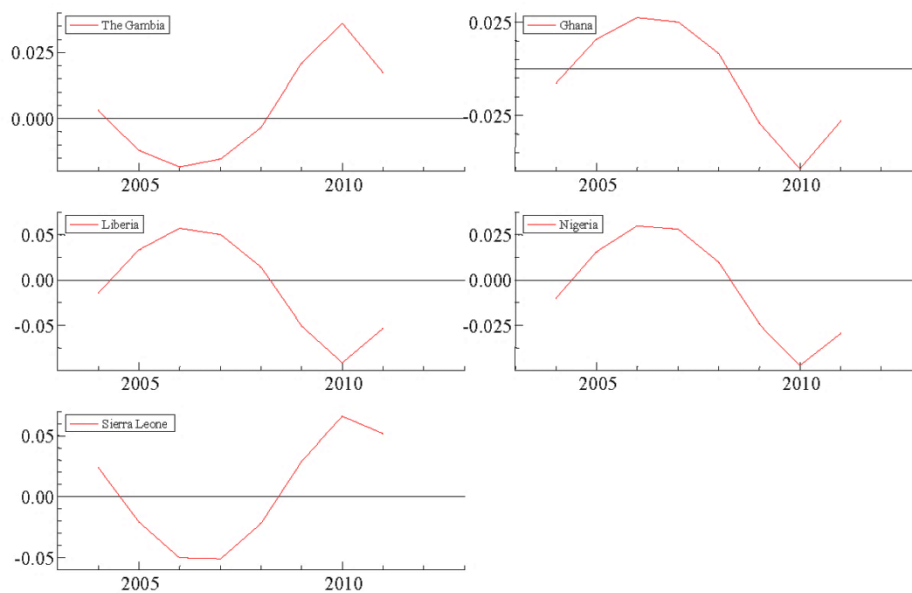
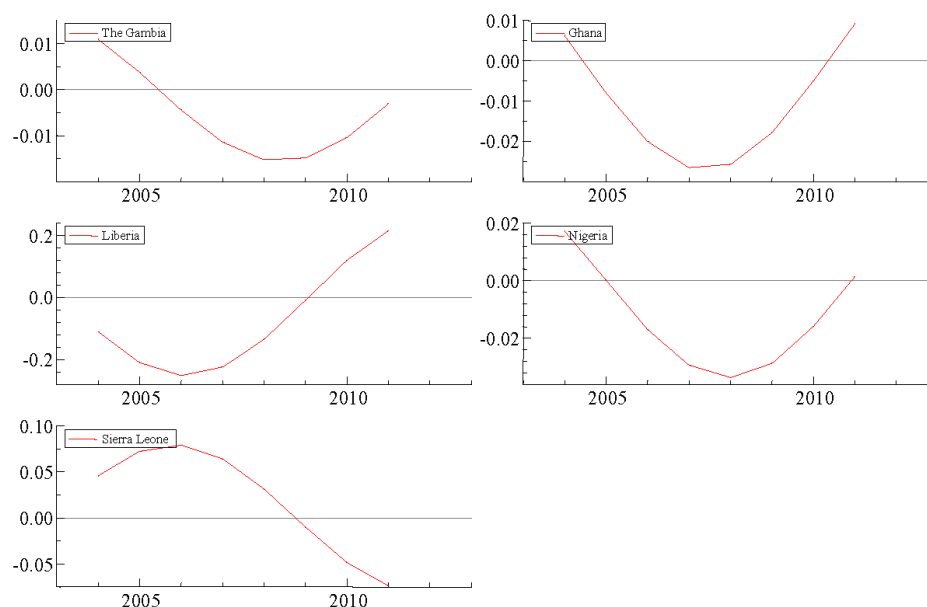
Figure 6: Dynamics of Irregular Components**Figure 7: Smooth short cycle components**

Figure 8: Smooth longer cycle components

5. Conclusion and Policy Recommendations

In this paper we have considered both the univariate and multivariate unobserved components models for annual real GDP per capita series for five WAMZ countries from 1970 to 2011. The main motivation for developing the models is to capture the properties of business cycle and the relations among countries within the WAMZ, and establish the convergence or otherwise of business cycles in the zone. In the context of single currency and common monetary policies, the similarity of the business cycles of the participant countries is a major concern. The paper also presents evidence on the degree of synchronisation and coordination between real incomes with the help of cyclical correlations.

The results based on the univariate model indicate that most of the countries hover around the mean of the Cycle 1 which spans 5 years. The mean length of the second cycle is 9.9 years, with 3 out of the 5 countries under consideration having their estimated Cycle 2 less than 10 years. More particularly, only Liberia and Sierra Leone have their lengths above the mean. A multivariate model of the WAMZ countries present evidence on the short cycle dynamics of two sub-groups in

which Ghana, Liberia, and Nigeria are highly synchronised whereas The Gambia and Sierra Leone form another synchronised group. In the long term, only Sierra Leone fails to synchronise with the rest of the members.

One interesting finding is that, the strength of the correlation between Liberia *vis a vis* Nigeria and Ghana diminishes in the long term. This presents some difficulty in finding clear cut evidence in support of long term synchronisation in the region. This lack of evidence on synchronisation signifies that WAMZ countries advance different business cycle paths, which casts doubts on the equality of welfare distribution in the context of common monetary policies with a single currency.

Barring few earlier findings that dissent on WAMZ integration, our evidence provides some optimism for business cycle synchronicity that paves the way for successful WAMZ integration. To some extent, the current attempts made to integrate the WAMZ economies has successfully synchronised the business cycles of majority of the member countries. Considering the long-term dynamics, one would believe that full convergence in the region is achievable given a few more years. It is very difficult to find evidence of full convergence in the WAMZ given the cross-country dissimilarities in institutional, structural and macroeconomic characteristics of the countries (see Coleman, 2011; Asongu, 2013; Asongu, 2014; Alagidede *et al.*, 2008; Tsangarides and Qureshi, 2008). Debrunet *al.* (2005) applies a model of monetary and fiscal policy interactions finds that the proposed ECOWAS union is appealing for most WAMZ countries, except for fiscal distortions due to Nigeria's preponderant weight. Masson and Pattillo (2001) also finds that Nigeria's large terms of trade shocks might be disruptive. Broadly, if such heterogeneity exists in the WAMZ region, a number of policy questions would pop up about the diverse degrees of exposure to terms of trade shocks that signify lack of convergence and business cycle synchronisation. How can fiscal and monetary policies be synchronised to ensure equitable welfare distribution across the monetary union? In particular, should the common monetary policy aim to achieve output gap stabilization or be fully optimal? Is it plausible to integrate the economies of all members at once, or it may make sense to seek integration of strongly imbedded fundamentals of one group of countries versus another group?

We conclude that, inasmuch as there seems to be some homogenous sub-groups within the region, it would be worthwhile to prefer integration of fewer synchronised countries to integration of the whole zone. This proposition corresponds with Celasun and Justiniano (2005). WAMZ policymakers should advance modalities aimed at ensuring that the integration of WAMZ serves as a strategy for achieving sustainable economic growth as there is a consensus that by merging its economies and pooling its capacities, endowments and energies, the continent can overcome its daunting development challenges. However, a few caveats hold as our analysis has been purely based on real GDP per capita. Although we make attempts to justify our results, we do not suggest that the attributes of the recent past that hampered a more coordinated ECOWAS can be relevant in future analysis or judgement. As this has been based on business cycle fluctuations, other attempts could be taken from different angles and on other aspects of economic integration to uncover the salient issues associated with ECOWAS integration.

References

African Development Fund (2008). *WAMZ Payment System Development Project (The Gambia, Guinea and Sierra Leone): Appraisal Report*, Sector Operations Governance, Economic and Financial Management Department (April).

Alagidede, P., Coleman, S. and Cuestas, J. C. (2012). 'Inflationary shocks and common economic trends: Implications for West African Monetary Union membership', *Journal of Policy Modeling*, Vol 34(3), 460-475.

Alagidede, P., Tweneboah, G. and Adam, A. M. (2008). 'Nominal exchange rates and price convergence in the West African monetary zone', *International Journal of Business and Economics*, Vol 7(3), 181-191.

Asongu, S. A. (2013), 'Are proposed African monetary unions optimal currency areas? Real, monetary and fiscal policy convergence analysis', *African Journal of Economics and Management Studies* (forthcoming).

Asongu, S. A. (2014), 'REER Imbalances and Macroeconomic Adjustments in the Proposed West African Monetary Union', *South African Journal of Economics*.doi: 10.1111/saje.12039

Beveridge, S. and Nelson, C. R. (1981), 'A new approach to the decomposition of economic time series into permanent and transitory components with particular attention to measurement of the business cycle', *Journal of Monetary Economics* Vol 7, 151– 174.

Carmignani, F. (2010), 'Cyclical fiscal policy in Africa', *Journal of Policy Modeling*, 32, 254–267.

Celasun, O. and Justiniano, A. (2005), 'Synchronization of Output Fluctuations in West Africa: Implications for Monetary Unification', IMF Working Paper, Washington, D.C.: IMF

Coleman, S. (2011), 'Investigating Business Cycle Synchronization in West Africa', Discussion Papers in Economics No. 2011/1, Nottingham Trent University, United Kingdom

Debrun, X., Masson, P. and Pattillo, C. (2005), 'Monetary union in West Africa: Who might gain, who might lose and why?' *Canadian Journal of Economics*, Vol 38(2), 454-481.

Doornik, J. A. and Hansen, H. (1994), 'An omnibus test for univariate and multivariate normality', Working paper, Nuffield College, Oxford University, Oxford, UK

Harvey, A.C (2006), *Forecasting with Unobserved Components Time Series Models*, In G. Elliott, C.W.J. Granger and A. Timmermann (eds), *Handbook of Economic Forecasting* Vol 1, 327–412.

Harvey, A. C. (1989). *Forecasting, Structural Time Series Models and the Kalman Filter*. Cambridge: Cambridge University Press.

Harvey, A. C. (1997), 'Trends, Cycles and Autoregressions', *Economic Journal*, Vol 107 (440), 192-201.

Harvey, A. C. and Koopman, S. J. (1997). Multivariate structural time series models, In C. Heij, H. Schumaker, B. Hanzon and C. Praagman (eds), *Systematic dynamics in economic and financial models*, Chichester: John Wiley and Sons, 269–298.

Harvey, A. C. and Trimbur, T. M. (2003), 'General model-based filters for extracting cycles and trends in economic time series', *The Review of Economics and Statistics*, Vol 85(2), 244–255.

Harvey, A.C. and Jaeger A. (1993), 'Detrending stylized facts and the business cycle', *Journal of Applied Econometrics*, Vol 8, 231–247.

Harvey, A.C. and Koopman, S. J. (1992).Diagnostic Checking of Unobserved-Components Time Series Models.*Journal of Business and Economic Statistics*, Vol 10(4), 377-389.

Harvey , A.C. and Koopman, S. J. (2000), 'Signal Extraction and the formulation of unobserved components models', *Econometrics Journal* Vol 3, 84-107.

Hodrick, R. J. and Prescott, E. C. (1980). Post-war U.S. business cycles: An empirical investigation. Discussion Paper No. 451, Carnegie-Mellon University.

King, R. G. and Watson, M. W. (1996), 'Money, Prices, Interest Rates and the Business Cycle', *The Review of Economics and Statistics*, Vol 78(1), 35-53

Mason, P. and Pattillo, C. (2001). Monetary Union in West Africa (ECOWAS): Is It Desirable and How Could It Be Achieved? International Monetary Fund *Occasional Paper* No. 204, Washington, D.C.: IMF

McKinnon, R. I. (1963), 'Optimum Currency Areas', *American Economic Review*, Vol 53, 717-724.

Mundell, R. A. (1961), 'A Theory of Optimum Currency Areas', *American Economic Review*, Vol 51, 509-17.

Tsangarides, C. G. and Qureshi, M. S. (2008), 'Monetary union membership in West Africa: A cluster analysis', *World Development*, Vol 36(7), 1261-1279.

World Bank (2013). World Development Indicators, Washington, D.C: World Bank.

FDI, Private Investment and Public Investment in Nigeria: an Unravelling Dynamic Relation

Amassoma Ditimi¹ and Ogbuagu Matthew I²

For decades, scholars have continually emphasized the importance of FDI in the Less Developed Countries. Suffice it to say that, some believe that FDI can fill investment gaps, either private or public and mobilizes savings (Lee and Suruga, 2005; Todaro and Smith, 2003; Hayami, 2001). This research therefore, seeks to verify the interactions and transmission mechanism between FDI, private direct investment and public direct investment in Nigeria. Furthermore, these variables were examined to ascertain their direction of causality and whether or not they have long run linear relationship. Also, the impulse responses of these variables to shocks in the extraneous variables were verified; using the Multiple-Equation VAR models with time series data ranging from 1981-2012. The co integration result indicates that there is no long run relationship between these variables. In addition, the variance decomposition result shows that 46 percent of innovations in FDI were explained by its own past values, while 21 percent of the innovations were due to shocks, to private domestic investment with 31 percent due to public investment. The response of public and private investment to shocks in FDI is positive and significant in the short run and so is consistent with the findings of Jansen (1995), Misun and Tomsik (2002). Efficient infrastructure in terms of public investment in basic infrastructure cannot be overemphasized amongst others.

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1. Introduction

The significance of Foreign Direct Investment (FDI) cannot be overemphasized in both developing and developed economies. This is owing to the voluminous rewards FDI offers to both investors and the recipient country. According to Rishikesh (2014), one of the primary benefits of FDI is that it allows money to freely go to whatever business has the best prospects for growth anywhere across the world. This is not far-fetched from the fact that investors aggressively seek the best return for their money with the least risk. Notably, this motive does not take into awareness the component of religion or any form of government. Consequently, the need to examine the nexus between FDI and Private investment and Public investment in Nigeria.

As a matter of fact, it would not be out of place to affirm that (FDI) is an imperative promoter of economic development and economic growth as stipulated by (Lee and Suruga, 2005). Many scholars have argued that the flows of FDI could fill the gap between desired investments and domestically mobilized saving (Todaro and Smith, 2003, Hayami, 2001). FDI has proven to have the capacity to increase tax revenues and improve management, technology, as well as labour skills in host countries as opined by (Todaro and Smith, 2003; Hayami, 2001). In addition, rise in FDI inflow has the tendency to assist the host country to break out of the vicious cycle of underdevelopment as observed by (Hayami, 2001).

To buttress our second objective, the study reviewed studies that investigated the extent of causality among these variables that are in question. Scholars like; Hooi et al (2011) examined the linkages among FDI, direct investment (DI) and economic growth in Malaysia for the period 1970-2009. In their study they discovered that FDI, DI and economic growth were all co-integrated. Furthermore, they established that a uni-directional causality exist between FDI and DI. Similarly authors like; (Choe, 2003; Razin, 2003; Kim and Seo, 2003; Hecht et al, 2004; Apergis et al, 2006; Tang et al, 2008; Adams, 2009; Merican, 2009) empirically analyzed the dynamic linkages between FDI and domestic investment in influencing economic growth, both separately and together. To corroborate the above, Ang (2009) pinpoints that both public investment and FDI are complementary with private investment in Malaysia. The studies found the existence of the long run relationship

among FDI, DI and economic growth but the direction of causality among the variables remain vague. For example, Choe (2003), Kim and Seo (2003). Hecht et al (2004) and Apergis et al (2006) found bilateral causal relationship between FDI and economic growth. In contrast to the above, Tang et al (2008) discovered in his study that there is only one way causality from FDI to DI and to GDP in China, while the causal link between DI and economic growth is bi-directional.

In the examination of nexus between FDI and domestic investment, the linkages among FDI, public investment and private investment also serves as a significant consideration. Remarkably, this consideration will enable us ascertain the necessary policy implications that can be utilized to maximize the gains from FDI at large. The reason for this is not far-fetched from the fact that these variables are often related over time and even in a dynamic relationship, where causality can run from both directions. Expectedly, a strong private investment climate can act as signals of high returns to capital, as well as an improved public infrastructure through public investment thereby reducing cost of doing business are vital in attracting foreign capital. FDI could be seen as complement or substitute as evidence from the following studies. For instance, Eroglu and Hudson (1997); Insel and Sungur (2003); Kara and Kar (2005) found a positive association between FDI and domestic investment, whereas some conclude that FDI negatively affects domestic investment as observed by Guven (2001). Though, the empirical evidence on this issue is scarce as buttressed by Saglam and Yalta (2011).

Also, like other developing countries, Nigeria is going through a substantial process of liberalization with macroeconomic and political instability (Terrorism), and drastic fall in crude oil prices causing financial melt-down and decline in the expansion of industries. To meet its financial needs, she has been building up new rules and regulations in the hope of attracting FDI. The flows of FDI into Nigeria were \$4024.0 million and \$54,254.2 million in 1986 and 2007 respectively. Yet, the question remains as to the possible effects of FDI on domestic investment.

The objectives of this research are to verify the interactions and transmission mechanism among FDI, private domestic investment and public domestic investment by considering the case of Nigeria.

Furthermore, the variables shall be examined to ascertain their direction of causality and long run relationship (Co-integration); finally, the impulse response of these variables to shocks in the extraneous variables shall also be verified.

This research work therefore, differs from the previous studies as it focuses on the dynamic interactions among the variables by using a multivariate VAR framework in Nigeria. The issues of stationarity and endogeneity of these variables are generally addressed. This is evident in the review of literature on FDI in Nigeria. The remaining sections of this research work are divided into section 2 Review of Literature; section 3 Methodology and Data; section 4 Empirical Analysis and Results Presentation; section 5 Policy Recommendations and Conclusion.

2. Review of Literature and Empirical Evidence

There are several studies on FDI. Some of the pioneering works include: Aluko (1961), Brown (1962) and Obinna (1983). These authors separately reported that there is a positive linkage between FDI and economic growth in Nigeria. Edozien (1968) discussed the linkage effect of FDI on the Nigerian economy and submits that it has not been considerable and that the broad linkage effects were lower than the Chenery-Watanabe average.

Specifically, Ndikumana and Verick (2008) considered the case of Sub-Saharan African countries and found a two-way relation between FDI and private investment; however, their study confirmed that public investment is not a driver of FDI.

Similarly, Hooi et al (2011) examined the linkages among FDI, direct investment (DI) and economic growth in Malaysia for the period 1970-2009. They discovered that FDI, DI and economic growth are co-integrated. Furthermore, they established that a uni-directional causality exist between FDI and DI.

Also, (Choe, 2003; Razin, 2003; Kim and Seo, 2003; Hecht et al, 2004; Apergis et al, 2006; Tang et al, 2008; Adams, 2009; Merican, 2009) empirically analyzed the dynamic linkages between FDI and domestic investment in influencing economic growth, both separately and

together. To corroborate the above, Ang (2009) pinpoints that both public investment and FDI are complementary with private investment in Malaysia. The studies found the existence of the long run relationship among FDI, DI and economic growth but the direction of causality among the variables remain vague. For example, Choe (2003), Kim and Seo (2003), Hecht et al (2004) and Apergis et al (2006) found bilateral causal relationship between FDI and economic growth. In contrast to the above, Tang et al (2008) discovered in his study that there is only one way causality from FDI to DI and to GDP in China, while the causal link between DI and economic growth is bi-directional.

In the same vein, Agosin and Machado (2005) have observed that if FDI crowds out DI, the increase in total investment would be smaller than the increase in FDI. And if on the other hand, there is a crowding in, the increase in total investment will be more than the increase in FDI. In contrast to the aforementioned, Kim and Seo (2003) opines that an expansion in FDI neither crowds in nor crowds out the DI in South Korea. However, Wang (2010) found that contemporaneous FDI crowds out DI in the developing countries.

Kumari (2013) using equity inflow through regression and trend analysis of FDI, determined the effect of FDI on total FDI. This paper opined that FDI equity inflow is a significant determinant of total FDI inflow in India.

Richard et al (2014) discussed the past twenty-five years of economic and political transition in Poland. They traced the “Polish Dilemma” by pointing out the “Grand Failure” of the command economy. The article further described how business attractiveness, business climate and business friendliness have attracted FDI into Poland.

Merican (2009) examined the linkages between FDI, DI and economic growth in four ASEAN members namely: Indonesia, Malaysia, Thailand and the Philippines over the period of 1970-2001. Focusing on Malaysia, the study found that FDI was better than DI in promoting economic growth in Malaysia.

Saglam et al (2011) investigated the relationship among FDI, private investment and public investment in Turkey for the period 1970-2009 using a multivariate VAR model. Results imply that there is no long-run

relationship among FDI, public and private investment; suggesting that there is no interaction among public, private and foreign investments in the long run. They recommended that the government of Turkey should improve their infrastructure through increase in public investment, stabilize prices, and correct fiscal deficiencies with both macroeconomic and political stability so as to increase inflow and benefits of FDI.

Marc et al (2012) investigated the impact of domestic investment on Foreign Direct Investment (FDI) in Developing Countries (DC). Using a cross-country sample (68 countries), over a period (1984-2004), he discovered that lagged domestic investment has a strong influence on FDI inflows in the host-economy, implying that domestic investment is a strong catalyst for FDI in DC and that Multinational Companies do follow economic development. Vietnam has been reasonably successful in attracting FDI since it implemented its Foreign Investment Law in 1987. According to Ministry of Planning and Investment, from 1987 to the end of 2003, total FDI inflows to Vietnam were approximately US\$ 40.8 billion in terms of commitments, while the actual inflows were US\$ 25 billion. This influx of dollar encouraged GDP growth, international trade and employment (Tran, 2005). He did a panel analysis of twelve provinces in Vietnam, looking at the relationships between FDI and economic growth; and then FDI and poverty using two models. In order to ascertain the relationship among these three important variables, he adopted the Two Stage Least Square Methods for his analysis. His result shows that FDI had a positive impact on economic growth and was statistically significant; also economic growth had a positive and significant impact on poverty reduction in Vietnam.

Okon et al (2012) investigated the relationship between foreign direct investment and economic growth in Nigeria between 1970 and 2008. They proposed that there is endogeneity i.e. bi-directional causality between FDI and economic growth in Nigeria; single and simultaneous equation systems were employed to examine if there is any sort of feedback relationship between FDI and economic growth in Nigeria. Their results showed that FDI and economic growth are jointly determined in Nigeria and that there is positive feedback from FDI to growth and from growth to FDI. They further suggested policies that attract more foreign direct investment to the economy, greater openness and increased private participation and reinforcement to ensure that the domestic

economy captures greater spillovers from FDI inflows and attains higher economic growth rates.

Oseghale and Amonkhienan (1987) found that FDI is positively associated with GDP, concluding that greater inflows of FDI will spell a better economic performance for the country.

Odozi (1995) placed special emphasis on the factors affecting FDI flows into Nigeria in both pre and post Structural Adjustment Programme (SAP) eras and found that the macro policies in place before SAP were discouraging investors. This policy environment led to the proliferation and growth of parallel markets and sustained capital flight.

Adelegan (2000) explored the Seemingly Unrelated Regression model (SUR) to examine the impact of FDI on economic growth in Nigeria and found out that FDI is pro-consumption, pro-import and negatively related to gross domestic investment. In another paper, Ekpo (1995) reported that political regime, real income per capita, inflation rate, world interest rate, credit rating and debt service were the key factors explaining the variability of FDI inflows into Nigeria.

Similarly, Ayanwale and Bamire (2001) assessed the influence of FDI on firm level productivity in Nigeria and reported positive spillover of foreign firms on domestic firm productivity. Ariyo (1998) studied the investment trend and its impact on Nigeria's economic growth over the years. He found that only private domestic investment consistently contributed to raising GDP growth rates during the period considered (1970-1995). Furthermore, there is no reliable evidence that all the investment variables included in his analysis have any perceptible influence on economic growth. He therefore suggested the need for an institutional rearrangement that recognizes and protects the interest of major partners in the development of the economy.

A common weakness that has been identified in most of these studies is that they failed to control for the fact that most of the FDI inflows to Nigeria has been concentrated on the extractive industry (to oil and natural resources sector). According to Ayanwale (2007), these works invariably assessed the impacts of FDI inflows to the extractive industry on Nigeria's economic growth. Akinlo (2004) specifically controlled for the oil, non-oil FDI dichotomy in Nigeria. He investigated the impact of

foreign direct investment (FDI) on economic growth in Nigeria, using an error correction model (ECM). He found that both private capital and lagged foreign capital have small and not a statistically significant effect on economic growth. Further, his results support the argument that extractive FDI might not be growth enhancing as much as manufacturing FDI.

Examining the contributions of foreign capital to the prosperity or poverty of LDCs, Oyinlola (1995) posits that foreign capital includes foreign loans, direct foreign investments and export earnings. Using Chenery and Stout's two-gap model (Chenery and Stout, 1966), he concluded that FDI has a negative effect on economic development in Nigeria. Further, on the basis of time series data, Ekpo (1995) reported that political regime, real income per capita, rate of inflation, world interest rate, credit rating and debt service were the key factors explaining the variability of FDI into Nigeria. However, Anyanwu (1998) paid particular emphasis on the determinants of FDI inflows to Nigeria. He identified change in domestic investment, change in domestic output or market size, indigenization policy and change in openness of the economy as major determinants of FDI inflows into Nigeria and that it effort must be made to raise the nation's economic growth so as to be able to attract more FDI.

Ayanwale (2007) investigated the empirical relationship between non-extractive FDI and economic growth in Nigeria and also examined the determinants of FDI inflows into the Nigeria economy. He used both single-equation and simultaneous equation models to examine the relationship. His results suggest that the determinants of FDI in Nigeria are market size, infrastructure development and stable macroeconomic policy. Openness to trade and human capital were found not to be FDI inducing. Also, he found a positive link between FDI and growth in Nigeria. Our work is similar to that of Ayanwale (2007), in that we seek to examine the determinants and impact of FDI on growth in the Nigerian economy.

3. Model Specification

The three variables of foreign direct investment (FDI_t), private investment ($DPRV_t$) and domestic public investment ($DPUB_t$) at time were determined and expressed in the natural log values of the data to

express them in common denominator. Since we are interested in examining the dynamic interactions between private investment, public investment and FDI, we rely on a vector autoregressive model (VAR) and in order to understand the dynamics of responses, both the impulse response functions (IRFs) and variance decomposition (VD) are used.

More so, the impulse response functions track the responsiveness of the regressands in the VAR to shocks to each of the other variables while the variance decompositions provide information on the proportion of the movements in the dependent variables accounted for by their own shocks vis-à-vis the shocks to other factors. This approach has also been used by Kim and Seo (2003), and Tang et al. (2008) to examine the relationship between FDI and investment in Korea and China respectively. VAR model has certain advantages in that in a VAR model, dependent variables are expressed as functions of their own and each other's lagged values and all the variables are allowed to affect each other (Enders, 2005). Following Bayraktar and Yasemin (2011), we use a general unrestricted P th order VAR model as follows:

$$Y_t = \alpha + \sum_{l=1}^m \alpha_l Y_{t-l} + \varepsilon_{t-1} \quad (1)$$

Where Y_t refers to investment measures (domestic private investment, domestic public investment and FDI), t ($t = 1 \dots T$) refers to the time period, and l refers to the lag number. ε_t is the error term. However, a VAR (p) trivariate model in the context of this study could then be expressed as thus:

$$\ln FDI_t = C + \sum_{j=1}^p \alpha_{1j} \ln FDI_{t-j} + \sum_{j=1}^p \alpha_{2j} \ln DPRV_{t-j} + \sum_{j=1}^p \alpha_{3j} \ln DPUB_{t-j} + \varepsilon_{1t} \quad (2)$$

$$\ln DPRV_t = C + \sum_{j=1}^p \beta_{1j} \ln DPRV_{t-j} + \sum_{j=1}^p \beta_{2j} \ln FDI_{t-j} + \sum_{j=1}^p \beta_{3j} \ln DPUB_{t-j} + \varepsilon_{2t} \quad (3)$$

$$\ln DPUB_t = C + \sum_{j=1}^p \delta_{1j} \ln DPUB_{t-j} + \sum_{j=1}^p \delta_{2j} \ln FDI_{t-j} + \sum_{j=1}^p \delta_{3j} \ln DPRV_{t-j} + \varepsilon_{3t} \quad (4)$$

The variance decomposition test result has shown that FDI contributes more towards the development of private investment in Nigeria and

vice-versa. As a result of this, it will be necessary to ascertain the direction of causality between FDI and private investment.

The Granger causality model is of the form:

$$\ln FDI_t = C_1 + \sum_{j=1}^p \alpha_{1j} \ln FDI_{t-j} + \sum_{j=1}^p \alpha_{2j} \ln DPRV_t - j + \mu_{1t} \quad (5)$$

$$\ln DPRV_t = C_2 + \sum_{j=1}^p \delta_{1j} \ln DPRV_t - j + \sum_{j=1}^p \delta_{2j} \ln FDI_t - j + \mu_{2t} \quad (6)$$

As earlier defined, $\ln FDI$ denotes log of foreign direct investment, $\ln DPRV$ denotes log domestic private investment while $\ln DPUB$ represents log of domestic public investment.

4. Methodology and Data

4.1 Variable Description and Data Sources

Data used in this paper are annual figures covering the period 1981 – 2012 and the variables are sourced from Central Bank of Nigeria Statistical Bulletin for various years and World Development Indicators database (WDI). Foreign Direct Investment (FDI) was obtained via official aid and other development assistance (ODA), Domestic Private Investment (DPRV) was proxied by gross fixed capital formation while Domestic Public Investment (DPUB) is measured as the sum of Federal Government Capital Expenditure on Economic Services and Social Community Services.

4.2 Empirical Analysis and Result Presentation

The analysis begins with ascertaining the order of integration of the variables. The procedure adopted in this study involves the use of the two standard unit root tests namely Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) tests. The null hypothesis of ADF and the PP tests is non-stationary, thus failure with respect to rejection implies unit root in the series. The obtained results are reported in Table 1 below where all the series appear to be integrated of order one, which is a standard result in the literature for series of this nature.

4.2.1 Unit Root Test

Table 1: Unit Root and Stationarity Tests

	Augment Dickey-Fuller (ADF)			Phillip-Perron (PP)		
	<i>Level</i>	<i>First Difference</i>	<i>I(d)</i>	<i>Level</i>	<i>First Difference</i>	<i>I(d)</i>
<i>LNFDI</i>	-1.4083 ^a	-5.5236 ^{a*}	I(1)	-2.5391 ^b	-7.1915 ^{a*}	I(1)
<i>LNDPRV</i>	-0.1688 ^a	-4.0574 ^{a*}	I(1)	0.2408 ^a	-3.7325 ^{a*}	I(1)
<i>LNDPUB</i>	-0.6106 ^b	-2.9317 ^{a***}	I(1)	-1.3526 ^b	-2.8776 ^{a***}	I(1)

Note: ^a Indicates a model with constant but without deterministic trend; ^b is the model with constant and deterministic trend as exogenous lags are selected based on Schwarz info criteria. *, **, *** imply that the series is stationary at 1%, 5% and 10% respectively. ADF and PP represent Augmented Dickey-Fuller and Phillips-Perron Unit Root tests respectively. The null hypothesis for ADF and PP is that an observable time series is not stationary (i.e. has unit root).

It is seen in the table above that the null hypothesis of a unit root is accepted for the level series, but rejected for the first differenced data thus indicating that all series are non-stationary in their levels but become stationary after taking the first difference. Following these unit root tests, the Johansen (1988) maximum likelihood approach to cointegration is employed to examine the presence of any long-run association among the variables.

Engle and Granger (1987) states that a linear combination of two or more non-stationary series may be stationary and in this case these non-stationary time series are said to be cointegrated. The stationary linear combination can be interpreted as a long-run relationship among the variables. Therefore, after confirming that FDI, DPRV and DPUB are all *I* (1), we continue with testing long-run cointegration relationship between the variables using Johansen cointegration technique. Since the Johansen approach is sensitive to the lag length chosen, we conduct a series of tests to determine the optimal lag length and choose a model with lag length 1.

In testing cointegration, two tests are used: the trace test and maximum eigenvalue test to determine the cointegration rank. In Table 2, we present Johansen Cointegration test results. In the first model, we try to identify if there is a long-run relationship between domestic private investment (DPRV) and FDI, in the second model, we equally examine

the existence of long-run relationship between domestic public investment (DPUB) and FDI while model 3 examines if domestic private investment, domestic public investment and FDI are cointegrated.

4.2.2 Cointegration Test

Table 2: Johansen Cointegration Test Results

Model	Hypothesized Number of Cointegrated Equations	Eigenvalue	Trace Test	5% Critical Value
<i>Model 1</i> (<i>LNDPRV, LNFDI</i>)	None	0.28	9.94	15.49
	At most 1	0.02	0.55	3.84
<i>Model 2</i> (<i>LNDPUB, LNFDI</i>)	None	0.13	5.83	15.49
	At most 1	0.06	1.65	3.84
<i>Model 3</i> (<i>LNDPRV, LNDPUB, LNFDI</i>)	None	0.43	21.86	29.80
	At most 1	0.14	5.43	15.49
	At most 2	0.03	1.00	3.84

Note: * indicates the existence of no cointegrating relationship at the 5 percent significance level.

Looking across the three models, evidence reveal in Table 2 above implies we do not reject the null hypothesis that there is no cointegrating vector. To this end, we therefore conclude that there is no long-run relationship between domestic private investment and FDI, domestic public investment and FDI as well as private investment, public investment and FDI relationship even when examined simultaneously. The implication from the aforementioned therefore suggests that FDI is neither a complement for domestic private investment nor a substitute for domestic public investment in Nigeria. This may not be unconnected to the fact that FDI to Nigeria has not been targeting the real sector of the economy, but are rather mainly capital intensive in telecommunications and oil sectors.

Given the above background, where evidence of no long-run cointegration among the variables that is; domestic and foreign direct investment is revealed, we then proceed as earlier stated to further examine the relationship between the variables while utilizing

innovations that account for variance decomposition and impulse response function. However, the first differences of the variables will be employed since the variables are neither stationary nor cointegrated. The VAR model we estimated was ordered using Cholesky decomposition as FDI, PUB, and PRV. And this is because, the results of VAR can be very sensitive to the ordering of the variables, we tested other possible orderings and found that our results do not differ when the ordering of the variables is changed.

4.2.3 Variance Decomposition Functions

The variance decomposition allows us to make inference over the proportion of movements in a time series due to its own shocks versus shocks to other variables in the system (Enders 1995). The variance decomposition results reported within a 10-year horizon are presented in Table 3 below.

Table 3: Variance Decomposition percentage of ten-year error variance

Percent of forecast error variance in:	Typical Shock in		
	<i>LNFDI</i>	<i>LNDPRV</i>	<i>LNDPUB</i>
<i>LNFDI</i>	46.70	21.67	31.62
<i>LNDPRV</i>	18.08	65.33	16.59
<i>LNDPUB</i>	6.21	21.10	72.70

The results show that 46 per cent of innovations in FDI are explained by its own past values, while 21 per cent of the innovations are due to shocks to private domestic investment with 31 per cent due to public investment. The forecast error variance of Nigerian private domestic investment is grossly explained by its own past values of 65 per cent, while shock to the domestic public investment and FDI accounts for 16 per cent and 18 per cent respectively. Consequently, the forecast error variance of the Nigerian public domestic investment by its own innovation is higher compared to that explained by the domestic private investment and FDI. From an economic point of view, these results indicate that FDI does not have a strong influence on Nigeria's private and public domestic investment. Notwithstanding however, the

influence of FDI on private domestic investment seems to be greater than that of domestic public investment.

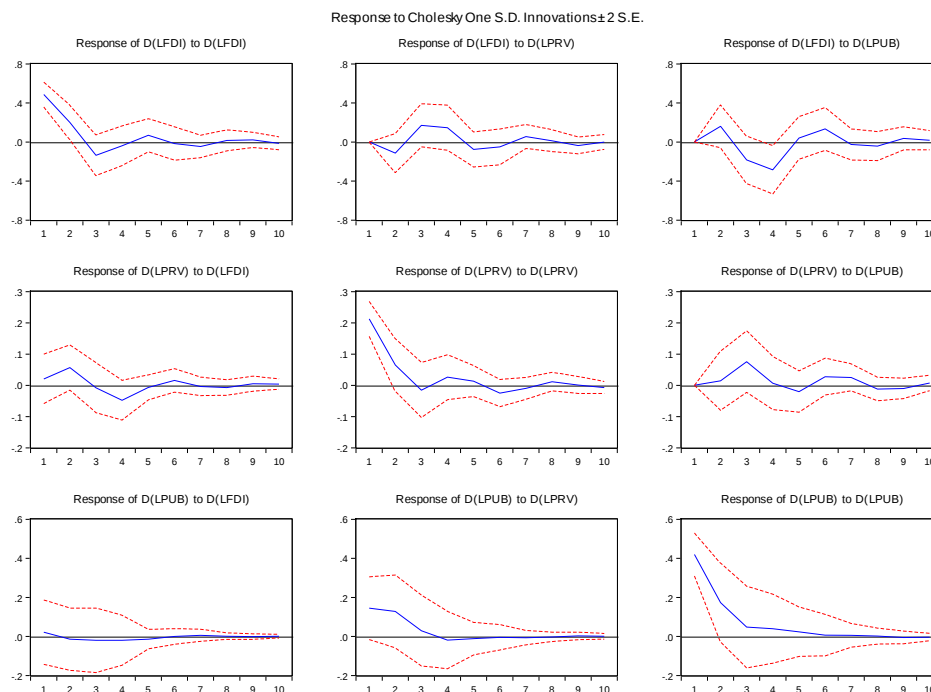
In attempt to strengthen the robustness of this analysis, we further utilize impulse response function to examine the dynamic causal relationship between FDI, private and public domestic investment. The impulse response function traces the effect of a one-time shock to one of the innovations on current and future values of endogenous variables. Figure 1 presents impulse responses to a shock in FDI.

The accumulated impulse responses are plotted in Figure 1 and the dynamic responses are obtained from a time interval with ten periods. The main findings could be summarized as follows:

- I. There is no significant long-run linkage among private domestic investment, public domestic investment and FDI.
- II. Impulse response analysis reveal significant response of FDI to shocks in private and public investments, but the response is negative for private investment and positive for public investment.
- III. The response of public and private investment to a shock in FDI is reveal to be positive and significant in the short run. This finding is consistent with that of Jansen (1995) for Thailand and for Hungary and Czech Republic (see Misun and Tomsik, 2002).
- IV. The response of public investment to a shock in private investment is negative and significant for the first three periods. On the other hand, the response of private investment to a shock in public investment is positive and as well significant. The latter result thus conform to the existing literature which suggest that efficient infrastructure in terms of public investment in basic infrastructure, such as roads, ports and telecommunications may contribute to private sector investments. This therefore, is an indication that an effective and efficient allocation of public resource is a significant means of promoting domestic private investment in Nigeria.

4.2.4 Impulse-Response Functions

Figure 1: Impulse Response Functions



5. Summary and Conclusions

African nations and specifically, Nigeria attach significant importance to foreign direct investment. Hence, an indispensable channel of the effects of FDI on development in the host economies is no doubt through the interactions between FDI and domestic public and private investment. This study therefore, seeks to provide evidence on these linkages to maximize the benefits of FDI. The findings of the paper have important policy implications on how to explore the benefit of FDI while giving due attention to the performance of both the private and public domestic investment. To this end, the study has investigated the relationships between FDI, private investment and public investment in Nigeria between the periods 1981-2012 using a multivariate VAR model. The paper pointedly suggests that, there is no long-run relationship between FDI, public and private investment. In other word, we find no interaction among public, private and foreign investments in the long

run. The absence of long run relationship between the concern different types of investment in the context of this study thus implies that, more and deeper actions are required to improve the investment climate in Nigeria.

The hostile nature of most African countries (Nigeria inclusive) that often result from political, religious and ethnic difference might as well be responsible for the inability of FDI to positively boost domestic investment in Nigeria. In addition, the inadequate public infrastructure in terms of public investment, high inflation, fiscal deficiencies with macroeconomic instability in Nigeria are vices necessarily responsible for the poor interaction among different types of investment as found in this study. To attract and maximize gains from FDI in Nigeria would among other things require measures that can make the environment conducive for the domestic investment to thrive. This would expectedly attract investors from other part of the world and thus a necessity for establishing a meaningful and gainful interaction between the domestic and foreign investment in the long-run.

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References

Adelegan, J.O. 2000. "Foreign Direct Investment and Economic Growth in Nigeria: A Seemingly Unrelated Model", *African Review of Money, Finance and Banking, Supplementary Issue of Savings and*

Development, Milan, Italy, pp: 5-25.

Agosin, M. and R. Machado. 2005. "Foreign Investment in Developing Countries: Does It Crowd in Domestic Investment?", *Oxford Development Studies* 33(2): 149-162.

Agosin, M. R and M. Ricardo. 2000. "Foreign Investment in Developing Countries: Does it Crowd-in Domestic Investment?" UNCTAD Discussion Paper, No: 146, Geneva: UNCTAD

Akinlo, A. E. 2004. "Foreign direct investment and growth in Nigeria: An empirical investigation", *Journal of Policy Modeling*, 26: 627-639.

Alfaro, L. A., S. K. Chanda and S. Sayek. 2004. "FDI and economic growth: The role of local

Financial Markets", *J. Inter. Econ.*, 64(1): 89-112.

Aluko, S.A. 1961. "Financing Economic Development in Nigeria", *Nigerian J. Econ. Soc. Stud.*, 3(1): 39-67.

Ang, J.B. 2009. Determinants of Foreign Direct Investment in Malaysia. *Journal of Policy Modeling* 30: 185-189.

Anyanwu, J.C. 1998. "An Econometric Investigation of Determinants of Foreign Direct Investment in Nigeria", In *Investment in the Growth Process: Proceedings of the Nigerian Economic Society Conference*, Ibadan, Nigeria, pp: 219-240.

Apergis, N., Katrakilidis C.P. & N.M. Tabakis 2006. Dynamic Linkages between FDI Inflows and Domestic Investment: A Panel Cointegration Approach. *Atlantic Economic Journal* 34:385-394

Ariyo, A. 1998. "Investment and Nigeria's Economic Growth", In *Investment in the Growth Process*:

Proceedings of the Nigerian Economic Society Conference, Ibadan, Nigeria, pp: 329-349.

Ayanwale, A.B. and A.S. Bamire. 2001. "The influence of FDI on firm level productivity of Nigeria's Agro-Allied sector", Final Report Presented to the African Economic Research Consortium, Nairobi.

Ayanwale, A.B. 2007. "FDI and Economic Growth: Evidence from Nigeria", AERC Research Paper 165,

African Economic Research Consortium, Nairobi.

Brown, C.V. 1962. "External Economies and Economic Development", Nigerian J. Econ. Soc. Stud., 4(1): 16-22.

Borensztein, E., J. De Gregorio and J.W. Lee. 1998. "How Does Foreign Investment Affect Growth?" Journal of International Economics 45 (1): 115-135.

Cardoso, E. and Dornbusch R. 1989. "Foreign Private Capital Flows", Handbook of Development Economics, in Hollis Chenery and T.N. Srivasan (ed.), Handbook of Development Economics, edition 1, volume 2, chapter 26, pages 1387-143.

Chenery, H.B. and A. Stout. 1966. "Foreign Assistance and Economic Development", American Econ. Rev., 55: 679-733.

De Mello, L.R. 1997. "Foreign Direct Investment in Developing Countries and Growth: A Selective Survey", J. Dev. Stud., 34: 1-34.

De Mello, L. 1999. "Foreign Direct Investment Led Growth: Evidence From Time Series and Panel Data", Oxford Economic Papers 51: 133-151.

Edozien, E.G. 1968. "Linkages Between Direct Foreign Investment and Nigeria's Economic Development", Nigerian J. Econ. Soc. Stud., 10(2): 119-203.

Ekpo, A.H. 1995. "Foreign Direct Investment: Evidence From Time Series Data", CBN Econ. Financial Rev., 35(1): 59-78.

Enders, W. 1995. "Applied Econometric Time Series", New York: John Wiley and Sons Inc.

Engle, R. F. and W. J. Granger. 1987. "Co-integration and Error Correction: Representation, Estimation and Testing", *Econometrica*, 55, issue 2, p. 251-76, <http://econpapers.repec.org/RePEc:ecm:emetrp:v:55:y:1987:i:2:p:251-76>

Eroglu, O. and J. Hudson. 1997. "The Effects of Foreign Capital İnflows in Turkey", *Hacettepe University Journal of Economics and Administrative Sciences* 15 (1).

Guven, S. 2001. "Sermaye Hareketlerinin Nedenleri, Etkileri ve Türkiye Örneği", *İktisat, İşletme ve Finans Dergisi*, 16 (185), ss. 79-98.

Hayami, Y. 2001. "Development Economics: From the Poverty to the Wealth of Nations",

Oxford University Press, 2001.

Hecht, Y., Razin, A. and Shinar, N.G. (2004). Interaction between Capital İnflows and Domestic Investment: Israel and Developing Economies. *Israel Economic Review*, 2(2), pp. 1-14.

Hooi H. and Bee W.T. 2011. Linkages between Foreign Direct Investment and Economic Growth in Malaysia; *Journal of Economic Cooperation and Development*, Vol. 32(4), pp 75-96.

Insel, A. and N. Sungur. 2003. "Effect of Capital Flows on Basic Macroeconomic Indicators: Evidence from Turkey", 1989 III-1999. <http://www.tek.org.tr/toplanti/php>

Jansen, K. 1995. "The Macroeconomic Effects of Direct Foreign Direct Investment: The Case of Thailand", *World Development*, 23, 193-210.

Kar, M. and M. A. Kara. 2005. Yabancı Sermaye Çeşitlerinin Yatırımlar ve Tasarruflar Üzerine Etkilerinin Ekonometrik Analizi", *Journal of Economics, Business and Finance*, 20 (228): 93-108.

Kumari .N. 2013. A Study of FDI in India: *Journal of Economic and Sustainable Development*, Vol. 4(3), pp. 25-40.

Lipsey, R.E. 2002. "Home and host country effects of FDI", NBER working paper: 9293.

Merican, Y. 2009. Foreign Direct Investment and Growth in ASEAN-4 Nations. *International Journal of Business and Management*, 4(5), pp. 46-61.

Ndikumana, L. and S. Verick. 2008. "The Linkages between FDI and Domestic Investment: Unravelling the Developmental Impact of Foreign Investment in Sub-Saharan Africa", *Development Policy Review* 26(6): 713-726.

Obinna, O.E. 1983. "Diversification of Nigeria's External Finances through Strategic Foreign Direct Investment", *Nigerian Economic Society, Annual Conference Proceedings*, JOS, 13-16th May.

Odozi, V.A. 1995. "An overview of foreign investment in Nigeria 1960-1995", *Occasional Paper No. 11*

Research Department, Central Bank of Nigeria.

Oseghale, B. D. and E. E. Amonkhienan. 1987. "Foreign debt, oil export, direct foreign investment (1960-1984)", *Nigerian J. Econ. Soc. Stud.*, 29(3): 359-380.

Oyinlola, O. 1995. "External Capital and Economic Development in Nigeria (1970-1991)", *Nigerian J. Econ. Soc. Stud.*, 37(2-3): 205-222.

Richard .J.H., V.R. Leo and C.S.V. Ryan. 2014. Poland 2014: Twenty Five Years of Transistion: Is Poland Now a Normal Country?: *Global Journal of Human-Social Science: E Economics*; Vol.14(1), pp. 1-8.

Rishikesh, K (2014), FDI in India. Retrieved from: http://en.Wikipedia.org/wiki/Foreign_direct_investment

Saglam B. B. and A. Y. Yalta. 2011. "Dynamic Linkages Among Foreign Direct Investment, Public Investment and Private Investment: Evidence From Turkey", *Applied Econometrics and International Development* Vol. 11-2: 71-82.

Sun, H. 1998. "Macroeconomic Impact of Direct Foreign Investment in China: 1979-1996", *The World Economy*, 21 (5):675-94.

Todaro, M. P. and S.C. Stephen. 2003. "*Economic Development*". Pearson Education Limited.

Trans Trong H. (2005) impact of FDI on Poverty Reduction In Vietnam: IDS GRIPS.

World Bank. 2009. "Global Economic Prospects and the Developing Countries, Investing to Unlock Opportunities", Washington D.C.

Rebalancing Exports through Expansions in Intra-ASEAN Trade? Insights from Gravity Panel Estimates

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This paper examines the impact of common economic factors on intra-ASEAN bilateral exports through estimations of panel data using a gravity model. In particular, the paper compares the determinants of two-way bilateral exports within the pioneer ASEAN member economies from that of the pioneer-newer ASEAN economies, to provide insights on the specific channels and trading relationships relevant for boosting intra-regional exports. The gravity estimates imply the importance of the overall size effects and similarities in size between the pioneer-newer ASEAN partnerships for export expansions, and also for trade in agriculture and manufactures. These channels however do not bolster exports amongst the pioneer ASEAN economies. The empirical findings therefore add weight to the observation that strategic partnerships are necessary within the region to bolster intra-regional exports through the level and relative size effects. We therefore posit that any rebalancing strategy to increase intra-regional exports should move beyond the focus on the pioneer ASEAN members per se, to foment greater trade cooperation between the pioneer and newer ASEAN economies.

1. Introduction

Of the total USD2.1 trillion total trade in 2010, only 25 per cent of it was represented by trade amongst ASEAN (Association of Southeast Asian Nations) members (The Star, 17 October 2011). The extent of intra-ASEAN trade pales in comparison with the levels of intra-regional trade in the North American Free Trade Area (NAFTA) and the

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European Union (EU) at approximately 50 per cent and 60 per cent respectively. The level of intra-ASEAN trade is obviously unsatisfactory, especially if the grouping wants to evolve into an economic community⁴ (Aggarwal and Chow, 2010). With the current low level of intra-regional trade, it also seems not conceivable for ASEAN to rebalance its export strategy⁵ towards a regional focus to cushion export contractions, following the slowdown in external demand.

It is widely acknowledged that intra-ASEAN trade has somewhat reached a plateau as it has remained fairly constant since the 1997 financial crisis (see also Thornton and Goglio, 2002; Sally and Sen, 2005; Ravenhill, 2008; Aggarwal and Chow, 2010; Bhattarchayay, 2010; OECD, 2010), despite the formation of the ASEAN Free Trade Area (AFTA)⁶ in 1992 (Sharma and Chua, 2000) and the subsequent dismantling of tariffs. Various reasons have been offered for the limited intra-regional trade, such as the small domestic market, few economic complementarities between member economies and the global orientation in trade (Sharma and Chua, 2000; Plummer and Jones, 2006; Angresano, 2006; Plummer, 2009). This calls into question the viability of expanding intra-ASEAN exports to compensate for the weakening global demand, as policymakers recently underscore the importance of strengthening intra-regional trade in light of the global financial crisis. This paper therefore attempts to answer the following question: In what way can intra-regional exports be bolstered? More specifically, through what channels and which strategic partnerships can there be expansions in intra-ASEAN exports? This paper can be differentiated from previous studies in that the focus has largely been on the ASEAN5 setting and the implications of AFTA on ASEAN trade flows (Plummer, 1997; Sharma and Chua, 2000; Elliott and Ikemoto, 2004; Sudsawasd and Mongsawad, 2007; Jayanthakumaran and Verma, 2008; Nguyen, 2009; Siah *et al.*, 2009). This paper, whilst focusing on ASEAN, further

4 ASEAN established the ASEAN Economic Community (AEC) with the 2003 Bali Concord II to create a single market and production base for a free movement of goods, services, investment and skilled labour by the year 2020 (now to fast-track the establishment of the AEC by 2015).

5 Export rebalancing policy was proposed to deter external risks (Tantisantiwong, 2010) following the global financial crisis, as demand from advanced economies for ASEAN exports, particularly from Singapore, Malaysia, Thailand and Cambodia, decelerated. It should be noted here that the rebalancing strategy does not refer to just increasing intra-regional trade, but to also promote trade diversification through both products and markets. Only the former is given due attention in this paper.

6 The trade creating effects of AFTA however remains mixed at best. For example, Elliott and Ikemoto (2004) and Nguyen (2009) find significant trade creation among members following the formation of AFTA.

distinguishes intra-ASEAN trade into two-way export flows within the pioneer/ founder economies (herein ASEAN5, comprising Malaysia, Singapore, Thailand, the Philippines and Indonesia) from that of pioneer-newer ASEAN members (herein ASEAN*, where the newer⁷ member economies refer to Brunei, Cambodia, Laos, Myanmar and Vietnam). It is worth mentioning here that ASEAN* does not include two-way trade between the newer economies.

In view of the above, this paper takes stock of the regional bias and trade structure of the various trading relationships within ASEAN5 and ASEAN* and subsequently identifies the main determinants of export flows within both groups. Guided by new trade theories (NTT), the paper employs an extended gravity model to compare the sources of bilateral trade flows for ASEAN5 and ASEAN* utilizing recent data for the period 1990-2010. The findings of the paper will forward our understanding on the reality of enhancing intra-regional exports.

2. Regional Bias and Trade Structure

To obtain a more useful measure of trade concentration in the region, intra-regional trade shares (export, imports and total trade) as a proportion of its world trade is calculated for ASEAN and individual ASEAN economies in Tables 1a and 1b respectively.

The regional trade bias for ASEAN has increased from 19 per cent to 25 per cent between 1990 and 2010 (Table 1a). Clearly, ASEAN accounts for its lion's share of its trade with the outside world. The regional bias is found to be marginally higher from the export perspective vis-à-vis the import side. The same can be said for both the sub-samples of ASEAN5 and ASEAN*. From the export perspective, the regional bias for ASEAN is higher for trade in manufactures relative to agriculture. Similar trends prevail when the regional bias is considered for the ASEAN5. This is however not the case for ASEAN*, as the regional bias is higher for agriculture products relative to manufactures, from both the export and import perspectives.

From Table 1a, it is also noted that trade between the pioneer ASEAN economies (ASEAN5) form the bulk of intra-regional trade flows (see

⁷ Brunei joined the ASEAN in 1984, whilst Cambodia, Laos, Myanmar and Vietnam (CLMV) made ASEAN10 in the 1990s.

also Ravenhill, 2008). Though the bilateral pioneer-newer ASEAN economies (ASEAN*) partnerships are relatively weak, their contribution to intra-ASEAN trade has grown over the years, particularly from the export perspective for trade in agricultural products. The low and increasing levels of intra-regional trade between the pioneer and newer ASEAN may well reflect unexplored trade opportunities.

Further, Table 1b examines the regional bias of individual ASEAN economies. From Table 1b, we can infer that the importance assigned by the pioneer members to ASEAN as an export market does not vary much. Approximately one-fourth of the ASEAN5 economies' trade is with the region, based on the 2000 statistics. Singapore, more specifically, records the highest regional export bias given that it engages in intra-regional entreport trade (Plummer, 2009) and its role as the regional center of cross-border production networks (Athukorala, 2008). Conversely, the asymmetry in intra-regional trade is much sharper between the newer member economies. Intra-regional bias is supposedly highest for Laos (not shown in Table 1b due to limited data) and Myanmar, whilst Cambodia and Vietnam remain far more integrated with the world economy than the former.

Apart from the regional bias, the trade structure of the bilateral ASEAN flows is also examined. Tables 2a and 2b report the calculated Grubel-Lloyd (GL, 1975) index⁸ for the various trading relationships within ASEAN5 and ASEAN* to capture the extent of intra-industry trade (IIT)⁹. It is widely known that trade flows within ASEAN5 are largely dominated by IIT (more specifically parts and components, see Athukorala, 2008; Athukorala and Hill, 2010; Jongwanich, 2010), particularly for manufactures within the electrical and electronics (E&E) sub-sector. In fact, the E&E industry, which has established a dense production network, has become a leading force of economic integration in the region (Kuroiwa, 2009). This leads to strong spatial linkages between the pioneer economies, particularly between Malaysia-

8 The GL indices at the 5-digit SITC level are aggregated across the agricultural (SITC 0-4) and manufacturing (SITC 5-8) sectors, taking into account their different weights. The weighted average GL index is given as:

$AGL_i = [\sum(X_i + M_i) - \sum|X_i - M_i|] / \sum(X_i + M_i)$ where i = particular industry at the 5-digit level.

9 The case whereby a country's exports and imports share a single industry classification dominates. In the case of ASEAN, the high IIT levels do not reflect product differentiation, but production sharing within the same industry.

Singapore, Malaysia-Thailand and Singapore-Thailand. Comparatively, trade in agriculture is largely of the inter-industry (IT) type.

More recently, regional production networks have begun to expand to the newer member economies, particularly Vietnam (see also Hew *et al.*, 2009). This explains the higher GL indices between the pioneer ASEAN economies and Vietnam relative to that between the former and other newer member economies (see Table 2b). However, the GL indices for the bilateral trading relationships between the pioneer and newer economies (Table 2b) remain far much lower than that for pioneer-pioneer trade (Table 2a).

The differences in the trade structure between Table 2a (ASEAN5) and Table 2b (ASEAN*) suggest that IIT dominates in trade of the former whilst the latter bilateral country-pairs are engaged more in trade of the IT type. It seems that production networks are regionalized only within the pioneer economies in comparison with newer economies. Thus the two different sub-samples, ASEAN5 and ASEAN*, appear to be somewhat stratified according to their regional bias and trade structure. The differences in the trading patterns between both samples further justify the empirical investigations of this paper.

3. Methodology and Data

3.1 Model Specification and Theoretical Underpinnings

This paper employs the extended gravity model, developed by Chengang *et al.* (2010) based on Egger (2000), Baltagi *et al.* (2003) and Peridy (2006), to investigate the influence of common economic factors on intra-ASEAN trade. Using a panel data¹⁰ framework, the equation is specified as follows:

$$\ln X_{ijt} = \beta_1 \ln GDPT_{ijt} + \beta_2 \ln SIMGDP_{ijt} + \beta_3 \ln GD_{ij} + \beta_4 \ln FDST_{ijt} + \beta_5 \ln SIMFDS_{ijt} + \beta_6 \ln RLFAC_{ijt} + \zeta_t + \varepsilon_{ijt} \quad (1)$$

10 Other studies that have applied the panel framework in the estimation of a gravity equation include Egger and Pfaffermayr (2003), Rose (2004) and Chengang *et al.* (2010).

$$\ln TRADE_{ijt} = \beta_1 \ln GDPT_{ijt} + \beta_2 SIMGDP_{ijt} + \beta_3 \ln GD_{ij} + \beta_4 \ln FDST_{ijt} + \beta_5 SIMFDS_{ijt} + \beta_6 RLFAC_{ijt} + \zeta_t + \varepsilon_{ijt} \quad (2)$$

where X_{ijt} is country i 's (reporter) exports to country j (partner) in year t . X_{ijt} is used interchangeable with $TRADE_{ijt}$, which represents total trade (summation of exports and imports) of country i to country j . The other variables are as defined below.

$GDPT$ = total GDP of countries i and j

$SIMGDP$ = similarity in the levels of GDP in i and j

GD = geographical distance between i and j

$FDST$ = total inward FDI stock of i and j

$SIMFDS$ = similarity in inward FDI stocks in i and j

$RLFAC$ = relative factor endowments in i and j

In equations (1) and (2), β 's represent the coefficient estimates, ζ_t is time effects and ε_{ijt} is a white-noise disturbance term.

The above equation follows from a standard gravity model comprising gross domestic product (GDP) and geographical distance (GD) between countries, augmented with the stocks of inward foreign direct investment (FDS) and relative factor endowments ($RLFAC$) on the basis that the latter two variables are closely related to a country's trade capabilities and transaction costs respectively. The following explains the theories that underlie the selection of the explanatory variables in equations (1) and (2), beginning with the core variables of the gravity model.

The level of GDP of both reporter and partner countries are supposed to positively affect their trade. Instead of using the levels of GDP of both countries independently, the total GDP of both partners, $GDPT$, is included in the estimations to jointly capture economies of scale or the size effect (and production capacity). The higher the $GDPT$, the larger

the trade flows, given that a greater division of labour and specialization becomes feasible under a larger scale of operation.

However, Baltagi *et al.* (2003) and Chengang *et al.* (2010) argue that the level of GDP alone may not be sufficient to explain trade as the relative size of the two trading partners GDPs are of no less importance. From a theoretical perspective, similarity in the level of GDP (*SIMGDP*) is most likely to increase trade either through the expansions in trade in manufactures or the increase in scope for product diversity. In short, the more similar the two countries are in terms of GDP, the higher the share of IIT.

The next core argument of the gravity model is the *GD* variable. *GD* remains important for considerations of transport costs (Egger, 2000), transaction costs (Bergstrand, 1985; Edmonds *et al.*, 2008) and timeliness in delivery (see also Rojid, 2006), and is included in our model. . Accordingly, the variable *GD* is expected to carry a negative sign, that is, $\beta_3 < 0$ (Tinbergen, 1962; Poyhonen, 1963).

As explained by Chengang *et al.* (2010) and others, foreign direct investment (FDI) contributes to intra-firm trade through global production networks and the increase in product variety in the host economy. This in turn increases the volume of trade, mainly through IIT. However, if FDI and trade are substitutes, for example if FDI is mainly channeled into domestic production of the host economy, then, it does not necessarily contribute to expansions in exports. As such, the relationship between *FDST* and international trade remains inconclusive and has to be investigated empirically.

The distribution of *FDS* amongst trade partners is also considered important for international trade. If the size of *FDS* is similar between trade partners, one may expect similar volumes and varieties of bilateral exports from the partner countries. Following which, the import capabilities of both partner countries are also likely to be similar, leading to expansions in bilateral trade. Conversely, if the size of *FDS* is uneven between trade partners, the country with a smaller stock, offers less export capabilities and likewise smaller import capabilities, resulting in lower expansions in bilateral trade. Based on this reasoning, one may predict a positive relationship is envisaged between *SIMFDS* and exports.

Differences in factor endowments or factor intensity (capital-labour ratio or K/L) do matter for international trade (see Bergstrand, 1990; Frankel *et al.*, 1995; Baltagi *et al.*, 2003; Debaere, 2003; Ghosh and Yamarik, 2005; Chan-Hyun, 2005; Baxter and Kouparitsas, 2006; Cieslik, 2009). Traditional neoclassical trade theories suggest that comparative advantages based on differences in factor endowments explain basically IT. Alternatively, NTT based on economies of scale and product differentiation attribute similarities in factor endowments to trade expansions through IIT. Thus, the differences and similarities of factor endowments (apart from *SIMGDP*) are closely linked to the structure of trade. If the structure of trade is IT-based, differences in relative factor endowments will most likely facilitate trade expansion vis-à-vis similarities in factor endowments. In this respect, the expected sign for β_6 will be positive (negative) if IT (IIT) dominates. Nevertheless, caution should be drawn in interpreting the signs of the β_6 coefficient as vertical IIT (VIIT) characterizes much of the nature of ASEAN intra-regional trade and differences in factor endowments (or comparative advantage) are still crucial in determining VIIT (Chan-Hyun, 2005).

3.2 Data Sources and Variable Construction

Our dataset includes two-way bilateral intra-ASEAN¹¹ (Singapore, Thailand, Philippines, Indonesia, Brunei, Cambodia, Laos, Myanmar and Vietnam) trade flows. The data span the period 1990-2010 (annual).

The primary data on export (X) and total trade ($TRADE$) flows based on the Harmonized System (HS) nomenclature is derived from the UN COMTRADE database. The data on GDP , labour force (L) and gross fixed capital formation ($GFCF$)¹² are sourced from the World Bank Development Indicators and Global Development Finance (online World dataBANK). The data on FDS is obtained from the online database of the United Nations Conference on Trade and Development (UNCTAD), which is UNCTADstat. Data for GD on the basis of the average distance

11 The bilateral trade pairs that have been excluded in the empirical estimations include the following due to lack of trade data: Philippines-Laos and trade between Laos (reporter) with the other 5 ASEAN partner countries.

12 Using the data on $GFCF$, capital stock (K) is estimated as follows (Miller and Upadhyay, 2000): $K_0 = GFCF_0 / [\lambda gd + (1 - \lambda)gw + \delta]$ where the initial or base year is 1970; gd is the average growth rate of the GDP series for the country in question for the period 1990-2010; gw is the estimated world growth rate at 2.95 per cent for the period 1990-2010; $\lambda = 0.25$, is a measure of mean reversion in growth rates and $\delta = 0.05$, is the assumed rate of depreciation. The estimated capital stock is $K_t = GFCF_t + (1 - \delta)K_{t-1}$

between the capitals for country-pairs are extracted from the CEPII database. The definition and measurement of the key variables used in regression analysis are summarized in Appendix Table 1.

The analysis is first conducted for the full sample of ASEAN and subsequently, for ASEAN5 and ASEAN*. The empirical estimations constitute a three-dimensional balanced panel of 2,730 observations (65 country-pairs x 2 product groups x 21 years; the cross-section dimension relates to the country-pair-product group) for ASEAN, and 840 observations (20 country-pairs x 2 product groups x 21 years) and 1,890 observations (45 country-pairs x 2 product groups x 21 years) for the sub-samples of ASEAN5 and ASEAN* respectively. For all three groups, ASEAN, ASEAN5 and ASEAN*, the analysis further distinguishes between the agriculture and industrial sectors respectively. The broad product groups¹³ in the cross-sectional dimension refer to the agriculture (HS01-HS24) and industrial/manufacturing (HS25-HS97) sectors.

4. Empirical Findings

Table 3 presents the results of the Random Effects (RE) models. The Breusch-Pagan (1980) Lagrange Multiplier (LM) test is employed to determine whether RE Generalized Least Squares (GLS) is appropriate and the simple pooling can be rejected. The LM statistics are overwhelmingly significant and support the appropriateness of the panel GLS model for all specifications.

The RE estimator is chosen for the following reasons, despite the fact that the Fixed Effects (FE) estimator is much more common in gravity models than the RE estimator (see Egger, 2000). The RE estimator has the advantage of not requiring the exclusion of variables that are time invariant. In this case, distance (*GD*) is invariant across time periods, and this variable is of considerable interest to this study. Furthermore, all of the variables exhibit more variation in the data across country-pair-product group (between variation) than over time (within variation). This is not surprising given the large number of cross-section entities (based on country-pair-product groups) used for the estimations, which

13 This level of aggregation would balance the issue of disaggregated versus aggregated analysis, in addition to reflecting the agriculture and industry based products. This level of aggregation also reduces the problem of a standard sample selection bias, as many more trade relationships on a product-specific level at HS2 are nonexistent. Instead at this level of aggregation, there are no observations with zero trade flows.

are believed to have some influence on bilateral exports. As such, a FE may not work well for data with minimal within variation or for variables that change slowly over time.

Since FDI and new growth theories predict that *GDPT* and *FDST* are likely to be endogenous, the Hausman and Taylor's estimator (henceforth HT, 1981) technique is also employed (see also Egger, 2000; Nguyen, 2009). Qualitatively, the HT results in Table 3 are similar to the RE estimates. Therefore the following discussion will focus mainly on the HT estimates. We have estimated the results in three contexts. First, we estimate the gravity model [equation (1)] for intra-ASEAN trade as the benchmark context. Next, we estimate the same specification for the sub-samples, ASEAN5 and ASEAN* respectively. Overall, the model passes the standard diagnostic tests and most of the regressors are found to be highly significant, indicating that the gravity model is appropriate and useful in explaining intra-ASEAN trade flows.

Focusing on the results in Table 3, we found that the combined total size of trading partners positively affects the volume of export activity only in the case of ASEAN*. (See Siah *et al.*, 2009, for negative estimates of size on intra-ASEAN5 trade). The estimated coefficient, β_1 , in the full sample and the ASEAN* goes beyond the normal range of 0.75-0.95, derived in various studies (Chan-Hyun, 2005). The coefficient of the product of GDPs is undeniably high, indicating that an increased size has a more than proportional effect on exports. One plausible reason why the increase in bilateral trade volume is more than proportionate to the increase in GDP is the smaller home-bias effect. The ASEAN local distribution network is widely acknowledged as being limited, given the small market base for final goods. From this, we can conjecture that pioneer-newer ASEAN trade flows comprise mostly that of quantity-based final products, as the newer member economies remain less integrated in the regional production networks, which are sensitive to overall market size.

Though FDI is an important priority in the ASEAN region, the coefficients for *FDST* are found to be generally negative and insignificant. This implies that the sum of FDI stocks between ASEAN partner countries do not promote bilateral exports, as foreign capital (efficiency-seeking or "network-forming-type FDI", Kimura, 2008) has

been a key factor in driving extra-regional (through intermediate trade) relative to intra-regional exports. In fact, intra-regional intermediate remained almost unchanged relative to intermediate trade with the other East Asian economies (OECD, 2010). Plummer (2009) further argues that to the extent that FDI is involved in the fragmented production chain across countries in the region, a successful policy of increasing FDI inflows could lead to a decrease in intra-regional trade shares, if ASEAN value-added in the production chain is low. We further note that the magnitude of the coefficients for *FDST* are larger for ASEAN* relative to ASEAN5. A plausible explanation for this is that there could be some substitution effects taking place in the newer member economies, since the limited foreign capital in these economies are more likely be channeled into domestic production. One example of this is Laos, where extractive industries, such as gold and copper, have been attractive to foreign investors. Another case is Vietnam in the initial stages of liberalization (prior to the late 1990s), where FDI was heavily concentrated in domestic-market-oriented-capital-intensive industries such as chemicals and automotives. Interestingly, there is also no significant relationship between *SIMFDS* and exports. Though the pioneer member economies, in particular, have already accumulated an almost equal abundance of capital¹⁴, this again does not favour intra-regional trade. The results of *FDST* and *SIMFDT* clearly show that foreign capital has no bias towards the regional market.

Geographical distance is found to be a resistance factor for intra-ASEAN trade, where the absolute estimate on distance is larger for ASEAN* than the one in the ASEAN5 context. A possible reason is the weak trade connectivity and trade facilitation in the newer member economies (particularly Cambodia, Laos and Myanmar). From this point, we can infer that distance becomes a more important impediment to two-way export flows between the pioneer and newer member economies than between the pioneer economies.

More importantly, is the trade impact of *SIMGDP* and *RLFAC*, which explains the underlying trade structure. We find that if a pioneer

14 For example, Singapore, Malaysia, Thailand and Indonesia are amongst the eight largest developing country recipients of FDI (Athukorala and Hill, 2010; see also Plummer 2009). CLMV only accounts for about 9 per cent of total FDI inflows to ASEAN. Singapore also dominates as a source of intra-regional FDI (accounting for one-third of intra-ASEAN FDI), which is largely concentrated in Malaysia and Thailand (Plummer, 2009).

ASEAN country is similar in size with another pioneer trading partner, there is a decline in exports, whilst the opposite holds when the trading partner is a newer counterpart. The significant negative impact of *RLFAC* on ASEAN* exports imply that export volumes are smaller the more dissimilar the pioneer-newer economies are in terms of *RLFAC*. Contrary to expectations, the results suggest that IIT dominates in pioneer-newer ASEAN trade. At this juncture, we will not draw any strong conclusions from this result based on total exports.

The estimations are conducted using trade as a dependent variable [equation (2)], instead of exports (see panel two of Table 3). The results are found to be remarkably robust in terms of the signs and significance of the coefficient estimates. More importantly, the estimates are further conducted by distinguishing between the agriculture and manufacturing sectors respectively. It is important to distinguish both sectors for the following reasons: IIT dominates trade in manufactures; and the newer economies are largely agrarian based (though there is a structural shift in some economies towards manufacturing). The panel gravity estimates for agriculture and manufactures are presented in Tables 4 and 5 respectively.

Again, size effects and similarities in GDP are clearly found to be positive and significant for export expansions in manufactures and agriculture for ASEAN* trading relationships only. Conversely, similarities in GDP incur a negative impact on intra-ASEAN5 exports in manufactures.

The significant negative results for total inward FDI stock as found for total export flows in Table 3, remain for exports in manufactures and agriculture for ASEAN*, and for exports in agriculture for ASEAN5. The reason why *FDST* does not significantly influence exports of manufactures for ASEAN5 is reflective of the fact that manufactures in the pioneer economies remain the single most important sector for most major sources of FDI. Similar sizes of FDS have however decreased exports of agriculture products between pioneer ASEAN economies, but do not matter for the ASEAN* exports.

Surprisingly though, *RLFAC* has a negative impact on exports of agriculture in ASEAN*, consistent with the findings on total trade in Table 3. The positive sign on the coefficient estimates of *RLFAC* for

ASEAN5 should not be misinterpreted to reflect IT type of trade, but is probably best explained by the VIIT type of trade based on comparative advantages. Finally, distance is found to be a deterrent for exports in manufactures in ASEAN* and exports of agriculture in ASEAN5.

Peculiar to the pioneer-newer trading relationships, the gravity estimates clearly imply the importance of the size effect (see also Sharma and Chua, 2000; Siah *et al.*, 2009; Nguyen, 2009), similarities in GDP and similarities in relative factor endowments (mainly for agriculture products) as drivers of export flows between pioneer and newer ASEAN economies.

5. Binding Trade between Pioneer and Newer ASEAN Economies

Many challenges prevail in binding trade between the ASEAN member economies, specifically between the pioneer and newer members. The following briefly elucidates some of the major issues in fomenting trade cooperation.

Since market size and similarities in GDP are found to be significant for bolstering exports between the pioneer and newer ASEAN economies based on the empirical findings, it becomes even more imperative to enlarge regional markets and address the development divide or economic asymmetries between both groups. What remains baffling is that individual members persist in moving forward on their own by negotiating nearly 60 agreements, with Singapore taking the lead (Dent, 2006; Sudsawasd and Mongsawad, 2007; Aggarwal and Chow, 2010; OECD, 2010). This has clearly undermined or rather shifted the trade integration efforts away from the partnerships between the pioneer and newer member economies (see also Sally and Sen, 2005). Though strategic partnerships outside the region are important to intensify ASEAN's trade networks, strategic partnerships within the region should likewise be intensified and not be compromised with the pursuit of the former. In this context, the pioneer member states should make substantial contributions to addressing the development divide within ASEAN.

Physical connectivity is also critical to the wider objective of reducing the development gap between the pioneer and newer members for rebalancing ASEAN growth towards increased intra-regional trade and

regional demand (Bhattacharyay, 2010). Improving logistics mainly through land transport, can enlarge regional markets and establish new regional supply chains by allowing firms to move further inland in response to congestion along coastal areas. Despite the various regional initiatives¹⁵ for infrastructural development, these initiatives are met with challenges that take several forms, such as geographical diversity, differing technical capacities, asymmetric regional distribution of projects costs and benefits, weak legal and regulatory environment and the lack of effective governance and coordination. Therefore, transport infrastructure still remains less developed in Cambodia, Laos and Myanmar relative to the pioneer economies (OECD, 2010). For example, Laos, as a land-locked economy, is most costly in trading across borders.

In the context of pioneer-new ASEAN trade, intensification of trade networks also depend on the dismantling of non-tariff barriers (NTBs)¹⁶ (see also Ravenhill, 2008) particularly in the priority goods sectors, such as the sanitary and phytosanitary measures for agro-based products and fisheries, safety and other technical measures for rubber-based products and security and environmental measures for wood-based products. Based on the OECD (2010) report, it is estimated that NTMs could be binding constraints to the expansion of intra-regional trade as they could raise import prices significantly.

Finally, there should be a political willingness within the various stakeholders, governments and businesses, to drive intra-regional exports. Enhancing regional connectivity, particularly physical connectivity, requires strong commitment and partnerships among the ASEAN governments to give due attention to ASEAN-level initiatives. Further, businesses have also a critical role to play, as it is business that must drive economic integration. At present, there is little business pressure to promote intra-regional trade (Ravenhill, 2008) and intra-regional investment. This is also eluded too in the empirical findings where the total FDI stock in the ASEAN partner countries does not

15 Infrastructure development in ASEAN is currently being pursued through sub-regional infrastructure cooperation programmes, namely the Greater Mekong Sub-Region (GMS), the Brunei-Indonesia-Malaysia-Philippine East Asia Growth Area (BIMP-EAGA) and the Indonesia-Malaysia-Thailand Growth Triangle (IMT-GT), and some long-term cross-border flagship projects in energy and transport.

16 Under the AEC, 5 ASEAN countries (Malaysia, Singapore, Thailand, Indonesia and Brunei) will eliminate NTBs by 2010, the Philippines by 2012, and 4 ASEAN countries (Cambodia, Laos, Myanmar and Vietnam) by 2015 (by 2018 for certain sensitive items).

appear to generate exports between the ASEAN member economies, mainly because of the low intra-regional FDI flows of about 14 per cent of the total (Plummer, 2009). The primary concern of subsidiaries of foreign corporations is with the extra-ASEAN dimensions of trade. It is acknowledged that “ASEAN as an economic bloc is still not in the minds of many CEOs,” despite that there is still much potential to be tapped (The Edge Malaysia, 24 October 2011). The recently launched ASEAN Business Club (ABC), helmed by an advisory council comprising 10 representatives from ASEAN5, is seen as promising platform for business leaders to network, collaborate and play a leading role in the process of ASEAN economic integration.

6. Concluding Remarks

The empirical results indicate that the gravity model is appropriate in explaining intra-ASEAN trade flows. Overall size effects and similarities in size and similarities in factor endowments (i.e. similarities in preferences) are all found to have a significant favourable influence on two-way flows for pioneer-newer ASEAN exports. Interestingly, overall size effects and similarities in size are found to be export enhancing only in the case of pioneer-newer ASEAN partnerships, and not for pioneer-pioneer trade. It can be argued that the newer member States are small (from an economic perspective) and access to larger markets with the pioneer economies is important to reap the potentials from economies of scale relative to the pioneer-pioneer partnerships. The empirical findings therefore add weight to the observation that strategic partnerships are necessary within the region to bolster intra-regional exports through the level and relative size effects.

This paper though does not argue for an export rebalancing strategy through greater regional integration (i.e. we are clearly not in favour of a regionally closed system), instead it emphasizes that greater intra-regional trade is at best plausible if the regional scope of ASEAN trade integration is broadened. In short, trading relationships in ASEAN can no longer be focused on or dominated by the ASEAN5, but instead should be more inclusive to foment deeper trade cooperation between the pioneer and newer member economies. New economic opportunities based on complementarity trade may emerge if such patterns of bilateral trade between strategic trading partnerships, namely between pioneer and newer member economies, evolve consistently with their changing

comparative advantages. For example, regional supply chains can be established by combining rubber plantation in the newer ASEAN member countries (Cambodia, Laos, Myanmar and Vietnam, CLMV) with the promotion of natural rubber products in the pioneer economies. Likewise, the wood-based products supply network can be established regionally through forest plantation, wood processing and furniture manufacturing. Alternatively, the newer economies can plug into the existing production networks in neighbouring countries, for example Laos-Malaysia and Myanmar-Thailand (Kuroiwa, 2009). The pioneer ASEAN member economies should assume the role of a “core” and deploy the existing vertical production networks to the “periphery” of the newer economies.

In this context, efforts should be strengthened to close the developmental divide and reduce transaction costs to enlarge markets and facilitate trade between the pioneer and newer member economies. This final recommendation, which is the strengthening of supply-side factors, may not be different from those of others; nonetheless, it is one of the policy recommendations that should be given further emphasis.

References

Aggarwal, V.K. and Chow, J.T. (2010), "The Perils of Consensus: How ASEAN's Meta-Regime Undermines Economic and Environmental Cooperation," *Review of International Political Economy*, 17(2), 262-290.

Angresano, J. (2006), "ASEAN+3: Is An Economic Community in their Future?" in Michael G. Plummer and Erik Jones eds., *International Economic Integration and Asia*, Singapore: World Scientific Publishing Co Pte. Ltd., pp. 97-134.

Athukorala, P.C. (2008), "Singapore and ASEAN in the New Regional Division of Labor," *Singapore Economic Review*, 53(3), 479-508.

Baltagi, B.H., Egger, P. and Pfaffermayr, M. (2003), "A Generalized Design for Bilateral Trade Flow Models," *Economics Letters*, 80(3), 391-397.

Baxter, M. and Kouparitsas, M.A. (2006), "What Determines Bilateral Trade Flows?" NBER Working Paper No.12188, Cambridge Massachusetts: National Bureau of Economic Research.

Bergstrand, J.H. (1985), "The Gravity Equation in International Trade: Some Microeconomic Foundations and Empirical Evidence," *Review of Economics and Statistics*, 67(3), 474-81.

Bergstrand, J.H. (1990), "The Hecksher-Ohlin-Samuelson Model, the Linder Hypothesis and the Determinants of Bilateral Intra-Industry Trade," *Economic Journal*, 100(403), 1216-1229.

Bhattacharyay, B.N. (2010), "Infrastructure for ASEAN Connectivity and Integration," *ASEAN Economic Bulletin*, 27(2), 200-220.

Chan-Hyun S. (2005), "Does the Gravity Model Explain South Korea's Trade Flows," *Japanese Economic Review*, 56(4), 417-430.

Chengang, W., Yimgqi, W. and Xiaming, L. (2010), "Determinants of Bilateral Trade Flows in OECD Countries: Evidence from Gravity Panel Data Models," *World Economy*, 33(7), 894-915.

Cieslik, A. (2009), "Bilateral Trade Volumes, the Gravity Equation and Factor Proportions," *Journal of International Trade and Economic Development*, 18(1), 37-59.

Debaere, P. (2003), "Relative Factor Abundance and Trade," *Journal of Political Economy*, 11(3), 589-610.

Dent, C. (2006), "The New Economic Bilateralism in Southeast Asia: Region Convergent or Region Divergent?" *International Relations of the Asia-Pacific*, 6(1), 81-111.

Edmonds, C., S.J. La Croix and L. Yao (2008), "China Trade: Busting Gravity's Bounds," *Journal of Asian Economies*, 19(5-6), 455-466.

Egger, P. (2000), "A Note on the Proper Econometric Specification of the Gravity Equation," *Economics Letters*, 66(1), 25-31.

Egger, P. and Pfaffermayr, M. (2003), "The Proper Panel Econometric Specification of the Gravity Equation: A Three-Way Model with Bilateral Interaction Effects," *Empirical Economics*, 28(3), 571-580.

Elliott, R.J.R and Ikemoto, K. (2004), "AFTA and the Asian Crisis: Help or Hindrance to ASEAN Intra-Regional Trade?" *Asian Economic Journal*, 18(1), 1-23.

Ghosh, S. and Yamarik, S. (2004), "Are Regional Trading Arrangements Trade Creating? An Application of Extreme Bounds Analysis," *Journal of International Economics*, 63(2), 369-395.

Grubel, H.G. and Lloyd, P.J. (1975). *Intra-Industry Trade: The Theory and Measurement of International Trade in Differentiated Products*, New York: Wiley.

Hausman, J.A. and Taylor, W.E. (1981), "Panel Data and Unobservable Individual Effects," *Econometrica*, 49(6), 1377-1398.

Hew, D., Das, S.B. and Sen, R. (2009), "ASEAN Economic Integration and Implication for CLMV Countries," in Ikuo Kuroiwa ed., *Plugging into Production Networks: Industrialization Strategy in Less Developed Southeast Asian Countries*, Institute of Developing Economies, Japan: JETRO, pp. 72-111.

Im, K. S., Pesaran, M. H. and Shin, Y. (2003), "Testing for Unit Roots in Heterogeneous Panels," *Journal of Econometrics*, 115(1), 53–74.

Jayanthakumaran, K. and Verma, R. (2008), "International Trade and Regional Income Convergence: The ASEAN-5 Evidence," *ASEAN Economic Bulletin*, 25(2), 179-194.

Jongwanich, J. (2010), "Determinants of Export Performance in East and Southeast Asia," *World Economy*, 33(1), 20-41.

Kao, C. (1999), "Spurious Regression and Residual-Based Tests for Cointegration in Panel Data," *Journal of Econometrics*, 90(1), 1-44.

Kuroiwa, I. (2009), "Production Networks and Industrial Policy in Less Developed Southeast Asia," in Ikuo Kuroiwa ed., *Plugging into Production Networks: Industrialization Strategy in Less Developed Southeast Asian Countries*, Institute of Developing Economies, Japan: JETRO, pp. 36-71.

Levin, A., Lin C-F., and Chu, C-S. J. (2002), "Unit Root Tests in Panel Data: Asymptotic and Finite-Sample Properties," *Journal of Econometrics*, 108(1), 1–24.

Maddala, G.S. and Wu, S. (1999), "A Comparative Study of Unit Root Test with Panel Data and a New Simple Approach," *Oxford Bulletin of Economics and Statistics*, 61(1), 631-652.

Miller, S.M. and Upadhyay, M.P. (2000), "The Effects of Openness, Trade Orientation and Human Capital on Total Factor Productivity," *Journal of Development Economics*, 63(2), 399-423.

Nguyen, T.K. (2009), "Gravity Model by Panel Data Approach: An Empirical Application with Implications for the ASEAN Free Trade Area," *ASEAN Economic Bulletin*, 26(3), 266-277.

Organisation for Economic Cooperation and Development (OECD) (2010), *OECD Southeast Asian Economic Outlook 2010*, Paris: OECD Publishing.

Peridy, N. (2006), "The Effects of North-South Regional Trade Policies: A Comparison of Mediterranean Countries with ASEAN," in Michael G. Plummer and Erik Jones eds., *International Economic Integration and Asia*, Singapore: World Scientific Publishing Co Pte. Ltd., pp. 275-298.

Plummer, M.G. (1997), "ASEAN and the Theory of Regional Economic Integration: A Survey," *ASEAN Economic Bulletin*, 14(2), 202-214.

Plummer, M.G. (2009), *ASEAN Economic Integration: Trade, Foreign Direct Investment and Finance*, Singapore: World Scientific Publishing Co Pte. Ltd.

Poyhonen, P. (1963), "A Tentative Model for the Volume of Trade between Countries," *Weltwirtschaftliches Archiv*, 90(1), 93-99.

Ravenhill, J. (2008), "Fighting Irrelevance: An Economic Community with ASEAN Characteristics," *Pacific Review*, 21(4), 469-488.

Rojid, S. (2006), "COMESA Trade Potential: A Gravity Approach," *Applied Economics Letters*, 13(14), 947-951.

Rose, A.K. (2004), "Do We Really Know that the WTO Increases Trade?" *American Economic Review*, 94(1), 98-114.

Sally, R. and Sen, R. (2005), "Whither Trade Policies in Southeast Asia? The Wider Asian and Global Context," *ASEAN Economic Bulletin*, 22-1, 92-115.

Sharma, S.C. and Chua, S.Y. (2000). "ASEAN: Economic Integration and Intra-Regional Trade," *Applied Economics Letters*, 7(3), 165-169.

Siah, K-L, Choong, C-K and Zulkarnain, Y. (2009), "AFTA and the Intra-Trade Patterns Among ASEAN5 Economies: Trade Enhancing or Trade Inhibiting?" *International Journal of Economics and Finance*, 1(1), 117-126.

Sudsawasd, S. and Mongsawad, P. (2007), "Go with the Gang, ASEAN!" *ASEAN Economic Bulletin*, 24(3), 339-356.

Tantisantiwong, N. (2010), "Should Exports be Globally Diversified or Regionally Integrated? Evidence from ASEAN+3 Experience," *ASEAN Economic Bulletin*, 27(1), 55-76.

Thornton, J. and Goglio, A. (2002), "Regional Bias and Intra-Regional Trade in Southeast Asia," *Applied Economics Letters*, 9(4), 205-208.

Tinbergen, J. (1962), *Shaping the World Economy: Suggestions for an International Economic Policy*, New York: Twentieth Century Fund.

Appendix Table 1: Definition and Measurement of Variables

Variable	Definition	Measurement
<i>X</i>	Real exports	The <i>X</i> for agricultural and manufactures, expressed in current USD, is deflated by the export price index for agricultural and manufactures respectively, with 2000 as the base year.
<i>TRADE</i>	Total real trade	$TRADE_{ij} = X_{ij} + M_{ij}$ where <i>M</i> = imports The <i>M</i> , expressed in current USD, is deflated by the import price index, with 2000 as the base year.
<i>GDPT</i>	Total real gross domestic product (GDP)	$GDPT_{ij} = GDP_i + GDP_j$ The <i>GDP</i> , expressed in current USD, is deflated by the <i>GDP</i> deflator with 2000 as the base year.
<i>SIMGDP</i>	Similarity in the levels of GDP or relative size of trade partners	$SIMGDP_{ij} = 1 - \frac{GDP_i^2}{(GDP_i + GDP_j)^2} - \frac{GDP_j^2}{(GDP_i + GDP_j)^2}$ where $0 \leq SIMGDP_{ij} \leq 0.5$ If $SIMGDP_{ij} = 0$ (absolute divergence in size) $SIMGDP_{ij} = 0.5$ (equal country size)
<i>FDST</i>	Total real inward foreign direct investment (FDI) stock	$FDST_{ij} = FDS_i + FDS_j$ For associate and subsidiary enterprises, it is the value of the share of their capital and reserves (including retained profits) attributable to the parent enterprise (this is equal to total assets minus total liabilities), plus the net indebtedness of the associate or subsidiary to the parent firm. For branches, it is the value of fixed assets and the value of current assets and investments, excluding amounts due from the parent, less liabilities to third parties. The <i>FDS</i> , expressed in current USD, is deflated by the CPI index with 2000 as the base year.
<i>SIMFDS</i>	Similarity in the inward FDI stock of trade partners	$SIMFDS_{ij} = 1 - \frac{FDS_i^2}{(FDS_i + FDS_j)^2} - \frac{FDS_j^2}{(FDS_i + FDS_j)^2}$
<i>RLFAC</i>	Similarity in capital-labour ratios or the distance between countries in terms of relative factor endowments	$RLFAC_{ij} = \ln(K_{jt}/L_{jt}) - \ln(K_{it}/L_{it}) $ where <i>K</i> = capital stock; and <i>L</i> = labour force If $RLFAC_{ij} = 0$ (same proportion of factor endowments) Total labour force comprises people ages 15 and older who meet the International Labour Organization definition of theeconomically active population. Capital stock is estimated from the GFCF using the standard perpetual inventory calculation method (see footnote 1). The GFCF consists of outlays on additions to the fixed assets (land improvements; plant,machinery and equipment purchases; construction of roads, railways and the like) of the economy plus net changesin the level of inventories. The GFCF, expressed in current USD, is deflated by the CPI index with 2000 as the base year.
<i>GD</i>	Geographical distance	The average distance (in kilometres) between the capitals of <i>i</i> and <i>j</i> .

Table 1a: Intra-Regional Trade Shares (in per cent)

	Exports			Imports			All Products		
	Agri	Manu	Total	Agri	Manu	Total	Agri	Manu	Total
	% of World Trade of ASEAN								
ASEAN									
1990	16.89	21.72	21.13	28.98	16.91	17.64	21.16	19.11	19.29
2000	19.22	24.69	24.31	24.88	23.03	23.12	21.35	23.91	23.76
2010	22.32	26.04	25.71	30.45	23.71	24.11	25.36	24.93	24.96
ASEAN5									
1990	15.18	20.99	20.28	27.85	16.41	17.11	19.65	18.50	18.61
2000	14.15	22.08	21.52	20.21	21.62	21.55	16.43	21.86	21.53
2010	16.54	22.88	22.32	24.24	22.18	22.31	19.42	22.54	22.31
ASEAN*									
1990	2.31	1.26	1.39	1.13	0.50	0.54	1.89	0.85	0.94
2000	5.35	2.83	3.01	4.14	1.24	1.38	4.90	2.08	2.25
2010	9.00	4.21	4.59	5.68	1.35	1.61	7.75	2.84	3.21
	% of Intra-ASEAN Trade								
ASEAN5									
1990	86.71	94.23	93.48	96.09	97.05	96.95	91.17	95.57	95.13
2000	72.50	88.60	87.70	81.40	94.13	93.45	76.36	91.09	90.28
2010	64.73	84.23	82.76	79.78	93.78	92.73	70.99	88.48	87.08
ASEAN*									
1990	13.17	5.67	6.42	3.91	2.95	3.05	8.77	4.38	4.82
2000	27.41	11.35	12.25	16.69	5.39	5.99	22.75	8.67	9.44
2010	35.20	15.52	17.01	18.70	5.71	6.69	28.34	11.16	12.53

Note: (1) Agri – Agriculture; Manu – Manufactures.

(2) ASEAN5 refers to two-way trade flows between pioneer economies and ASEAN* refers to two-way trade flows between pioneer and newer member economies.

(3) The figures in the second panel do not add up to 100% as ASEAN* does not include two-way trade between the newer member economies.

Source: Calculated from UN COMTRADE.

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Table 1b: Intra-Regional Trade Shares, by Member Economies (in per cent)

		Exports			Imports			All Products		
		Agri	Manu	Total	Agri	Manu	Total	Agri	Manu	Total
Malaysia	1990	27.04	29.56	29.27	26.47	18.75	19.30	26.83	24.03	24.30
	2000	26.50	26.53	26.53	23.87	24.28	24.26	25.42	25.51	25.50
	2010	20.11	26.08	25.40	38.67	26.09	27.09	26.90	26.08	26.17
Singapore	1990	20.77	25.08	24.84	41.10	18.89	20.30	32.30	21.78	22.41
	2000	39.65	29.91	30.14	43.23	29.13	29.60	41.74	29.53	29.87
	2010	41.47	30.08	30.31	37.39	23.57	24.02	39.07	27.05	27.36
Thailand	1990	10.17	12.65	11.92	6.64	13.43	13.08	9.45	13.17	12.61
	2000	14.57	20.24	19.40	12.78	16.83	16.65	14.18	18.53	18.09
	2010	20.28	23.07	22.70	16.87	16.62	16.63	19.42	19.80	19.77
Philippines	1996	6.98	15.35	14.46	20.48	11.65	12.38	14.65	13.00	13.15
	2000	8.74	16.08	15.71	16.41	15.88	15.92	13.23	15.98	15.81
	2010	12.61	23.23	22.42	41.00	26.42	28.10	30.58	24.89	25.44
Indonesia	1990	14.92	9.32	9.96	13.66	8.33	8.61	14.57	8.85	9.34
	2000	17.11	17.56	17.52	18.71	19.42	19.35	17.72	18.21	18.16
	2010	22.54	20.87	21.14	18.16	29.69	28.68	21.15	25.13	24.62
Brunei	1992	87.48	23.51	23.51	64.54	30.95	35.24	64.54	26.18	28.10
	2001	81.39	22.10	22.13	72.30	47.01	51.58	72.37	27.20	29.16
	2006	24.25	24.78	24.77	76.73	41.92	47.89	75.52	27.42	28.94
Cambodia	2000	53.73	5.09	5.57	63.53	36.45	39.10	62.67	20.31	22.62
	2005	55.43	4.23	4.73	75.83	27.41	31.02	73.11	14.46	16.78
	2010	27.71	12.33	12.58	77.26	31.06	34.35	66.95	20.81	22.75
Myanmar	1992	29.89	32.89	31.32	80.34	19.72	28.63	43.95	23.53	29.76
	2009	----	----	----	82.87	44.00	46.78	82.87	44.00	46.78
Vietnam	2000	12.67	36.80	30.56	17.36	10.44	10.82	13.54	21.53	20.31
	2005	14.53	28.49	25.61	23.13	12.43	13.12	16.79	19.30	18.97
	2009	16.00	26.15	23.99	22.53	12.65	13.44	18.07	18.20	18.18

Notes: (1) ---- data is not available.
(2) For other notes, refer to Table 1a.

Table 2a: Aggregate GL Index for ASEAN5 (in per cent)

Country-pair	All Products			Agriculture			Manufactures		
	2000	2005	2010	2000	2005	2010	2000	2005	2010
MYS-SGP	45.11	43.35	38.16	29.40	8.37	10.83	47.72	47.24	43.06
MYS-THA	38.11	32.64	33.33	7.25	8.21	8.14	48.69	40.45	41.48
MYS-PHL	26.40	22.35	23.39	4.93	6.55	9.08	28.81	25.48	32.41
MYS-IDN	25.32	20.59	16.09	19.31	8.23	8.73	28.42	27.80	22.37
SGP-THA	39.47	44.18	37.88	8.52	12.64	8.56	41.35	45.78	41.05
SGP-PHL	31.87	38.30	36.75	6.36	6.55	16.12	33.25	40.38	38.49
SGP-IDN	13.81	16.65	32.69	16.72	7.42	9.71	13.18	18.36	41.43
THA-PHL	36.85	31.51	21.73	7.98	4.30	2.61	38.40	35.55	26.33
THA-IDN	22.39	30.49	18.34	18.84	38.19	2.19	24.55	27.16	23.79
PHL-IDN	3.95	5.50	4.77	3.87	3.18	1.70	4.02	8.98	10.05

Notes: (1) The GL index is calculated at the 5-digit SITC (Standard International Trade Classification) level, prior to aggregation.

(2) MYS – Malaysia; SGP – Singapore; THA – Thailand; PHL – Philippines; and IDN – Indonesia.

Source: Calculated from UN COMTRADE.

Table 2b: Aggregate GL Index for ASEAN* (in per cent)

Country-pair	All Products			Agriculture			Manufactures		
	2000	2005	2010	2000	2005	2010	2000	2005	2010
MYS-BRU	1.05	3.12	3.33	0.28	5.49	2.94	1.67	1.59	3.56
MYS-CAM	0.88	0.88	1.62	0.20	1.65	2.37	1.33	0.64	1.35
MYS-LAOS	0.00	0.02	0.12	0.00	0.00	0.00	0.00	0.02	0.13
MYS-MYA	0.37	0.49	0.70	0.01	0.16	0.17	2.48	1.00	1.92
MYS-VIET	4.67	8.38	14.92	0.42	2.19	15.92	9.33	14.08	13.95
SGP-BRU	3.78	4.72	5.15	0.19	0.15	0.29	5.20	5.37	6.14
SGP-CAM	0.77	11.89	4.53	0.64	43.90	7.00	0.85	2.33	2.93
SGP-LAOS	0.10	0.04	1.03	0.00	0.00	0.06	0.79	0.37	2.60
SGP-MYA	2.18	1.41	1.08	1.64	0.97	0.49	2.46	1.65	1.31
SGP-VIET	5.52	6.87	13.48	1.14	1.31	5.91	9.41	11.96	15.91
THA-BRU	0.03	0.00	0.00	0.00	0.00	0.00	1.62	0.00	0.00
THA-CAM	1.70	0.82	7.26	4.54	1.96	0.47	0.72	0.29	10.83
THA-LAOS	0.36	3.11	12.56	0.29	7.19	27.62	0.39	0.73	5.08
THA-MYA	0.50	0.20	0.49	0.32	0.15	0.29	0.68	0.42	1.05
THA-VIET	2.88	8.87	14.51	4.47	7.89	9.31	2.75	8.96	15.12
PHL-BRU	0.11	0.10	0.14	0.00	0.00	0.00	0.16	0.14	0.18
PHL-CAM	5.87	1.74	0.32	0.00	0.00	0.08	8.27	2.23	0.39
PHL-MYA	1.06	0.04	0.06	0.00	0.00	0.12	1.76	0.05	0.01
PHL-VIET	1.55	1.90	4.12	0.09	0.53	1.05	4.21	3.44	9.79
IDN-BRU	0.34	0.02	0.05	0.00	0.00	0.00	0.75	0.72	0.66
IDN-CAM	1.40	0.04	0.42	0.52	0.00	0.09	2.33	0.11	1.96
IDN-LAOS	0.00	0.00	9.92	0.00	0.00	79.20	0.00	0.00	5.29
IDN-MYA	0.19	0.29	0.03	0.07	0.14	0.02	0.25	0.37	0.04
IDN-VIET	12.83	3.13	10.37	20.85	0.59	4.08	2.49	5.76	13.71

Notes: (1) MYS – Malaysia; SGP – Singapore; THA – Thailand; PHL – Philippines; IDN – Indonesia; BRU – Brunei; CAM – Cambodia; LAOS – Laos; and MYA – Myanmar.

(2) For other notes, see Table 2a.

Source: Calculated from UN COMTRADE.

Table 4: Determinants of Intra-ASEAN Trade Flows in Agriculture

	RE			HT			RE			HT		
	ASEAN	ASEAN5	ASEAN*	ASEAN	ASEAN5	ASEAN*	ASEAN	ASEAN5	ASEAN*	ASEAN	ASEAN5	ASEAN*
	Dependent Variable: $\ln X$			Dependent Variable: $\ln TRADE$								
$\ln GDP$	0.734** (0.294)	-0.144 (0.210)	0.864** (0.370)	2.097*** (0.683)	-0.229 (0.215)	2.599*** (0.896)	0.545*** (0.191)	0.188 (0.128)	0.517*** (0.224)	2.840*** (0.679)	-0.211 (0.178)	3.872*** (0.887)
$\ln GDP$	0.078*** (0.018)	0.004 (0.008)	0.114*** (0.029)	0.114*** (0.027)	0.005 (0.009)	0.164*** (0.040)	0.042*** (0.012)	0.003 (0.004)	0.052*** (0.020)	0.129*** (0.026)	-0.002 (0.008)	0.203*** (0.040)
$\ln GD$	-2.629*** (0.613)	-1.496*** (0.298)	-2.203** (0.864)	-3.625*** (1.361)	-1.471*** (0.435)	-2.765 (2.054)	-2.007*** (0.383)	-1.527*** (0.127)	-1.894*** (0.481)	-3.871*** (1.329)	-1.465*** (0.379)	-3.019 (1.984)
$\ln FDS$	0.009 (0.322)	-0.578*** (0.110)	-0.232 (0.374)	-1.292*** (0.340)	-0.619*** (0.142)	-1.466*** (0.427)	0.709*** (0.265)	-0.683*** (0.092)	0.789** (0.312)	-1.511*** (0.339)	-0.855*** (0.116)	1.672*** (0.425)
$\ln FDS$	0.028** (0.013)	-0.008* (0.005)	0.014 (0.015)	0.016 (0.010)	-0.010** (0.005)	0.006 (0.013)	0.024** (0.012)	-0.0004 (0.003)	0.010 (0.015)	0.009 (0.010)	-0.006 (0.004)	-0.001 (0.013)
$RLFAC$	-1.043*** (0.287)	-0.017 (0.185)	-0.674** (0.332)	-1.453*** (0.306)	-0.104 (0.181)	-1.043** (0.412)	-0.836*** (0.215)	0.214*** (0.081)	-0.561** (0.229)	-1.273*** (0.304)	0.118 (0.151)	-0.712** (0.407)
constant	9.302 (11.561)	47.130*** (7.716)	5.164 (13.792)	7.839 (22.632)	50.781*** (7.761)	-11.898 (30.981)	-4.723 (8.079)	40.212*** (5.249)	-8.839 (8.738)	-6.324 (22.442)	56.429*** (6.421)	-42.260 (30.510)
Year effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No. of obs.	1365	420	945	1365	420	945	1365	420	945	1365	420	945
No. of groups	65	20	45	65	20	45	65	20	45	65	20	45
R^2 overall	0.183	0.542	0.107				0.308	0.727	0.265			
Breusch-Pagan	$\chi^2(1) = 2953.75$	$\chi^2(1) = 773.19$	$\chi^2(1) = 1919.82$				$\chi^2(1) = 850.21$	$\chi^2(1) = 441.54$	$\chi^2(1) = 412.92$			
LM test												
Wald test	310.23	1512.08	271.26	638.73	858.05	512.26	316.67	971.02	258.56	636.83	1121.2	528.65

Notes: 1. The figures in parentheses for the RE model are the standard errors, adjusted for clustering on country-pair-product group. ***significant at 1%, **significant at 5% and * significant at 10%.

Table 5: Determinants of Intra-ASEAN Trade Flows in Manufactures

	RE			HT			RE			HT		
	ASEAN	ASEAN5	ASEAN*	Full Sample	ASEAN5	ASEAN*	ASEAN	ASEAN5	ASEAN*	ASEAN	ASEAN5	ASEAN*
	Dependent Variable: $\ln X$						Dependent Variable: $\ln TRADE$					
<i>lnGDPT</i>	0.618*** (0.170)	0.256 (0.156)	0.580*** (0.209)	3.323*** (0.682)	0.102 (0.181)	4.237*** (0.898)	0.615*** (0.163)	0.010 (0.110)	0.546*** (0.203)	3.354*** (0.692)	0.142 (0.150)	4.252*** (0.906)
<i>SIMGDP</i>	0.065*** (0.011)	-0.010** (0.005)	0.080*** (0.018)	0.158*** (0.027)	-0.054*** (0.010)	0.238*** (0.040)	0.055*** (0.010)	-0.001 (0.003)	0.065*** (0.018)	0.146*** (0.027)	-0.043*** (0.008)	0.224*** (0.041)
<i>lnGD</i>	-2.823*** (0.390)	-1.312*** (0.187)	-2.895*** (0.503)	-4.781*** (1.390)	-0.665 (0.657)	-4.083** (2.097)	-2.612*** (0.370)	-1.226*** (0.111)	-2.708*** (0.471)	-4.572*** (1.377)	-0.721 (0.519)	-3.894* (2.076)
<i>lnFDST</i>	1.123*** (0.260)	0.021 (0.097)	1.070*** (0.304)	-1.181*** (0.339)	-0.113 (0.108)	-1.406*** (0.427)	1.172*** (0.259)	0.182** (0.077)	1.136*** (0.303)	-1.149*** (0.345)	-0.074 (0.090)	-1.384*** (0.432)
<i>SIMFDS</i>	0.038*** (0.013)	0.005 (0.004)	0.022 (0.016)	0.026*** (0.010)	0.005 (0.004)	0.018 (0.013)	0.029** (0.013)	0.004 (0.003)	0.013 (0.016)	0.016 (0.010)	0.005 (0.003)	0.006 (0.013)
<i>RLFAC</i>	-0.787*** (0.220)	0.438*** (0.109)	-0.489** (0.234)	-0.921*** (0.307)	0.250 (0.159)	0.395 (0.378)	-0.859*** (0.219)	0.364*** (0.059)	-0.591** (0.231)	-1.033*** (0.310)	0.307** (0.132)	-0.503 (0.417)
constant	-10.956 (7.651)	22.933*** (6.562)	-10.495 (8.700)	-22.890 (22.707)	28.003 (7.589)	-0.364 (0.413)	-12.273 (7.461)	26.459*** (4.799)	-11.036 (8.457)	-24.638 (22.922)	26.492*** (6.181)	-53.690* (31.327)
Year effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No. of obs.	1365	420	945	1365	420	945	1365	420	945	1365	420	945
No. of groups	65	20	45	65	20	45	65	20	45	65	20	45
R ² overall	0.412	0.797	0.324				0.408	0.884	0.334			
Breusch-Pagan	$\chi^2(1) = 926.09$	$\chi^2(1) = 759.79$	$\chi^2(1) = 434.64$				$\chi^2(1) = 823.42$	$\chi^2(1) = 273.63$	$\chi^2(1) = 380.88$			
LM test												
Wald test	412.28	1772.28	325.89	756.04	2313.66	591.45	431.74	2667.40	329.30	739.90	3164.55	592.38

Notes: 1. The figures in parentheses for the RE model are the standard errors, adjusted for clustering on country-pair-product group.
 ***significant at 1%, **significant at 5% and * significant at 10%.

Does Corruption Impede International Trade? New evidence from the EU and the MENA Countries

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This paper uses a gravity trade model to examine the effect of corruption on bilateral trade for a sample of 37 countries representing two regions: the Middle East and North Africa and the European Union during the period from 2002 to 2012. The study provides evidence that corruption negatively influences trade flows and that control of corruption improves trade potentialities. Also, subsamples estimations report robust support for this result but with more negative impact of corruption on regional trade for MENA countries. More traditional results suggest a positive effect of openness on the volume of trade, reflecting the need for regional integration. The empirical results provide evidence that, contrary to per capita GDP, GDP positively and significantly affects trade flows. Moreover, the study shows that countries may increase trade flows despite having different languages. However, distance and contiguity negatively impact trade flows. The nominal effective exchange rate as a price competitiveness variable positively and significantly influences trade flows.

1. Introduction

Examinations of foreign trade in industrialized nations and their growth trends show that countries which have liberalized their economies display higher economic growth rates. In this context, many developing countries have based their economic growth policies on the promotion of exports and generally on international trade. International trade volume is increasing for all countries and trade blocks as well. However, Trefler (1995) among others, reports that international trade flows are much less than they should be according to economic theory predictions. According to Eaton and Kortum (2002), international trade volumes would be five times larger than current levels if only trade was

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“*frictionless*”. These disparities in the volume of international trade highlight the existence of impeding barriers to trade (De Groot et al., 2004). A plausible reason for this is provided by a United Nations (2007) report which shows that trade flows in developing countries are relatively low, which could point to barriers such as corruption that are often cited as hindering international trade and resulting in the “mystery of missing trade”.

Given its negative effects on economic activity, the corruption phenomenon has represented a key research issue to economists since the 1960s. Back then, studies were essentially micro-economic and were limited to theoretical and descriptive analyses. Recently however, an increasing number of studies on corruption have considered numerous dimensions and demonstrated different potential impacts through which corruption may affect economic activity.

The literature on corruption provides several definitions of the concept. The most expanded definition provided by *Transparency International* defines it as ‘*an abuse of entrusted power for private gain.*’ Yet, corruption is a phenomenon that differs from one country to another depending on the political, economic and social environment. An extensive body of literature has examined various effects of corruption on economic activity. As discussed in Ben Ali and Saha (2015), two main strands of literature can be discerned when dealing with the corruption-economic development nexus. The first is the “*grease the wheel*” strand in which corruption is perceived to act as a greasing of the bureaucracy wheel for the firms. In this regard, Beck and Maher (1986) believe that bribes and corruption in general are considered as a way to save time and effort and therefore improve investment and economic growth. The proponents of the “*grease the wheel*” approach in which corruption is seen to act as a greasing of the bureaucracy wheel for the firms argue that corruption could facilitate international trade. Recently, De Jong and Bogmans (2010) report that the more frequently bribes are paid to customs officials, the higher the amount of trade (imports in particular). This implies that bribe paying acts like a lubricant. Also, several studies considered the corruption-trade nexus and found that corruption can positively impact regional trade and could even be considered as one of the most important catalysts for growth. For instance, Horsewood and Voicu (2012) suggest that corruption may

actually have the power to enhance trade by acting as a lubricant in countries with a weak institutional structure.

The second strand of the literature is the “*sand the wheel*” side, which argues that corruption is harmful since it induces costs and inefficiencies and therefore decelerates economic growth. The general agreement in this regard states that poor quality institutions negatively affect a country’s level of development (Rodrik et al., 2004). Numerous studies dealing with the corruption-international trade nexus from the “*sand the wheel*” approach exist in the literature. Both exports and imports are considered in this literature. From one side, when the quality of institutions is poor, referring to low quality of customs services and long waiting hours at the border, a country will have fewer imports (De Jong and Bogmans, 2010). From the other side, many studies argue that long waiting hours at the border restrict exports as well (Djankov et al., 2006). Based on firm level data, Kaufmann and Wei (1999) also report that corruption hinders trade as firms who are involved in bribery are likely to spend more time with officials.

From another point of view, countries that have rigid government regulations will more likely have protectionist trade policies, which would then require importers to obtain appropriate import licences before being able to import goods from abroad. As a consequence, this situation would encourage importers to rely on bribery and corruption as ways to facilitate business transactions (Krueger, 1974). Another effect that corruption has on international trade is associated with productivity. Poor quality of institutional structure causes low levels of output per worker, which makes the economy less competitive. Consequently, low competitiveness induced by low productivity leads to low volumes of international trade (Horsewood and Voicu, 2012). Moreover, incentives to engage in corruption will be greater as a country has more restrictive trade policies and the bureaucrats will then ask for more bribes. Based on this, there should be a negative relationship between bilateral trade and corruption, as well as a positive relationship between the degree of corruption and the volume of international trade (Horsewood and Voicu, 2012).

As far as corruption is involved, similarities in ethical standards among countries also play an important role in determining the level of trade between them. If both countries believe that bribing an official is

acceptable, depending on the business culture, then the international transaction will take place and this will increase international trade volume. This implies that the difference between the degrees of corruption between two countries will determine the volume of bilateral trade between them (Horsewood and Voicu, 2012). Similarly, firms that originate from countries with high ethical standards may be facing a bad reputation if they trade with a corrupt country. The resulting bad reputation may cause them to lose consumers in both domestic and foreign markets. Therefore, countries may prefer to undertake international transactions with countries that have similar ethical standards despite the possibility of high profitability exports somewhere else.

It is worth noting also that it is widely established in the literature that the effect of corruption on international trade depends on the nature of bribes. When the bribes to be paid are unknown in advance, traders develop a feeling of uncertainty. This “un-organised corruption” will reduce international trade since traders spend a longer time negotiating with and bribing officials, particularly for firms that are not willing to deal with these practices. (Shleifer and Vishny, 1993; Myint, 2000). However, when they are known in advance, predictable corruption could facilitate international trade.

As discussed above, both arguments, the “*grease the wheel*” and the “*sand the wheel*” approaches to the international trade-corruption relationship, are supported in the literature. Therefore, whether corruption is a factor that improves international trade or conversely it hinders international transactions is a subject that requires particular focus. To the best of our knowledge, no previous study has investigated this nexus by considering a large set of international trade determinants including corruption while considering different regions. The current study intends to take a further step and to fill this research gap by examining this nexus for the Middle East and North Africa countries and for the European Union countries as well. Two main motivations drive this study. First, we bring a new insight to the current empirical literature regarding the corruption-international trade nexus. Second, this study considers two different regions having different corruption levels which will make a major contribution regarding the impact of the level of economic development on the corruption-trade nexus.

The rest of the paper is organized as follows. Section 2 introduces the methodology, data, variables used and the estimation techniques. Section 3 discusses the main findings of this study. The last section concludes.

2. Model Specification, Estimation Methodology and Data

Since the precursory and seminal papers of Tinbergen (1962) and Pöyhönen (1963) and the extension of Linnemann (1966), gravity trade models (GTM) have been and are still the most used tools to assess bilateral trade flows between countries. The basic idea in these models is to integrate the spatial characteristics of each partner country in assessing their trade potential. These models have undergone several extensions by augmenting them using numerous factors and variables that could positively or negatively affect bilateral trade. In these models, the sizes of the exporting and importing economies are represented by GDP, giving a measure of the demand and supply potentials. Moreover, GTM includes dummy variables that affect trade volume between countries (Laaser and Schrader, 2002 and Anderson and Wincoop, 2003). For example, if the two countries have a common border, then a larger volume of trade will probably take place (Horsewood and Voicu, 2012). Besides the border effect, language also plays an important role in determining the level of trade (Horsewood and Voicu, 2012). Furthermore, export performance will be greatly influenced by a common history and the distance as a "proxy" for transport costs. Also, countries will prefer importing from a former colony (assuming a positive experience with it) than from other countries (Horsewood and Voicu, 2012).

All these variables can be specified and tested for correlation to indicate that they facilitate or restrict trade between two partner countries. Moreover, we introduce in this study two countries' corruption measures to capture the effect of corruption on trade potentialities. Thus our model is as follows:

$$\begin{aligned} \text{Log}(X_{ij}) = & \alpha + \beta_1 \text{Log}(GDP_{it}) + \beta_2 \text{Log}(GDP_{jt}) + \beta_3 \text{Log}(PGDP_{it}) + \\ & \beta_4 \text{Log}(PGDP_{jt}) + \beta_5 \text{Log}(OPEN_{it}) + \beta_6 \text{Log}(OPEN_{jt}) + \beta_7 \text{Log}(EXCH_{it}) + \\ & \beta_8 \text{Log}(EXCH_{jt}) + \beta_9 D_{ij} + \beta_{10} \text{Contig}_{ij} + \beta_{11} \text{Comlang}_{ij} + \\ & \beta_{12} + COR_{ij} + \beta_{13} COR_{jt} + \varepsilon_{ij} \end{aligned}$$

Where:

The dependent variable X_{ij} is the bilateral annual export in current dollars from country i to country j . i and j are the exporting and the importing countries, respectively. Where α is an intercept and ε_{ijt} is the error term. GDP_i and GDP_j are the gross domestic product in current dollars of countries i and j , respectively. Gross domestic products of partner countries express the potential market size. Therefore, the coefficients β_1 and β_2 are expected to be positively correlated with bilateral trade. $PGDP_i$ and $PGDP_j$ are the per capita gross domestic product in current dollars for countries i and j , respectively. Per capita GDP reflects the impact of consumer purchasing power of the two partner countries. The distance between partner countries D_{ij} is a proxy for transport costs. So, we expect that distance negatively affects bilateral trade. $OPEN_i$ and $OPEN_j$ are the trade openness for the two countries, respectively. Openness accelerates bilateral trade by facilitating exchanges of goods and services. Therefore, we expect a positive correlation between openness and international trade. $EXCH_i$ and $EXCH_j$ are the nominal effective exchange rate of countries i and j , respectively. The nominal effective exchange rate is a proxy of price competitiveness of partner countries and it is supposed to positively affect trade flows. COR is a general measure of corruption in the exporting and the importing countries. We use in this study two main measures of corruption for this general measure: the corruption perception index (CPI) as a corruption indicator and the control of corruption index (COC) as governance indicator, which we introduce one by one in the model. CPI_i and CPI_j are the corruption perception indices for i and j , respectively. COC_{it} and COC_j are the control of corruption indexes for countries i and j , respectively. The contiguity ($Contig_{ij}$) is a dummy variable, taking value 1 if partners have a common border, and 0 otherwise. Common language variable ($Comlang_{ij}$) is a binary variable taking value 1 if countries have common languages and 0 otherwise.

We use in this study macroeconomic annual data for a sample of 37 countries. Fifteen countries from the Middle East and North Africa region (Bahrain, Iran, Iraq, Jordan, Kuwait, Libya, Mauritania, Morocco, Oman, Qatar, Saudi Arabia, Tunisia, United Arab Emirates and Yemen). We also consider 22 countries from the European Union (Austria, Belgium, Croatia, Czech Republic, Denmark, Estonia, Finland,

France, Germany, Greece, Ireland, Latvia, Luxembourg, Malta, Netherlands, Poland, Portugal, Slovak Republic, Slovenia, Spain, Sweden and United Kingdom). Data covers the period from 2002 to 2012. Export statistics are extracted from United Nations Standard International Trade Classification, revision 3. The countries' gross and per capita domestic products were extracted from WDI-World Bank Development Indicators. Trade openness and exchange rate nominal exchange rates were drawn from the United Nations Conference on Trade and Development statistics (UNCTAD). The data on bilateral distance and on dummy variables such as contiguity, common language, common colonizer and colonial link, were extracted from CEPII database (CEPII – GEO). The corruption perception index was extracted from Transparency International publications and the control of corruption index was obtained from the World Governance Indicators database.

Estimating the gravity model using pooled ordinary least squares yields inconsistent coefficient estimates with the existence of individual effects. Therefore, we proceed with the Hausman (1978) test. Estimation outcomes of the Hausman test are in favor of the random effect model. However, we present the fixed effect model for benchmark comparison.

We should note that the estimation of the fixed effect specification does not allow estimating the time invariant variables in our model, such as distance, contiguity, common colonizers, and the existence of common borders. To overcome the problems of heteroscedasticity, detected by the Modified Wald test for group wise heteroskedasticity and also the risks of serial correlation.

3. Results and Discussion

Estimation outcomes for the whole sample (European Union and the Middle East and North Africa countries) are presented in Table 1. They show that GDP positively and significantly affects trade flows. Indeed, an increase by 1 percent of GDP in the exporting and the importing countries induces, other things being equal, an increase in exports by 1.3 percent and 0.9 percent in these countries, respectively. GDP per capita has a negative and significant effect on bilateral trade. Such a result shows that the closer the per capita incomes of two countries, the greater will be the intensity of trade between them. In other words, trade is

hampered when living standards are different. The coefficient of trade openness has a positive and significant effect on the exporting country side and a negatively insignificant one on the importing country side. This result suggests that a 1 percent increase in the degree of openness in the exporter country induces an increase in exports of about 0.8 percent. This result shows the positive impact of openness policies in improving trade potentialities between countries and the negative impact of the presence of tariff barriers.

The nominal effective exchange rate as a price competitiveness variable positively and significantly influences trade flows. The exchange rate of the exporting country has a positive coefficient showing that a depreciation of the currency of the exporting country leads to a significant and positive impact on its exports. The distance as a proxy for transportation costs has a negative coefficient and is highly significant at the 1 percent level. Moreover, the contiguity, which indicates the presence of common borders, presents a negative and significant coefficient. Common language is positive but not significant, suggesting that countries may increase trade flows while having different languages. As for corruption measures, the corruption perception indexes positively influence trade flows on both the exporter and the importer side. On the exporter side, a decrease in corruption in the exporting country improves trade. On the importer side, a decrease in corruption will induce an increase in trade volume. Estimation outcomes of our second estimation where we introduce the control of corruption index are reported in Table 1. The control of corruption index positively and significantly impacts trade flows. Indeed, an increase in the control of corruption by 1 percent in the exporting and importing countries respectively induces trade growth of 0.47% and 0.42% in these countries. The results for GDP and GDP per capita have kept the same signs. Importer countries' trade openness has a positive and significant effect with the persistence of the positive impact also in the exporting country. The contiguity coefficient gives final evidence that the existence of common borders enhances exports.

Table 1: Overall sample Estimation

	Fixed effects		Random effects		GLS	
	1	2	1	2	1	2
LogGDP_i	1,048406	1,100603	1,168418	0,9940215	1,295808	1,335465
	(13,38)***	(6,07)***	(31,71)***	(9,19)***	(81,32)***	(91,05)***
LogGDP_j	0,6665687	0,7390006	0,8372126	0,6096996	0,9035705	0,9777669
	(8,94)***	(3,65)***	(23,5)***	(5,44)***	(57,94)***	(66,58)***
LogGDP_i Per capita	-0,2050527	-0,3872646	-0,250314	-0,0278966	-0,3866657	-0,9165306
	(-2,21)***	(-1,75)**	(-5,33)***	(-0,24)	(-14,9)***	(-21,58)***
LogGDP_j Per capita	-0,3690696	-0,5272752	-0,5435728	-0,3988784	-0,2945588	-0,6857785
	(-4,11)***	(-2,36)***	(-12,19)***	(-3,28)***	(-12,4)***	(-16,27)***
LogOPEN_i	0,6916691	0,7907834	0,6297736	0,8796953	0,7787582	1,380838
	(7,95)***	(3,79)***	(8,48)***	(4,93)***	(14,26)***	(28,53)***
LogOPEN_j	0,2161687	0,3700665	0,1011437	0,4224324	-0,0431581	0,2975729
	(3,26)***	(2,2)**	(1,78)**	(3,06)***	(-0,8)	(6,12)***
LogEXCH_i	0,008976	-0,356333	0,1586189	-0,3992713	1,821985	0,0289468
	(0,07)	(-1,14)	(1,41)*	(-1,38)*	(14,79)***	(0,19)
LogEXCH_j	0,1702083	0,8012591	0,210401	0,9879806	0,2138409	0,1775638
	(2,18)**	(3,75)***	(2,79)***	(4,83)***	(2,24)**	(1,29)*
D_{ij}			-1,408565	-1,409621	-1,129102	-0,4619827
			(-18,11)***	(-6,15)***	(-47,5)***	(-20,24)***
Contig_{ij}			-0,3213357	0,0664463	-0,1247578	1,062812
			(-1,26)	(0,13)	(-1,64)*	(18,31)***
Comlang_{ij}			0,3320941	-0,1208288	0,803585	-0,424663
			(2,01)***	(-0,35)	(15,5)***	(-7,31)***
CPI_i	0,0779212		0,1425338		0,2299942	
	(4,82)***		(9,82)***		(19,13)***	
CPI_j	0,060476		0,1063552		0,115325	
	(3,82)***		(7,5)***		(10,25)***	
COC_i		0,1836488		0,4661501		0,4667622
		(1,52)*		(4,52)***		(15,57)***
COC_j		0,3468965		0,3888193		0,4175169
		(3,04)***		(3,83)***		(13,97)***
Intercept	-14,34299	-14,56517	-10,758	-3,23302	-27,10602	-14,72976
	(-8,14)***	(-3,98)***	(-8,86)***	(-0,96)	(-32,26)***	(-14,83)***
Observations	12135	12135	12135	12135	12135	12135
Groups	1224	1224	1224	1224	1224	1224
Fisher Test	40,79	40,55				
P-value	0,0000	0,0000				
Wald chi2 (13)			6446,81	6564,58	30628,46	30914,01
P-value			0,0000	0,0000	0,0000	0,0000
Hausman Test,	186,88	138,64				
P-value	0,0000	0,0000				
R²	0,2579		0,6963			

T-Student are reported in parentheses. ***, **, and * indicate significance levels at 1, 5, and 10 percent, respectively.

Table 2: GLS subsamples estimation - MENA and UE

X_{ij}	MENA		UE	
	1	2	1	2
LogGDP_i	1,354424	1,326043	1,347128	1,335465
	(21,02)***	(20,88)***	(92,3)***	(91,05)***
LogGDP_j	0,8149041	0,8773522	0,9874217	0,9777669
	(14,6)***	(15,18)***	(67,58)***	(66,58)***
LogGDP_i Per capita	-0,4072991	-0,5150981	-0,9873841	-0,9165306
	(-6,13)***	(-7,12)***	(-23,06)***	(-21,58)***
LogGDP_j Per capita	-0,3137279	-0,3578538	-0,7381866	-0,6857785
	(-4,79)***	(-5,12)***	(-17,38)***	(-16,27)***
LogOPEN_i	1,237805	1,536163	1,389463	1,380838
	(5,99)***	(7,55)***	(28,92)***	(28,53)***
LogOPEN_j	0,9995504	1,169287	0,3021024	0,2975729
	(5,4)***	(6,33)***	(6,26)***	(6,12)***
LogEXCH_i	-0,1362274	-0,1848577	0,1225033	0,0289468
	(-0,48)	(-0,65)	(0,79)	(0,19)
LogEXCH_j	1,185143	1,149854	0,26118	0,1775638
	(5,27)***	(5,05)***	(1,91)*	(1,29)*
D_{ij}	-1,132767	-1,139159	-0,4682808	-0,4619827
	(-14,89)***	(-15,02)***	(-20,69)***	(-20,24)***
Contig_{ij}	0,1867116	0,1942587	1,058759	1,062812
	(1,08)	(1,13)	(18,38)***	(18,31)***
Comlang_{ij}	-0,1129198	0,0092566	-0,4346584	-0,424663
	(-0,99)	(0,08)	(-7,54)***	(-7,31)***
CPI_i	0,6624822		0,2142584	
	(12,33)***		(17,41)***	
CPI_j	0,1732958		0,1879865	
	(3,66)***		(15,33)***	
COC_i		1,459785		0,4667622
		(12,34)***		(15,57)***
COC_j		0,3917583		0,4175169
		(3,99)***		(13,97)***
Intercept	-21,4012	-16,65578	-16,40818	-14,72976
	(-8,48)***	(-6,73)***	(-16,78)***	(-14,83)***
Observations	1431	1431	5078	5078
Groups	169	169	462	462
Wald chi2	1825,93	1839,27	31642,69	31078,02
P-value	0,0000	0,0000	0,0000	0,0000

T-Student are reported in parentheses. ***, **, and * indicate significance levels at 1, 5, and 10 percent, respectively

To check for our previous effects, we subdivided our sample into two sub-samples, namely the European Union sample (EU) and the Middle East and North Africa Countries sample (MENA).

Estimation outcomes are presented in Table 2. Estimation for the MENA sample reports traditional results. For example, GDP positively and significantly affects trade flows. GDP per capita still negatively and significantly affects export flows. For openness it has positive and significant coefficients for both exporting and importing countries. The nominal effective exchange rate has a positive and significant effect on exports for the importing country, while it has a negative and non-significant effect on the exporter side. Corruption remains a negative factor for trade growth. For example, the control of corruption as a proxy for good governance positively and significantly affects trade flows.

Estimation outcomes for the European Union sample show that GDP, per capita GDP and the effective exchange rates have the same previous effects. However the two dummy variables (contiguity, common language) are highly significant in explaining trade flows. On the one hand, contiguity positively influences bilateral trade. This result shows that two countries with common borders will exchange more. On the other hand, the absence of common languages hinders intraregional trade with a clearly negative effect. As for corruption, our results confirm the evidence that good governance with an anti-corruptive institutional system promotes regional trade. We should note in this regard that the negative effect of corruption on international trade is more important for MENA countries than for the European countries.

4. Conclusion

This paper mainly aims to assess the determinants of regional trade and to investigate whether corruption hinders international trade, or whether it encourages cross-border trade. We considered a panel data gravity model with a sample of 37 countries representing two different geographical regions.

Our results highlight the negative effect of different forms of corrupted behaviour on international trade. More traditional results suggest a positive effect of openness on the volume of trade, reflecting the need for regional integration. With different corruption levels, corruption does hinder trade within the European Union but it has more impact in the Middle East and North Africa countries. Moreover, similarities in the ethical business environment between trading partners contribute to increasing the volume of bilateral trade. The greater these similarities are, the higher will be trade volumes.

References

- Anderson, J.E., VanWincoop, E. (2003). Gravity with gravitas: a solution to the border puzzle. *The American Economic Review*, 93 (1): 170–192.
- Beck, P. J., and Maher, M. W. (1986). A comparison of bribery and bidding in thin markets. *Economics Letters*, 20 (1): 1-5.
- Ben Ali, M. S. and Saha, S. (2015). Corruption and Economic Development, in *Economic Development in The Middle East and North Africa*, Ben Ali, M. S. (Eds), Palgrave Macmillan, New York.
- De Groot, H. L. F., Linders, G.-J., Rietveld, P. and Subramanian, U. (2004). The Institutional Determinants of Bilateral Trade Patterns. *Kyklos*, 57 (1): 103–123.
- De Jong, E. and Bogmans, C. (2010). Does Corruption Discourage International trade? *European Journal of Political Economy*, 27(2): 385-398.
- Djankov, S., Freund, C., Pham, C. S., (2006). Trading on time. *World Bank Policy Research Working Paper*, no. 3909. The World Bank, Washington DC.
- Eaton, J. and Kortum, S. (2002). Technology, Geography, and Trade. *Econometrica*, 70 (5): 1741–1779.
- Hausman, J. (1978). Specification Tests in Econometrics, *Econometrica*, 46 (6), 1251-1271.
- Hausman, J. A., and Taylor, W. E. (1981). Panel Data and Unobservable Individual Effects. *Econometrica*, 49 (6): 1377–1398.
- Horsewood, N. and Voicu, A. (2012). Does Corruption hinder trade for the new EU members? Does Corruption Hinder Trade for the New EU Members?. *Economics: The Open-Access, Open-Assessment E-Journal*, 6 (2012-47): 1—28.

Kaufmann, D., Wei, S.J., (1999). Does 'Grease Payment' Speed up the Wheels of Commerce?, *NBER Working Paper*, No 7093.

Krueger, A. O. (1974). The political Economy of the Rent-seeking Society. *American Economic Review*, 64(3): 291–303.

Laaser, C.F. and K. Schrader (2002). European Integration and Changing Trade Patterns: The Case of the Baltic States. *Kiel Working Paper*, No. 1088. Kiel Institute for the World Economy, Kiel.

Linnemann, H., (1966). An Econometric Study of International Trade Flows. Amsterdam: North-Holland Publishing.

Myint, U. (2000). Corruption: Causes, Consequences and Cures. *Asia-Pacific Development Journal*, 7 (2): 33–58.

Poyhönen, P., (1963), Tentative Model for the Volume of Trade Between Countries, *Weltwirtschaftliches Archiv*, No. 90: 91 – 113.

Rodrik, D., Subramanian, A. and Trebbi. F. (2004). Institutions rule: The primacy of Institutions over Geography and Integration in Economic Development. *Journal of Economic Growth*, 9(2): 131–165.

Sargan, J. D. (1958). The Estimation of Economic Relationships Using Instrumental Variables. *Econometrica*, 26 (3) : 393-415.

Shleifer, A., Vishny, R.W., (1993). Corruption. *The Quarterly Journal of Economics*, 108 (3): 599–617.

Tinbergen, J. (1962). Shaping the World Economy: Suggestions for an International Economy Policy. 262-293, New York: The Twentieth Century Fund. Tinbergen J. (ed.), New York: the Twentieth Century Fund.

Trefler, D., (1995). The Case of Missing Trade and other Mysteries. *The American Economic Review*, 85 (5): 1029–1046.

United Nations (2007). *United Nations Annual Report*, 2007.

A Gravity Model Analysis of Effects of Regional Economic Integration on Factor Flows

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Recent empirical studies suggest that regional economic integration provides important stimulus not only to trade, but also to FDI and labour flows. In contrast, theory on FDI and labour flows does not provide a definitive relationship about the effects on concurrent trade and investment liberalization in the form of economic integration. This study analyses the effect of Economic Integration – in particular, the European Union and its effect on these factor flows. It attempts to identify whether being a part of the European Union aids or deters factor mobility (Labour is quantified by migration flows and capital by Foreign Direct Investment flows). Utilizing a modification to the conventional ‘Gravity Equation’ of Trade for FDI and migration, a comprehensive study on a Panel Dataset of 8 countries (France, Germany, Italy, United Kingdom, Japan, USA, India, China) on the period of 2001-2010 is carried out. Different variations of the underlying model reveal that being a part of the European Union, does in fact contribute to greater bilateral factor mobility.

1. Introduction

Globalization has become a key referent of contemporary political discourse and, increasingly, a lens through which policy-makers view the context in which they find themselves. (Colin Hay, Ben Rosamond, 2011). This is visible especially at the regional level, with the escalation of Regional Integration Agreements (RIAs) ranging from Free Trade Areas (FTAs) such as NAFTA and ASEAN to Customs Unions (CUs),

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such as Mercosur, further at the global level with the establishment of GATT and the set-up of the World Trade Organization (WTO). These changes add up, leading us to believe in the distinct possibility of a world of Economic Globalization led by increasing Economic Integration.

Economic integration is the unification of economic policies between different states through the partial or full abolition of tariff and non-tariff restrictions on trade. The European Union provides one of the most interesting laboratories to assess the impact of this sort of deep integration (Brenton, P., Di Mauro, F. & Lücke, M., 1999). In fact, many studies have been carried out to assess its economic impact after the Single Market Programme was implemented – for instance, Baldwin et al. (1995), Sapir (1996) and Brenton (1996). Amongst others, they attempted to include all aspects of potential effects: on trade, on efficiency and competition, on FDI, on income and employment and on the growth and convergence of EU Member States.

There have been many implications and changes ever since the first establishment of the Maastricht treaty and ascension into the European Union. Although economic integration is generally adopted with the intention of increasing trade, however, empirical evidence and initial modeling work suggest that regional economic integration can provide an important stimulus not only to trade, but also to factor flows within the region concerned as supported by Francesca di Mauro (2000), Massimo Motta and George Norman (1996), Paul Brenton and Francesca di Mauro (1999) and Laura Casi (2009). The contents and significance of these works in relevance to our study are highlighted in the Literature Review Section.

It is necessary to understand the nature of factor flows (by factor, we refer to the factors of production), before the impact of regional economic cooperation on their direction and volume can be studied. This leads to the need for identification of the appropriate factors and adopting suitable definitions for their measurement. Right from the conception of the production function, be it the established works of Cobb-Douglas, Harrod-Domar or Solow-Swan, capital and labour have been considered the quintessential factors of production. On analyzing a flow measure for capital, the task is straight forward, as Foreign Direct Investment (FDI) is generally recognized as one of the main channels of economic integration (Brenton, P., Di Mauro, F., & Lücke, M., 1999).

FDI is less volatile than the other financial flows and is inalienable, giving it a relatively low default premium (Rui Albuquerque, 2000). To characterize labour flows, migration flows are considered. This is in fact, akin to many other studies on labour movements such as that by Adams (Adams Jr, R. H., 2003) while studying labour exports.

The relationship between international trade and migration has been long debated, especially for its policy implications. Various studies have been conducted on European countries, including the ones of interest to us such as the UK (Ghatak et al., 2009, Girma and Yu, 2002); Germany (Bruder, 2004); France (Briant et al., 2009); Italy (Murat and Pistoreshi, 2009); the EU 15 (Parsons, 2005), with nearly all suggesting that migration causes better efficiency and thereby leads to more trade.. Ever since the establishment of the Schengen area, which allows for movements among the constituent countries without passport, there has been a surge of internal migration within the EU and further, due to the common Schengen visa it attracts additional migrants from abroad. However, this is causing a sort of benefits-tourism culture. In fact UK and many other EU countries have and are attempting to stop this by increasing the criteria needed for benefits.

While considering the case for capital, it is revealed that the European Union is the world's largest investor abroad. Despite the growing importance of emerging economies as hosts to foreign-owned firms, the EU also remains the largest recipient of FDI. However, the available theory on FDI has yet to provide clear and empirically testable propositions on the effects of both trade and investment liberalization.

It is of use to acknowledge and understand the implications of economic integration on factor flows as a whole and not only on specific aspects of the economy. In this study, an attempt is made to help understand the effect of economic integration in the EU on these factor flows. Literature is biased in its understanding of the subject. While earlier literature proposes that factor flows are substitutes to trade, recent literature claims that there is a complementary relationship between the two. If there happens to be a correlation between factor flows and economic integration, there are very useful implications to policy that can help understand and deal with migration and economic expansion. This study aims to clarify and ascertain which aspect of literature is correct; is regional economic cooperation complementary to factor flows

or is it rival to such flows. The objective of our study is to test the dependence of belonging to a full-fledged economic integration (EU) and its effect on movements of labour and capital. Both, EU and non-EU countries are considered in the study to highlight the effect of the EU integration on factor flow mobility via a dummy variable approach which is discussed later. The EU members considered for this study include prominent countries that were present in the EU at the time of the Maastricht Treaty; namely France, Germany, Italy and the United Kingdom. Non-EU countries studied to distinguish between the two categories of regional grouping and others were China, Japan, India and USA.

The gravity equation has strong theoretical foundation on international trade and has been applied extensively to study trade in recent times - for instance, Kimura, F., & Lee, H. H. (2006), Ruzita Mohd Amin, Zarina Hamid & Norma MD Saad (2009), Feenstra, R. C., Markusen, J. R., & Rose, A. K. (2001). An augmented version of the Gravity Model approach is utilized to analyze these aspects over the panel dataset for the period of 2001-2010.

The paper is arranged in a lucid manner. After an exhaustive literature review and an understanding of the gravity model, the econometric model is specified and methodology used for the analysis and data sources are presented. The section on empirical analysis covers the results of the gravity model. This is followed by discussion and interpretation of results that throws light on important policy implications.

2. Literature Review

A paper titled 'How Far Will International Economic Integration Go?' (Dani Rodrik, 2000) initially interested us in the intricacies of Economic Integration. It is the belief of the authors that although we are far from achieving the utopian state of full economic integration that would give perfect flow and interchange of products and the factors of production, there is undeniable truth in the fact that Economic Integration grows on a global scale and that there should, on applying oneself to an intuitive thought process, be a relation with factor flows. There are many paradigms to analyze these relationships. The most suitable however, is an augmented Gravity Model.

The Gravity Model of trade predicts bilateral trade flows based on the economic sizes (often using GDP measurements) and distance between two units. The model was first used by Tinbergen in 1962. Early applications of the gravity model were viewed with skepticism. However, the work of scholars among others, Anderson (1979) and Oguledo and Macphee (1994), provided a sound theoretical foundation for a gravity model analysis of trade flows. Anderson (1979), in a theoretical paper, made the first formal attempt to derive the gravity equation from a model that assumed product differentiation. He derived a gravity equation from the properties of expenditure systems by including multiple goods, tariffs and distance in his equation and thereby provided a theoretically sound justification for the equation.

Oguledo and Macphee (1994) derived the gravity equation from a linear expenditure system in an attempt to answer criticism that the theoretical foundation of the gravity model is weak. They used the Gravity Model to estimate trade flows from 162 countries into 11 major importing countries for 1976(counting European Community as one). They concluded that factors in traditional gravity models such as GDP, population and distance, are significant influences on trade flows. As a result of these works, there has been a wider acceptance and more frequent application of the gravity model to explain international trade flows among nations.

The Gravity Model has been extensively used for empirical studies in economic integration. Although predominantly used to model international trade flows, recent research has brought attention to the modeling of migration, foreign direct investment (FDI), international portfolio capital movement, WTO membership and other trade agreements, currency unions or even internet traffic and the decay of colonial linkages. The distance and border coefficient often do not capture the full effect of trade costs and so a range of other variables have been identified to extend the standard gravity model.

The standard theory of multinational corporations assumes substitutions between trade and FDI, an assumption motivated by Mundell (1957), based on the Heckscher Ohlin model (1933) as a part of Ohlins' publication *Interregional and International Trade* (1952). However, more recent empirical work has discovered a complementary relationship.

In one such recent work, Francesca di Mauro (2000) uses the gravity-model approach to deal with two issues related to economic integration. France, Germany, Italy, UK, Japan, South Korea, US and Canada, constitute a set of 'home countries' (i.e. investing or exporting countries). The set of 'host countries' for either exports or FDI stocks is constituted by both OECD and non-OECD members. For analysis, three gravity-type equations for exports and FDI in 1988, 1993 and 1996, under various specifications are used. The first is to analyse the impact on FDI stocks of specific variables denoting the will to integrate, and their relative impact on exports. The results show, non-tariff barriers have a negative impact on FDI. In contrast to the impact on exports, exchange rate variability does not have a negative impact on FDI, since it can partially be overcome by directly investing in the host country. The second concern deals with the debate on the complementarity versus substitutability relationship between exports and FDI. At the aggregate level, the results show that a complementary relationship holds.

A paper by Paul Brenton and Francesca di Mauro (1999) uses the method of an augmented Gravity Model and in fact inspires the model for that econometric specification. In their paper, they use a gravity model approach on a time period of the 90s to assess the impact of the deepening integration between the EU and Central and Eastern Europe (CEEC) on FDI flows. They consider some key issues such as whether FDI in the CEECs, on the one hand, and source country exports and imports, on the other hand, are complements or substitutes and whether an increase in the attractiveness of the CEECs to foreign investors has affected the magnitude of FDI going to other European countries. They found that additional integration between the EU and the CEECs, in the form of the accession of the latter, is unlikely to substantially dampen the flows of overseas investment going to other European countries.

An important result to keep in mind is that suggested by Massimo Motta and George Norman (1996). In their theoretical paper, they produced a game-theory model that analyzed the effect of economic integration on oligopolists' international trade and foreign direct investment (FDI) activities, using a three-country, three-firm model. This model that they develop is an augmentation of the standard two-country oligopoly model. They conclude that economic integration, by improving market accessibility, will induce outside firms to invest in the integrated

regional bloc. But the geographic form that the induced FDI will take is not that which we would expect by focusing purely on country size as a determinant of FDI. Increased country size is likely to lead to dispersed FDI targeted primarily at local markets. By contrast, economic integration is more likely to lead to intra-regional export platform FDI, with the investing firm supplying the majority of the countries in the regional bloc by intra-regional export.

Another study by Ruzita Mohd Amin, Zarina Hamid & Norma MD Saad (2009), aims at investigating whether intra-ASEAN trade is trade creating (higher trade with efficient members) or trade diverting (higher trade with inefficient members) for both inter-industry and intra-industry trade. The study adopts the extended gravity model at the total as well as the disaggregated level using the one-digit Standard International Trade Classification (SITC) Revision 2. The study uses data from 1989 until 2006 for the estimation while for estimations that include volatility the data spans only from 1992 to 2006. They find that trade creation is present for total exports, and 5 sectors of goods. Membership in ASEAN is found to have no effect on the rest of the product classifications, i.e., neither trade creation nor trade diversion is found to be present.

It is notable that there is a dearth of literature that analyzes both capital and labour movements in context of economic integration. This is an aspect where there is a considerable scope for this study. There is however, an overview paper by Gabriel Felbermayr, Volker Grossmann and Wilhelm Kohler (2012); herein the authors go through the various techniques and methodologies including the gravity model, adopted to analyze migration, capital formation and trade by various authors. They conclude based on these various estimations by the reviewed papers that capital and labour are in fact complementary to the effects of trade.

In the case of migration, the studies are generally more recent than those undertaken for FDI, making exploration of this aspect of the gravity model usage more relevant. There have been, however, extensive migration studies on Europe and their closely knit working labour force. Laura Casi (2009) finds that migration has a statistically significant and robust enhancing effect on European countries exports after analyzing the benefits to trade that were experienced by European countries from immigration effects. The study focuses on 17 European Union member states and 10 extra-European partners with the highest immigration

flows towards the EU-27. The study uses a reduced form gravity equation of trade and migration over the period 1997-2006 with the intention to test whether migration is able to explain part of the basic gravity specification is not able to capture. Similarly, Nadia Campaniello (2013), using a gravity model of bilateral migrations on bilateral exports from the Mediterranean Third Countries (South) to the European Union (North) over the period 1970-2000 finds that in line with most of recent literature, there is a positive correlation, i.e. a complementarity, between migration and trade.

3. Methodology and Data

Our main research question can be stated as: is regional economic cooperation (in our case, the EU) complementary to factor flows or is it rival to such flows? The following is the research methodology and data sources that are used in answering this question.

i. Data Used:

The data used in the analysis is taken from various sources. An important fact to acknowledge is the difficulty in obtaining comprehensive migration data sets. However, the World Bank offers a Global Bilateral Migration Database that provides values for 10 year periods from 1960-2000. Values for 2010 are obtained from bilateral estimates as provided by World Bank. Unavailable data has been interpolated for missing periods using all available data points. An assumption is therefore made that the variable in question is related to time. This is a justified and acceptable augmentation of the dataset. In this manner, data for the period of 2001-2010 is utilised. The data for FDI has been obtained and augmented from the UNCTAD Bilateral FDI Statistics Reports for individual countries.

The remainder gravity variables are obtained from the Centre d'Études Prospective set d'Informations Internationales (CEPII) gravity database. CEPII makes available a "square" gravity dataset for all world pairs of countries, for the period 1948 to 2006. This dataset was generated by Keith Head, Thierry Mayer and John Ries (2010). A lighter version of this dataset has been used for some of the variables in our model, like the Common Language dummy variable as well as the Distance variable.

ii. Econometric Modelling and Specification:

Multiple models are needed to effectively and thoroughly analyse the effects of economic integration on factor flows; we have however, specified two models to evaluate our hypotheses:

Model I, takes migration as the dependent variable and the gravity variables to be independent, explanatory variables in order to analyze if being a member of a strong economic integration area, like EU, increases migration into the country.

Model II, takes FDI as the dependent variable and gravity variables to be independent, explanatory variables in order to determine if being a member of a strong economic integration area, like EU, promotes FDI into the country.

For all analyses, including panel data tests and FEVD modelling, STATA 11 (Statacorp.) was used.

Model I:

The research strategy is to investigate whether economic integration leads to a significant effect on migration, and also to determine the nature of the relation. The European Countries considered for analysis belonged to the EU prior to 1991. They are: France, Germany, Italy and the United Kingdom. Further, the non- European countries that are included in our study are China, India, Japan and USA. To distinguish between the two sets of countries, a dummy variable is used. Hence, the log-linear gravity model of migrations and the empirical specification is the following:

$$\ln(1 + M_{ijt}) = \beta_1 \ln GDP_{it} + \beta_2 \ln GDP_{jt} + \beta_3 \ln POP_{it} + \beta_4 \ln POP_{jt} + \beta_5 \ln D_{ijt} + \beta_6 EU + \beta_7 CommLang + \alpha_i + u_{ijt}$$

Where the subscript i and j represent, respectively, each of the 8 countries considered. This is therefore a panel data set that is up for panel data estimation. To avoid the effects of heteroskedasticity, robust standard errors are used.

Of these variables, M_{ijt} represents the migration flow from country i to country j during time period t . GDP_{it} represents the GDP (current US \$) for country i during time period t , D_{ij} is the population weighted bilateral geographic distance between countries i and j , EU is a dummy for whether the country belongs to the EU or not. Y is the year, α are country fixed effects (FEs). A weighted distance is used to overcome the effect of dropping of time invariant variables in the equation. An additional unit term is added to the log variable of migration to avoid the inconvenient effect of zero values. This is consistent with the methodology used by RuzitaMohd Amin, Zarina Hamid & Norma MD Saad (2009).

The equation is estimated using Panel data estimation across the eight countries for the ten year period. To solve the problem of heteroskedasticity due to intragroup correlations, robust standard errors at the country of destination and origin level are used in all estimates.

We are interested in the coefficient of the Dummy Variable EU . If it is statistically significant and positive, it means that migration and economic integration are complements; while if it is statistically significant and negative, it means that they are substitutes and that economic integration reduces labour migration.

Model II:

$$\ln(1 + FDI_{ijt}) = \beta_1 \ln GDP_{it} + \beta_2 \ln GDP_{jt} + \beta_3 \ln POP_{it} + \beta_4 \ln POP_{jt} + \beta_5 \ln D_{ijt} + \beta_6 EU + \beta_7 CommLang + \alpha_i + u_{ijt}$$

This is the equation for analyzing the effect of belonging to the European Union on FDI flows. FDI_{ijt} represents FDI flows from country i to country j during time period t . FDI flows and not stocks have been used to avoid the effect of aggregation of FDI stock in the bigger countries. The remaining variables have the same meaning as mentioned above in case of Model I.

To determine as to which particular method of panel data regression is appropriate, a combination of tests is used. First the Hausman test determines whether the data is best suited to fixed effects or random effects estimation. Further, to determine whether a panel or pooled estimation technique is appropriate, the F-test for the particular

technique determined by the Hausman test is utilized. Literature suggests that a gravity model of this particular kind is suitable to fixed effects panel data estimation.

In case fixed effects model is determined, then there is a new issue to be dealt with. Employing the fixed effects regression causes dropping of time invariant variables, which is detrimental to our econometric specification which includes invariant dummy variables. We need to employ additional techniques to overcome the dropping of time invariant models. There are multiple methods to overcome this particular problem of fixed effects panel data estimation. The traditional technique used is the Hausman Taylor Regression. However, we chose to employ the method of Fixed Effect Vector Regression/Decomposition (FEVD). It is a recent technique in panel data estimation utilized by Plumper and Troeger (2007) in their analysis. It is based on the model proposed by Hsiao (2003). It has come to be popular in attempting to solve the problem of time invariant variables. Its validity has been supported by further studies such as Plümer, T., & Troeger, V. E. (2011). It has been used widely in recent years - for instance, Akhter & Daly (2009), Sova, R., Albu, L. L., Stancu, I., & Sova, A. (2009). Gatti, & Guillaud(2008) and Beckmann, R. (2007).

FEVD modeling is employed instead of the Hausman and Taylor regression method because there are two important conditions to apply the Hausman Taylor method. These conditions are:

- (a) There should be strong correlation between endogenous and exogenous variables.
- (b)
- (c) Exogenous time variant variable should be greater than or at least equal to time invariant exogenous variable.

However, these conditions are not met in our dataset. Hence, the FEVD model is adopted instead. The FEVD technique is a three stage process as follows:

Stage 1: take dependent variable and time variant variables. Find Error component (residual) using fixed effects and therefore obtain unit effects.

Stage 2: Take error term generated in Step 1 as the independent variable and time invariant variables as the explanatory variables. Find residual using OLS.

Stage 3: Re-estimate the first stage by keeping the dependent variable as that in the original fixed effects model and dependent variables as all the variables taken originally including the error obtained from step 2. Estimate this model using pooled OLS.

These results are as useful and as significant as those produced by Hausman Taylor Regressions, and are therefore valid as per Plumper and Troeger. (2007)

Each of the variables in Models I & II are described in Table A.1 of the Appendix along with the source of the data.

4. Results & Findings

The gathered data set comprises a panel of seven variables across eight countries. To analyse the data, using the method of panel data estimation, we must first check between the suitability of fixed and random effects. The Hausman test is utilized to determine this. The Hausman test reveals the need for fixed effects regression but rejects pooled estimation for both models. However, owing to the presence of time invariant variables, the FEVD model is utilized. The final results of the last stage are presented below to study the impact of economic cooperation on migration, as Model I, and the effects on FDI are given in in Model II:

i. Study of Labour Flows (Migration):

Table 1: Model I Data Analysis Results

VARIABLES	Log(1+Mig)
LogGDPSource	0.129
	(0.0841)
LogGDPdest	2.100***
	(0.110)
LogPOPsource	0.333***
	(0.0522)
LOGPOPdestn	-0.332***
	(0.113)
LOGDistance	-341.8***
	(49.80)
DummyEUdestn	1.015***
	(0.125)
CommonLanguage	0.772***
	(0.0889)
Constant	1,105***
	(163.3)
Observations	560
R-squared	0.668

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Model I provides a good list of factors that are an explanation of international migration. The positive coefficient of the significant dummy variable indicates that when the destination country is a part of the EU, taking on dummy value of 1, it results in larger migration flows into that country. Further, all gravity variables are also found to be significant in explaining migration flows in our model. The longer the distance between the two countries the less are the migration flows as both costs and feasibility considerations reduce migrants' preferences in such cases. Common language promotes migration as a migrant is naturally more suited to relocate to a place with which he shares a

common language for ease of communication and his higher aptitude and usefulness in such foreign opportunities.

The GDP of the destination country for migrants is significant and directly related as it presents economic opportunities for labour. The GDP of the source country appears to be the only explanatory variable that is not significantly related to migration in our analyses. This leads to the understanding that migrants are concerned with the growth prospects of the country that they are migrating to, and are in fact attracted to the better economic prosperity in the new destination.

The population variables are significant for both the source and destination country, with expected relationship. The larger the population of the source country the more the migration from there and the larger the population of the destination the less the migration into that country, as indicated by the negative sign. It appears likely that a country discourages migrants if it has an active and dominant labour force of its own, perhaps because it has fewer remaining opportunities after employing its own workforce.

There is a positive correlation between being a part of the European Union and migration flows, which suggests that regional economic integration promotes migrant flows. It is in fact consistent with modern literature that documents this kind of complementary relationship between the two. This may be more so within the European Union: after the setting up of the Schengen area if you have a visa to travel to one Schengen country, you do not need a further visa to travel to the others. If you have a valid residence permit in one Schengen country you can travel to the others without needing a visa (in effect, a residence permit from a Schengen country is the same as a Schengen visa). This can be a major reason for greater migration into our EU countries.

Governments need to appreciate such relationship outcomes, but also realize that there can be possible risks of unstable labour resources as labour migrates from one country in the Union to another, abusing the system of social benefits as a minority class (Brücker, H., Epstein, G. S., McCormick, B., Saint-Paul, G., Venturini, A., & Zimmermann, K. F., 2002). Adequate safeguard policy measures are required to ensure that migrants do not build one way exploitative relations in foreign markets.

ii. Study of Capital flows (FDI):

Once again, the Hausman test reveals the need for fixed effects regression but rejects pooled estimation. Further, due to time invariant variables, the FEVD model is utilized. The final results of the last stage reveal the following relations between FDI inflows, membership of EU and gravity variables:

Table 2: Model II Data Analysis Results

VARIABLES	Log(1+FDI)
LogGDPSource	1.997***
	(0.0617)
LogGDPdest	1.142***
	(0.0804)
LogPOPsource	-1.442***
	(0.0383)
LogPOPdestn	0.846***
	(0.0828)
LogDistance	-277.7***
	(36.52)
DummyEUdestn	1.118***
	(0.0914)
CommonLanguage	0.361***
	(0.0652)
Constant	884.8***
	(119.8)
Observations	560
R-squared	0.903

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

It is clear that belonging to the EU has a significant effect on increased FDI flows to the countries studied. The variable is significant at the 1% level. Further, since the coefficient is positive, it seems that there is a

complementary relationship between being integrated to the EU and bilateral FDI flows to/from the country.

Integrationist accords, even those limited to trade, enhance credibility of the government in a transition economy in terms of commitment to economy-opening reforms. The impact of the policy-induced integration process on foreign capital inflows is twofold. First, by reducing the risk that global investors face and improving a country's business climate, they increase the flow of direct and portfolio investment often diverting them from other regions. Second, the increased foreign participation in investment establishes a framework to faster industrial development based on availabilities of better technologies and an improvement in corporate governance.

The negative relation between FDI and population of the source country could imply that market opportunities in the source nation are good, thus market seeking FDI is limited. Additionally, it seems that presence of a common language is significant and helps explain an overlooked aspect; there is an increase in the accessibility to international markets located in countries where communication is easier. Since access to foreign markets is an important asset for global firms, the FDI inflows are expected to increase to markets which share a common language with the source nation.

GDP of the source country and GDP of the destination country appear to be significantly and directly related to the FDI flows. Countries with large GDP are able to make more FDI due to greater economic resources and they also receive more FDI as they offer stronger markets and economic opportunities.

Longer distance between nations has a large negative coefficient and acts as an important limitation to FDI. Higher costs of FDI in distant places occurs as large part of FDI flows involve both labour and machinery movement and often also, result in exports to home countries.

iii. Comparison of results from both models:

A comparative analysis of the two models looking at migration flows and FDI flows suggests that distance is a significant variable that negatively affects both FDI and migration. Cost of transportation and

inconvenience contribute to making distance an important factor in determining inter country flows. An interesting fact to additionally observe is the fact that the presence of common language seems to favourably affect both migration and FDI flows, possibly owing to the human nature of migration involving cultural transactions, and of overcoming linguistic barriers.

The difference between the two models however lies in the fact that GDP of the source country does not affect migration flows, while it does affect FDI flows. International migration more often seeks specific labour opportunities in foreign destinations and is not gained by lack of employment in the source country as the key driver. The pull of attractive jobs in foreign places is the motivator for labour migration. GDP of the source country is a means enabler for surplus invertible resources that can move out as FDI.

Another point of difference is that while the relation for migration with population of the source country is positive, it is negative for FDI. For migration, this can be explained as the need for seeking opportunities due to an increase in population in home countries and by sheer size of number. In the case of FDI, the presence of a large populations translates to large markets at home and thereby reduces the need for market seeking FDI.

Additionally, while migration is negatively related to population of the destination, implying that countries with smaller populations need more foreign workers; migrants are more inclined to travel to countries that support smaller populations and therefore, offer more opportunities and benefits. FDI is however, positively related with the population of the host country. The more the population of the destination, the bigger is the market opportunity for FDI, given that suitable income conditions being met. Such FDI can be explained by countries trying to invest in emerging countries such as India and China which are considered in the study, thereby explaining the positive relation.

5. Conclusions and Implications

There is much to inquire and understand with the knowledge of these results. There are possibilities of wide-spanning political and economic implications. It is clear that belonging to a common market such as the

European Union produces vast opportunities for business growth as well as economic growth while simultaneously increasing and improving people's perception of the gains to be exploited in such a country. The FDI flows into a country are therefore complementary to the integration of the countries Germany, France, Italy and the UK. In fact, growth of regional economic groupings suggests that countries are aware of the widespread gains that can accrue from such cooperation and integration. The governments of these countries must capitalize on this. In general, there is an increase in bilateral capital flows with economic integration.

Further, it seems as though belonging to an economic integration leads to a higher level of mingling of populations, with higher levels of migration. This, in our study, can be attributed to the aging population of Europe that is believed to be attracting vast number of migrants. It is advantageous in nature, as there is will be more diversity in the constituent populations and a more efficient labour force.

To take this study further, the models can be expanded to include countries that are members of other important economic groups. It would be interesting and useful to study if the degree of economic cooperation plays a significant role in affecting factor flows. Does the effect on FDI and/or migration alter depending on the country being a part of a Free Trade Agreement, Customs Union or an economic common market? Further, by expanding the range of study, it can be made more meaningful and representative.

References

- Adams Jr, R. H. (2003). International migration, remittances, and the brain drain: A study of 24 labor-exporting countries.
- Akhter, S., & Daly, K. J. (2009). Finance and poverty: Evidence from fixed effect vector decomposition. *Emerging Markets Review*, 10(3), 191-206.
- Albuquerque, R. (2003). The composition of international capital flows: risk sharing through foreign direct investment. *Journal of International Economics*, 61(2), 353-383.
- Amable, B., Gatti, D., & Guillaud, E. (2008). How does party fractionalization convey preferences for redistribution in parliamentary democracies?.
- Anderson, J. E. (1979). A theoretical foundation for the gravity equation. *American economic review*, 69(1), 106-116.4
- Baldwin, R.E., Forslid, R. and Haaland, J. (1995) 'Investment Creation and Investment Diversion: Simulation Analysis of the Single Market Programme', Discussion Paper 1308, CEPR, London.
- Beckmann, R. (2007). Profitability of Western European banking systems: panel evidence on structural and cyclical determinants. *Available at SSRN 1090570*.
- Bommes, M., & Geddes, A. (Eds.). (2003). *Immigration and welfare: challenging the borders of the welfare state*. Routledge.
- Brenton, P. (1996) 'The Impact of the Single Market on Foreign Direct Investment in the EU', Report for DGII, European Commission
- Brenton, P., Di Mauro, F., & Lücke, M. (1999). Economic integration and FDI: An empirical analysis of foreign investment in the EU and in Central and Eastern Europe. *Empirica*, 26(2), 95-121.

Briant A., P.-P. Combes and M. Lafourcade (2009), 'Product Complexity, Quality of Institutions and the Pro-Trade Effect of Immigrants', Working Paper no. 2009 - 06 (Paris School of Economics Working Paper).

Brücker, H., Epstein, G. S., McCormick, B., Saint-Paul, G., Venturini, A., & Zimmermann, K. F. (2002). Managing migration in the European welfare state. *Immigration Policy and the Welfare System*, Oxford University Press, Oxford, 1-168.

Bruder J. (2004), 'Are Trade and Migration Substitutes or Complements? The Case of Germany, 1970-1998', Working Paper.

Campaniello, N. (2012). The Causal Effect of Trade on Migration: Evidence from Countries of the Euro-Mediterranean Partnership.

Casi, L. (2009). *Enhancing Trade Through Migration. A Gravity Model of The Network Effect* (No. 35). ISLA, Centre for research on Latin American Studies and Transition Economies, Università Bocconi, Milano, Italy.

Centre d'Etudes Prospectives et d'Informations Internationales (CEPII) (2012) GeoDist [database]. Available at http://www.cepii.com/distance/geo_cepii.xls, accessed on 27 April 2014

Di Mauro, F. (2000). *The impact of economic integration on FDI and exports: a gravity approach*. Centre for European Policy Studies.

Egger, P. H., Von Ehrlich, M., & Nelson, D. R. (2012). Migration and trade. *The world economy*, 35(2), 216-241.

Felbermayr, G. J., Grossmann, V., & Kohler, W. K. (2012). *Migration, international trade and capital formation: Cause or effect?* (No. 6975). Discussion Paper Series, Forschungsinstitut zur Zukunft der Arbeit.

Feenstra, R. C., Markusen, J. R., & Rose, A. K. (2001). Using the gravity equation to differentiate among alternative theories of trade. *Canadian journal of economics*, 430-447

Ghatak S., M. I. P. Silaghi and V. Daly (2009), 'Trade and Migration Flows between Some CEE Countries and the UK', *Journal of International Trade & Economic Development*, 18, 1, 61-78.

Hay, C., & Rosamond, B. (2002). Globalization, European integration and the discursive construction of economic imperatives. *Journal of European Public Policy*, 9(2), 147-167.

Head, K. and T. Mayer, (2013), "Gravity Equations: Toolkit, Cookbook, Workhorse."

Head, K., Mayer, T. & Ries, J. (2010), The erosion of colonial trade linkages after independence *Journal of International Economics*, 81(1):1-14

Hsiao, (2003), *Analysis of Panel Data*, 2nd edition, Cambridge University Press, Ch. 4, 1-4.6.

Kimura, F., & Lee, H. H. (2006). The gravity equation in international trade in services. *Review of world economics*, 142(1), 92-121.

Migration. - *European Commission*. N.p., n.d. Web. 29 Apr. 2014. <http://ec.europa.eu/economy_finance/eu/globalisation/migration/index_en.htm>.

Mohd Amin, R., Hamid, Z., & MdSaad, N. (2009). Economic integration among ASEAN countries: evidence from gravity model.

Motta, M., & Norman, G. (1996). Does economic integration cause foreign direct investment?. *International Economic Review*, 757-783.

Mundell, R. A. (1957). International trade and factor mobility. *the American Economic Review*, 321-335.

Murat M. and B. Pistoiesi (2009), 'Migrant Networks: Empirical Implications for the Italian Bilateral Trade', *International Economic Journal*, 23, 3, 371-90

Oguledo, V., & MacPhee, C. R. (1994). Gravity models: a reformulation and an application to discriminatory trade arrangements. *Applied Economics*, 26(2), 107-120.

Ohlin, B. (1952). *Interregional And International Trade. Vol. 39.*

Parsons C. R., R. Skeldon, T. L. Walmsley and L. A. Winters (2007), 'Quantifying International Migration: A Database of Bilateral Migrant Stocks', in C. Ozden and M. Schiff (eds.), *International Migration,*

Economic Development and Policy, (New York, N.Y.: Palgrave Macmillan/World Bank), 17-58.

Plümper, T., & Troeger, V. E. (2007). Efficient estimation of time-invariant and rarely changing variables in finite sample panel analyses with unit fixed effects. *Political Analysis*, 15(2), 124-139.

Plümper, T., & Troeger, V. E. (2011). Fixed-effects vector decomposition: properties, reliability, and instruments. *Political Analysis*, 19(2), 147-164.

Rodrik, D. (2000). How far will international economic integration go?, *The Journal of Economic Perspectives*, 177-186.

Sapir, A. (1997) 'Domino Effects in Western European Trade, 1960-92', CEPR Discussion Papers N. 1576, February.

StataCorp. 2009. *Stata Statistical Software: Release 11*. College Station, TX: StataCorp LP.

The Editors of Encyclopædia Britannica. "Maastricht Treaty (Europe [1991])." *Encyclopedia Britannica Online*. Encyclopedia Britannica, available at <http://www.britannica.com/EBchecked/topic/196490/Maastricht-Treaty>, accessed on 29 Apr. 2014.

UNCTAD Global Migration Reports, Available at <http://unctad.org/en/Pages/DIAE/FDI%20Statistics/FDI-Statistics-Bilateral.aspx>, accessed on 27 April 2014

APPENDIX

Table A.1: Definition of Variables in Models I & II

Variable	Description	Source of Data
M_{ijt}	Migration flow from country i to country j during time period t (Total)	The World Bank, <i>Global Bilateral Migration Database</i>
FDI_{ijt}	FDI flows from country i to country j during time period t	UNCTAD, <i>UNCTAD Bilateral FDI Statistics Reports</i>
GDP_{it}	GDP for country i during time period t (current US \$)	The World Bank, <i>World Development Indicators</i>
GDP_{jt}	GDP for country j during time period t (current US \$)	
POP_{it}	Population for country i during time period t (Total)	
POP_{jt}	Population for country j during time period t (Total)	
D_{ijt}	Population weighted bilateral geographic distance between countries i and j	CEPII's GeoDist
$CommLang$	Common Official Language: 1 if the pair of countries have a Common official language and 0 otherwise	
EU	Membership in the EU: 1 if the destination country belongs to the EU and 0 otherwise.	Author generated Source: European Union Website