

Journal of Economic Cooperation & Development

Rahmatina Awaliah Kasri and
Farid Arif Wibowo

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in Infrastructure Provision: Evidence from
Muslim Developing Countries

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EDITORIAL NOTE

As the newly appointed Director General of SESRIC and the editor-in-chief of the *Journal of Economic Cooperation and Development*, I would like to present, with great pleasure, the June issue of the 36th volume. The variety of paper submissions from a diverse set of emerging countries both from within and outside the OIC region is surely important with respect to the global objectives of our Journal. I am also delighted that researchers of applied economics, business and finance continue to demonstrate an increased interest in sharing the results of their valuable studies with the readers of our Journal.

This issue of Journal of Economic Cooperation and Development contains six outstanding articles which shed light on contemporary research questions.

The *first* paper investigates the determinants of private involvement in public infrastructure provision in Muslim developing countries. The issue is considered important due to the persistent gap between the demand for and supply of public infrastructure in most of the Muslim developing countries.

The *second* paper inspects the strategic alliance which has ignored new concepts on learning cycle and information that is given by partner. A failure of partnership in Small and Medium Entrepreneurship (SME) is usually caused by foundation from low commitment of partnership.

The *third* paper employs OLS and TSLS-instrumental variable techniques that take into account random effects to investigate the effect of corruption on savings, in addition to examining whether the effect of corruption on savings depends on income levels in the ECOWAS from 1996 to 2012.

The *fourth* paper studies the ASEAN economic integration progress based on the impact of ASEAN Free Trade Area (AFTA) on FDI inflows of both multi-country (Indonesia, Malaysia and Thailand) with macroeconomy-level data and single country (Indonesia) with micro firm-level data.

The *fifth* paper explains the relation between international R&D spillover from international trade and FDI channel with productivity (TFP) based on endogenous growth theory in Asian Newly Industrialized Countries (ANIC) in period 1990 - 2010.

The *sixth* and final paper investigates the client satisfaction of faith-based and mainstream microfinance institutions. In this paper the level of satisfaction is considered on eight independent factors identified through literature survey and experts' opinion.

I hope that this fine collection of articles will be a valuable resource for our readers and will stimulate further research. As our Journal mainly focuses on applied research in development economics, we welcome original papers dealing with important economic and social issues of immediate concern to the developing world. We will continue to give special attention to those papers which deal with the potentials for and possibilities of promoting and expanding economic and technical cooperation among developing countries as well as policy-oriented research papers which analyse successful economic development strategies and implementations in OIC Member Countries.

Amb. Musa KULAKLIKAYA
Editor-in-chief

Determinants of Public-Private Partnerships in Infrastructure Provision: Evidence from Muslim Developing Countries

Rahmatina Awaliah Kasri¹ and Farid Arif Wibowo²

This paper investigates the determinants of private involvement in public infrastructure provision in Muslim developing countries. The issue is considered important due to the persistent gap between the demand for and supply of public infrastructure in most of the Muslim developing countries. In this regard, an important infrastructure provision scheme increasingly utilised by the developing nations is Public-Private Partnership (PPP). Nevertheless, the policy outcomes of this scheme are diverse. Hence, when such schemes are implemented in those countries, improvements in public infrastructure and higher achievements in development expected from the policy seem to be limited.

Based on that perspective, this study employs advanced panel estimators to develop a cross-country analysis of private finance determinants in 48 Muslim developing countries for the period 2002-2011. The findings suggest that market conditions, institutional qualities and country risks are the most crucial factors determining the private involvement in infrastructure financing in the Muslim countries. It is hoped that the findings will encourage policy-makers in these countries to prioritise this agenda in their efforts to attract private investment in public infrastructure, which in turn will contribute to higher economic growth and better development in the Muslim region.

1. Introduction

It is generally known that a well-functioning and efficient infrastructure is instrumental in economic growth and development. It supports a more efficient production process, attracts more businesses and increases living standards. It also strengthens economic integration and facilitates trade as it eases the access to goods and services. Furthermore, infrastructure projects can create a demand for skilled labour, potentially

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reducing the unemployment problem and benefiting the economy in the long term (SESRIC, 2013a). As such, in a wider perspective, many studies such as those by Aschauer (1989), Munnell (1990), Prud'homme (1993), Canning and Fay (1993), and Easterley and Rebelo (1993) suggest that there is a link between the provision of public infrastructure and economic growth and development.

The key roles of public infrastructure availability in supporting economic growth, distributing wealth and reducing poverty have been among the main reasons why governments of developing countries, including Muslim countries, have strongly prioritised infrastructure development in their agendas. Several efforts have been made by a number of Muslim countries to accelerate infrastructure provision, particularly roads, railways, ports, power generation and water treatment. Unfortunately, many of these countries are constrained by a lack of government resources (limited budgets), inefficient state-owned enterprises, unskilled labour and low level of technology. Therefore, they are unable to expand the development of public infrastructure facilities to the level required to increase the quality standards of life (SESRIC, 2013a).

As limited budget capacity is believed to be the main constraint on public infrastructure provisions, an alternative form of financing to conventional public funding is considered an important remedy for the problem. In recent years, private financing has been regarded as a potential alternative for developing public infrastructure. In addition to providing supplementary sources of funding, it is seen as having more advantages than public financing, particularly in terms of improving projects' value-for-money, shortening delivery times and reducing projects' costs (Yescombe, 2007). This sort of arrangement has been applied in many parts of the world in different guises. The most common type is usually called Public-Private Partnership (PPP), while in some Commonwealth countries such as the UK and Malaysia it is well known as Private Finance Initiative (PFI). In other countries, the arrangement is often called Private Participation in Infrastructure (PPI), Private Sector Participation (PSP), Privately-Financed Projects (PFP), P3, or P-P Partnership (Yescombe, 2007). For the purpose of clarity, this paper will mainly use the term PPP to cover all types of arrangements for private participation in the kind of public infrastructure mentioned above.

In the Islamic world, a number of developing countries have also been identified as countries attempting to adopt PPP policies for their public infrastructure development. Some notable developments of PPP implementations have been seen in countries such as Turkey, Egypt, Morocco, Pakistan, Malaysia, Indonesia and Bangladesh. The projects conducted commonly include provisions for energy, transport, telecoms, and water/sewage infrastructure. However, the achievement of such implementation differs from one country to another. While some countries have been making rapid progress in attracting private investment in infrastructure, others are still developing very slowly (SESRIC, 2013b).

Few studies, however, have attempted to investigate the reasons behind the success of some countries in attracting private finance for the development of public infrastructure. Hammami *et al.* (2006) analysed determinants of PPP implementations across low-income and middle-income countries from 1990 to 2003. Banerjee *et al.* (2006) conducted an empirical study to investigate the institutional structures and their effects on the implementation of PPP in developing countries, while Reside and Mendoza (2010) focused on the key risks affecting PPP in Asian countries. More recently, Sharma (2012) has looked at the determinants of PPP in developing economies covering the period 1990-2008.

In view of the above, this paper aims to investigate the factors that determine private financing involvement in public infrastructure provision in Muslim developing countries. Muslim developing countries are selected for this study primarily due to the wide and persistent gap between the demand for and supply of public infrastructure in most of the Muslim developing countries. On the one hand, the countries wanted to improve the quality and quantity of the provision of public infrastructure such as energy, transport, telecoms, and water/sewage infrastructure to their people. On the other hand, they have been attempting to provide such infrastructure but have achieved limited results. Despite this, to the best of our knowledge, no previous study has explored this issue in the case of Muslim developing countries. Therefore, this study attempts to fill the gap in the literature by examining the determinants of PPP in these countries. The findings of the study are also expected to encourage the policy-makers to prioritise the agenda in their efforts to attract private investment in public

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infrastructure, which in turn will contribute to higher economic growth and better development in Muslim regions.

Additionally, the paper is interested in exploring the practice of involving the private sector in infrastructure development in Muslim developing countries, particularly based on the perspective that private participation is conceptually supported and suggested by Islamic financing principles. As outlined by Khan (2002), partnership schemes between the authorities and the private sector in developing infrastructure are consistent with Islamic financing principles as they ensure greater justice and equity. Iqbal and Khan (2004) also suggested that infrastructure financing using PPP schemes might help countries to avoid direct debt. Very similar support for such arrangements is also offered by Kahf (2002) and Hassan and Soumare (2007). In relation to this, our paper intends to examine how such views are actually implemented in developing countries with large Muslim populations.

Although this study focuses on cases of Muslim developing countries, the findings are not limited to those countries and can also be applied to cases in non-Muslim developing countries. Indeed, the importance of market conditions and institutional quality in determining PPP implementation found in this study are in line with the findings of previous research investigating PPP implementation in developing countries in general (see, among others, Hammami *et al.* (2006), Banerjee *et al.* (2006) and Sharma (2012)). Such findings are generally expected to stimulate policy-makers in the developing countries to improve the policy and implementation of PPP in the region, which are ultimately expected to increase economic growth and the level of development in the countries.

To achieve its objectives, the paper analyses the determinants of a number of PPP projects and the amounts of PPP investment while considering various critical factors such as government budget constraints, macroeconomic conditions, market conditions and institutional factors (government and political conditions) in the region. The analysis involves 48 Muslim developing countries during the period 2002-2011. To obtain robust estimation results, the study utilises various panel data estimation methods including the Random-Poisson and Generalised Least Squares regression models.

The rest of the paper is organised as follows. The second and third sections discuss the theoretical perspectives and previous studies on the determinants of PPP arrangements in developing countries. Section four explains the data and methodologies used in this study. Empirical results as well as policy implications and recommendations are elaborated in the subsequent sections. The final section concludes the study.

2. PPP Arrangements and Infrastructure Development in Muslim Developing Countries

Most governments that embark on PPP generally justify their policy based on two main reasons. The first reason is the belief that a government might gain a budgetary benefit by involving private funding; thus, the development of infrastructure will not be dependent on public debt (Grimsey & Lewis, 2007). This is the case because the government is able to avoid the advance capital cost of infrastructure projects which can be spread out over their lifetimes (Kwak, *et al.*, 2009; Yescombe, 2007). The second motive comes from the idea that PPP might also improve the value for money due to its more efficient allocation of risks, based on the belief that the risks are likely to be managed better by the private sector than by the public sector (Grimsey & Lewis, 2007). Nevertheless, some studies see PPP as more of a short-term ‘quick fix’ that may be an expensive option for the public in the longer term since the financial burden will potentially be passed on to the next generation (ACCA, 2002; Parker, 2012).

From an Islamic economics and finance perspective, it is widely known that Islamic financing modes have been used to finance public infrastructure projects since the medieval era (Ebrahim, 1999; Hassan & Lewis, 2007). The infrastructure investment also fits well with Islamic finance since both are generally concerned with social investments and are typically characterised by asset-backed and equity-based financing (Ahmed, 2010b; Ismail, 2013). Moreover, in terms of involving private financing in the development of public infrastructure, diverse Islamic financing schemes are consistent with the various needs of infrastructure project finance which involves the private sector (Kahf, 2002).

In contemporary times, this sort of arrangement is strongly supported as an alternative financing structure for Muslim countries. The involvement of private funding has been found to help countries avoid public debt

when financing the development of public facilities (Iqbal & Khan, 2004). Furthermore, governments do not have to spend their money on infrastructure investments, as this task can be left to the private sector (Kahf, 2002). Additionally, good interplay between governments, private entrepreneurs and multilateral agencies might enhance Islamic financing for large-scale capital-intensive infrastructure projects such as power plants, roads, ports and tunnel projects (Hassan & Soumaré, 2007), which eventually contribute to higher economic growth and the development of Muslim countries.

Despite some positive encouragement in the development of public infrastructure from the Islamic perspective, the current figures show that deficiencies in infrastructure services are one of the main problems faced by Islamic developing countries. Table 1 shows the infrastructure indicators for some developing countries listed as members of the Islamic Development Bank (IDB), particularly in terms of electricity, water provision, sanitation and telecommunications as representations of infrastructure service fulfilment. It can be inferred from the Table that infrastructure services provision in some Muslim countries is generally lagging behind the average value of each respective group or area, although there are also some figures showing satisfactory achievements. It is also found that access to electricity is still deficient in countries such as Bangladesh, Yemen, Cameroon and Indonesia. In water provision, Azerbaijan, Kyrgyz Republic, Yemen, Mozambique, and Nigeria are also still far below the average. In the case of telecommunications, Bangladesh, Kyrgyz Republic, Egypt, Syria, and Sudan are all undersupplied compared to their neighbouring countries. In recent decades, following the global trend of involving the private sector in public infrastructure, there has been a growing awareness in Muslim countries of opportunities to implement PPP schemes. Notable developments can be found in Malaysia, Pakistan, Turkey, Indonesia, Jordan and other MENA countries, with some varieties in progress.

Table 1: Infrastructure Indicators in Selected Muslim Countries, 2011

Country	GNI per capita (current US\$)	Access to electricity (% of population)	Electric power consumption (kwh per capita)	Improved water source (% of population with access)	Improved sanitation facilities (% of population with access)	Total telephone subscribers per 100 inhabitants
<i>South Asia Average</i>	1,305	29	304	77	47	27
Bangladesh	470	20	136	80	36	14
Pakistan	870	na	456	90	58	25
<i>Europe and Central Asia Average</i>	5,795	Na	2,907	94	90	100
Azerbaijan	2,550	Na	2,407	78	80	53
Kyrgyz Republic	590	Na	1,842	89	93	32
Turkey	8,020	Na	1,898	97	88	96
<i>Middle East and North Africa Average</i>	3,825	87	1,934	89	80	53
Algeria	3,620	98	899	85	94	71
Egypt, Arab Rep.	1,580	94	1,245	98	66	38
Iran, Islamic Rep.	3,470	98	2,117	94	Na	53
Jordan	2,850	95	1,676	98	85	85
Lebanon	5,770	95	2,242	100	98	49
Morocco	2,250	71	644	83	72	56

Table 1: Infrastructure Indicators in Selected Muslim Countries, 2011(Cont.)

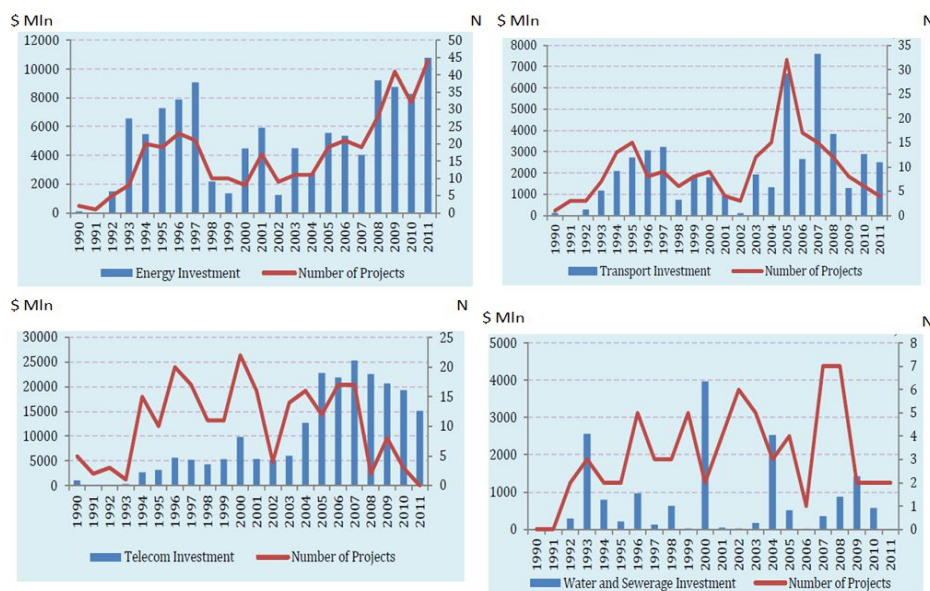
Syrian Arab Republic	1,760	86	1,411	89	92	41
Tunisia	3,200	95	1,194	94	85	84
Yemen, Rep.	870	50	174	66	46	18
<i>Sub-Saharan Africa Average</i>	1,670	27	812	67	33	22
Benin	570	22	69	65	30	13
Cameroon	1,050	20	196	70	51	20
Côte d'Ivoire	910	50	170	81	24	23
Gabon	6,670	31	999	87	36	57
Gambia, The	320	na	na	86	52	29
Mozambique	320	7	450	42	31	12
Nigeria	930	40	127	47	30	25
Senegal	820	30	151	77	28	27
Sudan	960	30	94	70	35	14
<i>East Asia and Pacific Average</i>	2,358	63	1,182	79	62	33
Indonesia	1,650	53	509	80	52	35
Malaysia	6,540	97	3,262	99	94	92

- Data are collected and the presentations are modified from Private Participation in Infrastructure Database, The World Bank Group and PPIAF available at <http://ppi.worldbank.org> accessed 1 August 2013.
The methodology and classification refer to the same source.

- n.a: data not available

The government of Malaysia, for instance, has officially announced a PFI program under the National Privatisation Plan of the 9th Malaysia Plan (2006 – 2010) which was followed by the completion of a significant number of PPP projects (Takim, *et al.*, 2009). Examples of such projects include the development of Kuala Lumpur International Airport and the Kuala Selangor Expressway (Ismail, 2013). Pakistan has developed a PPP program under the Infrastructure Project Development Facility (IPDF) (ADB, 2008). A similar framework was issued by the Government of Indonesia in 2005 and some transportation projects have been offered to the private sector in that country (Wibowo, 2006). In Jordan, the building of Queen Alia International Airport was financed by a PPP scheme (Mahmud, 2012). More recently, the Arab countries have established an initiative to promote private financing for public infrastructure development in the region through the Arab Financing Facility for Infrastructure (AFFI), which is facilitated by the World Bank and the IDB (World Bank, 2012).

Figure 1: Total Investments through Private Participation in Selected Muslim Countries³, 1990-2011



Source: Compiled from SESRIC's Report (2013b)

³ The Muslim countries here comprise 49 members of the Organisation of Islamic Conference (OIC), which is explained later in the SESRIC's report.

Given the above development, the amount of PPP investments and the numbers of PPP projects in Muslim countries have increased in the past decades. As shown in Figure 1, there are four major sectors where the private sector participates in building public infrastructure, namely energy⁴, transport⁵, telecoms,⁶ and water and sewage sectors.⁷ The largest investment amounts have been channelled into telecoms infrastructure, while the smallest investment sums have been allocated to water and sewerage infrastructure. Specifically, between 1990 and 2011, telecom infrastructure projects with private involvement received contractual investments amounting to \$214.6 billion through 226 projects. At the same time, only around 70 water and sewage infrastructure projects reached contractual or financial closure with investment amounts of \$16 billion (SESRIC, 2013b). Nevertheless, it is also notable that there have been large fluctuations in the number and amounts of PPP investments in the region, particularly in the last two decades.

All of these developments raise expectations of positive progress towards infrastructure improvements in the region. Despite that, issues such as governments' credibility and capacity may still potentially decelerate the infrastructure provision process. These conditions definitely raise concerns regarding the extent and challenges of implementing PPP arrangements in Muslim developing countries. One particular question that becomes the central theme of this research work concerns the determinants of PPP implementations in Muslim developing countries.

3. Theoretical Perspectives

As explained earlier, most of the governments that opted for PPP arrangements for financing public infrastructure generally justified their policy based on budgetary benefits and value for money (efficiency) arguments. These claims have been evident in many cases of PPP

⁴ Energy infrastructure covers natural gas and electricity generation, transmission and distribution.

⁵ Transport infrastructure consists of airport runways and terminals, railways, toll roads, bridges, highways, tunnels, port infrastructure, terminals, superstructures, and channels.

⁶ Telecom infrastructure involves fixed or mobile local telephony, domestic long-distance telephony, and international long-distance telephony.

⁷ Water and sewage infrastructure consists of sectors related to drinkable water generation and distribution as well as sewage collection and treatment.

implementation, particularly in developed countries such as the UK, Australia and Canada (Grimsey & Lewis, 2007). However, the evidence is not particularly convincing in developing countries primarily due to various complex and dynamic factors determining the success of PPP implementations in those parts of the world (Banerjee, *et al.*, 2006).

The literature suggests that there are many factors potentially influencing and explaining the various outcomes of private financing arrangements in public infrastructure provision. The determining factors include, among others, government budget constraints, macroeconomic conditions, market conditions and institutional factors such as government and political factors (Banerjee, *et al.*, 2006; Hammami, *et al.*, 2006; Sharma, 2012). Most of the above factors, particularly macroeconomic conditions and institutional factors, influence the PPP arrangements positively. However, factors such as government budget constraints and government effectiveness may have negative influences on the PPP arrangements.

Specifically, PPP arrangements are commonly adopted by governments that have infrastructure gaps but are constrained by limited internal and external resources (Reside & Mendoza, 2010). This is often cited as the main argument for making PPP arrangements to finance public infrastructure (Grimsey & Lewis, 2007). While there are many indicators for government resources, in the context of developing countries the government revenues are usually associated with income from natural resources such as oil, gold and other mining activities. It has been found that countries with large amounts of natural resources tend to have fewer PPP projects and investments since their governments are able to use money from the natural resources to finance infrastructure provision (Hammami, *et al.*, 2006). Additionally, to reduce the financing gap, such countries tend to have a high amount of aid and external debt (Sharma, 2012). Thus, when governments have budget constraints reflected in large deficits and heavy debt burdens, they are more likely to adopt PPP arrangements to accelerate public infrastructure financing in their countries. However, when they have soft budget constraints as more revenues are generated from sources such as fuel exports, they are less likely to participate in PPP projects.

Another economic factor critically related to private participation in infrastructure financing is macroeconomic conditions. Theoretically,

stable macroeconomic conditions indicated by low inflation, stable money circulation and a high amount of international (currency) reserves may reduce the commercial risk associated with PPP, which in turn will increase the private sector's prospects of gaining profits. This is very important for the private sector because PPP projects usually have high advance costs and often require a considerable amount of time to generate revenues and profits (Hammami, *et al.*, 2006). Thus, it is generally suggested that PPP arrangements are more common in countries with credible, predictable and stable macroeconomic conditions (Banerjee, *et al.*, 2006; Reside & Mendoza, 2010; Sharma, 2012).

Market condition is another factor strongly associated with the number and amounts of PPP investments implemented in developing countries. Intuitively, demand for public infrastructure such as roads, bridges, water, electricity, telecommunications and other public goods will be high in countries with large populations. The demand will be even higher when the population have higher incomes and more purchasing power, as the public will be concerned not only about the quantity but also about the quality of the infrastructure (Hammami, *et al.*, 2006). Thus, it can be predicted that countries with favourable market conditions and large market size indicated by high levels of income and large populations will tend to have more PPP projects and investments.

More recently, infrastructure financing has been linked with non-economic and institutional factors which directly influence the country risk. By definition, PPP arrangements are contractual arrangements. As such, their sustainability depends critically on the regulatory environment, which in turn is determined by the quality of institutions such as government and political institutions. This is the case because weak institutions create uncertainties about the quality of regulations and therefore increase country risk. As the country risk increases, incentives for the investors to participate in PPP arrangements decrease. Thus, effective political, regulatory (legal) and government institutions are important for securing PPP arrangements (Hammami, *et al.*, 2006; Pistor, *et al.*, 2000). Despite having poor institutions, it is notable that in some cases governments tend to avoid private participation in public infrastructure financing and prefer to finance the infrastructure provisions from their own sources (Sharma, 2012). Additionally, it is found that, in some circumstances, the private sector tends to invest

more in countries with relatively unstable political conditions provided that they are able to ‘cooperate’ with the regime and gain substantial profits from their investments (Banerjee, *et al.*, 2006). As such, government effectiveness and political environment may influence the extent of PPP arrangements in either positive or negative directions.

To conclude, the literature suggests a number of variables with the potential to determine and influence the extent of PPP implementations in a positive direction. The factors include, among others, stable macroeconomic conditions, favourable market conditions and good institutions (particularly in terms of the quality of regulation and stable political institutions). Conversely, heavy government budget constraints and, to some extent, effective government may reduce the number and value of PPP investments in developing countries.

4. Research Methods

To investigate the determinants of PPP implementation in financing public infrastructure in Muslim developing countries, this study proposes two models. The first model analyses the factors associated with the number of PPP projects in the region, while the second model examines the variables determining the amount of PPP investments in the countries. These approaches are expected to explain the determinants and capture the implementations of PPP arrangements in the Muslim countries.

Following recent literature and discussion in the previous sections, the four critical factors influencing the numbers and amounts of PPP investments in developing countries included in this study are government resource constraints, macroeconomic conditions, market conditions, and institutional factors. Each factor is proxied by a number of indicators obtained from the Private Participation in Infrastructure (PPI), World Development Indicators (WDI) and Worldwide Governance Indicators (WGI) databases of the World Bank (World Bank, 2013a, 2013b, 2013c). These databases are considered the most comprehensive sources of PPP data to date (Hammami, *et al.*, 2006; Kaufmann, *et al.*, 2010). The variables used, data sources, and the direction of the relationships are summarised in Table 2.

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Table 2: Data Descriptions

Variables		Definition	Unit	Data Source	Relationship
Dependent Variables					
PPP Project	Nppp	Number of PPP projects	Count number, annual	PPI	
PPP Investment	Ippp	Amounts of PPP investments	USD million	PPI	
Independent Variables					
Government resource constraint	Aid	Aid	% of GNI	WDI	Negative
	Exdebt	External debt	% of GNI	WDI	Negative
	Fuel export	Fuel export	% of merchandise export	WDI	Negative
Macroeconomic conditions	Inf	Inflation	Annual %	WDI	Positive
	M2	Money and quasi-money	M2, as % of GDP	WDI	Positive
	Res	Total currency reserve	Months of import	WDI	Positive
Market conditions	Lypc	GDP per capita	PPP constant 2005, USD, logged	WDI	Positive
	Lpop	Population	Count number, logged	WDI	Positive
Institutional factors	Goveff	Government effectiveness ⁸	Index number (-2.5 < I < 2.5)	WGI	Positive/negative
	Regqual	Regulation quality ⁹	Index number (-2.5 < I < 2.5)	WGI	Positive
	Pol	Stable political environment ¹⁰	Index number (-2.5 < I < 2.5)	WGI	Positive/negative

Given the data above, the first model investigating the determinants of the number of PPP projects is formulated in Equation 1. Due to the nature of the dependent variable (i.e. count data), the relevant models commonly used in previous studies are the Random-Poisson regression model, the Binomial regression model and the Zero-Inflated Poisson

⁸ The index reflects perceptions of the quality of public services, the quality of the civil service and its degree of independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies (Kaufmann *et al.*, 2010).

⁹ The index reflects perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development (Kaufmann *et al.*, 2010).

¹⁰ The index reflects perceptions of the likelihood that the government will be destabilised or overthrown by unconstitutional or violent means, including politically-motivated violence and terrorism (Kaufmann *et al.*, 2010).

regression models (Enders, 2008; Hammami, *et al.*, 2006). However, the most common model used is the Random-Poisson model (Hammami, *et al.*, 2006; Sharma, 2012). Therefore, this model is utilised in this study.

$$N_{ppp} = f(\text{Aid}, \text{Exdebt}, \text{FuelEx}, \text{Inf}, \text{M2}, \text{Res}, \text{LYPC}, \text{LPOP}, \text{Goveff}, \text{Regqual}, \text{Pol}) \quad (1)$$

Furthermore, in line with most of the previous studies (see, among others, Hammami, *et al.*, 2006; Sharma, 2012), this study utilises the Generalised Least Square (GLS) model to estimate the determinants of PPP investment. However, depending on the nature of their data/variables, it is notable that some studies also use the Ordinary Least Square (OLS) and Tobit Regression Model (Banerjee, *et al.*, 2006). In this study, the determinants of PPP investment are modelled below and estimated using the GLS regression model.

$$I_{ppp} = f(\text{Aid}, \text{Exdebt}, \text{FuelEx}, \text{Inf}, \text{M2}, \text{Res}, \text{LYPC}, \text{LPOP}, \text{Goveff}, \text{Regqual}, \text{Pol}) \quad (2)$$

It is also worth noting that this empirical study covers 48 Muslim developing countries registered as members of the Islamic Development Bank (IDB) and Organisation of Islamic Conference (OIC). Importantly, the countries are also listed in the World Bank's PPI, WDI and WGI databases.¹¹ Some Muslim countries that are not listed in the databases are therefore omitted from the analysis.¹² Other than that, no exclusion criteria are applied in the selection of countries, although some countries have very few projects and very small amounts of PPP investment. The time period covered in this study is 2002-2011, representing an adequate timeframe for observations with a complete dataset while providing the most updated data from the World Bank's databases.

¹¹ The list is provided in Appendix 1.

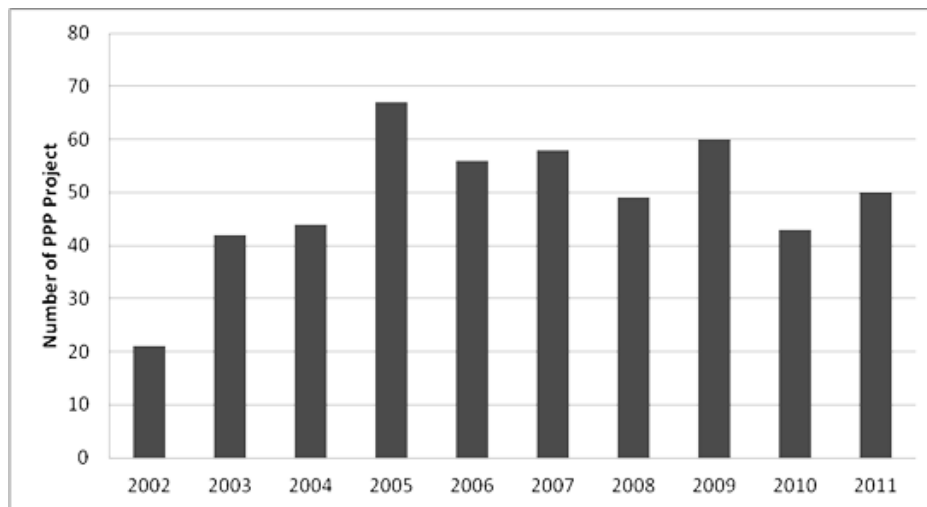
¹² The data are not available for Bahrain, Brunei, Kuwait, Libya, Oman, Qatar, Saudi Arabia, and the United Arab Emirates. The database also does not cover developed countries.

5. Results

5.1 Descriptive Statistics

Figure 2 illustrates the development of PPP projects in the Muslim developing countries investigated in this study. It is shown that the number of PPP projects increased between 2002 and 2005 and steadily decreased thereafter. The highest number of PPP projects in the countries was 67 in 2005, yet in 2011 the number had dropped to only 50 projects, a decline of around 25.37%. Consistent negative growth was also identified for the number of PPP projects implemented during the period 2006-2011, resulting in an average negative growth rate of 3%. However, on average, one PPP project was implemented in each of the 48 countries during the period 2002-2011.

Figure 2: Trend in the Number of PPP Projects in Muslim Developing Countries, 2002-2011



Relatively the same trend appears for the amounts of PPP investments implemented across the developing countries (Figure 3). From 2002 to 2005, the amounts of PPP investments increased gradually and reached a total investment of around 35.6 billion USD in 2005. This is equal to an average growth rate of 77.84% during the period. From 2005 to 2006, the average amount slightly decreased before increasing again, eventually reaching a peak in 2007 with total investments of around 37.3

billion USD. However, after that, amounts of PPP investments decreased gradually. Indeed, in 2011, the total investment value was only around 28 billion USD, which is close to the 2004 figure for PPP investment values. On average, the amount of PPP investments during the period 2002-2011 was approximately 561.85 million USD annually.

Figure 3: Trend in the Amount of PPP Investments in Muslim Developing Countries, 2002-2011

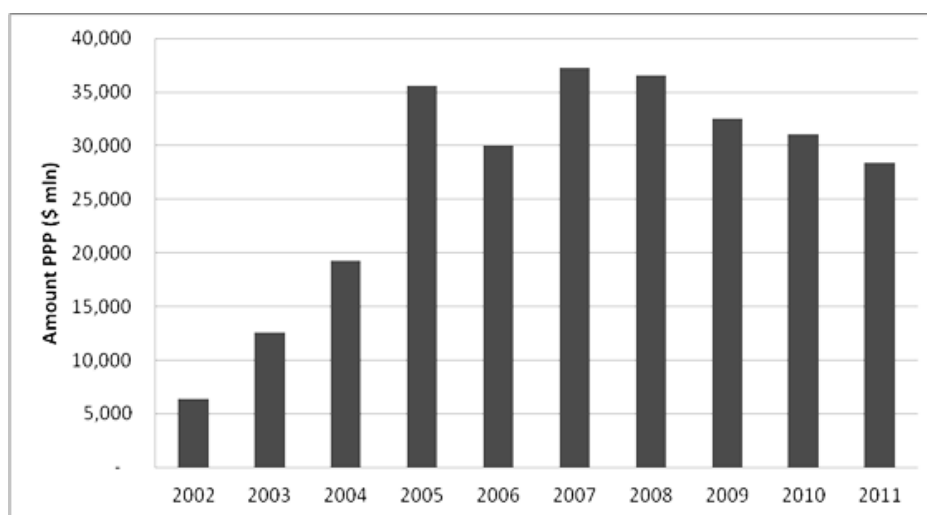


Table 3 summarises the descriptive statistics of the factors potentially influencing the number and amounts of PPP investments in the Muslim developing countries during the period 2002-2011. It is shown that an average of 52.77% and 7.73% of the overall GNI was allocated to external debt and foreign aid respectively; meanwhile, fuel exports, which provide revenues for the countries, only accounts for an average 28.99% of the merchandise exports. Macroeconomic conditions seem to be relatively stable, as suggested by the low level of average inflation and modest level of average international reserves. Overall, these indicators suggest that the developing countries seem to have budget constraints amidst relatively sound macroeconomic conditions.

Table 3: Descriptive Statistics for the Determinants of PPP, 2002-2011

Variable	N	Mean	Std. Dev.	Min	Max
Aid (% of GNI)	414	7.73	10.04	0.00	78.84
External Debt (% of GNI)	423	52.77	42.89	2.03	501.83
Fuel Export (% of merchandise export)	320	28.99	34.63	0.00	99.74
Inflation (% annual)	457	8.58	9.85	-30.14	95.85
M2 (% of GDP)	425	48.66	40.70	7.03	247.82
Reserves (months of imports)	357	5.62	4.84	0.27	36.69
Ln GDP/Cap (PPP 2005)	457	7.05	1.04	5.00	9.34
Ln Population (number)	480	16.23	1.50	12.55	19.31
Government (index number)	480	-0.72	0.59	-2.45	1.24
Regulation Quality (index number)	480	-0.69	0.61	-2.67	0.74
Political Environment (index number)	480	-0.81	0.92	-3.32	1.01

In terms of market conditions, the average amounts of annual income and the mean size of population were USD 2033/capita and 30 million people respectively during the period 2002-2011. It is notable, however, that around 70% of the countries' people have an average annual income below the mean income of developing countries of approximately USD 6597.¹³ Furthermore, the population distribution was relatively uneven. Some of the Muslim developing countries, such as Indonesia and Pakistan, have relatively large populations of more than 200 million people. In contrast, other countries such as the Maldives and Suriname were inhabited by only around 300,000 to 500,000 people in 2011.

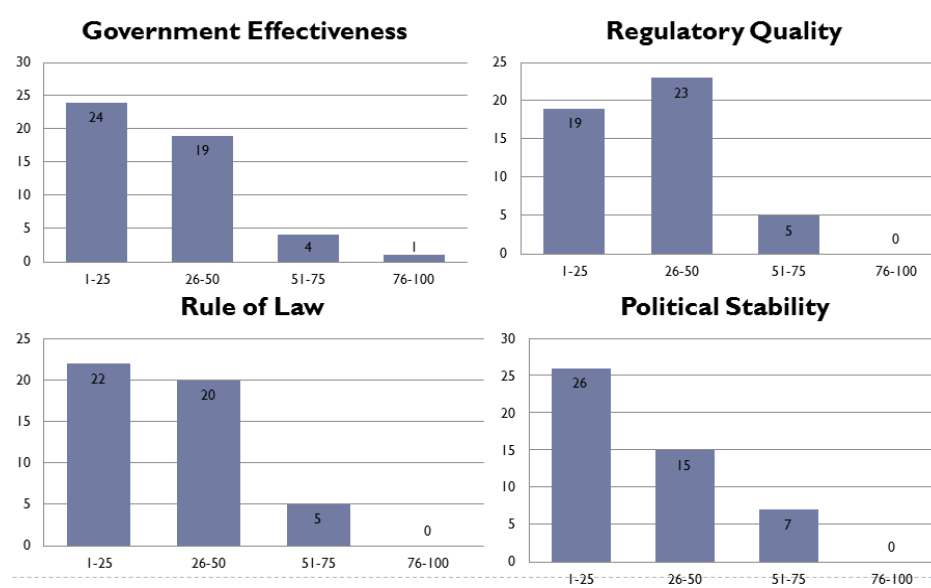
In relation to the institutional factors, it is evident from the Table that the average values of the index numbers have negative signs, thus implying that the quality of institutions in the region is not really favourable during the time period. Nevertheless, further observations suggest, at least in recent years, that not all of the Muslim countries have poor institutions. Decomposition and ranking of the index in 2011,¹⁴ as shown in Figure 4, reveal that a few of the countries have relatively

¹³ Indeed, by the end of 2011, only two Muslim developing countries maintained incomes per capita above USD 15000, namely Malaysia (USD 15,579) and Lebanon (USD 15,597), while Turkey stood slightly below it (USD 14,616) (World Bank, 2013b).

¹⁴ Percentile rank among all countries (ranging from 0 or lowest rank to 100 or highest rank).

good institutions. Indeed, three countries (Malaysia, Turkey and Jordan) consistently rank above average in all of the institutional factors. Despite that, around half of the countries (i.e. between 40%-54%) have relatively poor institutions, particularly with respect to political stability. This may explain the tendency towards a negative index shown in the region.

Figure 4: Institutional Factors in Muslim Developing Countries



5.2 Determinants of PPP Projects

Table 4 reports the estimation results for the determinants of the number of PPP projects in the selected Muslim developing countries. The main findings suggest that the number of PPP projects in the region is positively and strongly affected by favourable market conditions (high income and large market size) and good institutions (high government effectiveness and quality regulations). Positive and strong relationships are also found with respect to macroeconomic conditions (international currency reserves). Meanwhile, negative associations with the number of PPP projects are revealed in relation to political stability and money supply.

Table 4: Determinants of the Numbers of PPP Projects in Muslim Developing Countries, 2002-2011

Dependent Variable: Number of PPP Project (nppp); Model: Random-Poisson		
Variable	Coefficients	St. Error
Aid	0.0367*	0.014
Exdebt	-0.0002	0.003
Fuelex	-0.0016	0.003
Inf	-0.0019	0.008
M2	-0.0076***	0.002
Res	0.0360***	0.011
Lypc	0.3862***	0.103
Lpop	0.3607***	0.074
Goveff	0.7911***	0.262
Regqual	0.6506**	0.312
Pol	-0.7746***	0.116
Constant	-8.7574***	1.574
Chi-square	322.32	
Prob > Chi-square	0.0000	
Observations	257	

Note: *, ** and *** denote significance levels of 10%, 5% and 1% respectively.

In particular, results from the model show that the number of PPP projects is positively related to market conditions. Indeed, the empirical findings suggest that a 10% increase in income (GDP/capita) is likely to increase the number of PPP projects by 3.86 units. Similarly, it is found that a 10% increase in the population size will increase the number of PPP projects by around 3.60 units.

The estimation results also found evidence of a positive relationship between the number of PPP projects and institutional factors. A 10-point increase in the government effectiveness and regulation quality is associated with an increase in the number of PPP projects of around 7.9 units and 6.51 units respectively. Additionally, it is shown that political environment affects the number of projects negatively. Thus, political instability is associated with fewer infrastructure projects in the developing countries.

The number of PPP projects is also significantly related to country (currency) risk, where a 10-month increase in the international (currency) reserves for imports is associated with an increase in the number of PPP projects of around 0.36 units. It is also suggested that money supply (M2) significantly affects the number of PPP projects although the impact is negative and negligible (i.e. close to zero). Inflation, however, is not statistically significant according to the estimation result.

The study also found that government budget constraint in the form of foreign aid is positively related with the number of PPP projects. Although the impact is negligible and statistically weak¹⁵, the result somewhat indicates that private investors tend to have more projects in countries with large amounts of foreign aid. Meanwhile, other proxies of government budget constraint (i.e. external debt and fuel exports) are not statistically significant during the period 2002-2011.

5.3 Determinants of PPP investments

Table 5 summarises the factors that critically influence the amounts of PPP investment in the Muslim developing countries. The factors include market conditions (income and size of population), the institutional factor in terms of regulation quality, and macroeconomic conditions, particularly in relation to money supply. The findings generally suggest that higher incomes, larger populations, better regulation quality and better monetary policy are all related to higher amounts of PPP investment.

The estimation results suggest that the impacts of market size and conditions on the amounts of PPP investment are very high and significant. It is found that a 1% increase in GDP/capita is associated with an increase in PPP investments of approximately 758.49 million USD. Similarly, it is revealed that a 1% increase in the population size is positively associated with an increase in PPP investments of around 662.32 million USD. As such, these factors are clearly important for any private sector actors wishing to participate in PPP arrangements in the countries.

¹⁵ It is significant at 10%.

Table 5: Determinants of PPP Investment in Muslim Developing Countries, 2002-2011

Dependent Variable: Amount of PPP Investment (pppinv); Model: Random-GLS		
Variable	Coefficients	St. Error
Aid	13.8830	19.271
Exdebt	2.2953	2.899
Fuelex	-5.0341	4.087
Inf	-16.4538	10.765
M2	-8.9140***	3.167
Res	-7.2119	20.924
Lypc	758.4058***	172.537
Lpop	662.3218***	103.691
Goveff	-316.3809	357.379
Regqual	1205.6970***	402.585
Pol	-196.4959	155.360
Constant	-14811.4300***	2513.659
R-square	0.4966	
Observations	257	

Note: *,** and *** denote significance levels of 10%, 5% and 1% respectively.

Regulation quality is also considered an important determinant of PPP investments in the region. The estimation result suggests that a 1-point increase in the regulation quality index number is associated with an increase in the amounts of PPP investment of around 1205.70 million USD. Furthermore, it is notable that M2 has a negative and significant relationship with the amounts of PPP investment. However, other institutional and macroeconomic factors do not significantly affect the amounts of private investment in public infrastructure financing during the period. Similar results are found with respect to government resources/budget constraints indicators.

6. Discussions

The results of the study highlight a number of interesting findings and implications in relation to the determinants of PPP in the Muslim developing countries. First, favourable market conditions are found to be the main determinant of private sector involvement in PPP arrangements

in the developing countries. These results are quite intuitive and consistent with the earlier findings suggesting that higher incomes and larger populations generally demand more public infrastructure (Banerjee, *et al.*, 2006; Hammami, *et al.*, 2006; Sharma, 2012). Furthermore, considering that the countries have gradually been enjoying higher incomes and experiencing relatively high population growth rates compared to the global average¹⁶, it is natural for them to demand more and better-quality public infrastructure. The demand will be particularly high with respect to public infrastructures which are still undersupplied in the region, such as electricity and water. Thus, these factors are clearly important for any private sectors wishing to participate in the PPP arrangements in the countries.

From a policy perspective, policies related to market sizes are probably not easy to change and are strongly related to country-specific conditions. Highly populated countries such as Indonesia and Pakistan may want to reduce their population growth, while small countries may prefer the opposite (Mauldin, 1978). However, a new study has found that the mortality rates in South East and South Asia - where most Muslim developing countries are located - tend to be higher overtime than in other regions of the world (Dartanto, 2013) and therefore any policies related to population will have big challenges to be implemented. Despite that, it is generally agreed that higher per capita incomes and greater purchasing power will contribute positively to improving the quality of people's lives, which is directly related to greater demand for public infrastructure, including through PPP arrangements (SESRIC, 2013a).

Second, good institutions in terms of effective government and good regulations are critical for attracting private financing for infrastructure development. Effective government reflected in, among other things, high-quality public/civil services that are committed to implementing public policies are undoubtedly necessary for securing policies such as PPP and ensuring that they are well implemented. Furthermore, regulation quality which enables the government to formulate and implement sound policies/regulations that promote private sector development is also crucial for developing the infrastructure. In a more general sense, strong institutions may also reduce uncertainties about the

¹⁶ See the results presented in Table 3.

quality of regulations and country risk, which in turn provides more incentives for investors to participate in PPP arrangements. Meanwhile, quite intuitively, political instability has reduced the number of PPP projects in the regions. Overall, these findings are generally in line with the conclusions of existing studies which suggest that institutional factors are highly important in private sector decisions on involvement in PPP financing for public infrastructure (Banerjee, *et al.*, 2006; Hammami, *et al.*, 2006; Kaufmann, *et al.*, 2010; Reside & Mendoza, 2010; Sharma, 2012).

Improving government effectiveness and regulation quality, however, are no ordinary tasks (Garvey, 1993), especially for the Muslim developing countries which have relatively poor institutions (see Figure 4). In relation to PPP policies, it is notable that PPP is an arrangement in which a government as the owner of a project makes an agreement to share the risks and returns with a private partner in developing public infrastructure. The workability of the arrangement is therefore highly dependent on the government's credibility (Grimsey & Lewis, 2007). Credibility can be established by, among other things, ensuring that the regulatory system is in place and enforceable since a functioning regulatory system provides protection for the private sector's rights in securing their assets and claiming their share of the returns (Wankuan, *et al.*, 2010). In selecting private partners for the bidding/procurement provision process, a government might also demonstrate its credibility by developing transparent and accountable procedures in order that selection based on cronyism and corruption, as found in some Muslim countries, might be avoided (Beh, 2010). Furthermore, in a wider perspective, credibility might be increased by enhancing the government's capacity to formulate and implement sound PPP policies as well as maintaining stable political environments in the countries (ADB, 2008). These should be the primary concerns for the governments of contemporary Muslim developing countries.

Third, PPP implementation is also generally influenced by stable macroeconomic conditions although the impacts are not as great as those found in other regions cited by other studies (Banerjee, *et al.*, 2006; Reside & Mendoza, 2010; Sharma, 2012). In particular, controlled money supply has a negative association with PPP investment while international reserves have a positive relationship with the number of PPP projects. Intuitively, higher international reserves and a less

controlled money supply may reduce the country risks, in turn creating higher certainties for investors interested in pursuing PPP projects in the regions. However, inflation did not seem to influence PPP implementations in the developing countries. This is probably related to the fact that there were large gaps in inflation levels in some of the countries¹⁷; hence, at a regional level, it did not become a main concern for the investors. As such, the government should increase its efforts to formulate and implement sound macroeconomic policies, which are more attractive for investors and contribute more positively towards the provision of public infrastructure in the regions.

Fourth, the study found that government budget constraint is not considered the main reason for the Muslim countries' involvement in PPP schemes. This result implies that, regardless of budget constraints, the countries still invest in PPP projects. In other words, there are other reasons for becoming involved in PPP-type arrangements apart from aid, external debt and resources constraints. This is in contrast to the common belief that PPP-type arrangements are preferred due to government budget constraints in financing public infrastructure (Grimsey & Lewis, 2007; Hammami, *et al.*, 2006; Iqbal & Khan, 2004; Kahf, 2002; Reside & Mendoza, 2010).

A possible explanation for this interesting result is that the Muslim developing countries have adopted PPP schemes because they are considered a trend and a 'global fashion', a term often used in institutional change (Abrahamson, 1996; Røvik, 1996) among developing countries. This trend is arguably related to 'progressive' advice, mostly based on the experience of developed countries, recommended by international agencies despite wide acknowledgment that the international bodies tend to advocate relatively the same 'grand policies' for resolving problems faced by the member nations (Easterly, 2003).¹⁸ It is also possible that these countries adopt PPP because it is believed to deliver better value for money. As argued earlier, value for money may be obtained from its more efficient allocation of risks

¹⁷ There were some countries with low inflation in 2011 such as Morocco (1.5%), Chad (2%) and Benin (2.8%). However, there were also many more countries with double-digit inflation figures at that time, such as Sudan (20%), Pakistan (13.9%) and Nigeria (10.60%) (World Bank, 2013b).

¹⁸ This is probably influenced by the fact that, as shown in Figure 1, there was a tendency amongst the countries to invest in telecommunications infrastructure instead of the most basic necessities such as water and sewerage infrastructure.

provided that the risks are managed better by the private sector than by the public sector (Grimsey & Lewis, 2007). Therefore, the developing countries have adopted PPP arrangements although some of them may not have budget constraints in financing public infrastructure.

Fifth, in a wider perspective, the study found additional evidence that the Muslim developing countries are generally deficient and undersupplied in the provision of critical public infrastructure such as water and electricity. This may potentially jeopardise economic growth and long-term development in the region. Accordingly, it is important that the government invest in and build more public infrastructure such as electricity (particularly in Bangladesh, Yemen, Cameroon and Indonesia), water (especially in countries such as Azerbaijan, Kyrgyz Republic, Yemen, Mozambique, and Nigeria) and telecommunications (most notably in Bangladesh, Kyrgyz Republic, Egypt, Syria, and Sudan). This might be done not only through an efficient and effective PPP implementation but also through more initiatives and cooperation in the region.

In this respect, international Muslim organisations such as IDB and OIC might potentially play important roles. To promote private financing in the provision of public infrastructure, it is essential that the governments of Muslim developing countries extend their concern to the improvement of institutional capacities and macroeconomic stability in addition to focusing on the acceleration of Islamic banking growth and efficiency, and the advancement of financial/banking structures and financial deepening suggested by many policy studies (see, for instance, Bello, 2014; Hassan, *et al.*, 2012; Hutapea & Kasri, 2010; Kasri & Kassim, 2009; Kermani & Afandi, 2014). Considering their strategic position in the Muslim world, this is something that can be facilitated by the international organisations as individual countries may not have necessary guidance or capabilities to improve their institutional qualities. In addition to that, IDB or OIC might act as a standard-setter and ‘controller’ to ensure that the institutional quality is improved over time. Such attempts would contribute positively to enhancing the quality of institutions in IDB and OIC member countries, which indirectly attract private financing, particularly for providing public infrastructure in the Muslim developing countries.

In a more practical perspective, the study suggests that a PPP scheme combined with Islamic financing instruments such as *sukuk* and *murabahah/mudharabah* should be increasingly utilised as an alternative arrangement to the commonly used conventional scheme for financing infrastructure development in Muslim developing countries. Such an alternative, which is characterised by greater emphasis on profit/risk-sharing features and socio-economic functions, may potentially insulate the projects from speculative activities, which are partly to blame for previous financial crises (Ahmed, 2010a; Solé, 2008). Such a combination might also reduce financial instability and support more sustainable development (Dogorawa, 2012). More recently, provision of basic infrastructure such as education, healthcare and social care suggested through revitalisation of the cash-*waqf* instrument (Mohsin, 2013) might also be operationalised through the PPP scheme in order that more people receive the benefits of the public infrastructure provision.

Overall, it might be suggested that the governments of developing Muslim countries design and implement policies that improve market conditions, enhance institutional qualities and reduce country risks to attract more private involvement in infrastructure financing. The policies should be implemented by various means; however, the use of Islamic financial instruments such as *sukuk* and cash-*waqf* are strongly recommended. Cooperation between Islamic countries should also be extended and facilitated by international Islamic organisations such as IDB and OIC. Ultimately, these strategies are expected to contribute not only to meeting the infrastructure demand but also to accelerating economic growth and development in the Muslim regions.

7. Concluding Remarks

This study investigates the determinants of private financing in 48 Muslim developing countries using the PPI World Bank database covering the period 2002-2011. The study is motivated by the fact that, even though private financing (PPP) is conceptually encouraged in Islamic finance discourse, the implementation of such financing to provide public infrastructure which might potentially accelerate economic growth and increase living standards in Muslim developing countries is still relatively low.

The study found empirical evidence that private financing in infrastructure projects in Muslim countries is primarily determined by market conditions and institutional quality. Thus, it can be concluded that private sectors are more attracted to countries that have huge demands for infrastructure and provide better protection for their income and assets through sound regulations. It might also be emphasised from the findings that institutional quality is important for attracting private investments in infrastructure and hence deserves more attention by the Muslim developing countries that intend to encourage private participation in the development of their public infrastructure.

Finally, the authors acknowledge that the study has many limitations, particularly in terms of data and model specifications.¹⁹ Nevertheless, it is believed that the findings and analysis of this study might provide important insights into the importance of institutional factors in public infrastructure discourse and have also contributed to and enriched the discussion on public and private infrastructure financing in the Muslim developing countries.

¹⁹ The study includes only a limited number of variables and countries. Therefore, investigations incorporating more variables and different model specifications (for example by incorporating dummy variables for global crises, and decomposing the analysis into specific regions of the Muslim developing countries (i.e. Asia, Africa, MENA, etc.) or specific sectors of infrastructure (technology, energy, transportation, communication, etc.)), might be undertaken to sharpen the analysis of such study.

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Appendix 1: List of Sample Muslim Developing Countries

No	Country	No	Country	No	Country	No	Country
1.	Afghanistan	13.	Egypt, Arab Rep	25.	Malaysia	37.	Somalia
2.	Albania	14.	Gabon	26.	Maldives	38.	Sudan
3.	Algeria	15.	Gambia	27.	Mali	39.	Suriname
4.	Azerbaijan	16.	Guinea	28.	Mauritania	40.	Syrian Arab Republic
5.	Bangladesh	17.	Guinea-Bissau	29.	Morocco	41.	Tajikistan
6.	Benin	18.	Indonesia	30.	Mozambique	42.	Togo
7.	Burkina Faso	19.	Iran, Islamic Rep.	31.	Niger	43.	Tunisia
8.	Cameroon	20.	Iraq	32.	Nigeria	44.	Turkey
9.	Chad	21.	Jordan	33.	Pakistan	45.	Turkmenistan
10.	Comoros	22.	Kazakhstan	34.	Palestine	46.	Uganda
11.	Cote d'Ivoire	23.	Kyrgyz	35.	Senegal	47.	Uzbekistan
12.	Djibouti	24.	Lebanon	36.	Sierra Leone	48.	Yemen, Rep.

Strategic Knowledge with Strategic Alliance Based to Achieve a Sustainable Competitive Advantage

Widodo¹

Strategic alliance has been acknowledged as an effective way to sustain a competitive advantage through knowledge management. However, research showed that strategic alliance has ignored new concepts on learning cycle and information that shared by partner. A failure of partnership in Small and Medium Entrepreneurs (SME) usually caused by foundation from low commitment of partnership. It does not base on their need to grow together with the partners. This study developed and tested strategic alliance model as strategic knowledge to achieve sustainable competitive advantage. Result of this study showed that strategic alliance as strategic knowledge can be used to improve social capital which then influence human capital. Social capital is developed through a trustworthy partnership model and networking quality. Human capital is developed through skill, creativity and be the best model.

1. Introduction

The fundamental problem of the strategy management is how an organization can achieve a superior performance and maintain a *sustainable competitive advantage* (Teece, D.J, Pisano.G and Shuen. A, 1997). However, the resources possessed by the organization, if it is too easy for a competitor to improve and create the more effective substitution resources, are not a major factor to achieve *sustainable competitive advantage*. Hsu (2007) and Partha Chowdhury Prasad (2013) define that , the easier the technology is imitated; with the rapid change of competitors and the rules of society; the more *organizational knowledge* emerges as a major source of competitive advantage. The study by Galunic & Rodan (2008) on *the resource-based view* emphasizes that the resources based *strategic knowledge* become an

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important component in the new economic era. Furthermore, the important element to create an effective strategic knowledge is an alliance strategic that its consequences can lead to achieve *sustainable competitive advantage* (Cegarara-Navarro, 2005).

Strategic alliances or partnerships is one of the effective ways to gain competitive advantage through knowledge transfer (Constantine Imafidon Tongo, 2013 and Liao , 2007). Strategic alliance or partnership is an agreement that arises between two or more organizations to share the costs, risks and benefits which is gained by developing new business opportunities involving exchange, sharing of knowledge, developing products, technology and services (Hong Ji , 2010) . Yet, the study by Yadong Lu (2008) evoke that the strategic alliance ignores new concepts of the learning cycle and given information provided by competitors. The failure of partnership on Small and Medium Enterprises (SMEs) are generally caused by a lack foundation of partnerships and merely based on mercies, under the coercion of others rather than on the need to move forward and develop together with partnered parties. A phenomenon in SMEs industry, especially batik, a hand craft in Central Java Indonesia, SMEs have low sustainable competitive advantage. It is because they do not optimizing the benefits of strategic alliance and do not take a learning condition between partner. As a result, most of SMEs members do their business with traditional ways, merely in production and marketing. Based on the description above, this article examines "*How a strategic alliances model as a strategic knowledge can realize the sustainable competitive advantage of small batik industry in Central Java Province.*"

2. Literature Review and Hypothesis Development

2.1 Strategic Knowledge

The process of learning as effect of the self-adjustment influences the relationship between a system and its external environment. The learning process can make people act in different ways according to the surrounding environment. In conclusion, it is the action of the actor itself that allows for learning. The strategic learning process refers to insight (an effort to find new things) and a view of the future. Nonaka and Takeuchi (1995) attribute the creation of knowledge with

continuous innovation; and continuous innovation with favorable competitive side. Therefore, strategic knowledge is knowledge that is created as a consequence of the cooperative learning process (David B. Zoogaha : 2011). Moreover, these include the following matters as follow:

a. Social Capital

Social capital is the actual and potential resources that can generate networking relationship with mutual respect and outfitting (Ferdinand, 1999). The study by Pennings , JM , K. Lee and A. van Witteloostuijn (1998) asserts that one of the important organizational resources is a *social capital* which is an experience of establishing a relationship with other organization. The relationship of the enterprises will continue to grow together with the value of social interaction (Salina David and Fadzilah Wan Yusoff Wan, 2010). Organizational resources and capabilities gained from the relationships are the source of strength and power of the enterprise (Elena Karahanna and David S. Preston , 2013 ; Tsai , 2005). In conclusion, the Indicator of social capital is reflected by the trust, quantity and quality of the networks.

b. Human Capital

Humans as a business actor have productive work ethics, skills, creativity, discipline, professionalism, and the ability to use, develop and control of science, technology and management skills. Human qualities as resources in various fields of the whole national life is in line with other advanced nations (Waseef Jamal, 2012). In real life, humans play a major role in improving productivity and advanced equipment of production. Moreover, It requires skilled and expert human resources by the expectation that their performance can improve the quality of life and humanism. The success of an organization is strongly influenced by the performance of human resources . Therefore, every organization or enterprise is always trying to improve the presence of *human capital* (Arnout Seghers , Sophie Manigart , and Tom Vanacker : 2012).

Human capital is the characteristics of human resources which is determined by the knowledge possessed by them to create values for the organization (Collins and Clark , 2003). The findings by Penning et. al (1998) explains that human capital management should pay attention to

the sources of knowledge and the ideology of the knowledge itself. The ideology of knowledge is proposed as a process of skill development and institutionalization of knowledge aimed to the market. Human capital is constantly changing (dynamic) due to internal and external factors . External factors related to the necessity of new recruitment to replace those who has resigned from the organization . Moreover, it also associated with the mutation. Meanwhile, the internal factor deals with the quality of human capital itself (Subramaniam and Youndt , 2005). Human skills may be less dynamic, so, the organization must immediately improve it through specific training programs. The study by Hsui (2007) and Song (2008) state that the improvement of commitment to the consensus will increase the *human capital*. Human capital is constructed by the indicator of changing skills, creativity and will to be the best. Organizational learning is used as a self-control strategy which can help humans to improve their skills and capabilities to obtain knowledge, so that, it can improve their performance (Cumings, 2006) . The findings of the study show that a learning orientation is able to encourage human resources to work harder, so, they can totally enjoy their work and lead to the high achievement performance (Sujan , Weitz , and Kumar , 1994).

An organization with a high level of human capital is more able to build a strategic relationship with external partners. Employees with high motivation and competence are more willing and able to influence and fulfill the needs of external partners, so that the external partners will be more willing to develop a long-term cooperation with the organization. The researchers emphasize that the social external relationship of individual provides an access to the important resources for the enterprise (Brown & Duguid, 1998). Human capital is viewed as an antecedenen networking resource because it represents the organizational capability to effectively respond to the needs of external partners, resolve the problems and provide various kinds of information. Therefore, the hypothesis built is:

H1: There is relationship between human capital and social capital.

2.2 Strategic Alliance

Strategic alliance or partnership is an agreement that arises between two or more organizations to share the costs, risks and benefits gained by

developing new business opportunities involving exchange, sharing of knowledge, developing products, technology and services (Hong Ji , 2010; David B . Zoogaha , 2011) . Strategic alliances can help enterprises in various aspects. Andrew C. Inkpen (2005) and Constantine Imafidon Tongo (2013) argue that the strategic alliance is an important strategy to improve organizational learning and a crucial element in the enterprise's competitive strategy.

Generally, Enterprises are hard to obtain *sustainable competitive advantage* in the market structure with hyper level conditions of competition (Ulrich L, 2009). Therefore, to deal with such competition, they need to have a cooperation (alliances) in *corporate strategy* to reduce the level of competition (Hong Ji , 2010; António Carrizo Moreira , 2013) . The study by Cegarra - Navarro (2005) reveals the two main elements of the strategic alliance that are exploration and exploitation of knowledge among partners. Meanwhile, according to Ulrich L, (2009) the strategic includes exploration, transfer and transformation of knowledge. Briefly, it can be explained as follows:

a. Knowledge Exploration

Knowledge exploration is initiated by a search, modification, risk-taking, experiment, and innovation in which the stage of new theories is introduced (Paul E., 2009). SMEs can encourage the exploration of knowledge by arranging formal and informal meetings or activities where customers and sellers can interact and work together to achieve certain goals (John P. Meyer , 2011, Cegarra , 2005). Exploration of knowledge is often needed to explore new capabilities and increase the fundamental knowledge exist in organizations (Ahuja , 2002) . Hence, the organizational learning as the core of the exploration creates a range of experiences associated with expanding knowledge. The exploration activities involve searching for new organizational norms, routines, structures, and systems; experimenting new approaches to technology, business processes, or markets; innovating and adopting a long-term orientation, and reconsidering existing beliefs and decisions (Tom JM , 2007).

So, the exploration is a prerequisite for exploitation. However, the benefits of exploration certainly depend on the amount of knowledge that has been accumulated and learned through exploitation (e.g.

routines, rules and procedure). Furthermore, the indicators of the knowledge exploration include frequency of meetings, maintaining collaboration, informal activities, discovering new possibilities related to products/services, processes or markets; evaluating a variety of options related to products/services, processes or markets; a strong focus on the renewal of the products / services and activities that need to learn new skills or knowledge that can improve the human capital and networking (Tom JM : 2007; Javier Tamayo-Torres, Antonia Ruiz - Moreno . 2011) Therefore, the hypothesis proposed is :

H2 : There is relationship between knowledge exploration and human capital.

H3 : There is relationship between knowledge exploration and social capital.

b. Knowledge Exploitation

Exploitation is basically process of acquiring competence by adopting, synthesizing and implementing the existing knowledge. It requires knowledge that has been created and internalized to be used to build reliability in experience (Weiping Liu, 2006). Exploitation refers to the application of external knowledge to improve existing products in the organization and its process (Paul E. Bierly, 2009 and Manuela Presutti, Cristina Boari, and Antonio Majocchi, 2011). The indicator of knowledge exploitation is active management change in which the introduction of new things and problem solving happen among partners, so then, it will lead to obtain more experienced-activities by the use of obtained knowledge (Tom J. M, 2007) .

The enterprise ability to apply knowledge to the process of innovation can be a crucial element to achieve competitive advantage. There are many types of knowledge (Grant, 1996), however, they are not able to be effectively generated and applied in the enterprise. The transfer and use of knowledge from external sources can expand the basic knowledge of the enterprise. The study by Hsui (2007) shows that 80% of respondents agree that knowledge becomes a strategic assets, and 78% of them agree that business opportunities fail because of not able to exploit the existing knowledge in the organization. Hence, the hypothesis built is :

H4 : There is relationship between knowledge exploitation and human capital

H5 : There is relationship between knowledge exploitation and social capital.

c. Knowledge transfer

Knowledge transfer is a major mechanism to facilitate knowledge sharing and integration practices in order to improve both short-term performance and competitive advantage (Yang, J. 2008). Moreover, the transfer of knowledge can be defined as the transmission of knowledge among people and absorption of knowledge from one to another (Young Bong Chang, 2012). Thus, it can be concluded that transfer of knowledge is a process by which certain capabilities are transferred from the source to the receiver whether individual or group of individuals. So, if a knowledge is transferred effectively, the recipients will enhance their ability. Finally, the individual and organizational performance will get improved collectively (Szulanski, 2002). The indicator of knowledge transfer includes *well-informed* employees related the purpose and result in which employees participate in defining the content and form of the process of resolving problems and making decisions without asking the leader.

Experts of social organization argue that enterprises can be identified as a social community, if it is specified to the speed and efficiency of the creation and transfer of knowledge. A view on a base knowledge organization is initiated by individuals and enterprises become superior with their ability to integrate knowledge across individual/*sharing knowledge* (Kogut & Zander, 1996).

An organizational learning requires human resources to use the time to pursue knowledge beyond the scope of their work. If the organization does not encourage the development of knowledge, the human resources will not be motivated to perform learning activities (Calantone, RJ et al. 2002; Qile He, David Galleary, and Abby Ghobadian .2011). By efforts and experiences, organizations can establish the continuity of interaction that recognize the value of the potential opportunities and choose what elements to be combined and then facilitate the exchange of knowledge

to improve the human and social capital (Lane & Lubatkin, 1998). Thus, the hypothesis offered is :

H6 : There is relationship between knowledge transfer and human capital

H7 : There is relationship between knowledge transfer and social capital.

d. Knowledge Transformation

Transformation of knowledge refers to the retention of knowledge over time (Lane et al, 2006). Transformation of knowledge is very important because knowledge must be maintained for years in order to be applied in new products (Wen - Long Chang, 2006). The indicators of knowledge transformation are employees provide creative solutions and participate in social events

A group of people who are highly motivated and skilled is a competitive advantage because it represents the firm-specific resources that are important, unique and difficult to be imitated. Companies with highly skilled and knowledgeable human resources have a higher human capital and more likely to create knowledge, make the right decisions and have better innovation on technology (Hitt et al, 2001). Study by Hsui (2007) reveals that the organizational learning associate with the development of new knowledge, it is very important for the ability of innovation and performance of organizations. The process of organizational learning in strategic alliances is a mechanism where the organization make the competitors as strategic knowledge (Cegarra - Navarro.2005) . Therefore, the hypothesis proposed is :

H8 : There is relationship between knowledge transformation and human capital

H9 : There is relationship between knowledge transformation and social capital.

2.3 Sustainable Competitive Advantage

Framework of resource-based perspective, organization is viewed as a relationship of resources and capabilities that can not be freely traded in

the market (Norus.J. 2006 and Prasad 2013). If the resources and specific competitive of the enterprise produces economical advantages and can not be imitated by competitors, the related resources and competitive will become a potential source of *sustainable competitive advantage* (Barney, 1991). Resource of enterprise is a whole factors; both *tangible* and *non-tangible* owned and controlled by enterprises and organizations; and it is used for production process to produce goods and services to meet people's needs (Amit & Schomaker, 1993).

However, the resources of the enterprise, in fact, is not a fundamental element to achieve *sustainable competitive advantage*. It is caused by the ease of competitors to repair and substitute resources more effectively. Therefore, a new paradigm develops to achieve a competitive advantage that is from the resource-based view of advantage to a competency-based. Organizational competence is heterogeneous, distributed and dispersed in a competitive environment. A heterogeneous competence can produce a competitive advantage by the following object-state (Barney, 1991):

1. Competence of the enterprises allows them to exploit the existing opportunities and neutralize threats or competition in the business environment.
2. Only a small number of enterprises in a competitive environment who possess and master the competencies.
3. Organizational competence is relatively immobilized in providing economic benefits for the enterprise. Competence can be said to be immobile if not easily imitated by competitors and can not be transferred from one enterprise to another.

Study by Chiquan G (2007) emphasizes that *sustainable competitive advantage* is based on durability, imitability and the ease to match the strategic assets of the enterprise. A group of people who are highly motivated and skilled is a competitive advantage because it represents the important, unique and unimitated resources of the enterprise. Companies with highly skilled and knowledgeable human resources have higher human capital and more likely create knowledge, make the right decision and have better innovation on technology and competitive advantage (Hitt, 2006). *Sustainable competitive advantage* is determined

by the strength of social capital. This makes sense because social capital is the actual and potential resources that can generate networking relationship of mutual respect and outfits (Ferdinand, 2005). Therefore, the hypothesis offered is:

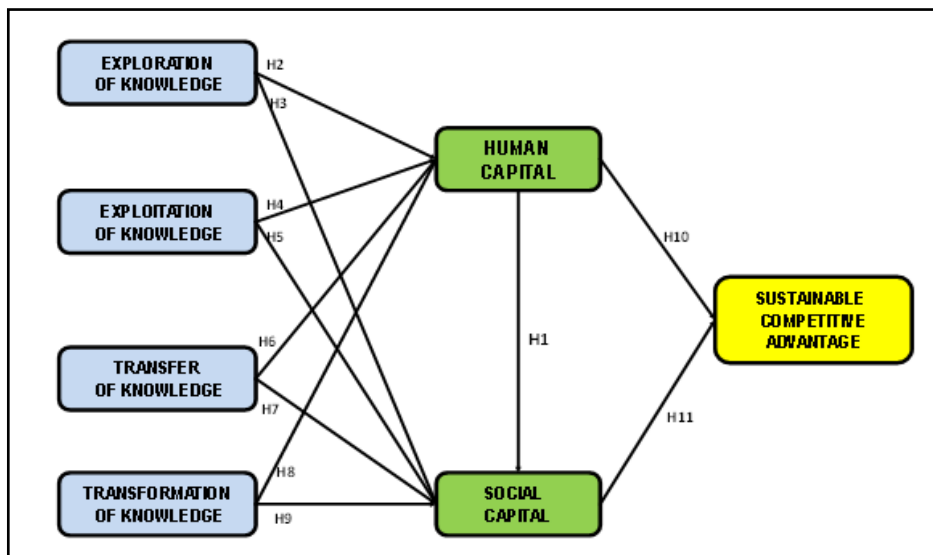
H10 : There is relationship between human capital and sustainable competitive advantage.

H11 : There is relationship between social capital and sustainable competitive advantage.

2.4 Empirical Model

Study that will be conducted is to identify and analyze models of strategic alliances as a strategic source of knowledge to achieve the sustainable competitive advantage of small batik industry in Central Java Province. Briefly, the research model can be seen in Figure 1 below:

Figure 1: Empirical Models



3. Research Methods

3.1 Sampling Technique

The population in this study is the whole small batik industries through out Central Java by the total of 1201 (Disperindag Prov.Jateng 2013). Then, the sampling used is purposive sampling technique, it means that it is based on the characteristics of the population covering area and location. The number of samples (sample size), according to Hair et al (1996), is indicators multiplied by 5 to 10 or at least 100 respondents. To be more optimal in generalizing the study sample, the sample of this study includes 150 respondents.

3.2 Variabel and Indicators

Variables and indicators in this study can be seen in the following table:

3.3 Analysis Techniques

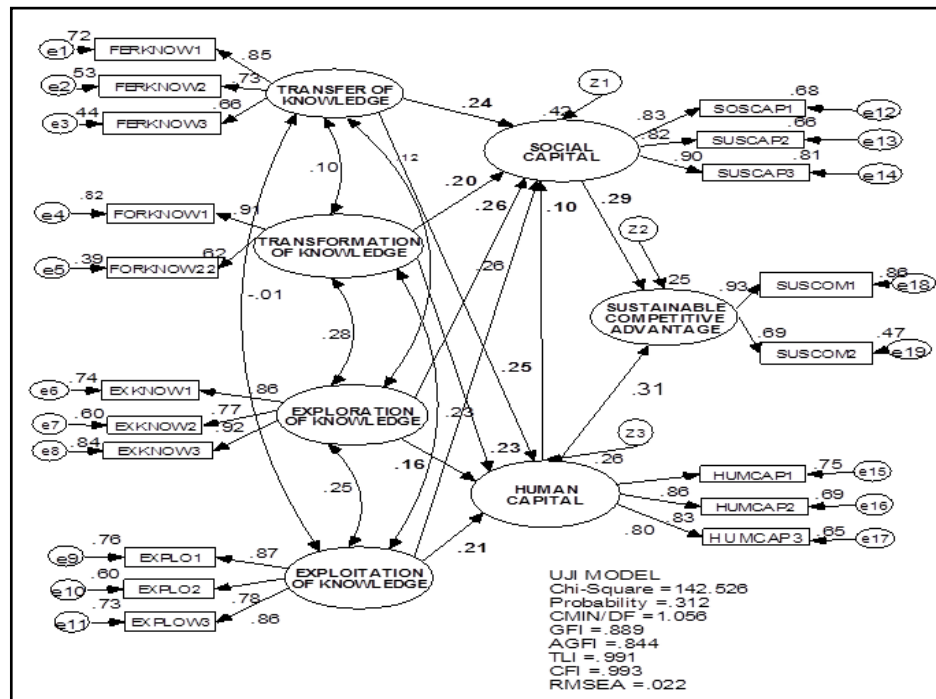
To analyze the data of the study, it is used *the Structural Equation Modeling* (SEM) of the AMOS 5.0 software package. This model is a collection of statistical techniques that allow the testing of a relatively complex set of relationships. The excess of SEM application in management research is its ability to confirm the dimensions of a concept or a factor as well as its ability to measure the relationships that exist theoretically.

4. Discussion

Based on the data analysis using AMOS software of full model *Structural Equation Model* (SEM) as shown on the figure 2, the test model shows that this meets the data or fits to the data used in this research. This is proven by Chi-Square, Probability, CMIN/DF, and TLI which are in a distance of expected score eventhough GFI and AGFI are accepted marginally. Then, based on this fit model, it will be conducted a hypothesis test proposed in this research as described in tabel 2.

Table 1: Variables and Indicators

No	Variables	Indicators	Sources
1	Knowledge Exploration New capabilities, and improvement of the basic knowledge existing in organizations.	• New possibilities • Evaluating options • Learning new skills or knowledge	Ahuja (2002)
2	Knowledge Exploitation The process of acquiring competence by adopting, synthesizing, and implementing existing knowledge. It requires knowledge that has been created and internalized to be used to build experience reliability.	• Being active on receiving the changes and introduction • Solving problems together • Using knowledge	Weiping Liu (2006)
3	Knowledge transfer The primary mechanism for sharing practice and facilitating the integration of knowledge in order to improve both short-term performance and competitive advantage	• <i>Well-informed</i> about the purpose and results • Making decisions without asking manager. • employee participation	Yang. J. (2008).
4	Knowledge transformation Related to the retention of knowledge over time	• Creative Solutions • Getting involved in social events	Lane et al (2006)
5	Human Capital Characteristics of human resources which are determined by human knowledge used to create value for the organizations.	• Changes in skills. • Creativity • The new idea • Being the best	Collin and Clark, (2003).
6	Social Capital An actual or potential resources which are capable of producing network working relationship of mutual respect and mutual interpret	• Confidence with partners • The quality networking • Quantity networking	Ferdinand (1999)
7	Sustainable competitive advantage Resources that have sustainable competences.	• Possessing a long-standing excellence. • Possessing the excellence that the organizations do not have	Barney (2009)

Figure 2: Full Model Of Sustainable Competitive Advantage**Equation :**

1. $Y_1 = 0,23 X_1 + 0,23 X_2 + 0,18 X_3 + 0,21 X_4 + e$
2. $Y_2 = 0,24 X_1 + 0,20 X_2 + 0,28 X_3 + 0,26 X_4 + 0,26 Y_1 + e$
3. $Y_3 = 0,29 Y_1 + 0,31 Y_1 + e$

Tabel 2: Standardized Regresion Weight

	Std.Estimate	S.E.	C.R.
HUMAN_CAPITAL <- EXPLORATION_OF KNOW	0.264	0.104	2.622
HUMAN_CAPITAL <- EXPLOITATION_OF KNO	0.205	0.096	2.043
HUMAN_CAPITAL <- TRANSFORMATION_OF K	0.230	0.114	2.948
HUMAN_CAPITAL <- TRANSFER OF_KNOWLED	0.249	0.135	2.444
SOCIAL_CAPITAL <- TRANSFER OF_KNOWLE	0.238	0.137	2.447
SOCIAL_CAPITAL <----- HUMAN_CAPITAL	0.299	0.110	2.958
SOCIAL_CAPITAL <- TRANSFORMATION_OF	0.200	0.114	2.808
SOCIAL_CAPITAL <- EXPLORATION_OF KNO	0.264	0.104	2.775
SOCIAL_CAPITAL <- EXPLOITATION_OF KN	0.261	0.096	2.751
SUSTAINABLE_COMPET <- SOCIAL_CAPITAL	0.292	0.115	2.775
SUSTAINABLE_COMPETI <- HUMAN_CAPITAL	0.305	0.123	2.872

5. Hypothesis Testing and Interpretation

The estimated parameter between human capital and social capital shows a significant result with CR score = 2.298 or $CR \geq \pm 2,00$ with 0,05 (5 %) of significant level. Based on this finding, thus the first hypothesis is accepted. This result indicates that human capital builds the improvement of social capital. Each organization or enterprise always tries to improve human capital. It is a characteristic of human resources which is determined by the owned skill which is used to create a value for the organization.

The management of human capital must pay attention to the sources and the ideology of knowledge. The ideology means as a process of skill development and institutional knowledge especially something related to the market. Human resources with a high motivation and competence are better to desire and have more ability in influencing and fulfilling the need of external partner, so then the external partner wants better to improve a long relationship with the organization. The researchers state that the social relationship of individual external gives an acces to important human resources of enterprises. This study shows that the higher human capital, the wider social capital. This is in line with Brown

& Duguid (1998) who state that human capital is viewed as an antecedent of resource networking because it represents the capability of organizations to effectively respond external partner need, and solve several problems and information.

The second hypothesis *there is relationship between knowledge exploration and human capital*. The estimated parameter between *knowledge exploration and human capital* shows a significant result with CR score = 2.264 or $CR \geq \pm 2,00$ with 0,05 (5 %) of significant level. Hence, the second hypothesis is supported. The result also indicates that the intensity of knowledge exploration will improve the human capital. The knowledge exploration begins with searching, making variation, taking a risk, experimenting, and innovating. Those are steps where new practices and theories are introduced. Thus, organizational learning is the main point of exploration activity that creates several experiences related to broaden knowledge. The exploration activity includes finding norm of new organization, rutinity, structure, system, and experiment to new approach dealing with technology, bussines process, or market, innovation and long term orientation adaption, and reconsideration of current theory and decision.

Exploration is a prerequisite to exploitation. Yet, the advantage of it also depends on the number of knowledge which has been accumulated and learned through exploitation (rutinity, for instance, rule and procedure). This accepted hypothesis is in line with Tom J.M. (2007) study which states that meeting frequency, maintaining collaboration, informal activity, finding new possibilities related to product or service, process or market, evaluating various choices related to product or service, process or market, focusing on strong renewal of product or service, and also activity which needs to learn new skill or knowledge that can increase human capital and network.

The third hypothesis is *there is relationship between knowledge exploration and social capital*. The estimated parameter between *knowledge exploration and social capital* shows a significant result with $CR = 2.775$ or $CR \geq \pm 2,00$ with 0,05 (5 %) of significant level. Thus, the hypothesis is accepted. The result also indicates that to increase human capital, it needs the intensity of knowledge exploration. Knowledge exploration begins with searching, making variation, taking risk, experimenting, and innovating. Those are the steps where new

practices are introduced. Hence, organizational learning is the core of exploration learning that creates several experiences related to broaden knowledge. This exploration activity includes searching new organization norm, rutinity, structure, and system, experiment using new approach to technology, business process, or market, innovation and adaption and reconsideration current theory and decision. Exploration is prerequisite to exploit. Yet, the advantage of it also depends on the number of knowledge which has been accumulated and learned through exploitation (rutinity, for instance, rule and procedure). This accepted hypothesis is in line with Tom J.M. (2007) study which states that meeting frequency, maintaining collaboration, informal activity, finding new possibilities related to product or service, process or market, evaluating various choices related to product or service, process or market, focusing on strong renewal of product or service, and also activity which needs to learn new skill or knowledge that can increase network and social capital.

The fourth hypothesis is *there is relationship between knowledge exploitation and human capital*. The estimated parameter between knowledge exploitation and human capital shows a significant result with $CR = 2.043$ or $CR \geq \pm 2,00$ with 0,05 (5 %) of significant level. Hence, the hypothesis is accepted. This results also indicates that to increase human capital, it needs intensity of knowledge exploitation. The knowledge exploitation is based on external knowledge implementation to repair current product of organization and increase its process. In other word, exploitation is further usage development of the current competence. The ability of enterprise to implement knowledge toward innovation process can be an important source of competitive advantage. There are much knowledge (Grant, 1996), not all of it is effective to be practiced and applied in the enterprise. This supported hypothesis is in line with the result of Hsui study (2007) which shows that 80% of respondents agree that knowledge becomes a strategic asset. While, 78% agrees that business is failed because of unable to exploit the knowledge available in an organization. Transferring and using knowledge from external sources broadens knowldge basis.

The fifth hypothesis is *there is relationship between knowledge exploitation and social capital*. This estimated parameter between knowledge exploitation and social capital shows a significant result with $CR = 2.751$ or $CR \geq \pm 2,00$ with 0,05 (5 %) of significant level. Hence,

the hypothesis is accepted. This result also indicates that to increase social capital, it needs the intensity of knowledge exploitation. Knowledge exploitation is basically a process of gaining competence through adaption, synthesis, and implementation of the mastered knowledge. This needs knowledge which has been created and internalized to use and create mastery of experiences. Knowledge exploitation is based on external knowledge implementation to repair the existence product of organization and increase its process. In other word, exploitation is a further usage development of the existing competence. Enterprise ability to implement process of innovation can be an important source of competitive advantage. There are much knowledge (Grant, 1996), not all of it is effective to be applied and practiced by the enterprise. This accepted hypothesis is in line with the result of Hsui study (2007) which shows that 80% of respondents agree that knowledge becomes a strategic asset, while 78 % agree that business is failed because of unable to exploit the knowledge available in an organization. Transferring and using knowledge from external sources broadens knowldge basis, so it maintains the continuity of social capital.

The sixth hypothesis is *there is relationship between knowledge transfer and human capital*. This estimated parameter between knowledge transfer and human significant result with $CR = 2.444$ or $CR \geq \pm 2,00$ with 0,05 (5 %) of significant level. Hence, the hypothesis is accepted. This result also indicates that to increase human capital, it needs the intensity of knowledge transfer. Knowledge transfer can be knowledge transmission and knowledge absorption from one to another. Hence, transferring knowledge as process of certain ability is moved from source to receiver, where the source or receiver can be a person or individual group. So, if an effective knowledge is transfered, the receiever experiences increasing ability which results the increasing of individual work achievement as well as collective group of organization. The experts of social organization state that enterprise can be understood as a social community which specializes in speed and creature efficiency and knowledge transfer. The view of knowledge-based-organization begins with individual and enterprise which become superior of their ability in integrating knowledge across indiviual or sharing knowledge. This accepted hypothesis is in line with the study result (Lane & Lubatkin, 1998), which states that with an effort and experience, organization can build interaction continuity which recognizes value of potensial chance

and chooses what element will be combined and then facilitates knowledge exchange so that it can increase human capital.

The seventh proposed hypothesis is *there is relationship between knowledge transfer and social capital*. This estimated parameter between knowledge transfer and social capital shows a significant result with $CR = 2.447$ or $CR \geq \pm 2,00$ with 0,05 (5 %) of significant level. Hence, the hypothesis is accepted. It means that the higher the intensity of knowledge transfer is, the higher social capital will be. This result also indicates that to increase social capital, it needs the intensity of knowledge transfer. Knowledge transfer is the main of mechanism to share practice and facilitate integrated knowledge in order to increase either short-term work or competitive advantage. In other word, the transmission of knowledge is an absorption of knowledge from one to another. Hence, Transfers knowledge is a process in which certain ability is moved from source to receiver, where the source or receiver can be a person or individual group. So, if an effective knowledge is transferred, the receiever experiences increasing ability which lead them to increase the individual work achievement and, collectively, the whole organization. The experts of social organization state that enterprise can be understood as a social community which specializes in speed and creature efficiency and knowledge transfer. The view of knowledge-based-organization begins with individual and enterprise which become superior of their ability in integrating knowledge across indiviual or sharing knowledge. This supported hypothesis is in line with the study result (Lane & Lubatkin, 1998), which states that with an effort and experience, organization can build interaction continuity which recognizes value of potential chance and chooses what element will be combined and then facilitates knowledge exchange so that it can increase social capital.

The eighth hypothesis is *there is relationship between knowledge transformation and human capital*. The estimated parameter between knowledge transformation and human capital shows a significant result with $CR = 2.948$ or $CR \geq \pm 2,00$ with 0,05 (5 %) of significant level. Hence, the hypothesis is supported. It means that the higher the intensity of knowledge transformation is, the higher human capital will be. This result also indicates that to increase human capital, it needs the intensity of knowledge transformation. Knowledge transformation is important because it should be maintained for years till it has been implemented to

new product. A group of high motivated people and skilful is competitive advantage because they represent important certain resource of enterprise, rare and difficult to be imitated. An enterprise with high skilful and knowledgeable has higher human capital and more possibility to create knowledge, make right decision and have technology innovation better. This supported hypothesis is in line with the result of Cegarra-Navarro (2005) study which states that organizational learning connects to the development of new knowledge. This is very important to transformation ability, innovation, and a work of organization. The process of organization learning on strategy alliance is a mechanism where organization makes competitors become strategic knowledge.

The ninth hypothesis is *there is relationship between knowledge transformation and social capital*. The estimated parameter between knowledge transformation and social capital shows a significant result with $CR = 2.308$ or $CR \geq \pm 2,00$ with 0,05 (5%) of significant level. Hence, the hypothesis is accepted. This result also indicates that to increase social capital, it requires the intensity of knowledge transformation. Knowledge transformation is based on maintaining knowledge from time to time. It is important because it should be maintained for years till it has been implemented to new product. A group of high motivated people and skilful is competitive advantage because it represents important resource of certain enterprise, rare and difficult to be imitated. An enterprise with high skilful and knowledgeable resources has a higher human capital and more possibility to create knowledge, make right decision and have technology innovation better. This supported hypothesis is in line with the result of Cegarra-Navarro (2005) study which states that organizational learning connects to the development of new knowledge. This is very important to transformation ability, innovation, and a work of organization. The process of organization learning on strategy alliance is a mechanism where organization makes competitors become strategic knowledge. Moreover, it is in line with the study result (Lane & Lubatkin, 1998), which states that by an effort and experience, organization can build interaction continuity which recognizes value of potential chance and chooses what element will be combined and then facilitates knowledge exchange so that it can increase social capital.

The tenth hypothesis proposed in this study is *there is relationship between human capital and sustainable competitive advantage*. The

estimated parameter between human capital and sustainable competitive advantage shows a significant result with $CR = 2.872$ or $CR \geq \pm 2,00$ with 0,05 (5 %) of significant level. Hence, the hypothesis is accepted. This result also indicates that to increase sustainable competitive advantage, it needs the human capital. Every organization or enterprise always tries to increase human capital. It is the characteristic of human resources which is determined by knowledge known and used to create value for organization. Human capital management must consider knowledge sources and the ideology of those knowledge. The ideology means as a process of skill development and knowledge classification which is specially related to market. Human resources with high motivation and competence want better and has more ability to influence and meet external partners' need, so that they want better to extend long relationship with the organization. Some researchers state that social relationship of individual external gives access to an important resource of enterprise. This study result which shows the higher human capital, the higher sustainable competitive advantage, is in line with the study of Hitt (2006) which concludes that a group of high motivated and skillful people is competitive advantage because they represent important certain resource of enterprise. An enterprise with high skill and knowledge has higher human capital and more possibility to create knowledge, make right decision and have technology innovation better and competitive ability. The continuous competitive ability is determined by the power of human and social capital.

The tenth hypothesis proposed in this study is *there is relationship between social capital and sustainable competitive advantage*. The estimated parameter between between social capital and sustainable competitive advantage shows a significant result with $CR = 2.775$ or $CR \geq \pm 2,00$ with 0,05 (5 %) of significant level. Hence, the hypothesis is accepted. This result also indicates that to increase sustainable competitive advantage, it needs the social capital. Social capital is an actual and potential resource which can result networking of work relationship which is respectful and understands one another. One of the important organization resources is social capital which covers experience in creating relationship with other organizations. The relationship will grow more and more based on value of social interaction. Resources and organizational ability acquired from those relationships are the source of power and authority of enterprise.

6. Conclusion

Based on the significant support of hypothesis test, the research problems have been answered. There are six steps to improve strategic knowledge which can create sustainable competitive advantage. Those are: first, the steps on strategic alliance as strategic knowledge, which can create sustainable competitive advantage, can be done by increasing or improving social capital which is built by human capital. Second, the steps on strategic alliance as strategic knowledge, which can create sustainable competitive advantage, can be done by increasing social capital. Third, the steps on strategic alliance as strategic knowledge, which can create sustainable competitive advantage, can be done by increasing human capital which is affected by transfer of knowledge. Fourth, the steps on strategic alliance as strategic knowledge, which can create sustainable competitive advantage, can be done by increasing social capital which is affected by exploitation of knowledge. Fifth, the steps on strategic alliance as strategic knowledge, which can create sustainable competitive advantage, can be done by increasing human capital which is affected by transformation of knowledge whose indicator is that the employee gives creative solutions and participates in social activities. Sixth, the steps on strategic alliance as strategic knowledge, which can create sustainable competitive advantage, can be done by increasing social capital which is affected by exploration of knowledge.

7. Limitations and Future Research

The test results of full model SEM show that the model is relevant and fit with the data used. However, there are two conformance tests that are marginally accepted, those are *the Goodness of Fit Index* (GFI = 0.889) and *the Adjusted Goodness of Fit Index* (AGFI = 0.884). Then, the development of strategic knowledge model does not include the variable of environment. This happens because the study only focuses and starts with the phenomenon of internal conditions and the research gap.

Thus, for future research, organizational culture is an integrated pattern of human behavior related to the issue of adjustment or integration of internal and external conditions. Organizational culture has a role in the development of strategic knowledge as an effort to improve organizational performance. So, the upcoming study on organizational

culture in the development process of sustainable of competitive advantage will become more interesting. Then, in some advanced countries, the trigger of the improvement of organizational performance is generally centered in the internal condition . Meanwhile, in developed countries, the external conditions (environment) are the dominant aspect of the improvement of the organizational performance. Environmental conditions include : 1) . Environmental Complexity as the diversity of factors and problems that exist within the organization. 2) . Environmental dynamics which describes the level of changes occurred in the environment in which the organization operates. Thus, the future research agenda needs to be considered.

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Low Savings Rates in the Economic Community of West African States (ECOWAS): The Role of Corruption

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Although many empirical studies have been conducted on the determinants of savings, little has been done to examine the effect of corruption on savings, particularly in the ECOWAS region. This study employs OLS and TSLS-instrumental variable techniques that take into account random effects to investigate the effect of corruption on savings, in addition to examining whether the effect of corruption on savings depends on income levels in the ECOWAS from 1996 to 2012. The results illustrate that lower corruption is associated with higher savings, and the effect of corruption on savings decreases with income level. The results suggest that governments in ECOWAS should employ effective policies that will reduce corruption to raise savings, and raise incomes to reduce the negative effect of corruption on savings. These policies should be complemented with adequate funding of anti-corruption agencies, promotion of an efficient legal system and establishment of special courts to facilitate the arrest and prosecution of corrupt individuals, including the cooperation of the international community.

1. Introduction

Savings plays an important role in economic development of a country (Lucas, 1988; McKinnon, 1973; Romer, 1986; Shaw, 1973; Solow, 1956). More so, savings is an important macroeconomic variable which impacts on capital accumulation, productivity, economic growth, and the dependency or otherwise of a country on external resources (Adam and Agba, 2006). Savings mobilization is also very crucial for most developing countries in long term economic growth (Kohsaka, 1996).

Despite the significance of high savings rates, the World Bank's World Development Indicators (WDI) reveal that many developing regions experienced fluctuations in their savings rates during the 1970-2010

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period. Unfortunately, the Economic Community of West African States (ECOWAS) comprising of fifteen countries - Benin, Burkina Faso, Cape Verde, Cote D'Ivoire, Gambia, Ghana, Guinea, Guinea Bissau, Liberia, Mali, Niger, Nigeria, Senegal, Sierra Leone, and Togo, turned out to be one of the least successful regions in terms of savings mobilization. For instance, the region's savings rates were lower than those of other developing regions such as East Asia and Pacific, Middle East and North Africa, Latin America and Caribbean, Europe and Central Asia including world average savings rates during the same period. Moreover, many countries in the region and their Sub-Saharan Africa (SSA) counterparts witnessed decline in international capital inflow due to factors such as lending constraints (Elbadawi and Mwega, 2000) and corruption (Brunetti, Kisunko and Weder, 1998), making it difficult for them to reduce the already widened saving-investment gap and foster higher growth rates needed to reduce unemployment, poverty and inequality, just to mention few.

Although the literature has not adequately addressed the role of corruption in savings mobilization, it (corruption) may be an important determinant of savings particularly in ECOWAS countries, many of which have been labeled 'very corrupt' by the notable institutions such as the Transparency International (TI). Corruption can have some impacts on national savings through capital flight. For instance, Swaleheen (2008) illustrated a scenario where government officials that acquire wealth through illegitimate means transfer their assets abroad (capital flight) for the fear of being detected, arrested and prosecuted, and in the process lose such assets to the state. Jain (1988) suggested that capital flight arises from an agency problem where the leadership (agent) that has been vested with the power to borrow funds from abroad to invest in the domestic economy on behalf of the population (principal), borrow more than what is required and then appropriate part of the funds. The resulting capital flight reflects the amount by which national savings is reduced (Lessard and Williamson, 1987; Rodriguez, 1987; Swaleheen, 2008).

Chinn and Ito (2007) argued that corruption (including law and order, and bureaucracy quality) has some impact on the incentives to save and invest. For instance, if the legal system reduces corruption to the minimum (and promotes law and order, as well as guarantee property rights and contracts) it will encourage savings and investment. But if the

legal system is weak (to the extent that it is unable to reduce corruption and break-down of law and order, and guarantee property rights and contracts) it will have negative consequences on individual's savings and investment decisions. Similarly, the lack of good governance (that may results from public sector corruption) tends to reduce public trust in government and affects individual's savings and investment behaviour. In fact, public distrust may discourage people from increasing their savings (or investment) at higher real interest rates (or returns) because there is no assurance that government's future policies will be implemented in the best interest of the people. The situation becomes worsened if savings and investment are taxed arbitrarily and in an unpredictable manner (Aizenman, 2005).

Although numerous studies have been conducted on savings and its determinants, none to our knowledge has investigated the effect of corruption on savings particularly in the ECOWAS region. Whereas Adewuyi, Bankole and Arawomo (2010) empirically examined the determinants of savings rates in ECOWAS countries, the authors did not include corruption in the savings model. Moreover, most studies on savings in the region have focused mainly on individual country (see Nwachukwu and Egwaikhide, 2007; Nwachukwu and Odigie, 2011; Olusoji, 2003; Uremadu, 2007) without any basis for generalization of their findings (Adewuyi, Bankole and Arawomo, 2010). Furthermore, the recent study by Swaleheen (2008) on savings and corruption left out many ECOWAS countries such as Benin, Guinea, Guinea Bissau, Mali, Niger, Nigeria and Togo that are considered to be very corrupt in his analysis.

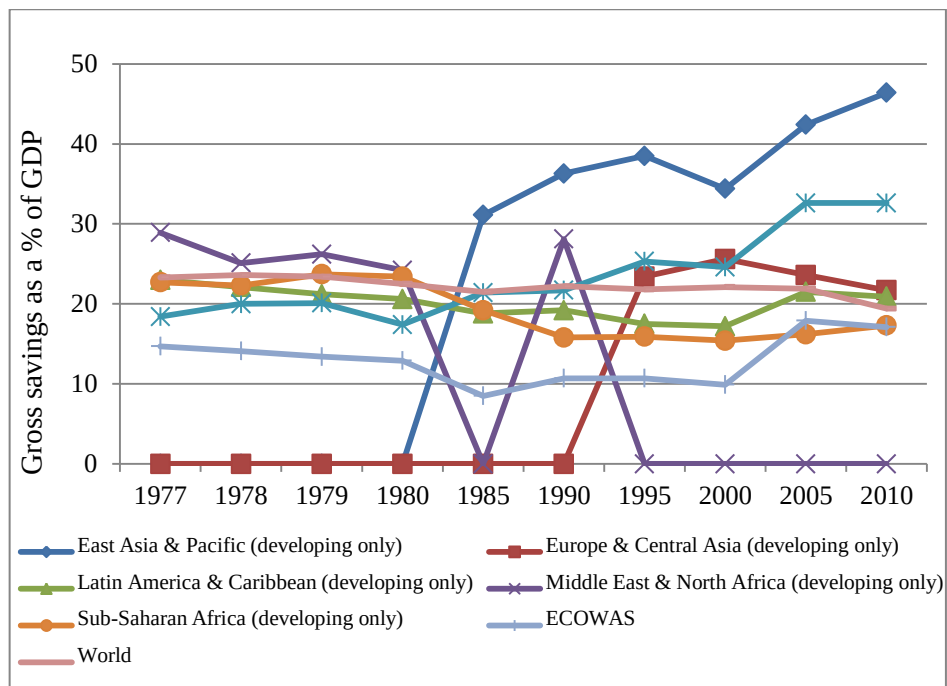
Besides, studies that examined whether the effect of corruption on savings depend on income level are almost non-existent. Given that low income countries tend to be very corrupt (Mauro, 1995) and have low savings rates as indicated by the WDI, the effect of corruption on savings may depend on income level, so that for low income ECOWAS countries the effect of corruption on savings will be higher. But at higher income levels countries tend to be less corrupt (Gokcekus and Suzuki, 2011), so that the effect of corruption on savings will be lesser. Thus, the objectives of this study are (i) to examine the effect of corruption on savings and (ii) to examine whether the effect of corruption on savings depends on income levels in ECOWAS countries. The rest of the paper is organized as follows. Section two is the overview of savings and

corruption in ECOWAS countries, while section three contains the review of relevant literature on savings and its determinants. Section four is for method and data, while section five consists of discussion of results. Section six concludes the paper.

2. Overview of savings and corruption in the Economic Community of West African States

As mentioned in the introductory section, ECOWAS lagged behind other developing regions and the world in terms of savings rates from between 1970 and 2010. For instance, the ECOWAS region had lower savings rates compared to Latin American and Caribbean, Sub-Saharan Africa and world averages during 1970-2010. Similarly, two regions - East Asia and Pacific, and Europe and Central Asia savings rates were higher than those of ECOWAS in 1980-2010 and 1990-2010, respectively (Figure I).

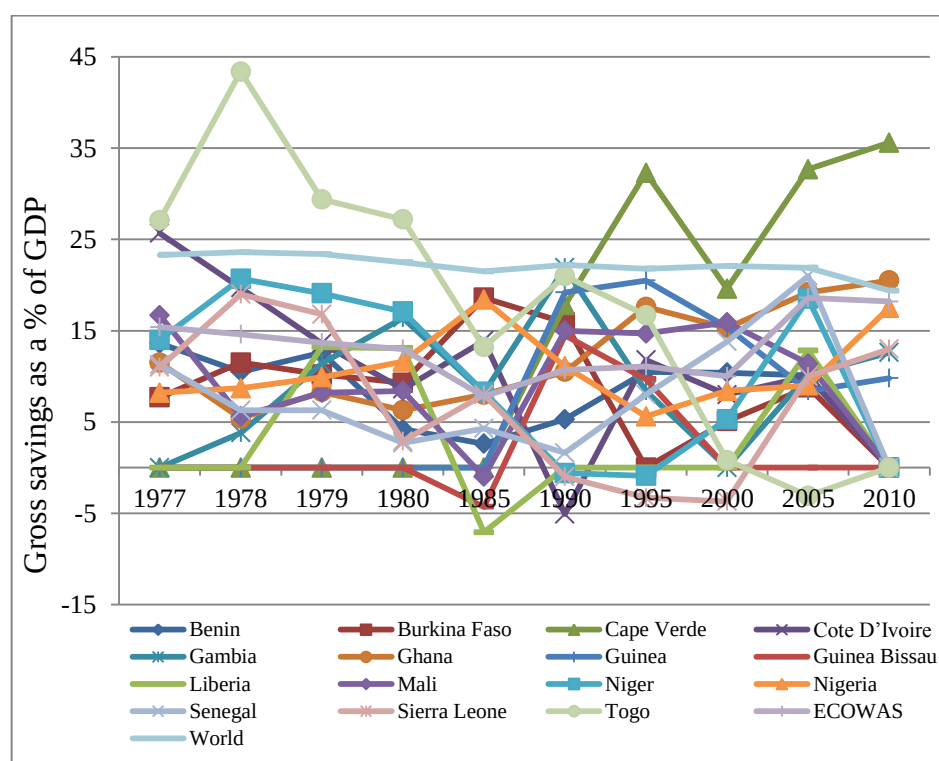
Figure 1: Savings Rates across Developing Regions



Source: Author

In addition, individual ECOWAS country's savings rates exhibited patterns similar to the region's average. Specifically, savings rates of most countries were not only lower than world averages, they also fluctuated between 1970 and 2010 (Figure II). The low savings rates in SSA countries including ECOWAS have been attributed to factors such as low income per capita, high young-age dependency ratio, and high dependence on aid (Elbadawi and Mwega, 2000).

Figure 2: ECOWAS countries Savings Rates



Source: Author

Besides the low saving rates, corruption is a serious problem facing many ECOWAS countries. Although corruption is a global phenomenon, its impact can be more devastating for the poor, majority of who live in developing regions of the world (ECOWAS inclusive). For instance, a report co-authored by Daniel Kaufmann (Director of global programmes at the World Bank) put the value of bribery around

the world at approximately US\$1 trillion, with the burden falling mostly on the bottom billion persons living in extreme poverty (British Broadcasting Corporation, 2007). Moreover, Hanson (2009) revealed that corruption costs Africa US\$150 billion a year, compared to the US\$22.5 billion developed nations gave in aid to SSA in 2008. Also, the Global Financial Integrity (GFI) (2012) report illustrated that illicit capital outflows which results from corruption (including crime, tax evasion, and other illicit activity) cost developing countries US\$5.86 trillion, while the growth of illicit capital flows was 23.8% for the African continent from 2001 to 2010. In addition, many ECOWAS countries were reported to have lost several millions of dollars, with Nigeria (the region's largest economy) accounting for US\$129 billion and ranking 7th in terms of magnitude of illicit capital outflows during the same period. Thus, for most ECOWAS countries in dire need of resources, losing these funds further limits their ability in reducing the savings-investment gap and enhancing higher growth rates.

Given the adverse effects of corruption on the economy, some institutions/organizations and groups have devoted their time and resources to publish perceived corruption indices for countries. One of such institutions is the TI, and its report on corruption for 2005-2012 for instance, showed that ECOWAS ranked among world's most corrupt regions. The TI corruption perception index (CPI) indicates the extent to which a country is perceived to be corrupt, and ranges between 0 and 10. A higher CPI value indicates lesser corruption, but a lower value implies higher corruption. Moreover, each country's TI ranking is a reflection of its CPI. Thus, a country is ranked very high if it has a higher CPI (a condition of less corruption) and vice versa. The CPI and ranking presented in Table I indicates that countries in the ECOWAS region are facing serious corruption crisis.

For instance, only Cape Verde has maintained a CPI of at least 5.0 on a scale of 10 since 2008, and it was the only country from the region to be ranked among the top 50 in 2012. Unfortunately, 9 ECOWAS countries were at the bottom of the ranking, indicating that corruption is very high in the region. Thus, low income ECOWAS countries appear to be very corrupt including having low savings rates.

Table 1: ECOWAS Countries Corruption Perception Index and Ranking

	Corruption Perception Index								Ranking
Country	2005	2006	2007	2008	2009	2010	2011	2012	2012
Benin	2.9	2.5	2.7	3.1	2.9	2.8	3.0	3.6	94
Burkina Faso	3.4	3.2	2.9	3.5	3.6	3.1	3.0	3.8	83
Cape Verde	N.A	N.A	4.9	5.1	5.1	5.1	5.1	6.0	39
Cote D'Ivoire	1.9	2.1	2.1	2.0	2.1	2.2	2.2	2.9	130
Gambia	2.7	2.5	2.3	1.9	2.9	3.2	3.5	3.4	105
Ghana	3.5	3.3	3.7	3.9	3.9	4.1	3.9	4.5	64
Guinea	N.A	1.9	1.9	1.6	1.8	2.0	2.1	2.4	145
Guinea Bissau	N.A	N.A	2.2	1.9	1.9	2.1	2.2	2.5	150
Liberia	2.2	2.1	2.1	2.4	3.1	3.3	3.2	4.1	75
Mali	3.2	2.9	2.8	2.7	3.1	2.7	2.8	3.4	105
Niger	2.4	2.3	2.6	2.8	2.9	2.6	2.5	3.3	113
Nigeria	1.9	2.2	2.2	2.7	2.5	2.4	2.4	2.7	139
Senegal	3.2	3.3	3.6	3.4	3.0	2.9	2.9	3.6	94
Sierra Leone	2.4	2.2	2.1	1.9	2.2	2.4	2.5	3.1	123
Togo	N.A	2.4	2.3	2.7	2.8	2.4	2.4	3.0	128

Source: Transparency International

3. Review of Empirical Literature on the Savings and its Determinants

Many empirical studies have been conducted to investigate the determinants of savings across countries. For instance, Collins (1991) used a regression analysis to examine the determinants of savings in 10 developing countries during the 1960-1984 period. The results show that income per capita, growth, and the share of youth population have a positive effect on savings. Edwards (1996) investigated the determinants of savings in 36 countries (of which 11 are industrialized and 25 developing nations) from 1970 to 1992. The results of the Instrumental Variable technique reveal a positive impact of income per capita growth, foreign savings, urbanization, and a negative effect of political instability and GDP per capita on savings.

Callen and Thimann (1997) assessed the important determinants of savings in 21 Organization for Economic Cooperation and Development (OECD) countries in 1975-1995 using cross sections and static fixed

effects. The results indicate that income growth and inflation have a positive effect on savings, while direct taxes, old-age dependency, debt-GDP ratio, government transfers and public savings have a negative effect on savings. Similarly, Masson, Bayoumi and Samiei (1998) employed cross section and panel regressions to analyze the determinants of savings in 21 industrial and 40 developing countries from 1971 to 1993. The results demonstrate that savings is an increasing function of growth rate, wealth, per capita GDP and the current account, while public savings, government current expenditure, government investment and age dependency have a negative effect on savings. In the same manner, Haque, Pesaran and Sharma (1999) evaluated the determinants of savings in 21 OECD countries during 1971-1993, using mean group and pooled mean group estimation methods. The results show that public savings and government expenditure have a negative effect on savings.

Elbadawi and Mwega (2000) investigated the determinants of savings with a primary focus on SSA from 1970 to 1995 using the pooled OLS regression. The empirical evidence suggest that gross private disposable income per capita, growth of gross private disposable income per capita, terms of trade growth, real investment rate, and government consumption have a positive effect on savings, while public savings, youth dependency, urbanization, private sector access to credit, inflation, and foreign savings have a negative effect on savings. Adewuyi, Bankole and Arawomo (2010) examined the determinants of savings in ECOWAS countries during the 1980-2006 period, using pooled OLS, fixed effects and random effects estimation techniques. The results indicate that life expectancy has a significant and positive effect on savings. On the other hand, other variables including gross domestic income per capita, deposit rate, financial sector development, inflation rate, budget deficits and terms of trade have a significant and negative effect on savings in ECOWAS countries. Swaleheen (2008) investigated the relationship between savings and corruption across countries using the Generalized Method of Moments (GMM) estimator. The results show that corruption has a negative effect on savings.

A cursory look at the literature suggests that there is paucity of research on savings-corruption relationship, and it seems that none has been done on ECOWAS, a region considered to be among the most corrupt. Even

the recent study on savings and corruption (Swaleheen, 2008) left out almost half of ECOWAS countries in his analysis. Also, it appears that no study has been conducted to examine whether the effect of corruption on savings depend on income levels. Thus, this study extends the literature by investigating the effect of corruption on savings, and examining whether the effect of corruption on savings depend on income levels in ECOWAS countries.

4. Method and data

In this section, we attempt to establish a link between savings and corruption, followed by the model specification. Swaleheen (2008) presented a situation where corrupt government officials who acquire wealth via unlawful means, know that they would not be protected by the home country's law and face the risk of been detected, prosecuted and even lose their assets to the state. Thus, the corrupt officials will most likely transfer such illegal proceeds abroad (capital flight) (Hutchcroft, 1997; Rose-Ackerman, 1999). On his part, Jain (1988) explained capital flight within the context of an agency problem in a political system. The author argued that, so long as the leadership (agent) is vested with the power to borrow funds from abroad to invest in the domestic economy, he/she may borrow more than what is required on behalf of the population (principal), and in the process appropriate part of the funds. Also, if the economy has a low absorptive capacity relative to the borrowed funds, the return on investment will be lesser and unattractive to (prospective) investors, leading to further capital flight (Swaleheen, 2008). Moreover, it has been suggested that national savings will decline by the amount of capital flight (Lessard and Williamson, 1987; Rodriguez, 1987; Swaleheen, 2008).

Corruption also influences savings in other ways through its effect on government revenue and investment in human capital such as education, provision of social services including subsidies and transfers, private investment particularly the small and medium enterprises (SMEs), rent seeking, international capital or foreign investment, economic growth, unemployment, inequality and poverty. For instance, political corruption (which refers to the use of power by government officials or bureaucrats for private gain) impedes the growth of government tax revenue because funds that ought to go to government's coffers end up in private pockets of government officials. Inadequate revenue reduces government's

capacity to execute projects that would help to reduce poverty and underdevelopment (Ghura, 2002). In less developed countries (LDCs), opportunities to earn income and save are usually very scarce.

Furthermore, corrupt officials connive with households and businesses to provide false information to government including tax evasion, resulting in huge loss of resources available for productive investments (Blackburn, Bose and Haque, 2010). The shortfall in government revenue (relative to expenditure) partly accounts for the annual deficit-budgeting operated in many ECOWAS countries, with its adverse effects on national savings. The African Development Bank statistics pocketbook (various issues) indicates that most ECOWAS countries had deficit budget (public dissaving) in the past few years. Fortunately, a recent study suggested that corruption compels government to operate deficit budgeting (Oto-Peralías, Romero-Ávila and Usabiaga, 2013), which in turn leads to low national savings.

In addition, corrupt government officials ensure that investment in human capital (like education) is less because it does not guarantee maximum private gain like bribes (Mauro, 1995), while a larger percentage of government expenditure and the GDP is voted for the purchase of military arms and ammunitions (Gupta, de Mello and Sharan, 2002). This has wider implications that include reduced access to education, lower labour productivity, unemployment including declining income, all of which in turn reduce people's ability to save. Corruption also promotes rent seeking behaviour, while discouraging skills and knowledge acquisition, including innovation and entrepreneurship. Thus, it is very common to see rich families giving preference to public sector employment like government ministries and agencies (where corruption is rife) with a view to sustaining their rent seeking activities (Dabla-Norris and Wade, 2002). Since only the few close to the corridor of power have access to the nation's resources, many are left with very little and denied the access to adequate government's social services, including subsidies and transfers. Thus, corruption leads to higher income inequality and poverty (Gupta, Davoodi and Alonso-Terme, 2002), and as a result lower savings.

Sometimes, sick patients are required to pay for services such as health even though it is meant to be free. Also, funds set aside for the provision of these services are either embezzled or misappropriated by

government officials (Blackburn and Forgues-Puccio, 2007). Moreover, the masses lack access to income generating opportunities as government officials prefer to investment in capital-intensive projects rather than labour-intensive projects that will contribute to their socio-economic wellbeing (Leite and Weidmann, 1999). In societies where poverty is high, it is difficult for people to finance their consumption and to a large extent save.

Corruption is partly responsible for the high cost of doing business in many poor countries because businessmen have to bribe government officials in order to register their businesses, collect licenses and permits, just to mention few. And for those unwilling to cooperate, they may have to spend weeks or months before they are attended to or have their request/application turned down. This discourages not only private investment, but also reduces the growth potential of SMEs (Tanzi and Davoodi, 2002), leading to higher unemployment, lower income generating opportunities and savings. Moreover, since corruption is a tax on private investment (Everhart, 2010; Shleifer and Vishny, 1993; Wei, 2000), it has a disproportionate impact on transaction costs including reducing profitability (Everhart, 2010; Goorha, 2000). Thus, corruption has adverse effects on private investment (Asiedu, 2006; Asiedu and Freeman, 2009; Mo, 2001; Smarzynska and Wei, 2002; Wei, 2000) and growth (Gyimah-Brempong, 2002; Mauro, 1995; Tanzi and Davoodi, 2002). For entrepreneurs (most of them small business holders) that cannot afford to pay bribes, they are compelled to join the working class, earning very low wages as a result of the high labour supply (Ahlin, 2001; Foellmi and Oechslin, 2007; Blackburn and Forgues-Puccio, 2007), leading to higher unemployment, low income and declining savings.

Given the issues raised above, we argue that savings (GSR) is dependent on the level of corruption (COR). Similarly, given that income varies across ECOWAS countries, it is possible that the impact of corruption on savings depend on the level of income (PCY). Thus, at low income levels the impact of corruption on savings would be higher, but its impact would be lesser at higher levels of income. In order to capture this effect, we included corruption-income interaction (COR*PCY) as a variable in the savings model. In addition, we introduced certain variables that have been found to be important determinants of savings in our model. They include, income growth (GPCY), age dependency

(DEP), inflation rate (INF), real interest rate (RIR), agriculture (AGR). Thus, the savings model to be estimated is specified as:

$$GSR_{it} = \beta_0 + \beta_1 COR_{it} + \beta_2 PCY_{it} + \beta_3 COR * PCY_{it} + \beta_4 GPCY_{it} + \beta_5 DEP_{it} + \beta_6 INF_{it} + \beta_7 RIR_{it} + \beta_8 AGR_{it} + U_{it} \quad 1$$

Where: it is the time period t in country i , and U is the error term. The variables are measured as follow:

GSR is measured as gross (national) savings as a percentage of GDP. The data were collected from the WDI. However, due to unavailability of savings data on Nigeria in the WDI, the data was obtained from the Central Bank of Nigeria. The variable has been used in recent studies (see Abu, Karim and Aziz, 2013; Balde, 2011; Bloom, Canning and Graham, 2003; Bloom et al., 2007; Cook, 2005).

PCY is measured as income (GDP) per capita. The subsistence-consumption theories argue that savings rates tend to be higher in high income countries and lower in low income countries (Metin-Ozcan, Gunay and Ertac, 2003). Thus, we expect a positive relationship between income per capita and savings rates. The data were collected from the WDI.

GPCY is measured as income (GDP) growth rate. The permanent income hypothesis predicts a negative relationship between income growth and savings because forward looking consumers anticipate increases in their future income, and therefore dissave against future earnings (Friedman, 1957). But the life cycle hypothesis asserts that increases in income growth has a positive effect on savings since it (income growth) increases savings of working population relative to non-working population (Metin-Ozcan, Gunay and Ertac, 2003). Thus, we expect the relationship between income growth and savings rates to be either positive or negative. The data were obtained from the WDI.

INF is measured as annual percentage change in price. Athukorala and Sen (2004) opined that the impact of inflation raises uncertainty about future income streams, leading to higher savings for precautionary purpose, particularly for households in developing countries whose income prospects are much more uncertain than their counterparts in developed countries. Also, if individuals seek to maintain a target level

of wealth or liquid assets relative to income, savings will rise with inflation. Metin-Ozcan, Gunay and Ertac (2003) submitted that macroeconomic uncertainty (captured by inflation rate) is expected to have a positive effect on savings, as individuals in such a society would try to hedge against risk by increasing their savings. This view was echoed earlier by Skinner (1988) and Zeldes (1989). Similarly, Hondroyiannis (2006) submitted that in societies where income prospects are less uncertain, higher inflation rate would result in lower savings. Thus, we expect either a positive relationship between inflation and savings rates. The data were collected from the WDI.

RIR is measured as nominal deposit rate adjusted for inflation rate. The life cycle hypothesis asserts that rising interest rate raises the opportunity cost of current consumption, making individual consumer to reduce current consumption and increase savings (substitution effect). But if consumer is a net lender, increases in interest rate would lead to higher income and consumption, and then results in lower savings (income effect). If the substitution effect outweighs the income effect, the relationship between interest rate and savings would be positive (Athukorala and Sen, 2004; Nwachukwu and Egwaikhide, 2007). Therefore, we expect the relationship between savings and real interest rate to be either positive or negative. The data were obtained from the WDI.

DEP is measured as the ratio of population below 15 years plus population over 65 years to working population (aged 15-64 years). Ando and Modigliani (1963) argued that individuals accumulate wealth during their productive/working years and save (or make provisions) for retirement, since income is expected to fall during retirement. Thus, if the working population rises relative to non-working (dependent) population, savings will rise and vice versa. Overall, we expect a negative relationship between age dependency and savings rates. The data was collected from the WDI.

AGR is measured as agriculture value as a percentage of GDP. Given that a larger percentage of ECOWAS population engage in agricultural production, it is obvious that many face uncertainty in their future earnings. Skinner (1988) suggested that greater uncertainty about future incomes compels consumers to set aside some resources on precautionary grounds. Chowdhury (2001) and Khan and Hye (2010)

discovered that agriculture has a positive effect on savings. Thus, we expect a positive relationship between agriculture and savings rates. The data were obtained from WDI.

COR is captured by indices of corruption that include the CPI and International Country Risk Guide corruption index (ICRG) published by the Political Risk Service (PRS). The corruption indices seem to have been endorsed by researchers as many recent empirical studies on corruption employed the indices for estimation purposes (see Abu, Karim and Aziz, 2015; Blackburn, Bose and Haque, 2010; Mauro, 1995; Treisman, 2000). Although the indices have different coverage, methodology and availability, they have been found to be highly correlated with one another and highly correlated with major economic variables, indicating that they are measuring the same phenomenon (Asiedu and Freeman, 2009; Blackburn, Bose and Haque, 2010; Treisman, 2000) and that spuriousness is not a serious problem per se.

Moreover, the various measures of corruption (particularly, the TI and ICRG) have been employed to check for consistency and robustness of results (Swaleheen, 2011). The two indicators have also been employed in previous studies (see Asiedu and Freeman, 2009; Blackburn, Bose and Haque, 2010; Swaleheen, 2011), and in a recent study the control of corruption indicator was employed (see Samimi and Abedini, 2012). The TI corruption index ranges from 0 to 10, while ICRG index ranges from 0 to 6. Higher value indicates lesser corruption and lower value means higher corruption. The data on the third indicator or measurement of corruption (control of corruption index) were collected from the Worldwide Governance Indicators (WGI). The primary source of the data is the Global Insight Business Conditions and Risk (WMO). The control of corruption indicator has a range of 0 to 1, and higher value means lesser corruption and vice versa. Base on past studies (Swaleheen, 2008), we expect a positive relationship between lesser corruption (increases in corruption indices) and savings rates.

COR*PCY refers to corruption-income interaction, and indicates that the effect of corruption on savings depends on income levels. Since low income countries tend to be more corrupt (Mauro, 1995) and have low savings rates, it is possible that the effect of corruption on savings depends on income levels. Therefore, we expect the impact of corruption on savings to be higher in low income ECOWAS countries,

while the impact should be lesser at higher income levels. The inclusion of the corruption-income interaction in the savings models to be estimated can lead to multicollinearity problem due to the presence of corruption and income per capita from which the interaction variable has been calculated. There is a possibility that these variables would be highly correlated. One way to eliminate multicollinearity is to regress the interaction term on the explanatory variables from which it was calculated. Then, the residuals series is taken to replace the interaction variable during estimation.

5. Discussion of Results

The literature has suggested that income (GDP) per capita and/or income growth is endogenous to savings (Baldé, 2011, Sinha and Sinha, 1998), indicating that increases in income per capita/growth lead to higher savings, and increases in savings also lead to higher income per capita/growth. The causality between the variables will result to correlation between the control variables and the error term, thus violating the assumptions of the linear regression model (Baldé, 2011). Moreover, it is impossible to determine the effect of individual variable and isolate its impact on savings, while the estimation of the relationship would result in a potential endogeneity bias. In essence, OLS estimates would be bias.

The problem can be solved using the Two Stage Least Squares (TSLS)-instrumental variable technique to estimate the relationship between the variables. The method involves finding variables that are highly correlated with the endogenous variable, but uncorrelated with the error term. Although, it is not easy to choose appropriate instruments to control for endogeneity, using lagged values of explanatory variables that are also endogeneous can be helpful (Baldé, 2011). Thus, we used income per capita and income growth lagged by one period as instruments for income per capita and income growth. Also, we employed the Hausman test to test if the random effects estimates are significant and preferred to the fixed effects estimates and vice versa. In a similar study, Baldé (2011) found that the fixed effects estimates were correct using the Hausman test, and therefore employed both OLS and TSLS-instrumental variable methods that take into account fixed effects to analyze the impact of foreign aid and remittances on savings/investment in SSA.

Our initial estimation indicates that random effects estimates were significant and preferred to fixed effects estimates via the Hausman test. This led us to estimate our relationship using OLS and TSLS techniques which take into account the random effects. The results of estimation presented in Table II demonstrate that declining corruption (measured by increases in the TI and ICRG corruption indicators) has a positive and significant effect on savings.

This finding suggests that lesser corruption increases savings through increased government revenue and possibly reduced deficit budgeting (public dissaving) that has become a common feature of many ECOWAS countries. In addition, lesser corruption raises government expenditure in productive investment and human capital, leading to increased access to education, higher labour productivity and income, as well as savings. Furthermore, declining corruption encourages the private sector and enhances investment growth since businessmen don't have to pay bribes to government officials to collect permits and licences including registration of their businesses (and incur high production costs). This in turn increases employment generation and incomes, leading to higher savings. Also, lower corruption raises the amount of social services, subsidies and transfers, etc, available to the people, leading to lower inequality, declining poverty and higher savings.

The results also show that the corruption-income interaction term is significant and negatively related to savings (using the WMO control of corruption index), indicating that the impact of corruption on savings is higher at low income levels but lesser at high income levels. Thus, the impact of corruption on savings would be larger in ECOWAS countries due to their relatively low income levels. In addition, the impact of corruption on savings would be higher in the region because corruption reduces government investment in human capital such as education, leading to lower productivity, higher unemployment and declining income. Moreover, the effect of corruption on savings will be larger since corruption limits the access of the masses to social services including subsidies and transfers, encourages capital flight, discourage the inflow of foreign capital, drives (prospective) small scale investors into the informal sector, and even turns employers of labour to job seekers.

Table 2: Estimation Results Using Various Corruption Indicators(Dependent Variable: Savings Rates)

	TI Corruption Index		ICRG Corruption Index		WMO Corruption Index	
Variable	OLS/Random Effects	TSLS/Fixed Effects	OLS/Random Effects	TSLS/Fixed Effects	OLS/Random Effects	TSLS/Fixed Effects
Constant	-15.0920 (19.1302)	28.8334 (18.2790)	-26.9912 (22.5203)	-35.1486 (24.1511)	-0.0236 (19.2501)	-4.7729 (25.6858)
COR	1.9037*** (0.6619)	1.9447*** (0.7436)	1.6139* (0.8268)	1.7313* (1.0033)	-2.5892 (2.7907)	-5.7559 (4.2257)
PCY	0.0037** (0.0016)	0.0054** (0.0021)	0.0051* (0.0030)	0.0082* (0.0046)	0.0053*** (0.0018)	0.0056** (0.0027)
COR*PCY	-0.0001 (0.0009)	-0.0002 (0.0010)	0.0051 (0.0036)	0.0056 (0.0038)	-0.0174** (0.0084)	-0.0178** (0.0088)
GPCY	-0.0602 (0.1474)	-0.4315 (0.3992)	0.1465 (0.1348)	-0.1188 (0.7388)	0.1377** (0.0645)	0.2098 (0.7889)
DEP	0.4764 (0.4133)	0.7287* (0.3792)	0.6902 (0.4399)	0.7634 (0.4765)	0.2717 (0.3835)	0.3704 (0.5498)
INF	0.3139*** (0.0075)	0.3737*** (0.0838)	0.5379*** (0.1589)	0.5693*** (0.1722)	0.3470*** (0.1174)	0.3902** (0.1540)
RIR	0.2155 (0.1555)	0.2470 (0.1691)	0.4592*** (0.1736)	0.5790** (0.2915)	0.2510** (0.1158)	0.2434 (0.1623)
AGR	-0.1269*** (0.1269)	-0.0602 (0.0966)	-0.1436** (0.0677)	-0.0409 (0.0855)	-0.1901** (0.0794)	-0.1671* (0.0890)
R ²	0.41	0.38	0.22	0.13	0.34	0.25
F-Stat.	6.76*** (0.0000)	8.32*** (0.0000)	3.99*** (0.0000)	3.22*** (0.0024)	10.50*** (0.0000)	6.75*** (0.0000)
Obs.	98	98	121	121	174	164

Note: *, **, *** indicates significance at 10%, 5%, and 1%, respectively. TI is Transparency International; ICRG is International Country Risk Guide; and WMO is Global Insight Business Conditions and Risk Indicators.

Another discovery from the results is that income per capita has a significant positive effect on savings. This finding is in line with the ones reported in previous studies (see Collins, 1991; Elbadawi and Mwega, 2000). The positive sign of the income coefficient suggests that at higher income levels, individuals can finance their consumption and

save the remainder. Metin-Ozcan, Gunay and Ertac (2003) submitted that at higher income levels countries are likely to have higher saving rates.

The results also illustrate that inflation rate has a significant positive impact on savings. This finding is line with past studies (see Burnside, Schmidt-Hebbel and Servén, 1999; Callen and Thimann, 1997; Hondroyiannis, 2006; Loayza, Schmidt-Hebbel and Servén, 2000). Thus, rising inflation (a measure of macroeconomic uncertainty) increases the uncertainty regarding future incomes, and compels individuals to raise their savings on precautionary grounds. Athukorala and Sen (2004) opined that, since uncertainty surrounding household's income is higher in developing countries compare to developed countries, they will increase their savings at higher rates of inflation. Thus, for many households in ECOWAS countries who are mostly employed in the agricultural sector, they face higher uncertainty in terms of future incomes, so that they would save for precautionary reasons.

The empirical evidence also indicates that real interest rate has a significant positive effect on savings. This outcome lends support to the one discovered by previous studies (see Athukorala and Tsai, 2003; Burnside, Schmidt-Hebbel and Servén, 1999; Hondroyiannis, 2006). The positive sign of the coefficient of the real interest rate suggests that, at higher interest rate, households would increase their savings so as to earn higher returns in the future. It has been suggested that one of the surest ways to ensure that real interest rates are kept high and attractive is to reduce inflation rate (Edwards, 1996).

Also, the results show that agriculture has a significant and negative effect on savings. This finding in line with the one reported by past studies (see, Ang and Sen, 2009; Muhleisen, 1997). The negative sign of the coefficient of agriculture is a reflection of the underdeveloped agriculture sector, a major employer of labour and contributor to the GDP, still practised at subsistence level, thus generating low incomes for most households in ECOWAS countries. Poor households would frequently draw on past savings (if they have them at all) rather than increasing their savings (Abu, Karim and Aziz, 2013).

Lastly, both OLS and TSLS estimates are identical particularly in the case of the variables of interest (corruption and corruption-income

interaction), indicating that the OLS estimates are consistent and unbiased, endogeneity is not a problem in the estimated relationships, and there is absence of simultaneity between savings and income per capita/income growth.

6. Conclusion

This paper employs both OLS and TSLS-instrumental variable techniques that take into account random effects to investigate the effect of corruption on savings, including examining whether the effect of corruption on savings depend on income levels in ECOWAS countries during the 1996-2012 period. The results indicate that declining corruption leads to higher savings, and the impact of corruption on savings is higher in low income ECOWAS countries. Thus, policies aimed at reducing corruption will lead to higher savings via increases in government revenue (and declining public dissavings), lesser capital flight, higher investment in human capital, increased provision of social services including transfers and subsidies to the poor, attraction of foreign investment, encouragement of private investment and growth of SMEs.

Secondly, given that the impact of corruption on savings is larger in ECOWAS countries due to the region's low income, governments should make efforts to permanently raise the income of their respective economies. At higher levels of income, countries have the resources to invest in the fight against corruption, provide social services and increase subsidies and transfers to the poor, raise investment in human capital, and attract foreign investment. These would raise employment, reduce poverty and inequality, and lessen the impact of corruption on savings. Moreover, since low income (poor economic conditions) has been cited as an important factor responsible for high corruption (Gokcekus and Suzuki, 2011), permanent increases in income will increase individuals ability in meeting their basic needs, and therefore reduce corrupt tendencies among them.

Related to inadequate income is the low civil service wages that has been found to account for the high corruption in the public sector. Therefore, the payment of higher wages will lessen corruption in the government sector (Gyimah-Brempong, 2002; Schumacher, 2013; Tanzi, 1998; Van Rijckeghem and Weder, 2001). In addition, an

efficient legal system is important in the fight against corruption and promotion of savings (Chinn and Ito, 2007). However, the legal system in ECOWAS countries is very weak and inefficient, and lack adequate funding. In certain countries such as Nigeria, politicians or public officials alleged to have embezzled or stolen public funds walk freely, with some even occupying elected offices. In fact, the former Chairperson (Mrs Farida Waziri) of the country's own anti-graft agency, the Economic and Financial Crimes Commission (EFCC), once advocated for the setting up of 'Special Courts' to prosecute offenders because of the slow pace of justice delivery by the conventional courts. To this end, governments in the region should establish special courts (where none exists) and increase the funding of anti-corruption agencies and the judiciary to prosecute those found to have helped themselves with state funds.

Thirdly, the cooperation of the international community and developed countries is highly recommended in the fight against corruption in the ECOWAS region. It must also be mentioned that developed countries have not shown serious commitments in the fight against corruption in less developed countries. Many corrupt African leaders and politicians have found European countries such as Switzerland and United Kingdom a 'Safe Haven' where they keep their loots. Thus, the leadership of these countries should monitor the flow of funds in and out of their financial systems to ensure that they are gotten from legitimate sources. The conviction of a former Nigerian Governor (James Ibori) over corruption by the British government was applauded by Nigerians all over the world. Finally, reducing corruption would lead to higher savings, and increasing incomes permanently would reduce the adverse impact of corruption on savings in ECOWAS countries.

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**Open-Ended Impact of AFTA on FDI inflows:
Evidence from Macro-level data of Indonesia, Malaysia,
Thailand and Firm-level data of Indonesia**

Kiki Verico¹¹

This study attempts to observe the ASEAN economic integration progress based on the impact of ASEAN Free Trade Area (AFTA) on FDI inflows of both multi-country (Indonesia, Malaysia and Thailand) with macroeconomy-level data and single country (Indonesia) with micro firm-level data. Macroeconomy level data uses macroeconomy data set with time-dummy variable of ‘before and after’ the comprehensive implementation of AFTA as the representation of AFTA. Micro firm-level data utilizes Indonesia’s manufacturing survey of 25,696 firms under the International Standard of Industrial Classification digit 5 (ISIC-5) with the ASEAN’s Common Effective Preferential Tariff (CEPT) of 19,425 tariff rates data as the representation of AFTA. The form of the macro-level data is longitudinal and the form of the micro-level data is cross-sectional. From the multi-country analysis this study finds that AFTA is not effective in attracting FDI inflows while from the single-country analysis it finds the opposite. These findings prove that the impact of AFTA on FDI inflows in ASEAN is open-ended and varies within member states.

1. Introduction

The World Trade Organization (WTO) considers Regional Trade Agreement (RTA), under the open-regionalism principle, as a complement to the multilateral trade liberalization frameworks. Pascal Lamy, Director of WTO has stated, “Regional Agreements are like the ‘pepper’ in the multilateral ‘curry’.”² He mentioned that RTA is important as more than 50 percent of world trade value came from it.

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² WTO DG Speeches in Bangalore, India, 17 January 2007. Pascal Lamy explains, “Pepper adds taste and can improve a sauce but pepper alone is not tasty, and good pepper in a poor sauce, will

One of the famous RTAs in the world is ASEAN Free Trade Area (AFTA) which was established by the Association of Southeast Asian Nations (ASEAN) in 1992 but took in-effect in 1999.

Yet, ASEAN signed her first Preferential Trade Arrangement (PTA) in 1977. It took more than 20 years from 1977 to 1999 for ASEAN to transform her RTA from PTA to FTA. Comparing this to the European Union's (EU) economic integration process, ASEAN's process is a bit slower. The EU completed FTA in less than 8 years from 1951 to 1957.

Despite its slow in progress in achieving economic integration, ASEAN still shares its grand vision of a regional economic integration, the ASEAN Economic Community (AEC) by this year 2015. Actually, ASEAN has three pillars: the ASEAN Economic Community, the ASEAN Security Community (ASC) and the ASEAN Socio-Cultural Community (ASCC). This study will focus only on the economic pillar of the ASEAN Economic Community.

The AEC covers wide and various economic cooperation areas such as infrastructure (Trans-ASEAN Transportation Networks, Regional Telecommunication Networks), energy and food security (Trans-ASEAN Energy Networks and Food Security Reserves), and investment cooperation (ASEAN Investment Area/AIA). Though areas such as local infrastructure capacity, logistic cost and domestic government reform are also very important, these are left to each member's discretion on domestic reform tasks. In terms of financial integration, AEC focuses on capital account liberalization, financial services liberalization, capital market development and exchange rate cooperation. The AEC of 2015 is basically a starting point to move forward from AFTA to the the next level of regional integration of (1) ASEAN Single Market, with trade in service liberalization (Mode 3: Commercial Presence), free movement of people (Mode 4: Presence of natural person) and free capital movement and (2) ASEAN financial integration, with single monetary union and single currency.

According to the basic theory, trade and investment integration in the region is a necessary condition for building a solid regional economic

not do the trick! Use the wrong recipe and it will be a disastrous dinner". Details in http://www.wto.org/english/news_e/sppl_e/sppl53_e.htm

community (Balassa, 1961). Therefore any Economic Community (EC) including the AEC requires comprehensive trade and investment integration. This integration is the most important factor to support free flows of capital and people (Plummer and Cheong, 2008). Given this, one of the important purposes of the AEC is to enhance trade (intra-regional trade) and investment (Foreign Direct Investment/FDI) integration in Southeast Asia.

For intra-regional trade purposes, ASEAN implements Common Effective Preferential Tariff (CEPT) at 0 percent among her member states in 2015 in order to attract FDI inflows. Furthermore in order to attract FDI inflows, ASEAN implemented specific agreements such as the ASEAN Industrial Project (AIP), ASEAN Industrial Complementary (AIC), ASEAN Industrial Joint Ventures (AIJV), ASEAN Industrial Cooperation (AICO) and the most important agreement among them is the ASEAN Investment Area (AIA) that had been established in 1998 and came into force the year after.

2. Objective

Given this background, this study attempts to assess the ASEAN's trade and investment integration progress by observing the impact of ASEAN regional trade (AFTA) to FDI inflows at two levels: a multicountry analysis covering Indonesia, Malaysia and Thailand and a single country analysis of Indonesia.

3. Research Question

This study attempts to respond the basic research question:

Does AFTA stimulate FDI inflows in Southeast Asia? The analyses cover both levels: multicountry analysis of Indonesia, Malaysia and Thailand with macroeconomy of panel data and single country analysis of Indonesia with microeconomy of cross-section firm-level data.

4. General Hypothesis

ASEAN Free Trade Area (AFTA) attracts Foreign Direct Investment (FDI) inflows in ASEAN. The Null hypothesis is AFTA affects FDI inflows in positive and significant relation.

5. Theoretical Framework: Related Literature Review

AFTA is expected to increase ASEAN's intra-regional trade and the relation between intra-regional trade and FDI inflows. Such findings have been found in some previous studies, including a research by J.H. Dunning (1990). Dunning argues that the acceleration of U.S. FDI inflows in Europe in the late 1950s was caused by the establishment of FTA in European Union.

Other studies shared similar results. For instance was on Baltagi, Egger, and Pfaffermayr in 2005. Their spatial econometric method with panel data analysis of EU member states in period of 1989-2001 using GMM (Generalized Method of Moments) found that an increased intra-regional trade in Europe as a proxy to FTA and Custom Union (CU) has significantly increased FDI inflows in Europe.

Donnenfeld (2003) found that if new countries join regional trading blocs then they will receive more FDI inflows than intra trade shares (proposition one), reducing the trade costs from regional trading block renders more inter-block FDI than inter-block trade (proposition two) and the more similar the economic size, the more incentive for FDI inflows.

R. MacDermott (2006) found that intra trade integration as a proxy to FTA stimulates the Total FDI inflows. He formulated the relationship between regional trade agreements in North America including NAFTA, and total FDI inflows using fixed-effects panel data of gravity model on 55 OECD countries in period 1982–1997. The equation is: $FDI_t = f(\text{HostGDP}_t, \text{ParentGDP}_t, \text{NAFTA}_t, \text{DIST}, Z)$.

Plummer and Cheong (2008) found that manufacturing sector is the most preferred sector for FDI investors in Southeast Asia. Their model uses fixed effects of panel regression with a gravity approach and finds

GDP and population size to be the most significant variables which affecting FDI inflows in Southeast Asia.

I. Daitoh and A. Kawamura (2009) found that the impact level of regional economic integration of FTA on FDI inflows depends on how protective the region towards its non-member states. The higher the gap between MFN and CEPT tariff rate, the more attractive the region for non-member states' investors.

However, Kindleberger (1966) found that the impact of discriminative trade agreement (FTA) could generate negative impact on FDI (out flows). This is possible to happen if multinational companies remove their FDI from host country if she implemented great discriminative investment policy gap between local and international firms. Now how about AFTA? Can it effectively attract FDI inflows for Southeast Asia?

6. Methodology

As ASEAN member states have different economic level and trade liberalization stages, before responding to the question above, in order to avoid bias selection of countries, this study selected the observed countries based on the following criteria:

First: Among all ten ASEAN member states, in terms of trade liberalization in AFTA, the ASEAN-6 (Indonesia, Malaysia, Thailand, Philippines, Singapore and Brunei) is more advance than the ASEAN-4 (Cambodia, Laos, Myanmar and Vietnam). This is because number of products on the Inclusion Lists (IL) in the ASEAN-6 is larger than that in the ASEAN-4 countries. ASEAN-6's time-line and deadline for trade liberalization are also earlier than those for the ASEAN-4 countries³.

Second: This study excludes outlier (advanced economy) member states. This step is needed to secure homogenous economic level in the

³ Further, AFTA implements the CEPT (Common Effective Preferential Tariff), the internal tariff for member states with maximum 5 percent to the ASEAN-6 (ASEAN's original members which consist of Indonesia, Malaysia, Thailand, Philippines, Singapore and Brunei) by 2002 and 0 percent by 2010 and 5percent to the ASEAN-4 (ASEAN's newer members which consist of Cambodia, Laos, Myanmar and Vietnam) by 2010 and 0 percent by 2015. Therefore in 2015 all of the ASEAN members (ten countries) will have 0 percent of CEPT rate. This will enhance trade and long-run investment relation (FDI/Foreign Direct Investment) in Southeast Asia.

observed countries. The outliers are those with high-income level (developed members) which main economic sectors are in non-manufacturing sectors.

Third: Tariff discrimination is compared between members and non-member states. This study compares AFTA's Common Effective Preferential Tariff (CEPT), which represents ASEAN's member states' internal tariffs to the Most Favored Nations Tariff (MFNT),⁴ which represents applied external tariffs from member states to non-member states.⁵ Tariff discrimination is a necessary factor because this study assumes that the more protective a member country to its manufacturing industry - usually characterized by imposing relatively high tariff rates against non-members - the higher incentive for non-member states to change their economic strategy from trade to investment. FDI inflows is expected to increase.

This study assumes that profit has influenced FDI inflows. Therefore FDI inflow is used as a dependent variable. Based on the formulation above, reduced-form model is constructed as follows:

$$\begin{aligned}\log(FDI_{it}) &= \alpha + \beta_1.\log(Cons_{it}) + \beta_2.\log(GDP_{it}) + \beta_3.\log(Pop_{it}) + \beta_4.\log(DOO_{it}) \\ &+ \beta_5.\log(Intra_{it}) + \beta_6.\log(RW_{it}) + \beta_7.(Empl_{it}) + \beta_8.\log(Edus_{it}) + \beta_9.(FDIP_{it}) \\ &+ \beta_{10}.\log(Electc_{it}) + \beta_{11}.\log(GNPCap_{it}) + \beta_{12}.\log(ER_{it}) + \beta_{13}.\log(GR_{it}) \\ &+ \beta_{14}.AFTA_{it} + \varepsilon_{it}\end{aligned}$$

This study adopts a time series analysis of 21 years (1988-2008) for three observed countries of Indonesia, Malaysia & Thailand. Due to the limited data availability of FDI inflow values, this study uses total value of FDI inflows of both ASEAN members and non-members.

⁴ MFN is non-discriminative preferential trading via multilateral agreements in GATT (predecessor of the WTO).

⁵ I observe this fact by looking at commodity levels, taking for example tableware and kitchenware. Indonesia, Malaysia and Thailand impose 30% import tariffs on imported products from non-members while Singapore and Brunei impose 0% and the Philippines impose 5% tariffs. CEPT is about the same according to AFTA, around 0%-5%. On average, MFN tariffs in Indonesia, Malaysia and Thailand are higher than those in Singapore, Brunei and the Philippines. Considering that trade discrimination needs relatively high external tariffs, this study looks at Indonesia, Malaysia and Thailand to verify the assumption that trade discrimination stimulates investment creation in Southeast Asia.

Dependent Variable

Definition of Foreign Direct Investment is net inflows of investment to acquire a lasting management interest (10 percent or more of voting stock) in an enterprise operating in an economy other than that of the investor. It is the sum of equity capital, reinvestment of earnings, other long-term capital, and short-term capital as shown in the balance of payments. This series shows total net, that is, net FDI in the reporting economy from foreign sources less net FDI by the reporting economy to the rest of the world. Data are in current U.S. dollars (Net Balance of Payment, in current US\$, GDF Data of the World Bank).

Independent Variables

Complete independent variables and each of their hypotheses of multicountry level are described as follows:

1. Value of Consumption (CONS). Consumption represents total output (good and service) at final price that consumed by the consumers at certain period. This variable is value of nominal consumption.
2. Value of Gross Domestic Product (GDP). This value of nominal GDP represents economic size. GDP is the most appropriate variable to express economic size of a country as this covers value added, return on input and expenditure of final output (Blanchard, 2006).
3. Number of Population (POP). This is a proxy to demand capacity. Economists use number of population as an indicator that reflects demand capacity.
4. Degree of Openness (DOO). In macroeconomics theory there are three definitions for degree of openness: openness in factor of production, in financial markets and in good markets. This study adopts the latest variable of openness (good). The formula is described as the percentage of total trade to GDP or TGDP. The formula is $TGDP = \frac{X_{it} + M_{it}}{GDP_{it}}$ where X_{it} is value of export of country i at time t; M_{it} value of import of country i at time t; GDP_{it} is

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Gross Domestic Product of country i at time t). This index could be higher than 1 (one). The higher the index the more openness the economy of the country.

5. Intra-regional Trade (INTRA). This variable is treated as dependent variable when testing the impact of AFTA to trade creation (intra-regional trade) of ASEAN. This study also uses INTRA as independent variable when testing the relationship between trade creation and investment creation (FDI inflows). The intra trade is intra ASEAN trade is formulated as follows:

$$in_{it} = \frac{X(r,r)_{it} + M(r,r)_{it}}{X(r,w)_{it} + M(r,w)_{it}}$$

; $X_{(r,r)it}$ is value of export (country based) from region to region

; $M_{(r,r)it}$ is value of import (country based) from region to region

; $X_{(r,w)it}$ is value of export from region to world

; $M_{(r,w)it}$ is value of import of region from the world

6. Real Wage (RW). This is an approach to productivity of labor. This is represented by the ratio of GDP per employment. This number is obtained by dividing the value of GDP to the number of employment. Thus this number is divided by CPI (Consumer Price Index) in order to get the productivity value.
7. Number of Employed Worker (EMPL). This represents the availability of productive production input of labor (L). This study uses number of employed worker as a proxy to employed labor force. This number represents productive production input.
8. Government Expenditure on Education (EDU). This variable is a proxy for human resource's quality. In order to deal with this data availability problem, this study chose to use 'government expenditure on education' as a proxy and this data also describes government role in human resource development.

9. FDI Profit (FDIPROFIT). This data is formulated by the World Bank in the form of value of Profit Remittance of FDI (in US\$). The data is collected from the *Global Development Finance*. The World Bank defines this as “*payments of direct investment income (debit side) which consist of income on equity (dividends, branch profits, and reinvested earnings) and income on the intercompany debt (interest)*”. This study adopts this data as a proxy for the profit advantage of the observed countries.
10. Electricity Consumption (ELECONS). This variable represents the availability of sound infrastructure. Supply of electricity is essential for the industrialization process. Electricity capacity is considered as the most appropriate variable to represent sound infrastructure. This study adopts electricity consumption in Yearly KWh (kilowatt hour per capita).
11. GNP per Capita (GNPCap). This variable is a proxy for purchasing power of country as well as describes its level of economy. It uses nominal GNP value divided by Total Population, both at over time.
12. Exchange Rate (ER). This variable is taken from the average exchange rate (domestic currency per US\$). Given that this study uses exchange rate as local home currency per local host currency therefore the increasing ER generates disincentive for the investors to invest FDI inflows in host country.
13. Percentage of Economic Growth (GR). This variable represents the ‘economic performance’. According to the theory economic growth is a positive indicator for the investors to invest in long-run investment or FDI inflows (Salvatore, 2004).
14. Dummy AFTA. In theory FTA is designed to generate trade creation within the region. AFTA represents progressive institutional development of ASEAN economic integration with its ‘inter-governmental’ mechanism to increase intra-regional trading in Southeast Asia. For this purposes AFTA became a legal-binding for signatories (Nesadurai, 2003). AFTA (ASEAN Free Trade Area) has been officially discussed in 1992 and signed the year after. AFTA

Dummy⁶ represents regional trade cooperation among ASEAN members. Malaysia adopted AFTA CEPT by reducing its tariff in 1992 but Philippines did it in 1997 while the initiator of AFTA (Thailand) and CEPT designer (Indonesia) did it in 1998. This dummy uses year of 1999 as an anchor therefore years starting in 1999 is 1 (one) and years before 1999 is 0 (zero).

At country level, this study adopted Indonesia as a case study with high disaggregated data at industrial level. It took year of 2008 as an observation because this year is 'before the global financial crisis' (GFC) so as to avoid the effect of global crisis in the model. This data is taken from the 'Manufacturing Survey in Indonesia'. This survey covers firm-level data with detail of 25 questions to 25,696 firms with International Standard of Industrial Classification digit 5 (ISIC-5) classifications. The impact of AFTA is observed using proxy of ASEAN Common Effective Preferential Tariff (CEPT) of 19,425 tariff rates. This study made harmonization of CEPT with ISIC-5. All of the variables are grouped into 316 industrial classifications.

At this level, this study uses share of foreign as a proxy to represent FDI inflows. Share of foreign capital to total capital (Shf) is defined as the proportion of capital owned by foreign to the total industry's capital. Data of the industry is adopted from *Statistik Industri 2008* of survey of manufacturing or industrial sector at firm level.

⁶ AFTA dummy is originally based on the first signature's year of AFTA which is 1 January 1993. Regarding the lag-effect this research use 1994 as the first year of dummy in which treated as 1 (one). However there was a revision done by the member states in September 1994 then this research also tried to use 1995 as the first year of dummy. Yet both time-dummy (1994 & 1995) were not satisfying the model. Considering Asian economic crises, this research attempted to test year of 1998 as time-dummy approach for the AFTA's establishment effect. Yet this dummy was still not satisfying the research. As known that two out of three observed countries in this Analysis (Indonesia & Thailand) fulfilled their commitment for the CEPT of ASEAN in 1998. Having 1 year dummy lag this article uses 1999 as the first year of AFTA's implementation and treated as 1 (one). Observation years before 1999 got 0 (zero) time-dummy while years after got 1 (one) time-dummy.

Table 1: Variables, Hypothesis & Sources of Data for Model of AFTA (dummy) and FDI Inflows of Indonesia, Malaysia and Thailand

DEPENDENT VARIABLE	INDEPENDENT VARIABLE	EXPECTED SIGN	SOURCE OF DATA
FDI Inflows (ADB Statistic & The World Bank – GDF)	1. Value of Consumption (CONS)	+	1. ADB Statistic
	2. Value of GDP(GDP)	+	2. ADB Statistic
	3. Number of Population(POP)	+	3. ADB Statistic
	4. Degree of Openness (DOO)	+	4. Own calculation using WTO Statistic
	5. Intra-Regional Trade (Intra)	+	5. Referring to Verico, K, 2008
	6. Real Income (RW)	+	6. Own calculation using ADB Statistic
	7. Number of Employed (Empl)	+	7. ADB Statistic
	8. Value of Expenditure in Education (Edus))	+	8. The World Bank (World Development Indicator / WDI)
	9. Value of FDI Profit (FDIP)	+	9. The World Bank (Global Development Finance: Profit Remittance on FDI in US\$)
	10. Value of Electricity Consumption (Electc)	+	10. The WB (WDI)
	11. GNP per Capita (US\$)	+	11.ADB Statistic
	12. Exchange Rate(ER)		12.ADB Statistic & IMF (Country Economic Outlook)
	13. Percentage of Economic Growth (GR)	-	13.ADB Statistic
	14. Dummy AFTA	+	14.Year of Took -in Effect (1999)

Source: Own analysis based on various sources

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$$\begin{aligned}\log(Shf_{it0}) &= \alpha + \beta_1 \cdot \log(VA_{it0}) + \beta_2 \cdot \log(VAW_{it0}) + \beta_3 \cdot \log(AVS_{it0}) + \beta_4 \cdot \log(NF_{it0}) \\ &= +\beta_5 \cdot \log(Shg_{it0}) + \beta_6 \cdot \log(CR4_{it0}) + \beta_7 \cdot \log(iper0_{it0}) + \beta_8 \cdot \log(MFN_{it0}) \\ &= +\beta_9 \cdot \log(CEPT_{it0}) + \varepsilon_{it0}\end{aligned}$$

This model uses static equation model to be solved with cross-section regression.

$$Shf_{it0} = \frac{Fcap_{it0}}{\sum cap_{it0}} \cdot 100\%$$

Where i represents space dimension of industry, t0 represents time dimension for cross-section data, Fcap is capital owned by foreign and $\sum cap$ is total capital of the industry-i at time-t0.

1. Value Added (VA). This is a proxy of size of industry in term of value (in Rupiah). The hypothesis is the higher the VA the higher incentive for the investor to invest in that industry as value added represents profit function.
2. Value Added per worker (VAW). This is a proxy of productivity of labor by industry (in value of Rupiah per worker). The hypothesis is the higher the VAW the higher incentive for the investor to invest in that industry as value added per worker represents productivity and finally drives profit.

$$Vaw_{it} = \frac{va_{it}}{w_{it}}$$

Where w is total number workers in industry-i at time-t and va is value added of the industry-i at time-t.

3. Average Size (AVS). This variable represents labor size per industry. It is defined as the ratio of total number of workers to total number of firms in the the industry-i at time-t.. The hypothesis is the higher AVS the higher incentive for the investor to invest in that industry as this variable indicates size of available labor supply.

$Avs_{it} = \frac{w_{it}}{\sum F_{it}}$ Where l is total number of worker and F is total number of firm in the industry- i at time- t .

4. Number of Firm (NF). This variable represents size of industry in term of number of involved firms. The hypothesis is the higher the number of firms the higher incentive to invest given the free entry and exit in the industry.
5. Share of government (Shg). This is the percentage of capital owned by the government both of local and central governments to total capital as a proxy for government ownership of the industry. The hypothesis is the higher share of government the higher incentive for investor to invest given its economic span control image over that sector.

$$Shg_{it} = \frac{Gcap_{it}}{\sum cap_{it}} . 100\%$$

Where $Gcap$ is capital owned by government and $\sum cap$ is total capital of the industry- i at time- t .

6. Concentration Ratio (CR4). This is a proxy of firm's control. The hypothesis is the higher CR4 the lower the incentive to invest given its high barriers to entry and exit in that industry.

$$CR4_{it} = \frac{\sum va_{4fit}}{\sum va_{it}} . 100\%$$

Where va_{4fit} is value added of big four firms of industry- i at time- t while va_{it} is value added of industry- i at time- t .

7. Input per Output (ipero). This is a variable of total intermediate input to total output share. The hypothesis is the higher input per output share the higher incentive to invest as this represents the free choice of using capital.

8. Most Favoured Nation (MFN). This is a proxy of protection under the WTO's framework. The hypothesis is the higher MFN the higher incentive to invest if the investor of FDI is domestic market orientated firm yet if the lower incentive to invest then investor of FDI is export market orientated firm.
9. Common Effective Preferential Tariff (CEPT). This is a proxy of trade discrimination under the ASEAN's regional framework. The higher CEPT the higher incentive to invest if the investor of FDI is non-regional market orientated firm yet if the lower CEPT the higher incentive to invest then investor of FDI is regional market orientated firm.

Complete independent variables and each of their hypotheses of single country level are described as follows:

7. Analysis

This study runs two models under the assumption that AFTA has direct impact to FDI inflows⁷. The first model of multicountry level proposes the hypothesis zero (H0) that AFTA has a negative impact towards FDI inflows while its hypothesis one (H1): AFTA has a positive impact on FDI inflows. The second model of single country level proposes the hypothesis zero (H0) that CEPT tariff rate as a proxy of AFTA has a negative impact towards Share of Foreign Capital to Total Capital (Shf) as a proxy of FDI inflows while its hypothesis one (H1): CEPT as a proxy of AFTA has a positive impact on Shf as a proxy of FDI inflows. Complete results of full-form and reduced-form models of panel data regression for multicountry analysis of Indonesia, Malaysia and Thailand are presented below:

⁷ This study finds that the model is healthy or BLUE (Best Linier Unbiased Estimator). The model does not have autocorrelation problem as its Breusch-Godfrey Serial Correlation LM Test probability is 0.17 (H0: No Autocorrelation) is accepted. Its Durbin-Watson indicator is almost 2 (1.8) confirming this 'No Autocorrelation' condition. This model runs under the White Heteroskedasticity test which solves the heteroskedasticity problem. All the variables are significant (t-stat) with good R^2 which indicates no multicollinearity problem. In addition the selected variables here are basically similar to those in classic Gravity Model.

Table 2: Variables, Hypothesis & Sources of Data for Model of CEPT (Proxy to AFTA) and Share of Foreign Capital (Proxy to FDI Inflows) of Indonesia

DEPENDENT VARIABLE	INDEPENDENT VARIABLE	EXPECTED SIGN	SOURCE OF DATA
Share of foreign capital to total capital (Shf) as a proxy to FDI inflows (source of data: Survey of Manufacturing in Indonesia, <i>Survey Industri Pengolahan Indonesia tahun 2008</i>)	1. Value Added (VA) of industry, in Rupiah	+	Survey of Manufacturing in Indonesia of 2008, <i>Survey Industri Pengolahan Indonesia tahun 2008</i>
	2. Value of Value Added per Worker (VAW), in Rupiah per Worker	+	
	3. Average Size (AVS), in unit number of worker per number of firm	+	
	4. Number of Firm (NF), in unit	+	
	5. Share of Government (Shg) in percentage	+	
	6. Concentration Ratio 4 (CR4) in percentage	-	
	7. Input per Output (ipero) in percentage-	+	
	8. MFN rate in percentage tariff rate	+/-	ASEAN Secretariat Statistic data (MFN & CEPT)
	9. CEPT rate in percentage tariff rate	+/-	

Source: Own analysis based on various sources

Table 3: FDI Inflows factors from Various Estimators and time-dummy of AFTA:Reduced Form Model with Simple OLS Regression

DEPENDENT VARIABLE: Total FDI Inflows	MODEL 1 (COMPLETE LOG-LOG)	MODEL 2 (COMPLETE LIN-LIN)	MODEL 3 (REDUCED FORM LIN-LIN, RE)	MODEL 4 (REDUCED FORM LIN-LIN, FE)
R-SQUARED	0.52	0.74	0.49	0.52
F-STATISTIC	2.71	9.14	65.44	12.07
PROB>F	0.0081	0.0000	0.0000	0.0000
Constant	-253.2	-20,862**	-2,399**	-4,707***
t-stat/z-stat (re)	-0.74	-2.34	-2.02	-2.81
Probability	0.46	0.02	0.044	0.007
Consumption	-0.78	1.65e-07**	-	-
t-stat	-0.15	2.14	-	-
Probability	0.88	0.04	-	-
GDP	19.73	-9.70e-08*	3.67e-08***	3.41e-08***
t-stat/z-stat (re)	0.88	-1.87	6.66	6.12
Probability	0.38	0.068	0.000	0.000
Population	-44.55**	95.5	-	-
t-stat	-2.04	0.68	-	-
Probability	0.05	0.5	-	-
Degree of Openness	3.81	8,417***	6,814***	8,719***
t-stat/z-stat (re)	1.32	3.17	5.55	5.44
Probability	0.2	0.003	0.000	0.000
Intra-Regional Trade	0.015	-19.46	-	-
t-stat	0.01	-0.00	-	-
Probability	0.99	0.99	-	-
Real Income	4.17	2.43	-	-
t-stat	0.66	1.70	-	-
Probability	0.52	0.095	-	-
Number of Employed Worker	6.1	0.12	-	-
t-stat	0.67	0.41	-	-
Probability	0.5	0.69	-	-
Government Spending on Education	0.22	-7.54e-10**	-	-
t-stat	1.46	-2.19	-	-
Probability	0.15	0.033	-	-

DEPENDENT VARIABLE: Total FDI Inflows	MODEL 1 (COMPLETE LOG-LOG)	MODEL 2 (COMPLETE LIN-LIN)	MODEL 3 (REDUCED FORM LIN-LIN, RE)	MODEL 4 (REDUCED FORM LIN-LIN, FE)
R-SQUARED	0.52	0.74		
F-STATISTIC	2.71	9.14	0.49	0.52
PROB>F	0.0081	0.0000	65.44 0.0000	12.07 0.0000
FDI Profit	-0.76	2.93e-07		
t-stat	-1.18	1.29	-	-
Probability	0.25	0.203		
Electricity Consumption	2.71	0.04		
t-stat	0.97	0.02	-	-
Probability	0.34	0.99		
GNP per Capita	-20.71	-3.79	-2.6***	-2.4***
t-stat/z-stat (re)	-0.83	-1.49	-6.27	-5.66
Probability	0.41	0.14	0.000	0.000
Exchange Rate	2.97	-1.09**	-0.72***	-0.44***
t-stat/z-stat (re)	0.70	-2.65	-5.89	-2.83
Probability	0.49	0.011	0.000	0.007
Economic Growth	0.65*	-40.75	-	-
t-stat	1.68	-0.39		
Probability	0.1	0.7		
AFTA	-0.1	-1,846	-1,838**	-3,015***
t-stat	-0.07	-1.23	-2.42	-3.54
Probability	0.95	0.23	0.016	0.001

Source: Own calculation, STATA

Hausman test for linier-linier model of reduced form of fixed or random effect (RE) below indicates that fixed effect estimator is the more appropriate as Probability>chi2 is 0.02 less than 0.05 or significant to use Fixed Effect (FE). Furthermore as the number of time (t) of this study is more than the number of space (i) then normally FE is more valid than RE.

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	Coefficients		(b-B) Difference	sqrt(diag(V _b -V _B)) S.E.
	(b) fixed	(B) random		
gdp	3.41e-08	3.67e-08	-2.58e-09	2.03e-09
doo	8719.472	6814.836	1904.636	1159.939
er	-.4429988	-.729427	.2864282	.10937
gnpcap	-2.405133	-2.609193	.2040599	.1648827
afta	-3015.381	-1838.062	-1177.319	480.1363

b = consistent under Ho and Ha; obtained from xtreg
 B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Test: Ho: difference in coefficients not systematic

chi2(2) = (b-B)'[(V_b-V_B)⁻¹](b-B)
 = 7.48
 Prob>chi2 = 0.0237
 (V_b-V_B is not positive definite)

From fixed effect estimator, the reduced form model obtains the most significant independent variables on GDP, Degree of Openness, GNP per Capita, Exchange Rate (ER) and AFTA.

GDP as the proxy of economic size has positive and significant relation at level of significance 1% to FDI inflows. This explains that the higher economic size of GDP the more attractive a country for the investors of FDI. An increase in GDP size of 1 unit will increase FDI inflows at 3.41e-08 unit. An increase in GDP means an increase in demand for products, this includes imports. In regards to the absence of tariff factories that create 'trade deflection effect' in Southeast Asia, non-members prefer to export in order to meet ASEAN's excess demand rather than to invest. This means that increases in domestic demand does not necessarily increase incentives for non-members to invest. The disincentive in investment creation is caused by 'trade deflection' in Southeast Asia.

Degree of Openness as a proxy of the attachment of a country to outside world has positive and significant relation to FDI inflows at 1% level of significance. This explains that the more open a country to the world economy the more attractive it for the investor of FDI. An increase in Degree of Openness 1% will increase 8,719% of FDI inflows.

GNP per Capita as an indicator for level of economy of a country has negative and significant relation to FDI inflows at 1% level of significance. This explains that the higher GNP per capita the less incentive for investor of FDI to invest. This phenomenon is related to the higher GNP per capita the more expensive input of production that indirectly indicates that investor of FDI inflows always attempt to find the less expensive production input including labor cost.

Exchange Rate shows the impact of depreciation to FDI inflows. An increase in exchange rate (depreciation of local currency) will decrease FDI inflows' growth at 1 percent level of significance. This proves the hypothesis that depreciation of local currency sends a negative signal for FDI inflows. During the 1998 Southeast and East Asia economic crises, the local currencies of the observed countries were significantly depreciated. The negative relation between ER and FDI shows that depreciation or devaluation of a national currency tends to lessen the incentive to invest in the observe countries.

This model finds that AFTA has negative and significant effect to FDI inflows at level of significance of 1 percent. It shows that AFTA has decreased FDI inflows level around -3,015 monetary units. Trade creation and trade diversion (leading to FDI creation) is based on trade and investment relations among member states and also between member and non-member states. Discriminative tariff rates after the implementation of AFTA between a member and non-member state makes the product price from non-member state - though produces X most efficiently - become higher than the product price offered by an efficient member state yet still priced lower than that of a less efficient member state. If trade creation is higher than trade diversion in regards to tariff revenue losses by all member states, then AFTA can be considered ineffective.

If the impact of AFTA on FDI inflows is negative, how about the impact of AFTA on intra-regional trade? Previous independent research shows that AFTA gives positive impact on FDI inflows (Verico, 2010)⁸. Empirical data also shows that after AFTA took in effect in 1999,

⁸ Kiki Verico, Does Intratrade affect Investment Creation in Southeast Asia? Case Study of FTA's Effect on FDI Flows in Indonesia, Malaysia and Thailand, The 44th Annual ASPAC International Conference, Portland State University, Oregon, USA, 18-20 June 2010

ASEAN intra trade share increased significantly from 12 percent in 1990 to more than two-folds (200%) at around 24.5 percent in 2009⁹.

Table 4: Share of Foreign Capital to Total Capital as a proxy of FDI inflows with selected independent variables including CEPT as a proxy of AFTA Static Model with Cross Section Regression

DEPENDENT VARIABLE: Share of Foreign capital to total capital (Shf)	MODEL 1 (ALL OBSERVED VARIABLES)	MODEL 2 (SELECTED VARIABLES)
R-squared	0.068	0.084
F-statistic	2.99	6.11
Constant	7.28	7.92**
t-stat	1.63	2.51
Probability	0.1	0.013
VA	-0.07	-
t-stat	-0.68	-
Probability	0.49	-
VAW	0.02*	-
t-stat	1.85	-
Probability	0.06	-
AVS	0.016 (linier)	2.4*** (log)
t-stat	1.33	3.65
Probability	0.18	0.000
NF	0.008*	0.018***
t-stat	1.65	3.89
Probability	0.1	0.000
Shg	-0.37***	-0.45***
t-stat	-3.03	-3.65
Probability	0.003	0.000
CR4	3.91	-
t-stat	0.98	-
Probability	0.327	-
ipero	10.1**	10.3**
t-stat	2.03	2.24
Probability	0.04	0.026
MFN	0.35**	0.3**
t-stat	2.41	2.2
Probability	0.02	0.028
CEPT	-0.33*	-0.3*
t-stat	-1.86	-1.7
Probability	0.06	0.09

Source: Own calculation, STATA

⁹ ASEAN: <http://www.aseansec.org/stat/Table18.pdf>

Cross-section regression shows that MFN is more significant (probability** 0.028) than CEPT (probability* 0.09) in affecting shf (share of foreign capital to total capital). Meanwhile, Pairwise Granger Causality Test (PGCT) shows the opposite that CEPT is more significant (probability 0.0028) than MFN (probability* 0.09) in affecting shf.

Table 5: Share Pairwise Granger Causality Test (PGCT) between MFN, CEPT and Share of Foreign Capital to Total Capital

Pairwise Granger Causality Tests			
Date: 01/20/14 Time: 15:34			
Sample: 1 316			
Lags: 1			
Null Hypothesis:	Obs	F-Statistic	Probability
MFN does not Granger Cause SHF	315	2.9	0.09
SHF does not Granger Cause MFN		0.29	0.59
CEPT does not Granger Cause SHF	315	9.1	0.0028
SHF does not Granger Cause CEPT		0.7	0.4
CEPT does not Granger Cause MFN	315	4.3	0.039
MFN does not Granger Cause CEPT		2.4	0.12

Source: Author's calculation with e-views

Both the cross-section regression test and PGCT show that MFN and CEPT has significantly affected shf. This indicates that both are robust to be independent variables that affect shf, a proxy to FDI inflows. These findings conclude that both tariff rates (MFN and CEPT) have significantly affected investment creation (FDI inflows) in Indonesia.

From firm-level of industrial sector survey, the model shows that most significant variables which affect share of foreign capital as a proxy of

FDI inflows are: First, average number of worker per firm at industry- i and time- t in non-linear form with level of significance 1%.

This result indicates that the higher number of worker per firm the higher incentive to invest FDI inflows as the effect of increase in confidence towards labor supply.

Second, the higher number of firm the higher incentive to invest FDI. This shows that investor is more interested to invest FDI inflows in the sector that offers free-entry and exit rather than in sector with high-barriers to entry one. This variable has level of significance of 1%. Third, the higher share of government the lower incentive to invest FDI. It indicates that investor reluctances investing FDI inflows in a state owned industrial sector. This variable has 1% level of significance. Fourth, the higher proportion of input per output the higher incentive to invest FDI inflows. It indicates that investor is pleased to have a freedom to choose proportion of intermediate input to total output. It demands no restriction to import intermediate inputs from the host country. This variable has level of significance of 5%. This result is the opposite of obligation from host country to home country of FDI investor to use certain proportion of intermediate input from domestic market regardless its quality.

Both models show that CEPT as a proxy to AFTA with 5% level of significance has negative relation to share of foreign capital (shf), a proxy to FDI inflows. On the other hand, MFN as a representative of non-discriminative WTO has positive relation to the share of foreign capital at 5% level of significance. CEPT and MFN have similar level of significance in both models.

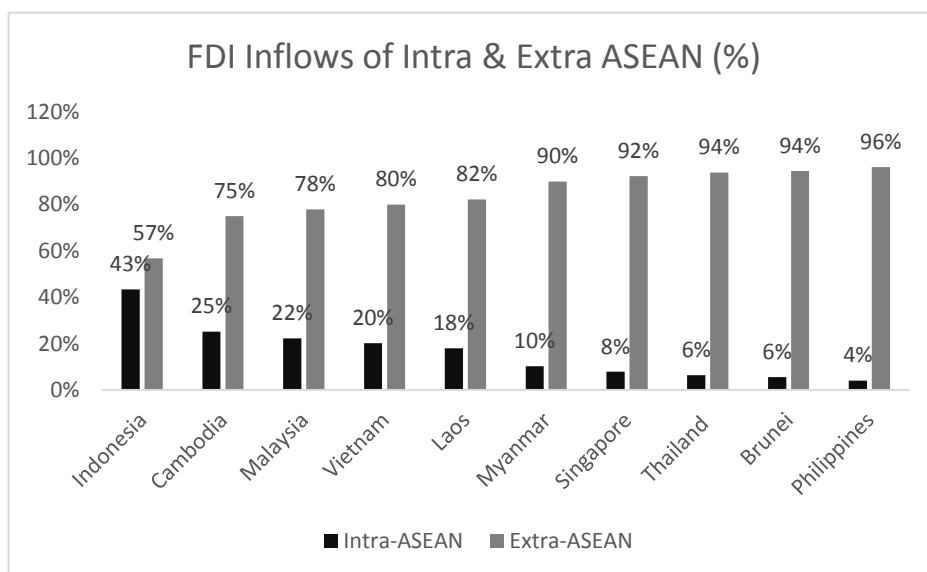
It indicates that the larger the gap between MFN and CEPT, simultaneously of the higher MFN and the lower CEPT, the more attractive a host country (Indonesia) for the FDI's investors.

This also shows that First, indirectly Indonesia is an interesting destination for the ASEAN's market oriented FDI investors. These findings proved that investor of FDI inflows in Southeast Asia is domestic market oriented with regional market preference. Second, as ASEAN is more effective in trade creation than trade diversion (Urata &

Okabe, 2007) then probability of FDI inflows coming from member state is higher than that from non-member state as the opposite when trade diversion is higher than trade creation.

Both of these findings are empirically verified in Indonesia. First, based on the ASEAN Secretariat data of Table 25, *ASEAN Statistics*, for instance in 2011, average intra-investment inflows of ten ASEAN members is 16.2% while for Indonesia is 43%. Indonesia is attractive in almost three times higher than the average intra-investment in ASEAN. Second, it indirectly indicates that trade creation effect in Indonesia is higher than trade diversion and confirmed that in the case of Indonesia AFTA gives positive impact on intra-regional trade and intra-regional investment. Figure on proportion of intra-investment (FDI inflows from members) and extra-investment (FDI inflows from non-members) can be seen below.

Figure 1: Proportion of Intra and Extra Investment in ASEAN 2011



Source: Table 25, ASEAN Statistics, the ASEAN Secretariat

If FTA stimulates trade creation higher than trade diversion then benefit and cost of regional economic integration will be paid by the member state. This is the opposite of the CU (Custom Union) with trade

diversion higher than trade creation. As for the benefit of AFTA, in the case of Indonesia, this study's model and graphic shows that Indonesia receives benefit from AFTA (the negative relation between CEPT and Share of Foreign Capital) that stimulates intra-investment (the highest proportion of intra-investment of FDI inflows within member states). As for the cost, there are voices that against the FTA and its other variances including the AFTA+1 such as the ASEAN China FTA (ACFTA)¹⁰. The cost has occurred as some less competitive domestic industry in Indonesia fails to compete with industries from China. Both benefit and cost of FTA happens to the member state has answered why a member state like Indonesia that receive most benefit from FTA (intra-investment) has strong domestic opposition to FTA. This explains Indonesia's paradox in responding the FTA, like two sides of the coin, one is pro and another is contra. This makes any process in making kind of agreements needs to consider potential domestic reluctance.

8. Conclusion & Recommendation

Macro-level data on multicountry analysis finds:

First, GDP positively affects FDI inflows. This indicates an increase in economic size of GDP attracts FDI inflows.

Second, Degree of Openness stimulates FDI inflows. The explanation is that the more open economy of a country, the more attractive a country for FDI's investors.

Third, GNP per Capita as a proxy of a country's economic level discourages FDI inflows. This perhaps indicates that increasing GNP per

¹⁰ Several links on this issue: Indonesia Should Seriously Consider Delaying Free Trade with China, details in <http://www.dailyindonesia.com/blog/2010/01/indonesia-should-seriously-consider-delaying-free-trade-with-china.php> DOA: April 3rd 2014; Indonesian Chamber of Commerce Dissapointed with Failure to Renegotiate ACFTA, details in <http://www.thejakartaglobe.com/archive/indonesian-chamber-of-commerce-disappointed-with-failure-to-renegotiate-acfta/> DOA: April 3rd 2014; Indonesian Workers Demonstrate on May Day (one of the crucial issues is negative impact on ACFTA), details in http://directaction.org.au/issue23/indonesian_workers_demonstrate_on_may_day DOA: April 3rd 2014; PPP (one of political parties in Indonesia in full name is Partai Persatuan Pembangunan) ask Government to Renegotiate ACFTA, details in <http://www.antaraneews.com/en/news/70352/ppp-asks-govt-to-renegotiate-acfta-> DOA: April 3rd 2014

capita increases input cost such as labor cost that creates disincentive for FDI's investors.

Fourth, an increase in exchange rate (depreciation of local currency) will decrease FDI inflows growth. This proves the hypothesis that depreciation of local currency sends a negative signal for FDI inflows. The negative relation between ER and FDI shows that depreciation or devaluation of a national currency tends to lessen the incentive to invest FDI. This confirms that unstable macroeconomic conditions which cause enormous domestic currency depreciation will increase investor's distrust and ultimately decrease FDI inflows.

Fifth, this macro level data of multicountry analysis shows that AFTA has negative and significant relation to FDI inflows. This indicates that AFTA is not effective in stimulating FDI inflows.

Micro-level data on single country analysis finds:

First, number of worker per industry stimulates incentive for the investor to invest its FDI inflows as it increases investor's confidence given the sustainable labor supply.

Second, number of firm provides incentive to the FDI investors. This finding shows that investor is more interested to invest in the sector that has free-entry and exit rather than that in high-barriers to entry.

Third, share of government in an industry discourages investors to invest FDI inflow. This shows that investor reluctances to invest FDI inflows in a state-owned industrial sector.

Fourth, the higher proportion of input per output the higher incentive to invest FDI inflow. It indicates that investor is pleased to have a freedom to choose proportion of intermediate input to total output as the opposite to domestic obligation of using intermediate inputs from domestic market regardless their quality.

Fifth, this micro firm-level data of single country analysis finds that the lower CEPT, a proxy of AFTA, the higher share of foreign capital, a proxy of FDI inflows. This explains that AFTA is effective in attracting FDI inflows in particular at country level.

Inconclusive finding between macro-level and micro-level data:

Inconclusive finding between macro level of panel data of multicountry and micro firm-level of cross section data of single country indicates that the impact of AFTA is varied within member states of ASEAN.

It is a need to analyze the impact of FTA on FDI inflows at country level as its impact is different within member states. This study concludes that the impacts of AFTA with CEPT as its proxy to FDI inflows with share of foreign capital as its proxy are ambiguous therefore the impact of free trade area to long-term investment in Southeast Asia remains unique within members.

Policy Implication:

Based on the empirical and research finding that AFTA is more effective in generating 'trade creation' than 'trade diversion', in order to attract FDI inflows, enlargement of the ASEAN economic cooperation to non-member states of ASEAN under the 'ASEAN umbrella' such as the ASEAN Plus Framework is the best strategy to enhance trade and investment integration in ASEAN.

The expansions of trade agreements between the AFTA members and non-members has to be done under the ASEAN liberalization umbrella (AFTA). Taking into account: (1) the divergence of trade competitiveness level among ASEAN members and (2) soft regional integration decision making process then the ASEAN umbrella will take longer time than the direct individual bilateral agreement between member state and non-member state, yet at least, this is more secure.

ASEAN has a comparative advantage that can attract FDI inflows from non-member states such as: (1) the number of population of about 567.4 million people with 80 percent whom are in productive age (under 40 years old). ASEAN is a big market (demand side) as well as a base for economies of scale (supply side); (2) Disparities between the economic performances of member states enlarges the opportunity to create effective production networks based in Southeast Asia.

ASEAN is quite attractive for non-members that it would be reasonable for ASEAN to leverage its bargaining position in order to expand its

regionalism wings to other non-members outside of East Asian countries, such as India. ASEAN continues to build common bilateral FTAs. The first example is the Framework Agreement on Comprehensive Economic Cooperation between ASEAN and China, signed 4 November 2002 in Phnom Penh. In addition, ASEAN enlarged her cooperation with other large countries such as India. AIFTA (ASEAN-India Free Trade Agreement) target has been formed within 10 years, from year 2002 to around 2012. Based on negotiation period of preparation, the China-ASEAN cooperation (2001-2010) started earlier than India-ASEAN. To balance the economic power of China in Southeast Asia, the United States of America formed the Enterprise for ASEAN Initiative (EAI), with the expectation to shift the role of APEC.

ASEAN Plus framework is the best option to enhance ASEAN's trade and investment integration towards the ASEAN Economic Community in 2015. ASEAN Plus is the ASEAN umbrella itself and this strategy fits with ASEAN's 'soft and open economic principle' which commonly known as the 'ASEAN Way'.

ASEAN Plus Frameworks is compatible with ASEAN's 'open and soft regionalism principle' therefore AFTA+ which enlarges ASEAN regional economic cooperation to non-members will complement the world trade relations. Lamy (2007) states that 'open regional integration principle' will complete the multilateral cooperation purposes. In other words, the ASEAN Plus framework is a 'building block' instead of 'stumbling block' for the WTO.

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BPS Survei Tahunan Perusahaan Industri Pengolahan 2008, Republik Indonesia

Analysis of International R&D Spillover from International Trade and Foreign Direct Investment Channel: Evidence from Asian Newly Industrialized Countries

Samuel Nursamsu and Fithra Faisal Hastiadi¹

This research tries to explain the relation between international R&D spillover from international trade and FDI channel with productivity (TFP) based on endogenous growth theory in Asian Newly Industrialized Countries (ANIC) in period 1990 - 2010. In this research, it is found that R&D spillover is a significant factor in increasing TFP, especially from trade channel. It is also found that the availability of educated workers is another important factor in increasing productivity. From the comparison of the two country groups in ANIC, it is found that in ANIC Tier 2, international R&D spillover from export is not increasing productivity, yet its spillover effect is still significant. Another finding of this research is FDI is not an important channel for technology spillover. However, there is a need to further discuss the FDI spillover measurement.

1. Introduction

The basic of economic growth theory is continuous output per capita growth in the long term. In this case, first theory of economic growth, neoclassical economic growth, created by Solow and Swan (1956) presume that technological innovation is an exogenous factor and capital accumulation does not have diminishing returns in certain technological level. The development of neoclassical economic growth theory, which is endogenous economic growth theorem, tries to explain other factors that cannot be explained by exogenous growth theorem, such as technological advancement and innovation as important variables for economic growth (Romer, 1990) and human capital (Hanushek and Kimko, 2000 and Spiegel and Benhabib, 1994). Similar to technological advancement, other factors, such as international relation and

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globalization, are also significantly affecting economic growth based on endogenous growth model (Coe and Helpman, 1995).

Focusing on the technological advancement, there are two channels that causing an increase in countries' technological advancement. The first channel is research and development from own country (Domestic R&D) and spillover effect that was brought from connecting with other countries (Wei and Liu, 2006). Spillover effect from other countries is caused by the non-rivalry characteristics from technology itself, which means technology can be spread to other regions voluntarily, this is called spillover process. This spillover process occurs when there are international trade and Foreign Direct Investment (FDI) between technology-giver country and technology-receiver country.

However, as the endogenous economic growth theorem said that technological advancement is an important factor for economic growth, there is significant difference in how the countries push their technological advancement, mainly from the R&D expenditure spent from the countries. Based on UNESCO data, it is found that R&D expenditure from the world is concentrated in developed countries, mainly OECD countries, as approximately 92% of R&D expenditure in year 1996 is from OECD countries. This percentage also does not change significantly over year and the proportion is literally the same as year 1996.

Therefore, it can be concluded that innovation and technological advancement concentrate on developed countries. This fact is particularly true because those countries became developed countries and industrialized while spending much on R&D expenditure, thus increasing economic growth, as the endogenous growth theorem stated. However, this fact rises up another question on how other countries can develop themselves to a degree where those countries are on par with developed countries while majority of the technological advancement is dominated by developed countries.

In fact, several countries have catch up effect and make their economies on par with those from developed countries category (Okabe, 2002). This research points out Asian Newly Industrialized Countries (ANIC) classification from UNCTAD, as the example for developing countries that have catch up effect, especially on ANIC tier 1 (Hong Kong,

Singapore, and South Korea), which start industrializing earlier than ANIC tier 2 (Indonesia, Malaysia, Philippines, and Thailand). From UNESCO data, it is shown that ANIC have 3 percent share of world R&D expenditure, with tier 1 is dominating while tier 2's share is very small. While this 3% share is significantly large comparing to the share of other countries in the world, which only accounts for 5%, it is still very small comparing to R&D expenditure of OECD countries, especially G7 countries (France, Canada, Germany, Italy, Japan, United Kingdom, and United States of America).

From World Bank data, it is shown that ANIC, both from tier 1 and tier 2 in period 1990 - 2010, have high GDP growth ranging around 4% – 8% per year, which is higher than the average GDP growth from G7 countries, which ranging between 1% and 4%, or below 4%, per year. This high GDP growth is also supported by high export in manufactured goods. From these facts, there is anomaly in Asian Newly Industrialized Countries as ANIC have low R&D expenditure, especially tier 2, the economic growth from those countries are high, and higher than G7 countries, which have far more R&D expenditure and technological advancement. This is also supported by the growth of manufacturing industry, which is described in high export of manufactured goods.

As for the international R&D indicators, this research focuses in R&D spillover from G7 countries as the world technological advancement is dominated by these countries. Because of the large share of world R&D expenditure, there is also probability that indirect spillover can happen to other countries as the technologies from G7 countries spread and used in all over the world (Coe and Helpman, 1995).

There is also strong connection between G7 countries and ANIC, as shown in trade relation. From table 1, it is found that import share from G7 countries is high, especially in ANIC tier 2 (with average of 50% share in year 1996) and South Korea with 72.32% share in year 1996. Even though the share is gradually declining over time, as shown by the table in year 2000 and 2010, the share of import is still high. There is also another fact that is shown in this graph, three dominating countries in R&D expenditure of G7 countries, which are USA, Japan, and Germany, have large import share to Asian Newly Industrialized Economies. In year 1990, import share from Germany is ranging from 2% to 7%, import share from Japan is ranging from 16% to 30%, while

import share from USA is ranging from 8% to 27%. Although the share is declining in year 2000 and 2010, these three countries still hold as three largest share in ANIC' share of import. This condition can further induce R&D spillover from technology leader countries and benefitting to the economic growth.

Table 1: Import Share of Total Import from G7 Countries

Share of total import								
Year 1990	Canada	Germany	France	UK	Italy	Japan	USA	Total
Indonesia	1.86%	6.88%	2.95%	2.01%	1.88%	24.27%	11.54%	51.38%
Malaysia	0.93%	4.51%	1.38%	3.76%	1.45%	25.29%	17.57%	54.89%
Philippines	1.48%	4.30%	1.23%	2.04%	0.72%	18.39%	19.53%	47.69%
Thailand	1.12%	4.87%	2.44%	2.69%	1.26%	30.60%	10.87%	53.85%
Hong Kong	0.42%	2.31%	1.39%	2.20%	1.69%	16.09%	8.07%	32.15%
Singapore	0.51%	3.10%	2.10%	2.69%	1.38%	17.50%	13.98%	41.27%
S. Korea	2.41%	5.40%	2.02%	2.02%	1.93%	30.61%	27.93%	72.32%
Year 2000	Canada	Germany	France	UK	Italy	Japan	USA	Total
Indonesia	1.92%	3.75%	1.21%	1.68%	1.04%	16.25%	10.21%	36.06%
Malaysia	0.47%	3.03%	1.68%	1.98%	0.68%	21.33%	16.96%	46.15%
Philippines	0.68%	2.18%	1.06%	1.05%	0.54%	18.83%	18.45%	42.80%
Thailand	0.57%	3.14%	1.28%	1.48%	0.92%	25.22%	12.01%	44.61%
Hong Kong	0.66%	1.94%	0.94%	1.86%	1.34%	12.00%	6.81%	25.55%
Singapore	0.30%	2.67%	1.38%	1.73%	1.05%	14.51%	12.81%	34.46%
S. Korea	1.56%	3.43%	1.67%	1.52%	1.22%	23.72%	21.83%	54.96%
Year 2010	Canada	Germany	France	UK	Italy	Japan	USA	Total
Indonesia	0.82%	2.22%	0.99%	0.69%	0.67%	12.51%	6.95%	24.85%
Malaysia	0.55%	4.09%	1.20%	1.12%	0.87%	12.70%	10.78%	31.31%
Philippines	0.79%	2.04%	1.20%	0.52%	0.39%	12.14%	10.90%	27.98%
Thailand	0.48%	2.66%	0.84%	1.08%	0.84%	21.65%	6.09%	33.63%
Hong Kong	0.36%	1.71%	0.89%	1.18%	1.05%	9.16%	5.38%	19.74%
Singapore	0.34%	2.90%	2.42%	1.82%	0.92%	7.75%	11.60%	27.75%
S. Korea	1.03%	3.31%	1.01%	0.77%	0.88%	15.09%	9.57%	31.67%

Source: Data taken from World Integrated Trade Solution (WITS), World Bank

As in endogenous growth theorem, technological advancement is an important factor for economic growth of a country, as the cases are clearly seen in G7 countries' development. However, there are several

developing countries that have catch up effect towards developed countries, namely Asian Newly Industrialized Countries, which have higher growth and export oriented economies while do not have much of domestic R&D expenditure. This case indicates that there are several factors in affecting economic growth beside own technological development. This research will focus on R&D spillover as outer factor that affects economic growth, while there are also several facts that indicates R&D spillover to ANIC.

While there are several facts that are supporting international R&D spillover's role and its importance in ANIC economic growth, as stated in the background, there is still unclear evidence in the interaction between international R&D spillover and economic growth. As the economic growth of ANIC is gradually increasing, there is an importance to observe determinants that cause high economic growth in ANIC. There is also an importance, especially for ANIC tier 2, to know whether high economic growth experienced at this time is also increasing their productivity or not in order to achieve long run economic growth.

From the existing researches, there are lacks of R&D spillover study in developing countries, especially developing countries in Asia. Many literatures are focused on OECD countries and trade channel, with G7 as the center of spillover, such as Coe and Helpman (1994) 22 OECD countries with period of 1971 to 1990, and Xu and Wang (2000) 21 OECD countries with the same period and FDI channel as an addition. Although there are several literatures that focused on developing countries, they are usually aggregates all of the developing countries without focusing on several country groups that may have different aspect towards R&D spillover (Falvey, et al, 2002, and Coe, et al, 1997). The closest research is from Okabe (2002), which observes developing countries in East Asia from year 1976 to 1996.

This research will carry out a difference in the terms of observed countries, time period, and research scope. Asian Newly Industrialized Countries, both from tier 1 and tier 2, are used for countries observation in this research with time period of 1990 – 2010, and also the comparison between ANIC tier 1 and tier 2. Period of 1990 – 2010 is used because this research takes account of high and steady economic growth after 1998 financial crisis and the industrializing and trade

openness of ANIC tier 2 after crisis, also for ANIC tier 1 that have start to develop their own technological advancement in that period.

In the end of the observation, there is also partial observation between ANIC tier 1 and tier 2 to compare the effect of international R&D spillover separately because of these countries have different stage of development.

2. Literature Review

The first attempt to endogenize technology is AK model. Assuming that labor grows proportionally to capital, the production function can be written as:

$$Y = F(K, L) = \min\{AK, BL\}$$

Where A and B are the fixed coefficients. Under this technology, producing a unit of output requires $1/A$ units of capital and $1/B$ units of labor; if either inputs fall short of this minimum requirement there is no way to compensate by substituting the other input.

In a fixed coefficient technology, when $AK < BL$, capital is the limitational factor. Firms will produce the amount of $Y = AK$, and hire the amount $(1/B)Y = (1/B)AK < L$ of labor. With a fixed saving rate, the capital stock will grow according to:

$$\dot{K} = sAK - \delta K$$

Thus the growth rate of capital will be:

$$g = \frac{\dot{K}}{K} = sA - \delta$$

In this case, output is strictly proportional to capital and g will also be the rate of growth of output, $g - n$ will be the growth rate of output per person.

From this model, an increase in saving propensity s will raise output growth g . However, if output per person ($g - n$) is rising, the growth will not be permanent because when K is growing faster than L , there is a binding constraint to output from the availability of labor as K grows

proportionally with L . Beyond that point there will be no more possibility of growth per capita output. However, if output per person is falling, the increase in growth resulting from an increase in saving will be permanent. In this case, diminishing returns will never set because growth of capital is accompanied by faster growth of labor input, which is possible because there is always a surplus of unemployed labor in economy.

Romer (1990) further developed production function model with accounting spillover effect in the formula. With an introduction of imperfect competition because of monopoly rents in intermediate goods sector, it allows firms to be represented as engaging in research activities aimed at creating new knowledge and compensated by monopoly rents. Therefore, Romer extended the model by assuming that in order to enter a new intermediate sector; firms must pay a sunk cost of product development, whose outlay is compensated with monopoly rents. Monopoly rents come from the existence of fixed production costs of increasing returns in intermediate goods sector. Due to the presence of these costs, intermediate goods sector is assumed monopolistically competitive.

Final output is produced using labor and intermediate goods. However, labor is divided into two in this new function as labor used in manufacturing the final good and labor used in research. Furthermore, Romer showed that technological knowledge is **nonrival goods** because all research activities can be used by other intermediate firms, indicating knowledge spillover. However, according to this theory, knowledge is **excludable** because intermediate firms must pay for exclusive use of new designs. In conclusion, there are two major sources of increasing returns in Romer model, which are specialization or product differentiation and research spillovers.

Grossman and Helpman (1990) developed a model for spillover effect based on production function theories that have been stated above. With the assumption that knowledge is public good, the characteristics of knowledge are **non-rivalry** because the same idea can be used in different applications and locations at the same time and **non-excludable** in many cases because the originators of the idea may have difficulty in extracting compensation from all agents that make use of it. There are three outcomes from this theory: First, the relative importance

of international trade spillovers as the source for accumulation of domestic knowledge capital declines over time. In the long run, cumulative trade experience makes negligible contribution compared to contribution by cumulative local research. Second, the knowledge gained from trade continues to drive growth in the long run. Third, both volume of trade and number of varieties grow at the rate of g in the long run equilibrium.

Flying Geese Model (Kojima, 2000) describes the relation in dynamic comparative advantage between countries and the industrialization phase in countries. Basic fundamental pattern for Flying Geese Model is the sequence of import (M), domestic production (P), and export (E) occurred in a certain industry.

Flying Geese Model is divided into four stages of growth, Stage I is when an underdeveloped nation first enters the international economy, the primary products, which are its specialties, are exported and industrial products for consumption are imported from advanced nations. In figure 1, it described in t_1 period when the consumer goods import curve (M) starts.

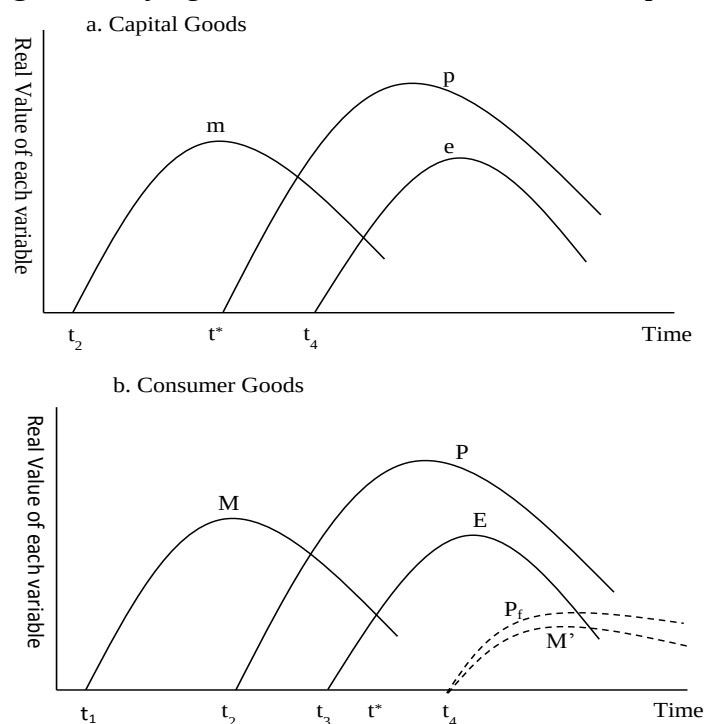
Stage II started at period t_2 , when domestic production of imported goods is initiated, with the domestic market as the target because of increasing purchasing power makes domestic production is profitable. There is also imported capital drawn into the activity. In figure 1, domestic production is showed by P curve initiates at t_2 in 1b and imported capital is showed by m curve which initiates at the same period in 1a.

In Stage III, domestic consumer goods industry develops into export industry. By this time most of the domestic markets have turned for domestic industrial goods. As production is put on larger scale for mass production and exported in increasing numbers to overseas markets. As for foreign capital goods, is slowly substituted to domestic capital goods and foreign capital goods begin to decline. In figure 1, period t_3 is when the Stage III started. At this period, consumer goods produced begin to be exported as the E curve starts. Around period t^* , domestic demand is fully covered by domestic production as $D = P - E + M$, and M curve intersects with E curve, creating trade in balance. Also in this period,

capital goods are started to be produced domestically, substituting foreign capital goods.

In the last Stage IV, the country is started to become a developed country at period t_4 . This can be seen from figure 1 that the country started to make offshore production in P_f curve and importing the consumer goods from less developed countries where the country offshores its industry, this is called reverse import. Meanwhile, this country now exporting capital goods at t_4 period as showed in e curve. Kojima called this whole stage IV process as “Pro-trade oriented FDI” because host country gives technology and capital to less developed countries, thus enhancing the comparative advantage from less developed countries, while for the host country, capital used in manufacturing former consumer goods can be reallocated to other consumer goods which enhancing new comparative advantage of host country. In conclusion, this FDI process augments comparative advantages in both countries.

Figure 1: Flying Geese Model of Industrial Development



Source: Kojima (2000), graph is redrawn

While flying geese model is not indirectly observe spillover effect between countries, it is clearly stated in the description that more developed countries tend to share their knowledge and technology through investment and trade, making catch-up effect from less developed countries, and those less developed countries started to industrialize and share the knowledge even further to other less developed countries.

First empirical test for the spillover effect is done by Coe and Helpman (1994) by observing only trade channel from the spillover. Countries observed in this research are from 21 OECD countries plus Israel with period of 1971 – 1990. By using domestic R&D Capital Stock and Foreign R&D Capital Stock, this research also compares the effect between domestic knowledge and international R&D spillover. It turns out that both of the domestic R&D stock and foreign R&D stock is significantly positive against productivity, which measures by TFP. However, it is found that domestic R&D has larger effect in G7 countries than in other OECD countries.

Coe, Helpman, and Hoffmaister (1997) observe the effect international R&D spillover in 77 developing countries using the same period as the research above. It is important to notice that this research does not use domestic R&D stock as the independent variable because of the lack of data and the portion is too small, thus they assume that domestic R&D stock is negligible in developing countries. In addition, they also use bilateral import of machinery (SITC7) instead of overall import because R&D spillover is more clearly generated from those goods, and they also add secondary enrolment ratio as a proxy to educated-workers. The weighting they used is from 22 OECD countries instead of only G7 countries. Similar to the other results, international R&D spillover is important to developing countries. In addition, educated workers have also become an important factor in affecting productivity.

Okabe (2002) observes international R&D spillovers from Newly Industrialized Asian Countries from year 1976 – 1996. Variables used in this research are spillovers from trade, royalty fee ratio of GDP, education expenditure ratio, and interaction of trade spillovers with import share of GDP, FDI inflows share of GDP, and export of intensive goods share of GDP. This research estimates the model from each

countries and overall observation. Education expenditure ratio used in this research is to proxy domestic knowledge and although there is no R&D spillover from FDI channel, this research interacts FDI inflows with trade spillover to observe the effect of FDI channel. The result is similar to other researches, that international R&D spillovers increase TFP on observed countries and international R&D spillovers are correlated with international trade, especially manufacture goods. Also, this research also concluded that international R&D spillovers increase economic growth from trade expansion.

de la Potterie and Lichtenberg (2001) observe international R&D spillover solely from FDI channel. The observation for this research uses 13 OECD countries and period from 1971 – 1990. The independent variables used are domestic R&D and foreign R&D with FDI as the indicators and interaction with inflow and outflow FDI. It is found that outward FDI flow and import flow is important spillover channels, even for industrialized countries, inward FDI is not significant because inward FDI tends to capture the technology of host country than share the technology from home country. USA is an important spillover generator, and Japan gets large benefit from foreign R&D but gives little spillover effect.

3. Method

Assuming that Cobb Douglas Production Function can represent the production process, this function is used in calculating Total Factor Productivity. Output in Cobb-Douglas Production Function is calculated from two factors, which are Physical Capital Stock (K) and Labor Force (L), the latter function is written as:

$$Y = A_t K_t^\alpha L_t^{1-\alpha}, \quad 0 < \alpha < 1$$

Y_t is Real Gross Domestic Product, K_t is physical capital stock, L_t is labor force, and A_t signifies Total Factor Productivity (TFP), which can be explained as other factors that is not embodied in the physical capital stock and labor force, which can be defined as technological progress in this research. Therefore, the Cobb-Douglas Production Function can be rewritten to calculate the TFP as:

$$TFP_t = \frac{Y_t}{K_t^\alpha L_t^{1-\alpha}}$$

Assuming the producer decides the quantity of inputs order the cost minimization problem, the marginal productivity of capital equals the real rental price of capital, and the marginal productivity of labor equals the real wage rate. Therefore,

$$\frac{\partial F(A, K, L)}{\partial K} = r, \frac{\partial F(A, K, L)}{\partial L} = w$$

With the latter derivation, income share of capital can be concluded as $\frac{K}{Y} \times r$, where r is real rental price of capital and w is real wage rate. In order to calculate α for TFP, it is assumed that real rental price of capital is equal to sum of real interest rate and depreciation rate. Therefore, α can be described as $\frac{K}{Y} \times (r_i + \delta)$, where r_i is the real interest rate and δ is depreciation rate. According to Okabe (2002), δ is assumed to be 0.1 for calculation. A base year from the data is used to make TFP growth into indices with base year of 2000 as 1. TFP for other years is calculated from the change of TFP in other years toward year 2000. However, TFP will be calculated from its growth, thus TFP variable will be transformed into logarithm form. TFP growth will be denoted as TFPG in the model.

While TFP can be calculated using earlier formula, physical capital stock, marked as K in the formula, must be calculated from capital formation in order to construct TFP. Physical capital stock can be calculated from Real Fixed Capital Formation data from World Bank's World Development Indicators according to the perpetual inventory method. Physical capital stock, expressed in K_t , is described as:

$$K_t = I_t + (1 - \delta) \times K_{t-1}$$

The initial value of physical capital stock, expressed in K_o , is computed as:

$$K_o = \frac{I_o}{(g + \delta)}$$

Where I is the real fixed capital formation at the initial period, g is the average growth rate of the real fixed capital formation during 1990 – 2010, and δ is depreciation rate of capital stock, which is assumed to be 0.1 in this calculation.

International R&D Spillover, expressed as FRD, can be constructed from the weighted average of foreign R&D capital stocks, which are the foreign R&D stocks from G7 countries as the developed countries. The weights used in FRD calculation are the share of import amount to the G7 countries and the share of Foreign Direct Investment (FDI) inflows to sample countries² from G7 countries. Based on Coe et. al, 1997, the weighting measure is described as:

$$FRD_i = \sum_{k=1}^7 \theta_{ik} RDS_k, \quad \sum_{k=1}^7 \theta_{ik} = 1$$

From the formula, it is described that the sum of θ_{ik} as the weight equals to 1. θ_{ik} can be defined in two ways, first is derived from the trade channel. θ_{ik} is defined by bilateral import of sample countries i from G7 countries k divided by total of bilateral import of sample countries i from G7 countries. Thus, the share of bilateral import can be summed to one. Bilateral import data used in this research from World Integrated Trade Solution (WITS) by World Bank.

The second definition of θ_{ik} is derived from the foreign direct investment channel (*FRDI*). The share of foreign direct investment is calculated similar to trade channel, as θ_{ik} is defined by foreign direct investment inflows from G7 countries k to sample countries i divided by total foreign direct investment inflows of sample countries i from G7 countries. The share of bilateral FDI inflows can also be summed to one. Data used for foreign direct investment share is obtained from OECD Analytical Database.

Because of the lack of data for bilateral FDI, especially for non-OECD countries, FDI inflows data is obtained from the FDI outflows from each of G7 countries to sample countries i . However, there is a slight difference between the calculation of share via trade channel and foreign direct investment channel caused by the lack of data. There are missing observations in some countries, especially in Canada, where the FDI outflows observations to Newly Industrialized Asian Countries are absolutely missing. In order to overcome this problem, the share of FDI inflows of sample countries i are no longer using G7 countries as the

² Newly Industrialized Asian Countries (Hong Kong, South Korea, Singapore, Indonesia, Philippines, Malaysia, and Thailand).

partners. FDI inflows share is calculated from FDI inflows from G6 countries instead, with Canada excluded from the calculation.

Following the calculation from Coe, et.al (1997), RDS is constructed similarly to physical capital stock calculation, which denoted as:

$$RDS_t = RDE_{t-1} + (1 - \delta) \times RDS_{t-1}$$

From the equation, t is period, especially for the current year, while RDE_{t-1} is R&D expenditure at $t - 1$ period. RDE data used in this research is obtained from OECD analytical database, which gives total R&D expenditure data by industry for G7 countries. In order to use this equation, there is a need to calculate a benchmark for R&D Capital Stock, which is defined similarly to physical capital stock as:

$$RDS_0 = \frac{RDE_0}{(g + \delta)}$$

Similar to the physical capital stock calculation, base RDS_0 is calculated by dividing R&D Expenditure at the base period (RDE_0) with the sum of average growth of RDE in observation period, which means 1990 to 2010, and depreciation rate. Again, the depreciation rate used here is the same as physical capital stock, which is 0.1 depreciation rate.

Other indicators used in this research are import share of GDP ($IMPY$), SITC 7 export share of GDP ($EXPY$), FDI inflows share of GDP ($IFDY$), education expenditure ratio ($EDUR$), and secondary enrolment ratio ($SECR$). $IMPY$, $EXPY$, and $IFDY$ are all calculated by dividing with nominal GDP, $EDUR$ is ratio of education expenditure to government total expenditure from sample countries, and $SECR$ is ratio of total secondary enrolment to secondary school age population from sample countries.

Model used in this research is loosely based from Coe and Helpman (1994). Generally, Coe and Helpman used International R&D Spillover from trade channel and Domestic R&D Stock as independent variables towards Total Factor Productivity as dependent variable. However, this research does not use domestic R&D stock in the regression because of the lack of data, instead, international R&D spillover from FDI channel used in this research. The basic Coe and Helpman model is modified

based on several literatures (especially from Okabe (2002), Coe, et.al (1997), and Xu and Wang (2000)). Thus, the basic model for this research is constructed as:

$$TFPG = \alpha_0 + \alpha_1 \ln FRDT + \alpha_2 \ln FRDI + \varepsilon, \quad (1)$$

The basic model (1) explains the role of international R&D spillover, both from trade (FRDT) and foreign direct (*FRDI*) investment channel, in defining TFP growth (TFPG). Although this model may capture the effect of international R&D spillover, this basic model does not properly capture the role of international R&D spillover from international trade and FDI channel simply because there is no interaction to international trade and FDI indicators, while FRDT and *FRDI* only include spillover from G7 countries.

In order to capture the effect of domestic knowledge, model (1) will be modified by inserting domestic knowledge variable, represented by education expenditure ratio (*EDUR*), as an independent variable. By doing this, the modified model is specified as the following model (2):

$$TFPG = \alpha_0 + \alpha_1 \ln FRDT + \alpha_2 \ln FRDI + \alpha_3 \ln EDUR + \varepsilon, \quad (2)$$

However, by inserting *EDUR* as independent variable, this model still does not adequately reflect the effect of R&D spillover from international trade and foreign direct investment because it only controls the interaction from R&D spillover towards TFP growth. Import share of GDP (*IMPY*), export share of GDP (*EXPY*), and FDI inflows share of GDP (*IFDY*) are multiplied with R&D spillover variables, thus creating interaction variables between R&D spillover and international trade and investment respectively. The modified model based on model (2) is specified as the following model (3) as:

$$TFPG = \alpha_0 + \alpha_1 IMPY(\ln FRDT) + \alpha_2 EXPY(\ln FRDT) + \alpha_3 IFDY(\ln FRDI) + \alpha_4 \ln EDUR + \varepsilon, \quad (3)$$

Model (3) accounts the interaction between international trade and investment into the specification, making this model is adequately represent international R&D spillover as the defining variables.

However, it is also important to account the interaction between educated workers and R&D spillover from FDI channel, as more workers that are educated in a country will induce more FDI into the country and increasing its R&D spillover, especially from FDI channel. Educated workers level is defined as secondary enrolment ratio in the country (*SECR*) and is multiplied with *FRDI* to reflect the interaction between R&D spillover through investment channel and educated workers. The specification, denoted as model (4), is described by the following function:

$$TFPG = \alpha_0 + \alpha_1 IMPY(\ln FRDT) + \alpha_2 EXPY(\ln FRDT) + \alpha_3 IFDY(\ln FRDI) + \alpha_4 SECR(\ln FRDI) + \alpha_5 \ln EDUR + \varepsilon,$$

All of these models are also estimated again by breaking the country observation into two groups, which are ANIC Tier 1 (Hong Kong, Singapore, and South Korea) and ANIC Tier 2 (Indonesia, Malaysia, Philippines, Thailand). By doing so, it is expected that the difference between two groups can be found, as these two country groups have difference in the economic conditions. All the regression will be done using panel regression method.

4. Result and Analysis

The first part of this chapter will discuss the regression using all observation. As can be seen in Table 2, the first regression has *lnFRDT* and *lnFRDI* as the independent variables. This regression using fixed effect after Hausman Specification Test and use Generalized Least Square (GLS) because there is violation to BLUE assumption.

Table 2: Summary of Estimation Results using All Observations**Dependent Variable: TFPG**

Independent	(1)	(2)	(3)	(4)
<i>lnFRDT</i>	0.8246 *** (0.0631)	0.9168 *** (0.0604)		
<i>lnFRDI</i>	0.0141 (0.0107)	0.0170 * (0.0097)		
<i>IMPY(lnFRDT)</i>			0.0295 *** (0.0045)	0.0214 *** (0.0053)
<i>EXPY(lnFRDT)</i>			0.0157 * (0.0081)	0.0117 * (0.0069)
<i>SECR(lnFRDI)</i>				0.0682 *** (0.0069)
<i>IFDY(lnFRDI)</i>			0.0163 (0.0136)	0.0031 (0.0124)
<i>EDUR</i>		-0.0064 *** (0.0013)	0.0002 (0.0017)	
<i>Constant</i>	-11.324 *** (0.8343)	-12.392 *** (0.7895)	-0.1801 ** (0.0818)	-0.8255 *** (0.0778)
Prob-F	0.000	0.000	0.000	0.000

Significance level: *) $\alpha = 0.1$; **) $\alpha = 0.05$; ***) $\alpha = 0.01$

The result for the first regression are *lnFRDT* as the proxy of R&D channel from trade is positive significant in affecting Total Factor Productivity growth (*TFPG*) while *lnFRDI* as the proxy of R&D channel from FDI is not significant. This can be concluded that from direct R&D spillover from G7 countries, only trade channel is significant in affecting TFP. As the trade channel (*FRDT*) can be interpreted as every 1 percent increase of R&D spillover from trade channel, there is an increase in Total Factor Productivity by 0.82 percent. This can be concluded that direct R&D spillover is an important factor in productivity.

This result is similar to de la Potterie and Lichtenberg (2001) where inward FDI is not significant because FDI inflows tend to capture technology from host country than spill the technology from home country. This fact also can be reinforced by flying geese model, when developed countries invest to less developed countries for offshore production, developed countries tend to use the comparative advantage

from less developed countries, such as cheap labor, and export their capital goods, so it may be that the spillover is embodied in trade channel. Xu and Wang (2000) also get the same results by stating that FDI data itself is a poor proxy for activities of multinational enterprises, not to mention technology related activities of multinational enterprises. Moreover, Xu and Wang (2000) also stated that inward FDI transmits technology in ways related to international trade. Keller (2009) also added that the size of positive technological externalities associated with FDI is difficult to obtain because of its relation with many conditions, such as increased competition by FDI inflows can cause either efficiencies or inefficiencies. Lack of measurement and control variables for FDI makes FDI variable may be spurious in technology spillovers.

The second regression tries to explain the relation between knowledge accumulation to productivity. This regression also used fixed effect and Generalized Least Square (GLS) estimation. Knowledge accumulation comes from two aspects, international spillover and domestic R&D. However, it is found that education ratio (*EDUR*) as the proxy of domestic knowledge has significant negative effect to Total Factor Productivity. This is inconsistent to the theory that domestic knowledge is an important factor to TFP. This indicates that while domestic knowledge affects GDP, education expenditure is not optimal as productive expenditures, when used in excess, could become unproductive (Devarajan, et al., 1996). However, education ratio itself has several problems and cannot be fully interpreted as domestic knowledge. This variable is also has several inconsistencies in other estimations, especially in fourth regression where it is detected to have high multicollinearity with education enrolment ratio, as both of them can be interpreted as human capital. Based on this fact, the second regression cannot explain the comparison between domestic knowledge and R&D spillover.

In the first and second regression, the focus of estimation is the direct spillover relation from G7 countries as there is no interaction between the R&D spillover and international trade. Third regression now tries to focus on the international R&D spillover by interacting the R&D spillover with international trade (*EXPY* and *IMPY*) and FDI (*IFDY*), as international trade can also increase country's productivity through

indirect spillover (Falve, et. al, 2002). The third regression also use fixed effect regression and Generalized Least Square (GLS).

From the result of the third regression, it is found that international R&D spillover from trade channel, especially from import channel ($IMPY(\ln FRDT)$) is positive significant in affecting productivity (TFP). However, while international R&D spillover from export channel is significant in affecting countries' productivity, its effect is lower than import channel, as it is significant only for 0.1 standard error. These facts can become evidence that R&D spillover from trade channel mainly come through importing goods, especially capital goods, with other countries. Moreover, flying geese model also explains that developed countries share their own knowledge through importing capital goods to less developed countries. While the other channel, which is export ($EXPY(\ln FRDT)$), does not have direct relation with R&D spillover.

Interaction with international trade through export channel presents unclear evidence because firms benefit from interacting with foreign customer, as firms will try to achieve higher product quality standards based on world's demand (Keller, 2009). In this case, third regression shows that there is significant relation, albeit weak, from high technology goods export channel with productivity, therefore R&D spillover happens through export channel. Every 1 point increase in export and spillover interaction variable will increase TFP by 0.015 percent. The coefficient from $IMPY(\ln FRDT)$ is approximately large, which can be interpreted as the increase of 1 point of interaction of international trade with R&D spillover gives approximately 0.029 percent increase to TFP index. It is found that education ratio variable ($EDUR$) is not significant; therefore, the coefficient of variable from second regression may be overestimated in its effect to TFP. In the third regression, $EDUR$ is positive but insignificant.

Other noticeable case from the third regression is interaction between FDI inflows share and R&D spillover from FDI channel with R&D spillover is insignificant. Similar to the previous explanation, interaction of international FDI inflows with R&D spillover is considered to have several lacks in measurement, which makes the FDI inflows variable is a poor proxy for describing FDI activities.

The fourth regression tries to explain the relation between secondary enrolment ratio (*SECR*) as the proxy of educated-workers and human capital. As already stated in chapter 3 that educated-workers are important in increasing countries' productivity directly from increasing workers' productivity and indirectly by attracting foreign direct investment (Coe, et. al, 1997), *SECR* also represents human capital in the countries as human capital directly increases productivity through the worker knowledge (Benhabib and Spiegel, 1994). Thus, secondary enrolment ratio is interacted with foreign R&D spillover from FDI channel as it enhances FDI inflows. Fourth regression also uses fixed effect regression and generalized least squares (GLS).

The result from fourth regression are positive and significant international R&D spillover from import channel (*IMPY(lnFRDT)*) and secondary enrolment ratio interaction with R&D spillover from FDI channel (*SECR(lnFRDI)*). For *IMPY(lnFRDT)*, it is consistent with the other regressions before. This result further reinforces the fact that international R&D spillover from trade channel is an important factor for countries' productivity. Variable *EXPY(lnFRDT)* is also consistent with the third regression, with weak significances. This fact further reinforces that R&D spillover from export channel is affecting productivity (TFP) from interaction with other firms and consumers. The variables can be interpreted as each increase of *IMPY(lnFRDT)* by 1 point will increase TFP by 0.02 percent and each increase of *EXPY(lnFRDT)* by 1 point will increase TFP by 0.01 percent. Variable *SECR(lnFRDI)* is significant and can be used to reinforce the statement that educated-workers as human capital are important factor in increasing productivity. this variable can be interpreted as 1 point of increase in this interaction variable will increase TFP by 0.068 percent.

Consistent with previous regression, *IFDY(lnFRDI)* variable is not significant when regressed by using fourth model. This indicates that the variable has omitted variable bias in third regression. This further improves the fact that FDI inflows cannot properly explain the spillover from FDI activities as FDI activities may be captured in other independent variables.

The fourth regression is supposed to have education expenditure ratio (*lnEDUR*) as independent variable. However, it is found that *EDUR*

variable has high multicollinearity with $SECR(lnFRDI)$. This is to be expected because both of the variables use education as the proxy, thus creating multicollinearity between them. Because of insignificant results from $lnEDUR$ variable, this variable is omitted. This can be concluded that education expenditure ratio is not a good proxy in estimating domestic knowledge.

There are two estimation results for this part; Table 3 is the summary of estimation results from Asian Newly Industrialized Countries (ANIC) Tier 1, which are Hong Kong, Singapore, and South Korea, and Table 4 is from ANIC Tier 2, which are Indonesia, Malaysia, Philippines, and Thailand. The regression specification is the same as the latter regression, with four types of regression. The estimation results are as follows:

Table 3: Summary of Estimation Results from ANIC Tier 1

Dependent Variable: TFPG

Independent (Tier 1)	(1)	(2)	(3)	(4)
$lnFRDT$	0.9966 *** (0.0993)	1.0021 *** (0.0997)		
$lnFRDI$	0.0263 (0.0169)	0.0266 (0.0169)		
$IMPY(lnFRDT)$			0.0318 *** (0.0057)	0.0827 *** (0.0435)
$EXPY(lnFRDT)$			0.0289 *** (0.0057)	0.0182 *** (0.0049)
$SECR(lnFRDI)$				0.0844 *** (0.0163)
$IFDY(lnFRDI)$			omitted	omitted
$EDUR$		0.0018 (0.0037)	-0.0036 (0.0040)	omitted
Constant	-13.830 *** (1.3061)	-13.974 *** (1.3343)	-0.1286 (0.1563)	-1.2097 *** (0.1500)
Prob-F	0.000	0.000	0.000	0.000

Significance level: *) $\alpha = 0.1$; **) $\alpha = 0.05$; ***) $\alpha = 0.01$

From the first regression, it can be found that both of the country groups have positive significant $lnFRDT$ variable and insignificant $lnFRDI$ variable. This can be concluded that both of the country groups gain an increase in TFP through R&D spillover from trade channel and R&D

spillover from FDI channel is not significant in affecting TFP. From the comparison of *lnFRDT* coefficients, it can be found that ANIC Tier 1 have higher effect from trade channel R&D spillover as the coefficient is 0.9966, while the coefficient in ANIC Tier 2 is only 0.7245. This means every increase of trade channel R&D spillover by 1 percent will increase TFP by 0.99 percent in ANIC Tier 1 and 0.72 percent in ANIC Tier 2.

Table 4: Summary of Estimation Results from ANIC Tier 2

Dependent Variable: TFPG

Independent (Tier 2)	(1)	(2)	(3)	(4)
<i>lnFRDT</i>	0.7245 *** (0.0785)	0.9001 *** (0.0735)		
<i>lnFRDI</i>	0.0065 (0.0132)	0.0127 (0.0111)		
<i>IMPY(lnFRDT)</i>			0.0353 *** (0.0079)	0.0216 *** (0.0048)
<i>EXPY(lnFRDT)</i>			-0.0315 * (0.0175)	-0.0306 *** (0.0105)
<i>SECR(lnFRDI)</i>				0.0643 *** (0.0060)
<i>IFDY(lnFRDI)</i>			0.0696 (0.0614)	0.0040 (0.0370)
<i>EDUR</i>		-0.0072 *** (0.0013)	0.0017 (0.0019)	<i>omitted</i>
<i>Constant</i>	-9.8214 *** (1.0415)	-12.135 *** (0.9740)	-0.2625 *** (0.0943)	-0.4992 *** (0.0565)
Prob-F	0.000	0.000	0.0690	0.000

Significance level: *) $\alpha = 0.1$; **) $\alpha = 0.05$; ***) $\alpha = 0.01$

In the second regression, there is *EDUR* as the additional independent variable. The result shown that in ANIC Tier 1, *EDUR* variable against TFP is not significant in the second regression and in the other specifications and significantly negative in ANIC Tier 2. This can be further concluded that education expenditure is not significant in affecting TFP, especially in ANIC Tier 1. Moreover, ANIC Tier 2 has similar result to the overall estimation before that it may be caused by excess and inefficient usage of education expenditure so that it becomes unproductive. However, there may be an indication that the effect of *EDUR* in ANIC Tier 2 is overestimated because it becomes insignificant in third regression. In both cases, education expenditure is not a good

proxy for domestic knowledge and cannot explain domestic R&D relation to TFP.

As for $\ln FRDI$, both of the country groups do not have significant effect to TFP. This further concludes that R&D spillover from FDI is insignificant, similar as the other regressions before. $\ln FRDT$ still has significant effect in both of the country groups, as every increase of R&D spillover from trade channel by 1 percent will increase TFP by 1.00 percent in ANIC Tier 1 and 0.90 percent in ANIC Tier 2.

In the third regression, the interaction between import and FDI share with R&D spillover to capture the interaction with international trade and FDI. From the result of estimation, it can be seen that $EDUR$ is not significant variable in both of the country groups, which reinforced the fact that $EDUR$ is not significant and second regression $EDUR$ result from ANIC Tier 2 is overestimated. $IFDY(\ln FRDI)$ insignificant in ANIC Tier 2; however, $IFDY(\ln FRDI)$ variable contains high multicollinearity with $EXPY(\ln FRDT)$ and the variable is omitted for the correction. One possible explanation from this fact is trade and FDI is strongly related. Export activity, especially high technology goods, is dominated by multinational firms that explained by FDI inflows. Therefore, there is multicollinearity because FDI inflows can cause export activities. Keller (2009) further reinforces this explanation by stating that multinational firms often account large portion of trade.

The important result in the third specification is variable $IMPY(\ln FRDT)$ as this variable is positive significant in both country groups. This result reinforces the fact that international R&D spillover from trade channel, especially from import, is important factor for TFP.

$EXPY(\ln FRDT)$ has significant result in both of the country groups, although the significances is weak in ANIC Tier 2. However, there is a difference in how the spillover affects the productivity (TFP). There is positive effect from $EXPY(\ln FRDT)$ in ANIC Tier 1, which reinforces the fact that high technology goods export channel is an important factor to increase productivity. However, there is negative effect from $EXPY(\ln FRDT)$ in ANIC Tier 2, which contradicts with the hypothesis. This fact implies that even if the high technology goods sector (SITC7) receives spillovers and raises its technology level, the TFP of the whole

economy does not increase unless the improved technology diffuses across other sectors (Okabe, 2002).

The fourth regression contains the interaction between educated workers and R&D spillover from FDI channel, while omitting *EDUR* variable because of multicollinearity. The result of this regression reinforces the previous facts even further. It is found that in both of country groups, *IMPY(lnFRDT)* and *EXPY(lnFRDT)* is constantly significant, with *EXPY(lnFRDT)* is negative in ANIC Tier 2. This means that international R&D spillover from import channel is an important factor for productivity and R&D spillover has different effect in both country groups with the previous explanation.

It is also found that variable *SECR(lnFRDI)* is consistently significant, which is the same result as overall estimation. This result further explains that human capital is an important variable for both of country groups. *IFDY(lnFRDI)* is also insignificant in affecting TFP for both of the country groups. This fact is also consistent to the result from overall estimation, which means that FDI inflows interaction with R&D spillover does not have any significant effect to TFP.

In conclusion, this research cannot capture the domestic knowledge because of inappropriate proxy, as domestic expenditure ratio has multicollinearity with secondary enrolment ratio. However, the findings of this research are international R&D spillover is generally important in increasing TFP, especially in trade channel. International R&D spillover from FDI channel has no significances to TFP in both of country groups, mainly because FDI cannot appropriately describes multinational firms activities. ANIC Tier 1 have different characteristics from Tier 2, especially from *EXPY(lnFRDT)* and *IFDY(lnFRDI)*. ANIC Tier 1 has negative and significant *EXPY(lnFRDT)*, contrast to ANIC Tier 2. This may be caused by the unequal spillover between the industries as high technology goods sector gained spillover from export, it is not diffused into other sectors, making total productivity does not increase. *IFDY(lnFRDI)* is omitted in ANIC Tier 1 group, as the variable contains high multicollinearity with *EXPY(lnFRDT)*. The possible explanation for this case is multinational firms, which are described by FDI, is the main source of high technology goods (SITC 7) exporter in ANIC Tier 1. This condition makes *IFDY(lnFRDI)* is related to *EXPY(lnFRDT)*. In

partial observation of country groups, education expenditure ratio (*EDUR*) has consistent insignificant result in the regression.

5. Conclusion

As the endogenous growth theory has stated that economic growth is induced by technological progress, less developed countries can catch up to developed countries by the means of increasing their technological advancement. However, there is an anomaly in the structure of world's technological advancement as R&D expenditure is dominated by developed countries, especially OECD. This fact raises a question about how the less developed countries can catch up to developed countries if they have little R&D expenditure to contribute in their technological advancement.

Endogenous growth theory is developed even further. Romer model indicates that knowledge is non-rivalry and excludable, which indicates that researches and knowledge from home countries can be used by other countries, at a cost. This also indicates that there is a possibility of knowledge spillover from other technological advancement to other countries in the world. The fact is there are several developing countries that have catch up effect to developed countries. This research focused on Asian Newly Industrialized Countries as catch up effect is clearly shown in ANIC Tier 1 and there is indication of catch up effect in ANIC Tier 2. These countries have high economic growth this later decade and start industrializing. Based on the theory, there is a strong indication that these countries received technology spillover from developed countries as ANIC have small domestic R&D expenditure to increase their technological advancement.

By calculating R&D spillover from G7 countries, as the technology leader countries, this research tries to explain the effect of international R&D spillover to productivity. R&D spillover itself can be achieved by two channels, which are trade and FDI, and productivity is represented by Total Factor Productivity (TFP). This research also compares the ANIC tier 1 and tier 2 as they have different economic condition.

This research found that R&D spillover from trade channel generally has positive significant effect to productivity, both directly and indirectly. However, this is not applicable to FDI channel as the effect is

not significant. However, this fact cannot conclude that FDI is not an important factor for productivity because FDI measurement itself is not enough to represent enterprises activities and there is a high probability that spillover activities from FDI is embodied in trade activities, such as importing capital goods. In addition, although high technology goods export interaction with R&D spillover is significant in affecting productivity, it has weaker significances than import interaction R&D spillover. This is mainly caused by various effects caused by high technology export interaction with R&D spillover in Asian Newly Industrialized Countries, and more indirect spillover from export than from import.

There is also a significant positive relation between interaction of secondary enrolment ratio and R&D spillover from trade channel to productivity. As secondary enrolment ratio represents human capital, it is to be expected that these variables have significant positive effect as educated workers enhance FDI indirectly and productivity directly. However, this research cannot find the relation from domestic R&D stock to productivity. As domestic R&D is represented by education expenditure ratio, it seems that education expenditure ratio is not an appropriate measure for domestic R&D as it has multicollinearity with secondary enrolment. Therefore, this research cannot answer the relation between domestic R&D and productivity.

From the comparison of the two country groups, it is found that ANIC tier 1 have positive significant effects from R&D spillover through trade channel both from export and import interaction. However, ANIC Tier 2 have different results concerning the R&D spillover. Although Tier 2 have significant positive effect from import interaction with R&D spillover, export interaction with R&D spillover shows significant negative effect. This fact can explain that while the spillover from export is significant in affecting the high technology goods sector, technology spillover in ANIC Tier 2 is not dispersed into other sectors. This makes total productivity in the countries does not increase by R&D spillover from export.

In ANIC Tier 1, it is found that FDI inflows interaction with R&D spillover is omitted because of high multicollinearity with high technology goods export interaction with R&D spillover variable.

Possible explanation from this result is high technology goods export is dominated by multinational firms, which is accounted in FDI inflows in ANIC Tier 1. Therefore, there is relation between FDI inflows and high technology goods export as FDI inflows will affect high technology goods export directly.

There are several constraints in this research. First is the lack of data concerning domestic R&D that makes this research uses education expenditure ratio to represent it. However, this ratio is not a good proxy for domestic R&D and make this research does not capture the effect of domestic R&D, which is important in affecting productivity.

Second, there is also a debatable issue concerning the calculation of TFP and R&D spillover, such as over-simplified TFP calculation and issues regarding weighting method of R&D spillover (Keller, 1997). This makes the indicator used for TFP and R&D spillover is still cannot completely capture the relation between these two variables. Although there is evidence from this research that these variables have significant effect, the result must be treated carefully.

Third, lack of control variables applied in this research which makes there are other indicators that affects productivity and not included in the estimation. TFP itself is not a proxy for technological change alone, but also other factors that is not accounted in exogenous growth theory. This fact means there are other indicators that affect TFP. The period used in this research contains much volatility, especially in the financial crises period. There is a need to control the variable and account the effect of crisis on this period. There is also an indication of non stationarity for larger time period.

Fourth, in R&D spillover from FDI channel, there is a bias in estimation as FDI inflows itself does not fully represent the FDI activities. Several literatures also stated that its effect is embodied through trade channel. However, there is still no appropriate calculation to divide the embodied effects. FDI outflow also an important factor for FDI channel, which is not included in this research because of the lack of data.

Finally, there is a great probability that the variables used, especially R&D spillover variables, in this research are non-stationary as the R&D indicators contain time trend (Edmond, 2001). In addition, the large

range of time period further enhance the probability of non-stationarity. The effect of R&D spillover is also happens in the long run, which means this effect cannot be obtained by merely simple regression. The non-stationarity of the variables are not treated in this research because of the limitations.

Based on the results of this research, there are several policy recommendations that can be suggested: As the results clearly stated that international trade is important factors in increasing productivity through R&D spillover, there is a need to increase the degree of openness to trade, especially from import and high technology goods export as the main source for R&D spillover. In addition, human capital is an important factor in productivity and R&D spillover as human capital is the main factor in capturing the effect of R&D spillover. With adequate education of human capital, R&D spillover can be fully absorbed and used to increase country's productivity.

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Client Satisfaction in Faith-based Microfinance: A Comparison with Mainstream Models of Microfinance

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The main purpose of this paper is to compare the client satisfaction of faith-based and mainstream microfinance institutions. The level of satisfaction is considered on eight independent factors identified through literature survey and experts' opinion. The data-set comprised of a total of 300 microfinance clients - 150 from faith-based microfinance institutions and 150 from the mainstream microfinance institutions. The data was collected through a structured questionnaire comprising of agreement disagreement on 5-point Likert scale. Independent sample t-test was employed to determine if any significant difference exists in the satisfaction level of clients in the two models of microfinance. The results indicate that there is no significant difference among the two groups on the variables reasonability of interest rates ($p=0.49$), loan procedure ($p=0.13$), technical assistance ($p = 0.822$), and branch location ($p = 0.36$). However, there are significant differences in the two groups on the variables clients repayment policy ($p=0.0001$), timely availability of loan ($p=0.0001$), non-discrimination ($p = 0.0001$) and supportive staff ($p = 0.005$). The mean values suggest that the clients of faith-based microfinance institutions are more satisfied on these variables. The recent reports on microfinance suggest that the mainstream microfinance programs and policies that were developed for delivering the benefits of financial inclusion and poverty alleviation neglected the client perspective. The results of this study should be of significance to policy makers who are considering various alternatives to attain the goals of poverty alleviation stipulated in the Millennium Development Goals. The paper contributes to the limited empirical studies available on client satisfaction as well as the faith-based model of microfinance.

1. Introduction

The role of microfinance in poverty alleviation, though adequately backed by empirical findings, has been countered by some researchers

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like Murdoch (2000). It has been argued that the effect of microfinance does not reach the poorest individuals. Secondly, a typical microfinance model assumes that the poor is entrepreneurial which may not actually be entirely true. The commercialization of the sector and the acceptance of microfinance as a business model have posed new challenges to the microfinance sector as well as poverty alleviation efforts. The sector has reported incidence of over-lending, multiple borrowings and diversion of loans for unproductive purposes (Buckley, 1996; Rahman, 1999). The size of the the market defined as “unserved” or “excluded” is over 2 billion (Rhyne, 2010) and less than 5% has been served so far (MIX Report, 2010). The cultural factors have also accounted for the exclusion of poor from using mainstream microfinance schemes (Obaidullah, 2007; Kozel and Parker, 1998). Since majority of microfinance models work on the same or an altered method of group lending, they all suffer from the same systemic problems. There is a need for innovation in product differentiation, operational procedures and targeting. Faith-based microfinance institutions operate on altogether different principles and may be able to reach the financially excluded population more efficiently. This study tries to explore the efficacy of the faith-based microfinance institutions in terms of client satisfaction.

2. Faith-based Organizations

Faith-based Organizations (FBOs) are organizations engaged in development or humanitarian activities that explicitly claim a religious motive (Kirmani and Zaidi 2010). Clarke and Jennings (2008) offered a comprehensive definition of Faith-based organizations:

“a faith-based organization is any organization that derives inspiration and guidance for its activities from the teachings and principles of the faith or from a particular interpretation or school of thought within that faith” (p6).

A faith-based microfinance and poverty alleviation initiative is generally started by, “a religious institution, or by an individual for strong religious motives; works with and through local ‘branches’ of the religion – churches, mosques, temples and raises substantial proportion of its funds from people of the same faith” (Harper et al. 2008). Faith-based Organizations (FBOs) are not similar, homogenous lot. Smith and Sosin (2001) also analyzed several institutions to study how faith is

present in an organization and suggested that the presence of faith can be found in the form of “resource dependency, authority and organizational culture”. The availability of funds, control of religious institutions or personalities, the influence of faith in the organizational design are some of the important factors that they found to be shaping the uniqueness of faith-based organizations (Sider and Unruh, 2004; Clarke, 2008; Hefferan, et al. 2009).

3. Literature Review

The empirical studies on faith-based organizations are few. Vidal (2001) mentions that the main reason for the scarcity of empirical analyses of these organizations is the absence of any listing of such organizations at international, country or even state/country level. There are several studies (Sider and Unruh, *ibid*; Jeavons, 1997) that point out the distinctive features of faith-based organizations. The role of these organizations in poverty alleviation has been investigated by few researchers (Martin, et al, 2007; van Engelenhoven 2006). Ashraf and Hasan (2013) presented an integrated model of poverty alleviation derived from Islamic faith. Ashraf, et al (2014) analyzed the faith dimension of microfinance institutions in terms of the country where the institution is based. A summary of the faith-based microfinance institutions present in literature is presented in Table 1.

Some studies have compared the performance of faith-based and mainstream microfinance institutions (Reinikka & Svensson, 2008; Mersland, et al. 2013). Their findings indicate that the faith-based microfinance institutions are more effective than mainstream institutions. In-depth analysis of faith-based microfinance institutions were also found in the literature (Ndemo, 2006; Jodka, 2009; Fikkert, 2000). Hoda and Gupta (2014) analyzed the loan portfolio of a faith-based microfinance institution in India.

4. Determinants of Client satisfaction in Microfinance

Client satisfaction is an important determinant of the performance of a microfinance programme. It has been attributed great significance for the future of an institution and it is seen as a basis for securing market position and achieving other objectives of the institution (Koraus, 2002). Client satisfaction is an evaluative process. It has been defined as “... a

judgment that a product of service feature, or the product or service itself, provided (or is providing) a pleasurable level of consumption related fulfillment, including levels of under or over fulfillment” (Swaid and Wigand, 2007). There have been several studies on the customer satisfaction in the banking sector that used scales like SERVQUAL (Bloemer et al. 1999) or BANKSERV (Pont and McQuilken, 2002) to measure the service quality as well as customer satisfaction. Hassan, et al (2012) assessed the technical and scale efficiencies of microfinance institutions in Middle East and North Africa region. This study used data envelopment analysis approach to measure the performance of microfinance institutions. The SEEP Tool (2000) provides a qualitative assessment of client satisfaction. A proper measure of satisfaction would include a separate assessment of both client expectations and the quality of provided service. Cronin and Taylor (1992) suggested an alternative measurement of customer satisfaction by focusing on actual perceived satisfaction.

Hypotheses development

Interest rates

Interest rate has been found to be an important factor of client satisfaction in many studies (IFAD, 2007; Murray and Lynch, 2003; Kanyurhi, 2013; Rahman, 1999; Coleman, 2006; Urquizo, 2006). For comparing the two groups of microfinance institutions, we formulate the following hypotheses:

H1o: Mainstream & Faith-based microfinance institutions are not significantly different on the variable reasonability of interest rate

H1a: Mainstream & Faith-based microfinance institutions are significantly different on the variable reasonability of interest rate

Loan procedure

Loan procedure includes the various stages, compliances and time required for the disbursement of loan to the poor client. Seybold (2001) reported that the customers ranked ‘turnaround time’, ‘easy requirements to comply with’ as the most important factors of microfinance service. Kanyurhi (ibid), Rahman (ibid) also presented similar findings and the importance clients place on this factor. A

microfinance institution needs to have a sound and effective loan disbursal mechanism for achieving the overall satisfaction level of the clients. We hypothesize the following.

H2o: Mainstream & Faith-based microfinance institutions are not significantly different on the variable loan procedure

H2a: Mainstream & Faith-based microfinance institutions are significantly different on the variable loan procedure

Loan repayment policy

The term of repayment is a crucial factor in the microfinance loan product. Due to the varying nature of the clients' occupation and income streams, the borrowers cannot repay in a single format. A borrower engaged in agriculture has a different earning pattern compared to a small trader. Hoda and Gupta (ibid) have provided the analysis of loan portfolio of a faith-based microfinance institution that suggests that there is a relationship between occupation and loan repayment. The importance of this factor has been confirmed in other studies (Kanyurhi, ibid; Rahman, ibid; IFAD, ibid; Coleman, ibid; and Urquizo, ibid). The following hypotheses are formulated for this factor.

H3o: Mainstream & Faith-based microfinance institutions are not significantly different on the variable repayment policy

H3a: Mainstream & Faith-based microfinance institutions are significantly different on the variable repayment policy

Timely availability of loan

Timely availability of loan is a critical factor for microfinance clients. This is more relevant in the repeat cycles. The loan requirements at various stages of the business cycle are partially responsible for the success of the business. Urquizo (ibid) also finds that the clients rank this factor as critical and important. We hypothesize the following regarding this factor.

H4o: Mainstream & Faith-based microfinance institutions are not significantly different on the variable timely availability of loan

H4a: Mainstream & Faith-based microfinance institutions are significantly different on the variable timely availability of loan

Discrimination in selection

Othman and Owen (2001) found that the cultural issues are important for microfinance institutions. A client may feel dissatisfied or opt out of the program if there is a neglect of the cultural factors. Obaidullah (ibid) reports the avoidance of the poor population towards the microfinance programs due to their feeling of discrimination. Rahman (ibid) has also found the discrimination in selection as a source of dissatisfaction. The discrimination may be based on gender, religion, caste, or any other factor. Such a policy adversely affects the satisfaction of the existing clients too. We therefore hypothesize the following.

H5o: Mainstream & Faith-based microfinance institutions are not significantly different on the variable discrimination among borrowers

H5a: Mainstream & Faith-based microfinance institutions are significantly different on the variable discrimination among borrowers

Technical assistance for business

Capacity building in the form of technical assistance is an important need of microfinance clients (Abdul Rahman and Dean, 2013, Rahman, ibid). This factor leads to the improvement in business and increasing the confidence of the borrowers. We hypothesize that.

H6o: Mainstream & Faith-based microfinance institutions are not significantly different on the variable technical assistance for business improvement

H6a: Mainstream & Faith-based microfinance institutions are significantly different on the variable technical assistance for business improvement

Location of the branch or point of transaction

The location of the branch and the distance a client has to travel to avail the services of a microfinance institution are important criteria for the microfinance clients. Patrick (2005) concentrated mainly on the access of the clients to the microfinance institutions for determining the overall success of the program. Alhemoud (2007) also found that clients rank this factor as important for a microfinance institution. We hypothesize that

H7o: Mainstream & Faith-based microfinance institutions are not significantly different on the variable location of the branch or place of transaction.

H7a: Mainstream & Faith-based microfinance institutions are significantly different on the variable location of the branch or place of transaction

Staff support

Othman and Owen (*ibid*) find that “responsiveness, dynamism and willingness for helping customers” are the most important factors of customer satisfaction. It could be gauged that those clients who have maintained a relationship with the microfinance institution for some time desire to have a differentiated service level and a better service is a general demand by all clients. This factor has been found significant in many other studies (Murray, 2001; Kanyurhi, *ibid*; Rahman, *ibid*; Owusu-Boateng, 2011; and Churchill and Halpern, 2001). On this factor we hypothesize that.

H8o: Mainstream & Faith-based microfinance institutions are not significantly different on the variable staff support

H8a: Mainstream & Faith-based microfinance institutions are significantly different on the variable staff support

5. Research Methodology

The design of this study is descriptive. The target population comprises of the beneficiaries of microfinance institution. The population is mainly divided into two groups – mainstream and faith-based. Purposive

sampling technique was used to collect the sample of beneficiaries from the two groups (see Appendix I). The loan officers and daily collection agents in the places of study provided the list of borrowers of the mainstream microfinance institutions. It is a general practice to employ these independent agents, mainly for loan recovery as well as savings collection on daily or weekly basis for a commission. A sample of 150 borrowers was selected from the list available with these daily collection agents. Three faith-based microfinance institutions from India were selected from a list of faith-based microfinance institutions (Table 2). Gramin Vikas Samiti is based in Jodhpur, Rajasthan and operates on Gandhian principle of village development. Al Khair Cooperative Society is situated in Patna and has been providing interest-free financial services based on Islamic principles. The Patna Parish Cooperative Society is owned by the Catholic Society and is based in Patna. 50 clients were selected from each of the selected faith-based institution. The data collection was done using a pre-tested schedule available in Hindi language too. The data analysis was done by the use of descriptive statistics such as frequency distributions, means, percentages and cross tabulations. Independent samples *t*-tests were employed to check for differences between mainstream and faith-based microfinance taking into account the different factors that constitute impact on client satisfaction. The assumption for applying a *t*-test is that the data for the 2 independent groups should be normally distributed irrespective of the scale. Levene's Test was employed to test the homogeneity of variances. The significance level of 0.05 was considered for the treatment of hypotheses. SPSS 19.0 was used for the data analysis.

Table 1:List of Faith-based Microfinance Institutions

S No	Name of the institution	Reported in	Faith	Location
1.	SNDP	Minimol and Makesh (2012)	Hinduism	India/Kerala
2.	Akhuwat	Harper , <i>et al. (ibid)</i>	Islam	Pakistan/Lahore
3.	Al Farz Foundation	Khaled (2011)	Islam	Pakistan/Lahore
4.	Al Khair Cooperative Credit Society	Khan (2009)	Islam	India/Patna
5.	American Friends Service Committee (AFSC)	Diklitch and Rice (2004)	Christianity	USA
6.	CAPARV	Harper , <i>et al. (ibid)</i>	Islam	India/Imphal
7.	Catholic Relief Services	Harper , <i>et al. (ibid)</i> , Diklitch and Rice (ibid)	Christianity	Various Countries
8.	Chinmaya Mission Sidhabari	Paul (2012)	Hinduism	India/Sidhabari
9.	Christian Aid	Kessler and Arkush (2009), Harper <i>et al.</i> (2008)	Christianity	UK/Oxford
10.	COVA	Harper, <i>et al. (ibid)</i> , Kaur (2007)	Islam	India/Hyderabad
11.	ESAF	Harper , <i>et al. (ibid)</i>	Christianity	India/Chennai
12.	Islamic Relief Worldwide	De Cordier (2009), Kirmani and Khan (2008)	Islam	UK/London
13.	LEAP	Harper , <i>et al. (ibid)</i>	Christianity	Liberia/Monrovia
14.	Lutheran World Relief (LWF),	Diklitch and Rice (2004)	Christianity	USA
15.	Mennonite Central Committee (MCC)	Diklitch and Rice (2004)	Christianity	North America
16.	Muslim Aid	Clarke (2008)	Islam	UK/London
17.	Muslim Fund Deoband	Khan and Nisar (2004)	Islam	India/Deoband
18.	Oxfam	Bradley (2009)	Christianity	UK/Oxford
19.	SKDRDP	Harper , <i>et al.</i> (2008) , Ashta (2010), Shetty and Vishwakumara (2009)	Jainism	India/Mangalore
20.	Tearfund	Wrigley (2011)	Christianity	UK/Teddington
21.	The Holy Cross Social Service Centre	Harper , <i>et al.</i> (2008)	Islam	India/Hazaribagh
22.	United Methodist Committee on Relief	Clarke (2008)	Christianity	USA/New York
23.	Village Development Project	Bradley (2009)	Hinduism	India/Jodhpur
24.	World Jewish Relief	Kessler and Arkush (2009)	Jewism	UK/London
25.	World Vision	Diklitch and Rice (2004)	Christianity	USA

Adapted from Hoda and Gupta (2014)

6. Results

A summary of the data-set is provided in Table 2. In case of faith-based microfinance institutions, the number of valid response received was 149 as one response was found to be invalid. The comparison was not affected as the normalized data was used for all the calculations. The age-group of beneficiaries of mainstream and faith-based microfinance institution highlights a similar pattern. Majority of respondents, 63% in case of mainstream MFIs and 56% in case of faith-based microfinance belong to the age group 30-45 years. In terms of gender, 97% of the respondents from mainstream microfinance are female whereas in faith-based the female respondents form 65% of the total respondents. The respondents belong to two main religions, Hinduism and Islam with 56% and 44% in the mainstream group. In the faith-based group, the respondents belong to Hindu (44%), Islam (38%) and Christianity (18%). A majority of the respondents in both mainstream and faith-based microfinance are uneducated and have never been to school. Head of household is the person who takes vital decisions, like expenditure, for the family. 81% and 86% of the households respectively in the two groups of respondents are headed by a male member (generally husband). Most of the respondents in both the groups (61% and 40% respectively) reported their monthly earnings in the range of Rs. 3001-6000. All the respondents were self-employed in case of mainstream microfinance and a similar proportion is seen in case of faith-based microfinance. Majority of the clients (63% and 42% respectively) of both the microfinance programmes are associated for less than 3 years. Those associated for a period of 3-5 years form 38% and 33% respectively in both the groups. None of the respondents are as old as 5 years in case of mainstream microfinance. In case of faith-based microfinance, 25% of the respondents are associated with their institution for more than 5 years.

Table 2: Summary of the Data-set

Item	Mainstream (N = 150)	Faith-based (N = 149)	Item	Mainstream (N = 150)	Faith-based (N = 149)
Gender			Head of household		
Male	4 (3%)	52 (35%)	Male	122 (81%)	128 (86%)
Female	146 (97%)	97 (65%)	Female	28 (19%)	21 (14%)
Age			Religion		
15-30	39(26%)	30 (20%)	Hindu	84 (56%)	66 (44%)
30-45	95(63%)	83 (56%)	Muslim	66 (44%)	56 (38%)
45-60	16(11%)	36 (24%)	Christian	0	27 (18%)
Education			Monthly Income		
Uneducated	71(47%)	73 (49%)	Below 3,000	16(11%)	43(29%)
Primary Education	47 (32%)	37 (25%)	3,001-6,000	91(61%)	60(40%)
Matriculate	10 (7%)	19 (13%)	6,001-9,000	43(28%)	46(31%)
Intermediate and above	22 (14%)	20 (13%)	Occupation		
Years of Association with MFI			Service	0 (0)	21(14%)
1-3 years	93 (62%)	63 (42%)	Self-employed	150 (100%)	119 (80%)
3-5 years	57 (38%)	49 (33%)	Daily wages	0 (0)	9 (6%)
5 years and Above	0 (0)	37 (25%)	Incidence of Borrowing		
			Borrowed	146 (97%)	142 (95%)
			Did not borrow	4 (3%)	7 (5%)

Source: Field Survey

The two groups of microfinance institutions were compared on the eight variables of client satisfaction. The results are summarized in Table 3.

Table 3: Summary of Mean, Standard Deviation, Standard Error Mean and t-test

variable	Mean		Standard Deviation		Standard Error Mean		t-Test for equality of means (Acceptable $\alpha = 0.05$)	
	Mainstream	Faith-based	Mainstream	Faith-based	Mainstream	Faith-based	t (297)	p
1. Reasonability of interest rate on loan	4.220	4.3087	1.12250	1.12044	.09165	.09179	6.84	0.49
2. Loan procedure	4.5400	4.6846	.91688	.70794	.07486	.05800	1.53	0.13
3. Loan repayment policy	4.0133	4.7383	1.47000	.56228	.12002	.04606	5.62	0.0001
4. Availability of loan	3.4933	4.5369	1.71353	.87397	.13991	.07160	6.63	0.0001
5. Discrimination in selection	1.2067	2.2752	.57108	1.80037	.04663	.14749	6.93	0.0001
6. Technical Assistance to clients for business	2.2533	2.2953	1.55519	1.66646	.12698	.13652	2.25	0.822
7. Location of the branch or point of transaction	4.1733	4.0134	1.18575	1.78578	.09682	.14630	0.91	0.36
8. Staff support	4.2733	4.6107	1.14045	.92057	.09312	.07542	2.81	0.005

6.1 Reasonability of interest rates

It was found that 64% of the clients of faith-based microfinance strongly agree that the rates are reasonable and 16% just agree. In case of faith-based microfinance 56% strongly agree and 23% just agree that the rates are reasonable. 5% and 4% of the clients of mainstream and faith-based microfinance strongly disagree that rates are reasonable. An equal variances *t* test revealed a statistically reliable difference between the mean number of Mainstream microfinance ($M = 4.22$, $s = 1.12$) and faith-based microfinance ($M = 4.31$, $s = 1.12$), $t(297) = 6.84$, $p = 0.49$, $\alpha = 0.05$. Since $p > \alpha$, we accept the null hypothesis that there is no significant difference between Mainstream & Faith-based microfinance institutions on the variable reasonability of interest rate.

6.2 Loan procedure

Loan procedure includes the application process, disbursal and the time involved in the process. 79% of the clients of faith-based microfinance and 69% clients of mainstream microfinance strongly agree that the procedure of obtaining loan is simple. Those who just agree in both the groups are 25% and 13% respectively. It may be inferred that the clients of both the groups are satisfied with the loan procedure. An equal variances *t* test revealed a statistically reliable difference between the mean number of Mainstream microfinance ($M = 4.54$, $s = 0.92$) and faith-based microfinance ($M = 4.68$, $s = 0.71$), $t(297) = 1.53$, $p = 0.13$, $\alpha = 0.05$. Since $p > \alpha$, we accept the null hypothesis that there is no significant difference between Mainstream & Faith-based microfinance institutions on the variable loan procedure.

6.3 Loan repayment policy

The microfinance institutions that follow the group methodology generally follow a rigid weekly repayment method. 79% of the borrowers strongly agree that the loan repayment policy is suitable while 59% of the borrowers of mainstream microfinance have similar reaction. 18% borrowers in both the groups just agree regarding the repayment policy. An equal variances *t* test revealed a statistically reliable difference between the mean number of Mainstream microfinance ($M = 4.01$, $s = 1.47$) and faith-based microfinance ($M = 4.74$, $s = 0.57$), $t(297) = 5.62$, $p = 0.0001$, $\alpha = 0.05$. Since $p < \alpha$, we reject the null hypothesis.

The alternative hypothesis that there is significant difference between Mainstream & Faith-based microfinance institutions on the variable repayment policy is accepted. The mean value suggests that the beneficiaries of faith-based microfinance are more satisfied with the repayment policy.

6.4 Timely availability of loan

The availability of loan amount is not the only criterion for meeting the needs of poor clients. It is important that the client receives the amount when there is need and also in adequate amount. 90% of the respondents in faith-based microfinance agree that loan is timely available whereas 61% agree in case of mainstream microfinance. The percentage of respondents disagreeing with the statement is quite large in case of mainstream microfinance. In total, 37% of the respondents disagree about the timely availability of loan. An equal variances *t* test revealed a statistically reliable difference between the mean number of secular microfinance ($M = 3.49$, $s = 1.71$) and faith-based microfinance ($M = 4.54$, $s = 0.88$), $t(297) = 6.63$, $p = 0.0001$, $\alpha = 0.05$. Since $p < \alpha$, we reject the null hypothesis and accept the alternative hypothesis that there is significant difference between Mainstream & Faith-based microfinance institutions on the variable timely availability of loan. The mean value ($M = 4.54$) suggest that beneficiaries of faith-based microfinance are more satisfied on this feature.

6.5 Discrimination in loan disbursement

The findings of this study suggest that the clients of faith-based microfinance feel there is discrimination. Almost all the respondents (97%) of mainstream microfinance disagree regarding the discrimination in loan disbursement. The rest 3% have no opinion. In case of faith-based microfinance the percentage of respondents agreeing to the statement regarding discrimination in loan disbursement is 28% whereas 5% do not have any opinion. An equal variances *t* test revealed a statistically reliable difference between the mean number of Mainstream microfinance ($M = 1.21$, $s = 0.57$) and faith-based microfinance ($M = 2.28$, $s = 1.8$), $t(297) = 6.93$, $p = 0.0001$, $\alpha = 0.05$. Since $p < \alpha$, we reject the null hypothesis and accept the alternative hypothesis that there is significant difference between Mainstream & Faith-based microfinance institutions on the variable discrimination in loan disbursement. The

beneficiaries of faith-based microfinance ($M = 2.28$) agree that there is discrimination among the borrowers.

6.6 Technical support for business

63% of the respondents of mainstream microfinance and 39% of the respondents of the faith-based microfinance disagree to the statement on receiving technical support in their business/income generating activity/idea for business. Those who agree that they have received technical assistance form 29% and 28% respectively in mainstream and faith-based group. An equal variances t test revealed a statistically reliable difference between the mean number of Mainstream microfinance ($M = 2.25$, $s = 1.56$) and faith-based microfinance ($M = 2.30$, $s = 1.67$), $t(297) = 2.25$, $p = 0.822$, $\alpha = 0.05$. Since $p > \alpha$, we accept the null hypothesis that there is no significant difference between Mainstream & Faith-based microfinance institutions for the variable technical support for business/income generating activity.

6.7 Location of branch/point of transaction

77% of the respondents of faith-based microfinance strongly agree while 16% just agree to the convenient location of the branch or place of transaction (like meeting point). In case of mainstream microfinance the percentage agreement is 53% and 30% respectively. 15% of the respondents of mainstream group disagree regarding this feature. An equal variances t test revealed a statistically reliable difference between the mean number of Mainstream microfinance ($M = 4.17$, $s = 1.19$) and faith-based microfinance ($M = 4.01$, $s = 1.79$), $t(297) = 0.91$, $p = 0.36$, $\alpha = 0.05$. Since $p > \alpha$, we accept the null hypothesis that there is no significant difference between Mainstream & Faith-based microfinance institutions on the variable location of branch/point of transaction.

6.8 Supportive staff

The respondents were asked regarding their agreement with the statement that the staff of their microfinance institution is supportive. To this, 79% of the respondents in faith-based group strongly agreed and 12% just agreed. The response of mainstream microfinance group was 61% and 20% respectively. 9% of the respondents of mainstream microfinance did not respond while 10% disagreed. An equal variances t

test revealed a statistically reliable difference between the mean number of Mainstream microfinance ($M = 4.27$, $s = 1.14$) and faith-based microfinance ($M = 4.61$, $s = 0.92$), $t(297) = 2.81$, $p = 0.005$, $\alpha = 0.05$. Since $p < \alpha$, we reject the null hypothesis and accept the alternate hypothesis that there is significant difference between Mainstream & Faith-based microfinance institutions on the variable staff support. The mean value ($M = 4.61$) suggests that the clients of faith-based microfinance are more satisfied regarding the support from staff compared to the Mainstream microfinance.

7. Discussion

The paper compared the faith-based and mainstream microfinance institutions on the selected variables of client satisfaction. The literature on services marketing and financial services prove that the customer satisfaction leads to better performance (Morgan and Rego, 2006). The extant mainstream models of microfinance have been criticized for their one-size-fit-all approach. It has been suggested that microfinance institutions focus on clients, listen to their demands, and learn about their financial strategies (Goglio and Alexopoulos, 2013). Faith-based microfinance institutions may be better connected to the poor population and understand their needs in a better way. These institutions are seen to be more humanitarian and empathetic towards the poor. Therefore, the client satisfaction for these institutions is expected to be more satisfied. The findings of the comparison of the two groups of microfinance institutions are discussed in this section.

The demographic profile of the respondents in both the groups was found to be similar in terms of age, education, income and household condition (specifically the head of household or the decision-maker). A notable finding is that 35% of the clients in the faith-based group are male. A further break-up of the results for the three institutions shows that the percentage of male clients is higher for the two institutions that are associated with Al Khair Cooperative and Patna Parish Cooperative associated with Islamic and Christian faiths respectively. Gramin Vikas Samiti (GRAVIS), that follows the Gandhian ideology of Gramin Seva (Village Development), has only women clients. However, other studies on microfinance institutions namely Shri Kshetra Dharmasthala in Karnataka (Harper et al, 2008; Shetty, 2007; Ashta, 2010), Sree Narayana Dharma Paripalana Yogam in Kerala (Sujatha and Somu,

2013) associated with Hindu faith report that they are not women-only. Overall, it may be inferred that faith-based institutions do not target women only. On the other hand, all the clients in mainstream microfinance institutions in this study were found to be women. The targeting of women only is a limitation of the mainstream microfinance. Ruben (2007) mentions that many microfinance programs target women only. Though women readily form groups and receive loans, they do not necessarily control the use of this amount. Conrad (2012) cites the findings of Gerhard Klas regarding the adverse effects of targeting women solely in microfinance programs.

The mainstream microfinance predominantly provide loan for productive use to micro-entrepreneurs. Karnani (2007) points out that not all poor clients necessarily possess entrepreneurial skills or the resources. They need loan and financial services for their personal needs too. The micro-entrepreneurs struggle with resources and generally operate at a low scale to achieve efficiency. This leads to a mismatch in their earning and loan repayment. Further a strictly standardized approach leads to the exclusion of “the truly destitute comprised of widows, orphans, the chronically sick, and the mobile landless” (Wright, 2000). A client-centric program will allow the inclusion of diverse population segment. It was found in this research that all the clients of mainstream group were micro-entrepreneurs. On the other hand, a significant portion (20%) of sample from faith-based group was found to be salaried or wage earners. This suggests that faith-based microfinance may accommodate more diverse segment of the poor population.

It was found that a majority of the clients (63% in mainstream and 42% in faith-based respectively) are associated with the institutions for less than 3 years. Those associated for a period of 3-5 years were 38% and 33% respectively in both the groups. None of the respondents are as old as 5 years in case of mainstream microfinance. In case of faith-based microfinance, 25% of the respondents are associated with their institution for more than 5 years. Dunn (2002) describes that due to the neglect of customer understanding, the customers withdraw from the schemes. Therefore, a long association of the clients with the microfinance institution may be a sign of loyalty and satisfaction. However, it cannot be concluded that the occurrence of shorter duration of association for mainstream microfinance institution is because of

withdrawal or drop-out. A detailed investigation will throw more light on this aspect.

The mean values suggest that the clients of faith-based microfinance are more satisfied regarding the reasonability of interest rates, loan procedure, technical support for business and convenient location compared to the mainstream group. However the p value is not large enough to accept the alternate hypothesis that there is a significant difference ($\alpha = 0.05$) between the two groups. The hypothesis that there is a significant difference in the perception of the clients of two groups is accepted for the variables repayment policy ($p = 0.0001$), availability of loan ($p = 0.0001$) and staff support ($p = 0.0001$). The mean values for each variable suggest that the clients of faith-based group are more satisfied on these parameters in comparison to the mainstream clients.

Transparency in the lending process is critical especially for borrowers who are unfamiliar with banking. The microfinance institutions should help ensure that the staff is supportive and help the clients understand -- their loan terms and budget management. (Khan, 2012). The outreach of several microfinance institutions is severely hampered because of the lack of understanding of customers. When the income is not earned on time, the borrower has to pay from his assets or by negatively impacting his resources (Wright, *ibid*). In one study by ASA (1996), the field officers tried to find the reasons for dropouts and found that the main reasons were inherent to the programme and processes. Mosley and Steel (2004) also emphasized that employment and repayment capacity of the borrowers should be properly gauged to avoid default and stress. This research suggests that the clients of faith-based microfinance have a better perception of the repayment policy. The three faith-based microfinance institutions employ different repayment policy and recovery methods. GRAVIS employs the weekly repayment method in meetings, Al-Khair Cooperative follows the daily recovery method in many of its loan products and the Patna Parish Cooperative has a monthly repayment method. Diversity in the overall procedure is also established when other studies on such institutions are considered as cited in Table 1.

On one of the variables, discrimination among the borrowers, there is found to be significant difference ($p = 0.0001$) between the perception of clients of the two groups. The mean values suggest the clients of faith-

based group agree more with the statement that there is a discrimination of the borrowers. This dimension needs to be probed further by taking a larger sample of clients of more faith-based institutions. In case it is established that the clients perceive that there is discrimination, the institutions must take appropriate steps to overcome this issue.

The traditional approach to microfinance has been institutional delivery. Since the microloans were normally required to be collateral-free, there was a need for the developers to find some alternative. They included peer pressure, social collateral and other tools like frequency of repayment, meetings, compulsory deposits and fear of expulsion. Further, the system of highly standardized credit was developed (Churchill and Halpern, *ibid*). The incidences of suicides by borrowers, drop-outs, willful defaults and low outreach have been the areas of concern for the microfinance industry. The microfinance institutions like other businesses need to understand the preferences and needs of the customers. The understanding of consumer behavior specifically requires the financial needs of the poor, the management of resources by poor and most importantly how do they face the emergency conditions (Sebstad and Cohen, *ibid*). The results of this research indicate that faith-based microfinance is customer-centric and has greater chance of developing the social capital for the poor. They are diverse in their procedures and more connected to the customers. So, this model may be able to overcome many problems facing the industry.

This paper considered only three faith-based microfinance institutions for analysis. On a wide scale, there is a need to consider more institutions for generalizability of the findings. The variables considered for client satisfaction were analyzed individually for a more objective assessment. There is further scope for studying the inter-relationships of the variables, inclusion of other variables and using scales similar to those used in the financial services industry. Client satisfaction is an important success factor for the microfinance institutions in the light of recent developments in the microfinance sector. The findings of this paper suggest that faith-based microfinance institutions are more client-centric and diverse in approach. The clients of these institutions were found to have a better perception on the various aspects of client satisfaction. However, further investigations are required to establish these propositions. Though sustainability studies carried out in earlier studies suggest that these institutions are sustainable too, researchers

may find this dimension interesting to be investigated. The faith-based model of microfinance may be considered by policy makers to play an important role in achieving the goals of financial inclusion and poverty alleviation.

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Appendix 1: Details of Sample from Mainstream and Faith-based Microfinance Institution

S No	Name of the MFI	Males	Females
Mainstream Microfinance Institutions			
1	BASIX	0	42
2	Astha	0	31
3	Bandhan	0	18
4	SKS Microfinance	0	45
5	Suraha Microfinance	4	10
Total (%)		4 (3%)	146 (97%)
Faith-based Microfinance Institution			
6	GRAVIS	0	50
7	Al Khair Cooperative	35	14
8	Patna Parish Cooperative	17	33
Total (%)		52 (35%)	147 (65%)



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