

# GLOBAL JOURNAL

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DISCOVERING THOUGHTS AND INVENTING FUTURE



### HIGHLIGHTS

An Analysis on Employees

Non Verbal Cues

Determinant Factors of Decision

Customer Relationship Marketing



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## CONTENTS OF THE VOLUME

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- i. Copyright Notice
  - ii. Editorial Board Members
  - iii. Chief Author and Dean
  - iv. Table of Contents
  - v. From the Chief Editor's Desk
  - vi. Research and Review Papers
- 
1. Customer Relationship Marketing and Customer Satisfaction: A Study on Mobile Service Providing Companies in Srilanka . *1-8*
  2. Non Verbal Cues in Group Behavior Amongst Youngsters. *9-12*
  3. A Study on Value Chain Analysis in Paddy Sector: Special Reference to Kilinochchi District, Srilanka . *13-22*
  4. Factors Affecting Quality of Work Life: An Analysis on Employees of Private Limited Companies in Bangladesh. *23-31*
  5. Determinant Factors of Decision Making Process in Higher Education Institution (A Case of State University of Gorontalo, Indonesia). *33-40*
  6. A Development and Empirical Validation of The Consumer Response Towards Sponsored Search Advertising (SSA) Model. *41-53*
  7. Productivity Growth and Its Influence on the Dollar/Euro Real Exchange Rate. *55-76*
  8. Modelling Millennium Development Goals' Indicators: A Comparative Analysis. *77-84*
  9. Determinants of Foreign Direct Investment in Africa : A Panel Data Analysis. *85-97*
- 
- vii. Auxiliary Memberships
  - viii. Process of Submission of Research Paper
  - ix. Preferred Author Guidelines
  - x. Index



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# Customer Relationship Marketing and Customer Satisfaction: A Study on Mobile Service Providing Companies in Srilanka

By Dr. T.Velnampy & S.Sivesan

*University of Jaffna, Sri Lanka*

*Abstract* - In the present era, customer relationship marketing plays a vital role. The major goals of customer relationship marketing can be expressed simply as understanding and treating customers better for increased loyalty and profit. Main purpose of the study is examining the relationship between customer relationship marketing and customer satisfaction. Customer relationship marketing can be measured through following ten variables trust, commitment, empathy and equity. Data were collected through a seven points Likert type summated rating scales of questionnaire. A sample of one hundred and seven customers was surveyed from three mobile service providing companies such as Airtel, Dialog, and Mobitel. Correlation and regression analyzed has been employed to measure relationship and contribution among the dependent and independent variables.

*Keywords* : Customer relationship marketing, customer satisfaction, service quality.

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# Customer Relationship Marketing and Customer Satisfaction: A Study on Mobile Service Providing Companies in Srilanka

Dr. T.Velnampy <sup>α</sup> & S.Sivesan <sup>σ</sup>

**Abstract** - In the present era, customer relationship marketing plays a vital role. The major goals of customer relationship marketing can be expressed simply as understanding and treating customers better for increased loyalty and profit. Main purpose of the study is examining the relationship between customer relationship marketing and customer satisfaction. Customer relationship marketing can be measured through following ten variables trust, commitment, empathy and equity. Data were collected through a seven points Likert type summated rating scales of questionnaire. A sample of one hundred and seven customers was surveyed from three mobile service providing companies such as Airtel, Dialog, and Mobitel. Correlation and regression analyzed has been employed to measure relationship and contribution among the dependent and independent variables.

**Keyword** : Customer relationship marketing, customer satisfaction, service quality.

## I. INTRODUCTION

In today's highly competitive business environment, companies are unable to longer survive with a transactional attitude towards customers. They have to focus their marketing lenses more rational dimension, which is considered to be the most suitable approach for satisfying and maintaining customers (Hollensen2010). For this reason, nowadays customer satisfaction has been viewed as an important theoretical and practical issue for most of the marketers and researchers (Ramin Rakhsha & Majidazar2011). Kotler (2000) defines it as a feeling in individuals after comparing product and service performances with their expectations. Satisfaction also refers to pleasant or unpleasant feeling caused with comparison between imaginative function and expectations. Customer relationship marketing is the biggest paradigmatic shift in marketing theory and practice in recent decades. It is taking back to its roots (Gronroos, 1996). In industries and service markets, customer relationship marketing is becoming a necessity in order to survive. The main goal of the relationship marketing is to build mutually satisfactory long- term relationship with key constituents

in order to gain and maintain their business (Gummesson, 2008).

In Sri Lanka, Telecommunication sector is highly competitive and also contribution of telecommunication for Gross Domestic Product (GDP) is continuously increasing. At 2010, Growth rate of Cellular phones users was increased by 16.3% (Annual report of Sri Lankan regulates committee 2010). The growth in the telecommunications sector in recent years was largely fuelled by the increased penetration of services in the northern and eastern provinces and provision of value added services at competitive rates. Five mobile service providing companies such Dialog, Mobitel, Airtel, Hutch and Eristl are providing the services. Each company is using different kinds of attractive packages to attract their valuable customers.

Significant of study are this study tries to disclose effect of customer relationship marketing on customer satisfaction on the mobile service providing companies in Sri Lanka. This study is intended to help them to formulate more rational strategies aimed at attracting and retaining consumers. This study is able articulates appropriate path to enhance the customer relationship marketing and customer satisfaction.

## II. RESEARCH PROBLEM

Customer relationship marketing (CRM) is replacing the traditional 'four Ps' of marketing - product, price, place and promotion. Long-term relationships with customers are the key to stability in an increasingly dynamic market. Customer relationship management (CRM) has become the main strategy to retain customers for companies regardless of its size. The emergence of customer satisfaction at financial institutions has been widely studied and focus on customer satisfaction is the primary goal of any organization, especially bank. Full understanding of this issue is important for researchers and officials [Arbore, 2009]. A survey of 1,500 companies found that 91% of businesses plan or have deployed CRM solutions, however 41% of the firms with CRM projects were experiencing serious implementation problems (The Data Warehousing Institute, 2000). Therefore the present study is initialed to find out what extent customer relationship marketing impact on customer satisfaction in mobile service providing companies?

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### III. OBJECTIVE OF THE STUDY

The main objective of the study is to examine the relationship between the customer relationship marketing and customer satisfaction in mobile service providing companies.

- To identify the role of customer relationship marketing on customer satisfaction;
- Investigate the impact of customer relationship marketing on customer satisfaction;
- To suggest the mobile service companies to build the customer value;

### IV. CONTRIBUTION OF THE STUDY

Customer relationship marketing is the biggest paradigmatic shift in marketing theory and practice in existing world. Customer relationship marketing concerns attracting, developing and retaining customer relationship (Berry and Parasuraman 1991). Customer relationship marketing is to identify establish, maintain, enhance, and when necessary, terminate relationship with customers and other stakeholders (Gronroos). Customer satisfaction is difference function between customer perception and customer expectation (Kotler1996). Customer relationship marketing assists to build the good relationship between customer and organization. Every organization try to fulfill their customer required with pleasure. An Examination of Relationship between Customer Relationship Marketing and Customer Satisfaction on Mobile Service Providing Companies in Sri Lanka is very important study in Sri Lanka. Nowadays, in Sri Lanka, five mobile service providing companies are running successfully but every companies faced more completion to survey in the market. This study is intended to help them to formulate more rational strategies aimed at attracting and retaining consumer, this research should contribute to a better appreciation and understanding of customer satisfaction related factors. This study helps to recognize that what are factors determine the customer relationship marketing.

### V. REVIEW OF LITERATURE

Customer relationship marketing is one of the best contemporary marketing strategies for all companies to satisfy their customer needs and wants. In customer point of view, trust, commitment, mutuality and long- term relationship with customer which are very essential factors to satisfy their customer needs and wants. Customer relationship marketing concerns attracting, developing, and retaining customer relationship (Berry and Parasuraman 1991).

Customer relationship marketing goal is to provide increased value to the customer and results in a lifetime value for the service provider (Liu, 2000). Trust has been defined as “a willingness to rely on an

exchange partner in whom one has confidence” (Moorman 1993). In addition trust provides the basis for loyalty, relationship enhancement (decreased perception of risk), and yet is mediated by customer perceived value of the relationship (i.e., perceived net benefits) (Morgan & Hunt, 1994; Selnes, 1998; Sirdeshmukh, 2002).

Customer satisfaction is a dimension of multiple items evaluated as a satisfaction measurement, which can vary from business to business (1991). Customer satisfaction is very important concept and also has been extremely analyzed subject in the marketing research (Hunt, 1977). In recent time, customer satisfaction has gained attention within the context of the paradigm shift from transaction marketing to relationship marketing (Gronroos, 1994: Sheth &Parvatiyar, 1994).

Customer satisfaction is the feeling or attitude of a customer towards a product or service after it has been used. The confirmation model treats satisfaction as a meeting of customer expectations (East, 1997; Oliver 1989) and is generally related to habitual usage of products (East, 1997). However, research on customer satisfaction has moved towards the disconfirmation paradigm which views satisfaction with products and brands as a result of two cognitive variables: pre purchase expectations and disconfirmation (Churchill and Surprenant, 1982; Peter and Olson, 1996).

Customer satisfaction has traditionally been regarded as a fundamental determinant of long – term consumer behavior (Oliver, 1980; Yi 1990). Satisfied customers are valuable assets for every organization to gain the customer loyalty and retention.

Customer satisfaction and its related research is not merely a tool that measures the attitudes of customers but can be used by relationship marketers as a tool to manage the relationships with the customers (Gengler and Ileszczyc,1997). Satisfaction and quality research “have evolved along parallel tracks” (Strandvik & Liljander, 1995).

The relation of both constructs is currently subject to a passionate and controversial debate (Gotlieb, Grewal,&Brown, 1994; Patterson & Johnson, 1993). For the investigation undertaken here, the following aspects for the distinction of satisfaction and quality are of particular importance .Because quality is a dynamic construct, additional consumption experiences influence and modify the existing quality perception and cause changes in this perception (Thompson & Getty, 1994).

Customer relationship marketing has been the subject of increasing interest globally with the absolute volume of research on the subject; however, most of the research has been done in developed countries. Other issue is lack of researcher paid the attention to find the relationship between the customer relationship marketing and customer satisfaction.

## VI. DATA COLLECTION

The primary and secondary data were collected for the survey. Primary data were collected through questionnaires and secondary data were collected from books, journals, magazine and etc.

## VII. HYPOTHESES

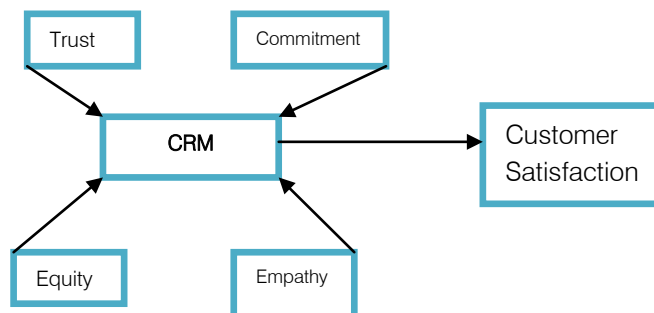
Following hypothesis were taken for the present study

H1- there is relationship between Customer relationship marketing and customer satisfaction.

H0- there is no relationship between Customer relationship marketing and customer satisfaction.

## VIII. CONCEPTUALIZATION

Below conceptualization model shows the relationship between variables. Thus customer satisfaction is considered as dependent variable whereas customer relationship marketing is the independent variable.



## IX. SAMPLING

A survey instrument in the form of close-ended questionnaire was developed for the purpose of collecting the main data for the study. Systematic quasi-random sampling method was taken to select the respondents of the study. It selected every second customer to enter the selected reload center on each day of the survey, starting with the first to come through the doors at start of business, at 9.30 am. This sampling method was chosen because it permits analysis of possible selection bias or error (Ndubisi, 2006). One hundred and thirty respondents were selected as a sample of the study. One hundred and seventeen respondents completed the questionnaire but fifteen questionnaires were damaged.

Table 1

Characteristics	Frequency	Percentage	
Age	18 – 25	21	20.6
	26 -45	48	47.1
	46 – 55	20	19.6
	56 and Above	13	12.7
Gender	Male	60	58.8
	Female	42	41.7
Occupation	Government	42	41.2
	Private sector	30	29.4
	Self employment	22	21.6
	Others	8	7.8
Income level	Below 5000	8	7.8
	5000 - 15000	24	23.5
	15000- 30000	44	43.1

	30000- 50000	13	12.7
	Above 50000	13	12.7
Company	Dialog	39	38.2
	Airtel	27	26.47
	Mobitel	12	11.76
	Dialog and Mobitel	09	8.82
	Dialog and Airtel	11	10.78
	Mobitel and Airtel	04	3.92

## X. QUESTIONNAIRES

An instrument/questionnaire was used to collect data.

This questionnaire consists of three sections A, B, and C. section A consists personal details such as sex, status, age, education, monthly income, company name, and length of time customer has been in brand, kinds of packages.

Sections – B consists of ten statements such as trust, commitment, equity and empathy to measure the customer relationship marketing.

Sections – C consists of ten statements to evaluate customer satisfaction.

Above information/ data were collected through the questionnaire which is prepared with seven point Likert scale ranging from excellent to poor. Then data were converted into quantitative manner and then the analyses were made. Using the above information the following model was formulated.

$$CVC = f(CRM)$$

$$CS = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 \dots\dots\dots (1)$$

Where,  
 CRM- Customer relationship marketing  
 CS – Customer Satisfaction  
 X<sub>1</sub>- Trust  
 X<sub>2</sub> – Commitment  
 X<sub>3</sub> – Empathy  
 X<sub>4</sub>- Equity

## XI. EMPIRICAL RESULTS

### a) Reliability

Before applying statistical tools, testing of the reliability of the scale is very much important as its shows the extent to which a scale produces consistent result if measurements are made repeatedly. This is done by determining the association in between scores obtained from different administrations of the scales. If the association is high, the scale yields consistent result, thus is reliable. Cronbach's alpha is most widely used method. It may be mentioned that its value varies from 0 to 1 but, satisfactory value is required to be more than 0.6 for the scale to be reliable (Malhotra, 2002; Cronbach, 1951). The Cronbach alpha estimated for trust was 0.889, Commitment scale was 0.890, Empathy scale was 0.908, Equity scale was 0.901, customer relationship marketing 0.855 and the overall customer value creation scale was 0.726. As the Cronbach's alpha in this study were all much higher than 0.6, the constructs were therefore deemed to have adequate reliability.

Table 2 : Details of reliability.

S.No	Details	Cronbach alpha
01	Customer Relationship Marketing	0.855
02	Trust	0.889
03	Commitment	0.890
04	Empathy	0.908
05	Equity	0.908
06	Customer Value Creation	0.726

### b) Validity

An important aspect of increased rigor in conducting scientific research in the modern positivist paradigm is the testing for content and convergent validity.

The Content validity ensures that the measure includes an adequate and representative set of items that tap the domain of the concept (Malhotra 2005, S2004, Warnakulasuriya, 2009). An exact literature review was carried out to ensure the content validity of the both construct.

Convergent validity can be measured through the inter correlation value. If inter correlation are

available among the more than 50% items (Hatcher,1994 ). Those are showing strong evidence of convergent validity.

### c) Multi-Collinearity

Two major methods were utilized in order to determine the presence of multi collinearity among independent variables in this study. These methodologies involved calculation of both a Tolerance test and Variance Inflation Factor –VIF (Kleinbaum et.al, 1988).The results of this analysis are presented in Table 03.

Table 3 : Test of Collinearity.

Variable	Tolerance	VIF
Trust	0.995	1.005
Commitment	0.988	1.012
Empathy	0.900	1.111
Equity	0.909	1.100

As can be seen from this data, none of the Tolerance level is < or equal to 01; and all VIF values are well below 10. Thus the measures selected for assessing independent variables in this study, do not reach multicollinearity.

Table 4 : Test of Durbin-Watson.

Variable	Durbin-Watson
Reliability	1.732
Responsiveness	2.124
Functionality	1.698
Call charges	1.899

The acceptable Durbin – Watson range is between 1.5 and 2.5. In this analysis Durbin – Watson values for all depended variable are well below 2.5. There was no auto correlation problems in the data used in the research. Thus, regression model was applied.

### d) Regression

Regression test was carried out to find the contribution of the customer relationship management in customer satisfaction.

Table 5 : Standard regression coefficient.

Independent variable:- Customer relationship marketing	Dependent:- Variable customer satisfaction
β	0.460
Significance of F	0.000
R <sup>2</sup>	0.211
Adjusted R <sup>2</sup>	0.204

According to the regression results in the Table - 5, the fitted model encountered a significant relation between customer relationship marketing and customer satisfaction. The R<sup>2</sup> value multiplied by 100 tells the percentage of variance in one variable accounted for by the predictor variables. The R<sup>2</sup> value is 0.211so, that

21% Percentage or almost quarter the variance in Customer satisfaction is accounted for by the predictor variable CRM. Further it means customer relationship marketing positively impact on customer satisfaction.

*Table 6 :* Correlation analysis for mobile service providing companies.

Variable	Customer relationship marketing	Customer satisfaction
Customer relationship marketing	1	460** .000
Customer satisfaction	460** .000	1

Significant at; \*P < 0.05, \*\*P < 0.01  
Scale; Strong (r > .5), Moderate (r = .5), Weak (r < .5)

*Table 6* shows correlation the relationship between customer relationship marketing and customer satisfaction. Results indicate that the customer relationship marketing is weakly but positively correlated with customer satisfaction. However, correlation was highly significant.

Four main dimensions such as trust, commitment, empathy, and equity were used to measure the customer relationship marketing and four main dimensions such as reliability, responsiveness, functionality, and call charges were used to measure customer satisfaction. Therefore

Correlation (matrix) analysis was applied to identify the relationship among these variables and results are revealed in the table -7. Results revealed significant correlation among dimension of customer relationship marketing and customer satisfaction. Correlation between CRM and dimensions of the customer satisfaction such reliability, responsiveness, functionality and call charges were positively correlated. Finally hypotheses testing

Ho: There is no relationship between customer relationship marketing and customer satisfaction.

H1: There is relationship between customer relationship marketing and customer satisfaction.

Null hypothesis has to be rejected when p value is 0.05 as a rule. Here, researcher has tested in 1 % of the significant level. However, p value is less than 0.05 at 1 % of the significant level. There is chance to reject null and accept alternative hypothesis. Therefore, researcher rejects null and accept alternative one. There refers to that researcher rejects there is no relationship and accepts that there is relationship between customer relationship marketing and customer satisfaction.

## XII. CONCLUSION AND MANAGERIAL IMPLICATION

Although there are only five mobile service providing companies (Dialog, Mobitel, Airtel, Etisalat, Airtel) in the Sri Lankan mobile service market, the competition between them is more intense than ever. They compete not only in infrastructure facilities like network, tower. They have invested the lot of amount of money to provide effective service for customers. This research clearly expressed that important of functionality of service in service quality and customer satisfaction. Customer relationship marketing has significant impact on customer satisfaction. However, proportion of impact CRM on customer was low level. Reason for that most of mobile service providing companies fails to build the trust among their customers. Companies spent lot of time and money to build and maintain their companies' infrastructure facilities but their fail to take full effort to satisfy their customer needs with psychological view. According to this research, as to what mobile service providing companies have been doing, the priority should be given to how to reduce customer dissatisfaction and improve mobile service network facilities, service quality, customer retention, customer loyalty.

## XIII. LIMITATION AND DIRECTIONS OF FUTURE RESEARCH

This research has been successfully applied what has been learnt from the literature with the support from Sri Lankan mobile service market. In Sri Lanka, five mobile services providing companies are providing mobile services but three mobile service providing companies like Airtel, Mobitel, and Dialog have been taken to this study and remaining other two companies have been not considered into this study. Furthermore, to provide even more convincing evidence for the casual relationship among constructs. In addition, it is also of practical and theoretical significance to extend behavior intentions of customers and take constructs such customer relationship marketing and customer satisfaction into consideration to provide more useful suggestions for mobile service providers.

Table 7 : Correlation matrix.

	RE	RN	FU	CC	T	C	EM	E	CRM	CS
RE	1									
RN	.709**	1								
FU	.720**	.656**	1							
CC	.692**	.607**	.756**	1						
T	.319**	.188**	.282**	.425**	1					
C	.283**	.207**	.430**	.356**	.547**	1				
EM	.289**	.260**	.302**	.465**	.534**	.457**	1			
E	.411**	.274**	.460**	.242**	.438**	.477**	.411**	1		
CRM	.401**	.291**	.467**	.484**	.797**	.835**	.780**	.691**	1	
CS	.909**	.879**	.883**	.849**	.335**	.358**	.363**	.399**	.460**	1

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## Non Verbal Cues in Group Behavior Amongst Youngsters

By Ms. Navdeep Dhillon

*Thapar University, Patiala*

*Abstract* - This paper aims to study non verbal cues in group behavior amongst youngsters. For this analysis two groups (age ranging from 18-19 years) of 66 students, 45 boys and 21 girls were studied. They were studied at different time intervals and in different setting. It has been observed that there were various non verbal cues which were more prominent and expressive than the verbal interaction. The non verbal cues of the participants which occur throughout the interaction were more instrumental in shaping the group behavior than the verbal cues.

*Keywords* : *Communication, non verbal cues, group interaction.*

*GJMBR-A Classification* : *FOR Code : 200105 JEL Code : D23, H75*



*Strictly as per the compliance and regulations of:*



# Non Verbal Cues in Group Behavior Amongst Youngsters

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**Abstract** - This paper aims to study non verbal cues in group behavior amongst youngsters. For this analysis two groups (age ranging from 18-19 years) of 66 students, 45 boys and 21 girls were studied. They were studied at different time intervals and in different setting. It has been observed that there were various non verbal cues which were more prominent and expressive than the verbal interaction. The non verbal cues of the participants which occur throughout the interaction were more instrumental in shaping the group behavior than the verbal cues.

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## I. INTRODUCTION

Communication is an exchange and flow of information and ideas from one person to another. It is the basic necessity of human life, as integral and vital as our breath. People sustain in the society through their interaction with fellow beings where meaning is conveyed in an attempt to create a shared understanding. "It is the process of transferring of thoughts or an idea so that the mental picture perceived by the receiver is the same as that envisioned by the sender." (Robbins, 1989). This flow of interaction is indicative of relationships people share in any cultural and linguistic group. In a communicative situation, one active participant encodes and transmits the message and the other receives and decodes it. The encoding and decoding takes place at different dimensions mainly verbal (using a language system) and mysteriously non verbal (using signs, symbols, posture, gestures, facial expression, artifacts etc). Communication is not only about language, rather a great deal of interaction takes place without using words through non-verbal cues, which cut across cultural and language boundaries. Albert Mehrabian (1981) has held that transmission of message is effective only when all three aspects of communication- the verbal (words-7% impact), the vocal (intonation, pitch, volume -38% impact) and the visual (gestures, posture 55% impact) are in tandem with one another.

Non verbal cues which are natural, unintentional and unconscious broadcast our true feelings in any given moment also clue us into the feelings of those around us. Although affective reactions are influenced by both verbal and nonverbal cues, inferences about

relationships and feelings (affect) are more heavily influenced by non verbal cues. (Zajonc, 1980). Non worded messages can reinforce, replace or contradict what is being communicated verbally. When people are skeptical of the sincerity of the speaker or if there is a deliberate attempt to confuse the receivers through excessive verbiage, non verbal signals are used as a yardstick to measure words and intentions of the sender. D.S. Sundaram and Cynthia Webster (2000) state that nonverbal cue of the communicators enhances pleasant affect and reduces psychological distances between them. They also modify and reinforce verbal communication.

It is important to understand non verbal signals in relation to their context. Message conveyed through non verbal medium is susceptible to misinterpretation when observed by people from different backgrounds. Charul Jain and Madhumita Choudhary (2010) suggest that in the era of cross-cultural learning, non verbal, potentially one of the strongest medium of communication can become critical in defining and displaying meanings and intentions. Therefore it is important that while transmitting or interpreting messages one should not focus on single cue in isolation but to understand the full context in which they appear.

There is a rich variety of dimensions by which we transmit and receive meaning nonverbally. Highlen and Hill (1984) have identified areas of study in non verbal behavior as *paralinguistics*, *kinesics*, *facial expressions*, *visual behavior*, *proxemics* and *touch*. Later day researchers from cultural anthropology and linguistics have added *oculesics*, *artifacts*, and *chronemics* to the list. Communication, therefore, is much more than an understanding of the spoken or written language. Abercrombie, one of the proponents of the study of paralanguage believes, "We speak with our vocal organs but we converse with our entire bodies; conversation consists of much more than a simple interchange of spoken words" (Abercrombie, 1972: 67). Based on the discussion on importance of non verbal cues in communication, this paper aims to study the non verbal / vocal behavior and attitude of students in group interaction and what role it plays in building up mutual consensus. Most of the studies have been focused on individual non verbal cues, here in this paper, an attempt would be made to study non verbal cues in a group and how it shapes the group interaction.

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There is a large amount of rich non verbal communication that acts as a catalyst in shaping the group behavior during a predominantly verbal discussion.

## II. METHODOLOGY

In this paper, a qualitative analysis of non verbal cues in a group interaction is studied by using case study method. Two groups (age ranging from 18-19 years) of 66 students, 45 boys and 21 girls were studied. They were studied at different time intervals and in different setting. Two groups labeled A & B were made consisting of 33 students each. Further each group was randomly divided into 3 sub groups (11 students each) - A1, A2 & A3; B1, B2 & B3. Intentionally different topics were assigned to each group.

## III. CASE STUDY I

For group A, interaction started by assigning variant topics to groups A1, A2 & A3. Participants of group A1 & A2 were both boys and girls; whereas A3 group consisted only boys. There were certain non verbal cues which were more or less common to all the groups. Their Formal verbal introduction was accompanied by illustrators (mainly hand gestures) enforcing the speech and accentuating it. Initially the hands of the students were placed on the table, feet placed firmly under their chairs and their bodies open to reception, displaying responsive body posture. Emblems like head movements for 'yes' and 'no' were prominent throughout the interaction. Non participants interlocked their fingers closing themselves to the interaction. "Of all the parts of the human body that are used to transmit information, the eyes are the most important and can transmit the most subtle nuances" (Julius Fast, 1971). The students who had sufficient knowledge about the subject tried making eye contact with every member of the group whereas those with lesser information withdrew eye contact, giving a sign of submission. While perceptions of a communicator's credibility become more favorable with more frequent and appropriately longer eye contact, perceptions of distrust increase with the absence of eye contact (Hemsley & Dobb, 1978). It was also noticed that students who were overconfident about their subject knowledge and verbal speaking skills made little eye contact with other participants but more with the evaluator displaying their superiority over the others.

One difference that was noticed in the students of group A2 was that most of them were dressed in formal attire which brought about an added formality to their verbal interaction and projected immense confidence, competence and credibility. The affect of attire was visible in physical appearance and resulting perception. Studies suggest that physically attractive communicators are more persuasive (Chaiken, 1975),

successful in changing attitudes (Kahle & Homer, 1985) and are perceived as being more friendly than less attractive communicators.

As discussion proceeded there were many ideas to which everybody did not agree to, before verbal disagreement, their retaliation was visible through defiant cues, their postures became combative by leaning forward, hands getting raised and fingers pointing; clearly signaling disagreement with the speaker. Whenever we talk of gender differences, non verbal cues can also not ignore this aspect. There was a marked difference in the non verbal cues of group A3 which consisted of only boys. They had fixed facial expressions indicating lack of conformity, whereas the participants of the other two groups (mainly girls) had expressive facial expressions. It was also observed that during the combative interaction paralinguistic cues such as vocal pitch, vocal loudness, tone and speed of group A3 was more aggressive than the other two groups. During disagreements they displayed fugitive body posture, rejecting the communication by moving back, looking around and folding their arms and sometimes even banging on the table. These gestures were not seen in group A1 and A2. It was also noticed that during argumentation members of group A3 moved closer to each other asserting their views without any gender inhibitions. The distance reserved for acquaintances vary depending on cultural interpretation of distance (Jain & Choudhary, 2010).

Towards the end of the interaction, as one member was concluding verbally, the consensus was communicated by the other members through their non verbal cues (nodding of heads, facial agreements and relaxed body posture). Showing sensitivity and concern about time (chronemics) the interaction ended in the allotted time. Non verbal cues played vital role in shaping the group behavior.

## IV. CASE STUDY 2

On the same grounds, three sub groups of Group B also started their interaction on three different topics. Group B1 and B3 had almost equal no. of boys and girls whereas group B2 had more girls compared to boys. Eagerness of participation was visible through their open arms and hands at the onset of every interaction. They were completely engaged in the beginning, evident through their posture, they were leaning forward, pens down, and hands on the table. All the participants displayed responsiveness and enthusiasm by making eye contact with others. Members of the group, who had information on the topic but were not able to communicate due lack of vocabulary used hand gestures more frequently than the others and gave submissive amusing smiles when they fell short of appropriate language. Auberge and Cathiard (2003) showed that amused smiles carry much

more information than mechanical smiles. Smiles communicate different meanings and can relate to different underlying meanings. As the interaction progressed, it was noticed that the non performers tried to mask their lack of subject knowledge by giving deceptive facial expressions but refrained from making eye contact with the other group members and also displayed nervous hand and leg movements. Ekman and Friesen (1972) noted that expressive parts of the body which are regarded high in 'sending capacity' are easy to control and are less likely to allow deception leakage, whereas other parts like hands and legs are less controllable and hence emit more leakage than face.

In group B2, which consisted of more girls than boys, it was observed that girls were more assertive in their paralinguistic and body language compared to the other two groups. They displayed their leadership qualities through verbal and vocal cues, whereas the girls in the other two groups made use of occulesics (eye and facial movements) while asking their counterparts to give their views. The display of interpersonal warmth is more effectively communicated through non verbal channels (Sundaram and Webster, 2000).

It was observed that the participants who were seated in the center of the round table got an advantage of spatial arrangement. They projected more leadership traits as they had more communicative proximity with each member of the group whereas participants sitting on extreme corners displayed more paralinguistic cues such as vocal pitch, vocal loudness, tone and speed in order to give their opinion on the topic. Lack of proximity with the other members was posing a barrier to their effective verbal communication. Their fingers and hand gestures projected restlessness while waiting to participate in the interaction and used object adaptors (pens and pencils) to assert their views. It was with the aid of non verbal cues that even the participants sitting at a distance were able to convince others to their view point shaping consensus for the group.

As the interaction of group B3 extended beyond the allotted time, some members gave cues to others for concluding the interaction by use of artifacts (looking at their watches). They hurriedly gave an amicable conclusion to their interaction while their gestures displayed fugitive body posture.

## V. CONCLUSION

To conclude, non-verbal cues are very important in shaping the group interaction as has been observed in different groups across different settings and different timings. Nonverbal cues affect and get affected by the group dynamism. Cues of casual smiling, light laughter, forward body lean, open body posture, and frequent eye contact are perceived as

conveying intimacy and non dominance, the characteristics commonly associated with friendliness and courtesy (Sundaram & Webster, 2000). Non verbal signals are equally, perhaps more, important than verbal signals in persuasive communication. It is estimated that less than ten percent of interpersonal communication involves words, the remaining being made up of voice tone, sounds and a variety of devices such as kinetics (movement), haptics (touch), occulesics (eye-contact), proxemics (space) and chronemics (time) as well as posture, sound symbols and silence, which either replace or accompany words.

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# A Study on Value Chain Analysis in Paddy Sector: Special Reference to Kilinochchi District, Srilanka

By Sivapalan Achchuthan & Rajendran Kajanathan

*University of Jaffna*

*Abstract* - Value chain analysis is essential to an understanding of markets, their relationships, the Participation of different actors, and the critical constraints that limit the growth of livestock production and consequently the competitiveness of smallholder farmers. These farmers currently receive only a small fraction of the ultimate value of their output, even if, in theory, risk and rewards should be shared down the chain.

Objective : Main objective of the study is to evaluate the effectiveness of the paddy field's value chain in the karachchi division, Kilinochchi district. And environs with a view to achieving the following broad output, to identify the key value chain actors in the paddy sector; to find out key factors influencing on value chain analysis for paddy sector; to discover the strengths and weakness of each value chain actors; to discover the opportunities and threats of each value chain actors; finally to suggest the value chain actors to strengthening the paddy sector in accordance with benefits of socio and economic point of view.

*Keywords* : Paddy sector, Value Chain Actors & Analysis.

*GJMBR-B Classification* : FOR Code:150314 , 070105 JEL Code: Q51, Q12



A STUDY ON VALUE CHAIN ANALYSIS IN PADDY SECTOR SPECIAL REFERENCE TO KILINOCCHI DISTRICT, SRI LANKA

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# A Study on Value Chain Analysis in Paddy Sector: Special Reference to Kilinochchi District, Srilanka

Sivapalan Achchuthan<sup>α</sup> & Rajendran Kajanathan<sup>σ</sup>

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**Methodology** : Qualitative study, especially field interview method has been utilized to get the valuable information from value chain actors as input suppliers, individual farmers, and processing & marketing actors in the paddy sector.

**Conclusion** : Kilinochchi district is considered as Agricultural District and it is highly suitable place for paddy cultivation. Also Large scale farming is feasible. But unfortunately people in this district have to face many difficulties such as lack of infrastructure facilities, limited storage, financial and water facilities. Due to that government and nongovernment organizations should focus their activities toward paddy farming.

**Keywords** : Paddy sector, Value Chain Actors & Analysis.

## I. INTRODUCTION

Agricultural sector in Sri Lanka contributes nearly 12 percent to the country's GDP and employs 33 percent of its labor force. Since the independence, there have been several attempts by successive governments and non government organizations to improve the productivity of the small farm paddy sector. These include the promotion of the use of high yielding varieties, subsidization of farm input

supply, provision of credit facilities, and liberalization of both producer and consumer prices (Thayaparan, 2010). Further, Northern Province consists of five districts. Natural endowments of the province are the strength for development of agriculture sector in the region. Major sector for economic development of the northern region is agriculture which includes crop, livestock and inland fisheries. In developed countries, agriculture was a platform for industrial development. The pace of economic growth of the sector until the emergence of conflict in 1983 was satisfactory. The conflict over two decades had tremendous impact on agricultural growth in the country. Societies in the conflict areas which were badly affected both physically and financially are just emerging out of the impact of the war. Revival of economic assets, development of infrastructures and effective resource utilization are major considerations in the planning process while thinking of quick rehabilitation to meet the present day development requirement of the country. Rehabilitation provides a good opportunity for modernizing economic infrastructures ( Sivayoganathan, 2009).

In this way, this study focuses on the value chain analysis in the paddy sector in the Karachchi Division, Kilinochchi District, Northern Province of Sri Lanka. After the successive resettlement in the Karachchi Division, people move to agricultural, dairy and poultry sector activities. The nongovernment organizations as World Vision – Sri Lanka, United Nation Development Program – Sri Lanka and International Organization for Migration- Sri Lanka have focused on the livelihood program. Especially World Vision- Sri Lanka has already approached the livelihood program successfully. Further they also focused the theme on the value chain training program in the paddy sector, karachchi division. Therefore, this study has the valuable purpose as strengthening the value chain actors (individual farmers, input suppliers, and processing & marketing) in the paddy sector, Karachchi Division.

## II. STUDY OBJECTIVES

The main objective of the study was to undertake value chain analysis for paddy sector, Karachchi division, Kilinochchi District, Sri Lanka and

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environs with a view to achieving the following broad output.

- To identify the key value chain actors in the paddy sector.
- To find out key factors influencing on value chain analysis for paddy sector.
- To discover the strengths and weakness of each value chain actors.
- To discover the opportunities and threats of each value chain actors.
- To suggest the value chain actors to strengthening the paddy sector in accordance with benefits of socio and economic point of view.

### III. REVIEW OF LITERATURE

Over the past decade, Sri Lanka's traditionally agriculture-based economy has become increasingly dependent on the manufacturing sector, especially the garment industry. Although the relative significance of the agricultural sector has steadily declined in recent decade, it is still an important determinant of the country's gross domestic product (GDP) (Stads, Gunasena and Herath, 2005). According to the Prasada, Kodithuwakku, Weerasooriya and Amerasekara 2010, they approached an evaluation of development interventions from a beneficiary Perspective in northern srilanka, Findings revealed that, while the number of interventions has a positive relationship with beneficiaries' perceptions of the priorities by service providers in agriculture and infrastructure, the number of interventions in relation to basic needs have a negative relationship with similar perceptions. Community perception of priorities varied across the three sectors studied (agriculture, basic needs and infrastructure). The perception of a particular sector as a priority by the recipient coincided with the number of interventions only in the case of agriculture. Respondents perceived that service providers did not consider accessibility to infrastructure and resources as priorities.

Based on the study of Baddawalage and Karunagoda, 2010. The study finding revealed that a substantial variation in input use among farmers and their response to the expected price of rice to be significant. Substantial variations in the use of fertilizer and seeds were also found, while the labor usage pattern was consistent within the region. The productivity of small scale farming was higher than that of large scale farming. The results further indicated that farmers do not possess adequate knowledge about optimum management practices and most of them being part time farmers do not allocate sufficient time to follow management practices. The results also revealed that food security is the major concern to engage in

paddy farming. This is followed by the quality attribution. Also, most of the farmers are of the view that paddy farming is viewed as an inferior occupation by the society. Further, Value chain perspective has become recent international agriculture development strategy which includes all the activities that are undertaken in transforming raw material into a product that is sold and consumed. This includes the direct functions of primary production collection, processing, wholesale and retailing as well as support functions such as input supply financial service, transport, packaging and advertising. In this way, kilinochchi district is considered as feasible place to Agricultural development, and also it is considered as an agricultural district. Therefore this study has an influence on the value chain analysis in the paddy sector. And also the governmental and nongovernmental organizations may get the valuable information from this study to frame the better strategies among paddy sector in the northern part of the srilanka.

### IV. METHODOLOGY OF THE STUDY

#### a) Study Design

Qualitative study, especially field interview method has been utilized to get the valuable information from value chain actors as input suppliers, individual farmers, processing & marketing actors in the paddy sector. Further judgmental sampling method was used to select the respondents in the key value chain actors.

#### b) Respondents in the Input suppliers

Firstly, Owners of three retail shops providing weedicide, fertilizer, and agriculture equipments to the paddy sector located in the Karachchi division were selected and interviewed.

Secondly, managing directors in the CIC agri (pvt) ltd and Dave tractors (pvt) ltd in the karachchi division providing agricultural related products as harvester machines and tractors to the paddy sectors were selected and interviewed.

Thirdly, in the category of input suppliers, especially in the financial services, managing in charge of Bank of Ceylon, Kilinochchi district and credit officer in commercial bank, Kilinochchi district were interviewed.

Finally, Responsible persons in the Government organizations as Department of Agriculture, govt. seed production farm, Regional Agricultural Research and Department centre, Kilinochchi and Agrarian Service Center in the Karachchi division were selected and interviewed.

#### c) Respondents in individual farmers

Twenty individual farmers who have involved in the paddy farming activities, Karachchi division were selected and also interviewed by the research team. (Areas as Sivanagar, Maruthanagar, Panamkandi, Krishnapuram, and Vaddakachchi in Karachchi Division)

d) Respondents in the processing & marketing activities in paddy sector

Under this category, two rice mill owners (Balamurugan grinding mill, and Sivanarulselan grinding mill) who conduct the business in the large scale in the karachchi division were selected and interviewed.

V. DESCRIPTIONS OF THE STUDY AREA

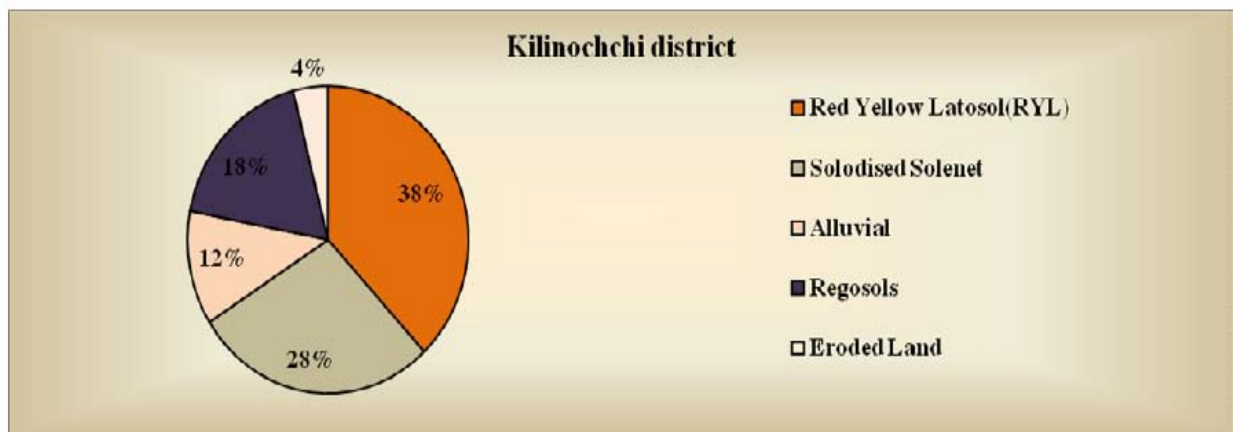
a) Introduction

Study area as Karachchi division is located in the Kilinochchi district, Northern Province of Sri Lanka. It has 42 GN divisions with 65000 populations approximately. The people in the karachchi division have involved in the agricultural activities. Generally, kilinochchi district is considered as the agricultural district in the Northern Province.

b) Land and Soil

According to the Comprehensive Master Plan for agriculture crop sector development, Northern

Province (2009), land of the region is relatively flat and of low elevation towards the coast. Six major soil groups have been identified in the region. The dominant group of soil in the region is Reddish Brown Earth (RBE). The association of Low Humic Gley (LHG) with RBE soil (92%) is well suited for paddy cultivation. Red Yellow Latosol, Non-Calsic Brown soil and Grumusol exist in Kilinochchi, Jaffna and Mannar areas respectively. The RBE has low organic matter content and the nitrogen and phosphorus status is usually low while potassium status varies from medium to low. These soils are very well supplied in calcium and magnesium, and they have a very good cat-ion exchange capacity. By tropical standards, these soils could be considered as having a very good chemical quality. The other soil types are alluvial of variable drainage and texture (4%), Rock Knob Plain (2%), Erosion remnants (1%) and Solodized Solonets & Solonchaks (1%).



Soil condition of the Kilinochchi district

c) Land Development

Land is a scarce resource in the region. Efficient and effective eco-friendly land use management, land conservation and preservation and appropriate/scientific land based resource management are imperative as the land expansion for agriculture is limited. Land use in relation to agriculture is given in Table 1.

Table 1 : Land Use Pattern in Kilinochchi district.

Total Land area (ha)	123711 ha
Agriculture land	59782 ha
Paddy irrigated land	12487 ha
Paddy rain fed land	12555 ha
Forest Land	35110 ha

Source: Comprehensive Master Plan for agriculture crop sector development. Northern Province, 2009.

d) Rainfall

According to the Comprehensive Master Plan for agriculture crop sector development, Northern Province (2009), The region falls under the low country dry zone. The total mean annual rainfall ranges from 1250 mm to 1720 mm out of which 65% - 75% is received during October – March period (Maha season) and the rest during April – September period (Yala season). The total rainfall in the region when compared with arid regions is high in aggregate terms but highly seasonal. The North- East monsoon is the main source of rain for the dry zone and lasts from October or early November to late December or early January. During these 2-3 months, most dry zone stations received 45% - 55% of the total annual rainfall. The rainfall during the pre North – East monsoon period, i.e., late September or early October is caused largely by cyclonic activity and provides another 20% - 25% of the rainfall. Thus,

about 65%-75% of the rainfall is concentrated into a period less than 4 months (October to January). Though occasional heavy rains occur in late March and early April, the seasonality of the rainfall is so marked that three to four months of drought is common in normal years. In lean years, there has been six months of absolute drought. These rainy periods determine the cropping seasons and cropping extent.

#### e) *Irrigation schemes*

According to the Comprehensive Master Plan for agriculture crop sector development, Northern Province (2009), there are 65 major and medium irrigation schemes and 698 functional minor irrigation schemes out of 2038 minor tanks. Iranamadu and Giant Tank are the largest and the oldest irrigation schemes in the region. The Irrigation schemes mainly depend on rainfall run off and river basins for capacity filling. As there are no perennial rivers, seasonal rivers drain off the rainfall water into the tank. Nevertheless, Surface runoff water is stored in the irrigation tanks. More than thousand minor irrigation schemes are available but only some of them are functional with irrigation system for crop cultivation.

## VI. VALUE CHAIN ANALYSIS

### a) *Introduction to value chain analysis*

Value chain actors as input suppliers, individual farmers, and processing & marketing in the paddy sector have been focused in this study. Strengths, weakness, opportunities and threats of each value chain actors are analyzed in the systematic way.

### b) *Individual farmers' perspective towards Paddy sector*

Twenty individual farmers who have involved in the paddy farming activities in Sivanagar, Maruthanagar, Panamkandi, Krishnapuram, and Vaddakachchi in Karachchi Division were focused and interviewed by the research team. And they generally cultivate some paddy varieties as Addakari ( local name), BG 300, BG 352, BG 351, CO-10, 406, 501, VG 11, Mottai Karuppan (local name), Kiri Samba ( local name), Kora, (local name) Kuruai (local name) etc.

#### *Challenges of the individual farmers towards paddy sector*

- Lack of labor force to conduct the activities in the paddy sector in karachchi division, labors in this area have involved in the road and building construction work in kilinochchi district.
- Labor cost is also the problematic one to the individual farmers; reasons behind the high labor cost are rocket speed inflation, high demand for labor in karachchi division.
- Lack of financial support in individual farmers, farmer organizations and co-op societies to cultivate the paddy sector in large scale.

- Planning and implementation of the Irrigation scheme as major and minor in karachchi division is in the question mark, because redevelopment of the particular scheme has not been done in the proper way.
- Ineffective waste management systems in the karachchi division, due to that both degradable and non degradable wastage generally block the water line for paddy cultivation.
- War period, Srilankan army have made the security boundaries with the help of large scale sand in karachchi division, due to that , water line for paddy cultivation through the channel system has been damaged in the dramatic way.
- Lack of support from governmental organizations as Department of Agriculture, govt. seed production farm, Regional Agricultural Research and Department centre and Agrarian Service Center in the Karachchi division. Only fertilizer is provided to the farmers with the minimum price.
- Lack of training and development programs related to the paddy field in karachchi division. The government organizations should concentrate on the training program in the continuous way.
- Lack of professional staffs in the Regional Agricultural Research and Department centre and Agrarian Service Center in the Karachchi division.
- People in the karachchi division are not ready to take the loans to cultivate the paddy in the large scale, because of the risks as marketing problems, risks in the weather condition, high cost of fertilizer, weedicide etc.
- Lack of knowledge in the paddy sector development, available financial service activities, agriculture services and other administrative activities related to the paddy sectors among people in the karachchi division.
- Ineffective transport facilities, road development is in the weakest level in the villages in the karachchi division, due to that, transporting of paddy seeds, fertilizer, paddy product in the large scale with the help of heavy vehicles is in the problematic one.
- Lack of marketing opportunities for paddy cultivation, business people from other districts as baticalo, Jaffna generally purchase the paddy product with large scale and ready cash, but unfortunately, individual farmers accept the business dealing with the minimum price. Because, they have the responsibility to settle the loans immediately after their harvesting event.
- Life time of the paddy product is lowest level especially now days, because harvesting activities are done by machines, in the machinery work,

humidity is the damaging factor to the paddy product. Due to that, drying facilities should be an important one to preserve the paddy product systematically.

- Price for paddy products is far low in the karachchi division.

#### *406 paddy variety*

Selling price of individual farmers / 1kg = 34 Rs (as a paddy)

Retail price of rice / 1kg = 55 Rs (as rice)

Differences in prices = 21 Rs / 1kg

- There is no control pricing system, government organizations as govt. seed production farm and Agrarian Service Center in karachchi division have not focused this marketing problems of the paddy sector

#### *Opportunities of the individual farmers towards Paddy sector*

- Introduction of the Machinery work has the competitive advantages than the labor force as cost effective, high speed, planned & neat work etc

Cost of harvesting / per ac (using machinery work) = 6000 Rs

Cost of harvesting / per ac (using labor work) = 20000 Rs

- Some minor irrigation schemes are developed by the government organizations, especially the project as vadakkin vasantham. (Like iyan tank in kirishnapuram).
- Government organizations as Department of Agriculture, govt. seed production farm, Regional Agricultural Research and Department centre and Agrarian Service Center have focused the agricultural activities after the resettlement of the people in karachchi division in the step by step procedures.
- Food security of the people in the karachchi division is in better position, almost 90 percentages of people involve in the agricultural activities.

#### *c) Input suppliers' perspective towards Paddy sector*

- Retail shops providing weedicide, fertilizer, and agriculture equipments to the paddy sector located in the Karachchi division*

Owners of three retail shops providing weedicide, fertilizer, and agriculture equipments to the paddy sector located in the Karachchi division were selected and interviewed (varaki retail shop, ambika retail shop, and green world retail shop). In Kilinochchi district, weedicides as CG rider ( chlorpyrifos 400 g/l EC), Countup, Sprit – 65, Granite 240 sc ( Penoxsulam 240 g/l sc), B.P.M.C ( fenobucarb 500 g/l EC) and

Fertilizer as Hayleys brand, Agstar brand, Asia commercial brand and CIC brand fertilizers are demanded by the people in the karachchi division.

They all pointed that marketing opportunities, especially in the maha and yala season are in the peak level. And also any loss from weedicide and fertilizer using for paddy cultivation has not been recorded yet now. Further in future the marketing opportunities of the weedicide and fertilizer will be increased. And also, the business can be expanded with help of the financial assistances from financial institutions as commercial banks, development banks, financial companies etc. further they all suggest the agro medicines to the farmers when they ask the solutions to the problems. Further, if the retail owners provide the credit facilities, the turnover will be increased dramatically. That will be the great signal to the development of the agricultural activities in the karachchi division. Because most of individual farmers are in the poverty level. At the same time owners of retail shops perceived that, the credit system is the most risky one. Because the earning possibilities of the paddy sector is in the question mark.

- Managing director in the CIC agri (pvt) ltd*

According to the URL of the CIC Agri (pvt) ltd, it is the leading agricultural company that manages over 10,000 Acres of its own Farm land, works directly with over 20,000 rural farmers and produces a variety of Agriculture & Livestock products like Seed Paddy, Rice, Fruits, Vegetables, Eggs, Yoghurt, Curd etc under its own Brand name for the local and export market, CIC Agri Businesses works with a strong commitment of enhancing farmer incomes, improving the Rural Economy and contributing towards the Development of Agriculture in Sri Lanka with a view of transforming the island Towards Nutritious & healthy Nation.

According to the statement of the Managing director in the CIC agri (pvt) ltd, Kilinochchi, Company generally provides the agricultural related products as weedicide, fertilizer, paddy seeds, harvester machines and tractors to the paddy sectors in the Karachchi division. Further, CIC agri ( pvt) provides the agricultural services to the people in the kilinochch district through opening the branch. Generally weedicide, fertilizer, and seeds are manufactured by the company. And harvester machines and tractor machines are sold by the company through the marketing strategy as the distribution strategy. And also the marketing opportunities in the kilinochchi district is in the better position, people in the particular division have raised the demand for the CIC brands already. Better profit has been recorded in the kilinochchi district compare with other districts in the Northern Province

- Managing directors in the Dave tractors (pvt) ltd in the karachchi division*

According to the URL of the Dave tractors (pvt) ltd, it is the right foundation laid in this agricultural

business, Dave Tractors (Pvt) Ltd was founded in the early 90s. Since then Dave Tractors has reached its highest level of success in the business of Agricultural equipment. Dave Tractors is the exclusive distributor in Sri Lanka for John Deere Agricultural Equipment, Golf/Turf/Construction and Consumer equipment. Dave Tractors is the Sri Lankan largest importer & distributor for Agro Machinery. Our Exclusive brands are sold in all parts of Sri Lanka with the support of more than 100 Dealers Island wide. The core products as Four Wheel Tractors, Power Tillers, Tractor Driven Combine Harvesters, Track Combine Harvesters, Mini Combine Harvesters, Combine Threshers, Rice Reapers, Bowsers all types, Trailers, Disc Ploughs, Tillers, and Rotovators.

*According to the Managing Director of the Dave tractors (pvt) ltd, kilinochchi district,* the company provides the harvester machines as standard combine harvester and tractors to the paddy sectors. Generally john deer brands are demanded in kilinochchi district, because, brand like john deer are manufactured by the high technological base. Due to that, the competitive advantages like cost effective, high speed, minimum wastage, and organized work are the better benefits to the customers.

Harvester and tractor are the high cost products in Sri Lanka. Especially in kilinochchi district, customers of these products are individual farmers who have not enough financial sound. But, fortunately financial institutions provide the leasing facilities to the individual farmers. Approximately, 200 harvester machines and 250 tractors were sold in the years 2010, 2011, and 2012.

*NOTE : Cost of the harvester and tractor*

*Cost of the Harvesters = 17.95 lacs, 24.25 lacs, and 42.95 lacs (Three varieties are available)*

*Cost of Tractors = 14.74 lacs, 15.60 lacs, 19.50 lacs and 24.25 lacs (Four varieties are available)*

*Technical Data for the Standard combine harvester*

<i>Steering</i>	<i>Power</i>
Cutter bar width	3657 mm
Cutter bar height	80mm – 800mm
Threshers drum width	1257mm
Threshers drum rpm	680-900 rpm
Concave width	1285mm
Grain tank capacity	1050 kg
Cutting capacity	1.5 – 2 acres per hour
Fuel consumption	4 liters per hour

He also pointed that 40 percentage of the people have failed to settle the installments on lease, therefore, they all have lost the machines and initial payment on lease, due to that, the responsible authority from government and non government organizations should focus on the particular problems.

- iv. *Managing in charge of Bank of Ceylon, Kilinochchi district and credit officer in commercial bank.*

*Managing in Charge of Bank of Ceylon*

In Karachchi division, twenty-five loans especially to the paddy and dairy sector have been provided to the people who have involved in the agricultural sector successfully. The resettlements of these loans are in the 90 percentage level. Further, the banks are ready to provide the loans with minimum procedures as two government employees' grantees, and required insurance. But most of the people involving in the agricultural activities have the lack of awareness towards loans, and also perceive in the negative way. Therefore, non government and government authority should conduct the training and development program on the financial availability and its procedures.

*Credit officer in commercial bank*

Private commercial banks in the kilinochchi district have the rigid procedures of loaning system compare with government oriented commercial banks, in the private sector, the commercial bank has the better loaning system to the self employment, in the island wide, even though in the karachchi division, the activities of the loaning system in the dairy and paddy sector is in the lowest level. Least percentage of loans has been provided to the paddy sector. It is the far lowest level compare with other districts in the Northern Province. Resettlement of the loans is in the question mark especially in the self employment purpose, because, people generally get the loans for the self employment purpose, but they use the loans for building constructions (housing) and other personal purpose. Due to that the credit unit and manager in charge of commercial bank in the kilinochchi district have the risks to provide the loans to the people.

- v. *Government organizations as Department of Agriculture, Agrarian Service Center in the Karachchi division*

*According to the URL of the Department of Agriculture (DOA),* its functions are under the Ministry of Agriculture and the DOA is one of the largest government departments with a high profile community of agricultural scientists and a network of institutions covering different agro ecological regions island wide. The objectives of the DOA are focused on maintaining and increasing productivity and production of the food crop sector for the purpose of enhancing the income and living condition of the farmer and making food available at affordable prices to the consumer. The major functions of the DOA include research, extension, production of seed and planting material, regulatory services related to plant quarantine, soil conservation and pesticides.

*In the kilinochchi district,* the services of the department of agriculture and Agrarian service center

are being improved in the dramatic manner. But the services of the particular government bodies are not enough one to the farmers.

*Services of department of agriculture and Agrarian service center in Kilinochchi district*

- Agriculture field officers from the government bodies give the awareness to the farmers in the continuous way through the field visits. And also give the solutions to the problems like diseases, paddy sector maintenance etc.
- Government bodies generally conduct the training and development program related to the paddy cultivation in kilinochchi district.
- They give the agro medicines to the farmers when the uncontrolled diseases are spread in the region.
- They also gives the fertilizer , weedicide with the minimum price as controlled price
- Minor irrigation schemes (within the 200 acres) are maintained by those government bodies, Major schemes (beyond the 200 acres) are maintained by the separate irrigation schemes. Further, approximately 400 minor tanks are under the control of the Agrarian Service Center in the Karachchi division.
- Channeling system and transportation system also are controlled by those government bodies in karachchi division.

*NOTE : Not enough professional staffs and labors in the department of agriculture and Agrarian service center in kilinochchi district, at the same time, kilinochchi district is considered as agro based district in the north part of the srilanka. Therefore, governmental authority should consider the problem and give the proper solution to the problem like lack of human resources.*

vi. *Regional Agricultural Research and Department centre, Kilinochchi*

*Services provided by the Research Center*

- *Providing seed paddy samples of high yielding rice varieties acceptable grain quality characters, pest and diseases resistance & resistant to abiotic stresses*
- *Dissemination of proven technologies on Plant Protection, Agronomy, Soil Fertility, Water Management to enhance the profitability and productivity of rice production*
- *Dissemination of proven technologies and newly improved rice varieties*
- *Distribution of seed paddy of newly bread rice varieties*

- *Providing Limited field visits and diagnosis of problems (pest, disease, weed, fertility, environmental, varieties etc.) of rice cultivation*
- *Soil testing for identified problems and recommendation of fertilizer for specific locations*

In Kilinochchi district, research center has 35 acres owned land for research and development, in which, research center conduct the research activities through cultivating the paddy and other vegetable plants. And also eight professional workers & twenty-seven labors are functioning in the research center. This center is the great infrastructure center to the kilinochchi district, because, it helps to improve the agro based business and self sufficient in the foods. Further, the center has not enough professional staffs to conduct the research activities in the large scale with an effective and efficient way.

vii. *Govt. seed production farm, Kilinochchi*

It provides the services as production of basic seed and planting material, production and distribution certified seed with contract growers, management of government seed farm, maintenance of buffer seed stock, and coordination of seed paddy supply program. In kilinochchi district, seed production farm has 100 acres owned land, in which 72 acres have been utilized for the paddy cultivation. Three office workers and forty labors are functioning under the govt. seed production farm, kilinochchi. Further, the farm has the drying and storing facilities with large scale.

d) *Respondents in the processing & marketing activities in paddy sector*

Two rice mill owners (Balamurugan grinding mill, and Sivanarulselvan grinding mill) who conduct the business in the large scale in the karachchi division were selected and interviewed.

i. *Mill owners' perspective towards paddy sector*

Six large scale grinding mills are functioning in the karachchi division, and also some small scale grinding mills also are functioning in the region. Balamurgan and sivanarulselvam are the leading grinding mills.

*Challenges of the value chain actors as grinding mills*

- Lack of financial support, and also interest payment for loans is in the problematic one. Because, the earning capacity is not fulfilled the interest and installments timely.
- Lack of labor force, owners is ready to pay the attractive pay, but most of the labor force are functioning in the road development and building construction.
- Lacks of awareness in the marketing strategies in the promotional perspectives, mills are utilized in the



- Lacks of awareness in the marketing strategies in the promotional perspectives, mills are utilized in the large scale, but, they don't know how to market the paddy related products in the island wide.
- Lack of communication between individual farmers and mill owners, most of the individual farmers have the business dealing with other province whole sellers, because of the ready cash, unfortunately, most of the farmers are cheated by the whole sellers (fraud in the weigh system of paddy product). Even though, local mill owners are ready to pay the fair value to the paddy products with the two weeks' time. But most of the farmers have the interest to deal with the whole sellers with ready cash from other province.
- High electricity payment, because machinery work, large amount of electricity power is required to conduct the processing. And also oil price is also in the highest level.
- Lack of educational background to expand the business in the island wide and export oriented, at the same time, the opportunities as great amount of supply of paddy product in the maha and yala seasons.

*NOTE : Opportunities of value actors as mill owners in the paddy sector as all the process can be done by the machinery work. Due to that efficient and effective work are the competitive advantages in the machinery work rather than the manual work.*

#### *Bala murugan grinding mill*

Processing capacity as 8,000 kg per day  
Storing capacity as 36,0000 kg  
8 workers

#### *Sivanarulselvam grinding mill*

Processing capacity as 25,000 kg per day  
Storing capacity as 108,0000 kg  
15 workers

## VII. RECOMMENDATION FOR VALUE ACTORS IN PADDY SECTOR IN KARACHCHI DIVISION

- Government sectors and non government organizations should focus on the marketing facilities of the paddy related products, because Paddy marketing has been one of the major constraints for paddy producers resulting in the realization that paddy cultivation is not a profitable venture. Paddy farmers are unable to market with optimum price and compelled for distress sale.
- Government oriented financial institutions as bank of Ceylon, people's bank and national development banks should focus the special scheme as loans and insurance for paddy sector to support the individual farmers, farmer organizations and co-op societies to cultivate the paddy sector in large scale.
- Planning and implementation of the Irrigation scheme should be done in the proper way to get the maximum yield from paddy cultivation.
- Waste management systems in the karachchi division should be planned and implemented in the effective way, responsible government authority should focus on the problem. Therefore both degradable and non degradable wastage can be processed systematically.
- Training and development programs related to the paddy field in karachchi division. Both government organizations and nongovernmental organizations should concentrate on the training program in the continuous way to give the awareness on available financial service activities, agriculture services and other administrative activities related to the paddy sectors.
- Lack of professional staffs in the Regional Agricultural Research and Department centre and Agrarian Service Center in the Karachchi division. Therefore central and local governmental bodies should focus on the problems.
- Road development should be focused in the regions especially in the villages, transporting of paddy seeds, fertilizer, paddy product in the large scale with the help of heavy vehicles may be helped by the redevelopment of the roads.
- To provide the skill development program in the continuous way to maintain the large scale paddy cultivation among individual farmers.
- Regional Agricultural Research and Department centre, Kilinochchi should focus on the research activities to find out the paddy varieties, diseases and better solutions for the diseases to get the better yield.
- Non government organizations can conduct the training programs to strengthen the relationship between value chain actors as individual farmers, mill owners, and retail shops in the karachchi division, in which problems and better solutions in the paddy cultivations and paddy business can be analyzed in the systematic way.
- 40 percentages of the people in karachchi division in purchasing the harvester machines have failed to settle the installments and interest. Therefore they have lost the initial payments and machines. At the same time 60 percentage of people have gained the advantage on lease , because the machine' s cost is in the highest level, leasing facilities are important one to get the high cost machine. Therefore the better training program should be focused by the nongovernment organization on the fact like



financial leasing and its nature. People in the region have the lack of educational background; due to that experts in the financial management should be assigned to give the awareness among people who have involved in paddy cultivation.

- Lack of educational background among owners who have the grinding mills in the large scale to expand the business in the island wide and export oriented, at the same time, the opportunities as great amount of supply of paddy product in the maha and yala seasons are in karachchi division. Due to that, training program on the international marketing can be conducted by the marketing experts with the help of the nongovernmental organizations.

## VIII. CONCLUSION

According to the Comprehensive Master Plan for agriculture crop sector development, Northern Province, Value chain perspective has become recent international agriculture development strategy which includes all the activities that are undertaken in transforming raw material into a product that is sold and consumed. This includes the direct functions of primary production collection, processing, wholesale and retailing as well as support functions such as input supply financial service, transport, packaging and advertising. In this way, kilinochchi district is considered as feasible place to paddy cultivation, and also it is considered as a agricultural district. Therefore, the value chain analysis in the paddy field, in karachchi division helps to government, non government organizations, policy makers and educators to enhance and update the information in the paddy field in karachchi division.

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Annexure : Participants as Individual farmers' Signature

Division:- Karachchi  
 GN Division:- D-3 Pannan kandy - rambha Donar - raxar Sidorakov  
 Date:- 19/07/2012  
 Programme:- Value Chain Program for Agriculture.

No	Name of Beneficiary	Male	Female	Signature
1	Albong Jeyarasa.	✓		[Signature]
2	Kanni Balasinkam.	✓		[Signature]
3	Sellaththurai Rames.	✓		[Signature]
4	Manimeetha Ramakany	✓		[Signature]
5	Kattasamy Kattakusa.	✓		[Signature]
6	Ralendiram - Sadarjoram	✓		[Signature]
7	Manimathu - Visvanathan	✓		[Signature]
8	Sinnaiya. Annamalai.	✓		[Signature]
9	Karubbaiva. Renkasan	✓		[Signature]
10	Velubbi Iai Rajenthiran	✓		[Signature]
11	R. Alakucantharam.	✓		[Signature]
12	R. Raththiran.	✓		[Signature]
13	A. Varter	✓		[Signature]
14	B. Parameswary		✓	B. Parameswary
15	J. Jayanthi malar.		✓	J. Jayanthi malar.
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# Factors Affecting Quality of Work Life: An Analysis on Employees of Private Limited Companies in Bangladesh

By Mohammad Baitul Islam

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**Abstract** - Quality of work life is a critical concept with having lots of importance in employee's life. Quality of work life indicates a proper balance both in work and personal life which also ensure organizational productivity and employee's job satisfaction. This research study attempted to find out the factors that have an impact and significance influence on quality of work life of employees in private limited companies of Bangladesh. To begin with the factors are identified through literature review and current context of Bangladesh. Seven factors were found and a quantitative research was done. After developing a questionnaire, survey was conducted among 100 employees. The outcome of the research is that six out of seven factors (work load, family life, transportation, compensation policy and benefits, working environment, working condition and career growth) have significant influence on quality of work life. The study concluded that an appropriate organization culture, compensation policy, career growth and relative facilities can leads to a satisfied employee mindset which ensure the overall organization productivity.

**Keywords** : *Quality of work life, Job satisfaction, Organization Productivity, Career, Organization Culture, Relative Facility.*

**GJMBR-A Classification** : *FOR Code: 150305, 150311 JEL Code: J28, O15*



*Strictly as per the compliance and regulations of:*



# Factors Affecting Quality of Work Life: An Analysis on Employees of Private Limited Companies in Bangladesh

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## I. INTRODUCTION

In Bangladesh a good number of people are working in private sector and they contribute a certain level of valuable time to their companies. In there, they give their best effort to get an appreciation and for company's goodwill. But quality of work life is such a concept which needs a certain balance both in professional and personal life. This research is all about identifying the factors that directly affects one's quality of work life. It is very important to have a positive quality of work life experience if someone wants to give his or her 100 percent effort to the company. Quality of work life is a philosophy or set of principals which holds that people are trustworthy, responsible and capable of making valuable contribution to the organization (Rose, Beh, Uli & Idris, 2006). However, quality of work life is directly influenced by job satisfaction and external environment and personal like. There should have be a proper level of balance in work life and total life space. In my research, I have identified some major factors that

may directly affect the quality of work life experience and the factors are, work load, working condition and career growth, compensation and benefits, working environment which are directly influence the job satisfaction. These factors are controllable by the company. Besides, family life and transportation facilities are the other factors that directly influenced individual's mental motivation in Bangladesh. However, the meaning of quality of work life may vary to different people. So the primary objective of this research is to test the reliability of identified factors that influenced the quality of work life and the insights are captured from the employees of private limited companies of Bangladesh. Based on the primary objective and data evaluation, a recommendation has been drawn in my research.

## II. BACKGROUND OF THE STUDY

It is very important for employees to have a sound mindset in their work field in order to utilize their full potential and to add value to the organization. A satisfied employee is an asset for a company as he or she will ensure the full productivity. To begin with, quality of work life is such a concept that directly related to the satisfaction. According to Dolan, Garcia, Cabezas and Tzafir (2008), quality of work life is a major concern for employees and how organizations compact with this issue is both of academic and practical consequence. Therefore, job satisfaction and satisfaction in private life both are important for having a positive quality of work life experience. Mostly the quality of work life considers the work life and it is to change the climate at work along with human-technological-organizational interface (Luthans, 1995). According to (Davis & Cherns, 1975; Sashkin & Burke, 1987), quality of work life is not only enhancing the company's productivity but also employee identification and a sense of belonging and pride in their work. Based on various researches we can identify some determinants of quality of work life which are – adequate and fair compensation, safe and health work environment, opportunity for career growth and security, social integration in the work organization which relates to freedom of speech, work and total life space and the social relevance to the work.

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In Bangladesh candidate's supply is more than the demand therefore it is difficult to find one's suitable job in the market. Though the private companies are increasing but employee satisfaction is still a major concern for quality of work life. Along with that, in Bangladesh employee satisfaction can be hampered by private life also. Transportation engagement is a major part of private life and in Bangladesh lack of transportation facility is a vital issue for late coming in the office. In this study I have included family life and transportation facility in to the quality of work life concept. These two factors are also related to mental health of employees and a sound mental health is very important to gain enthusiasm in the work. However, I have also included some other factors which works inside the organization and also related to quality of work life of employees.

In the context of quality of work life, organizations have policies and benefits for proper employee valuation. Quality of work life is often considered in two direction, one is to removal of negative aspects of work and working conditions and other direction is the modification of work and working conditions to enhance the capability of employees and to promote behavior which important for individual and society (Kotze, 2005). According to Dessler (1981), quality of work life was seen as the level to which employees are able to satisfy their personal needs not only in terms of material matters but also of self respect, contentment and an opportunity to use their talents make contribution and for personal growth. So it is very important for an organization to provide employees proper valuation which will satisfy them and will ensure the productivity.

### III. RESEARCH OBJECTIVES

#### a) *Broad Objectives*

- Determining the Factors Affecting Quality of Work Life: An Analysis on Employees of Private Limited Companies in Bangladesh.

#### b) *Specific Objectives*

- Determining the variables that affect the quality of work life of employees.
- Determining which variable plays the most significant role on quality of work life.
- Establishing hypothesis on the basis of the research work.
- Drawing a qualitative and quantitative conclusion on the basis of the survey.

### IV. LITERATURE REVIEW

Based on researchers analysis numerical articles have been written on quality of work life. In case of Bangladesh the research article on quality of work life

is very few. In this study I have tried my best to introduce some concerning factors that affects the quality of work life of those people who are working in private sector of Bangladesh. I do believe several advantages are associated with my study. Quality of work life is such a concept that indicates a balance both in personal and professional life of an individual. Therefore; it can be hampered if someone is not satisfied with his or her work life or family life. However; positive quality of work life experience is very important and it is directly interrelated with job satisfaction and productivity. It is a fact which also controls the mental health. According to Plug, Louow & Gouws (1991) mental health is a state of relative good alteration that is escorted by feeling of satisfaction, a zest for life and the actualization of potential skills as well as absence of psychopathological conditions. So to have a positive quality of work life experience, a good quality of life is very important. Mendola and Pellingrini (1979) summarized quality of life as it is the individual's accomplishment of a satisfactory social situation within the limits of apparent physical ability. Every human has a concern about their life and quality comes out when it the concentrations ends with some specific points. According to Shin and Johnson (1978) Quality of life is the ownership of resources necessary for the satisfaction of individual needs, wants and desires, participation in the activities permitting personal development and self actualization and satisfactory comparison between oneself and others. Moreover, a proper balance in quality of work life can generate more productivity for an organization. A satisfied employee can give more than 100 percent contribution to his or her company. If we consider the whole organization as an internal environment then it becomes very important to have optimum work pressure, accurate benefits and enough facility along with career development within the company. All of these interrelated with the job satisfaction and therefore quality of work life. Besides, if we consider the external environment then family life, social status and transportation will be the vital factors. So having a proper balance in these areas is also important.

In Bangladesh a great amount of people are working in private limited companies and the number of private company is increasing day by day. Considering the large number of population, in Bangladesh the human resource supply is more than the demand. Therefore, the bargaining power is more for company where candidates are having less bargain power. On the other hand, lots of employees are not running on their suitable jobs. It seriously affects their career development. Most of the employees consider compensation package and benefits, position, work load and career development as their satisfaction benchmark. However, in Bangladesh transportation facility is another very important factor that directly

affects employee's mental health. Based on this, some upper level company like Grameenphone limited, Robi, Unilever Bangladesh, Nestle Bangladesh, Banglalink, some private banks, private universities has develop their own culture and working environment. Besides, a good compensation package and benefits are offered by them. All of these are important for job satisfaction and finally quality of work life. In Bangladesh, companies are mainly performance oriented and their organizational culture and work pressure may be the reason of dissatisfaction in quality of work life. As human supply is more so high turnover rate and high competition is also a major concern regarding quality of work life.

Quality of work life has been defined in various ways. According to Rose, Beh, Uli and Idris (2006); quality of work life is a philosophy or set of principals, which holds that people are trustworthy, responsible and capable of making a valuable contribution to the organization. It also involves respect and the elements that are relevant to an individual quality of work life include task, working environment, organizational culture, administrative system and the relationship between on the job and off the job life. Serey (2006), define quality of work life as it is a certain and best meet the existing work environment along with meaningful and satisfying work. It also includes:

- a. an opportunity to implement one's talents and abilities to face challenges that require independent initiative and self direction.
- b. an activity thought to be valuable by the individual's involvement.
- c. an activity in which the role of individual in achievement of some overall goals is understandable.
- d. a sense of taking pride in what one is doing and in doing it well.

Lau, Wong, Chan and Law (2001) measures quality of work life as the favorable working atmosphere that chains and promotes satisfaction by giving employees with rewards, job security and career development opportunity. Therefore quality of work life and its relationship with employee health and performance has become an explicit objective for many of the human resource policies in modern organizations (Dolan, Saba, Jackson & Schuler, 2007). Heskett, Sasser and Schlesinger (1997) summarize quality of work life as the outlook that employees have towards their job, colleagues and organization that light a chain leading to the organization's growth and profitability.

Quality of life is such a concept which is basically associated with satisfaction mainly in the work life and Mirvis and Lawler (1984) highlighted that salary, working hours, working condition, safe working environment and opportunities for advancement describes- the basic components of a good quality of work life. Hackman and Oldhams (1980) suggest the

constructs of quality of work life in relation to the interaction between work environment and personal needs. Along with structural modification good relation between supervisor and subordinates is important for a good quality of work life (Bertrand and Scott, 1992). Quality of work life refers the quality of life that is associated with job characteristics and work conditions as well as capability of shaping a job with an employee's option, interest and needs (Lawler 1982; and Beukema 1987; Datta 1999). Katzell et. Al (1975) defined quality of work life more broadly as an individual's valuation of the outcome of the work relationship. They observed employee can have positive quality of work life if he has positive feelings towards his job, if he is motivated with his private life and if he has a balance between the two terms of his personal values.

To conclude, most of the studies on quality of work life are focused on personality and job satisfaction in where some studies also focused on motivation, organization culture and individual's needs and desire. In the context of Bangladesh the most important factors that directly affect the quality of work life are work load, compensation and benefits, colleagues and supervisor, working condition and career development, working environment, family life and transportation facilities. After evaluation of studies and considering the nation these factors individually has an impact on quality of work life.

## V. CONCEPTUAL FRAMEWORK

A conceptual framework has been developed (Figure 1) that is one of the relative construct of this study.

## VI. HYPOTHESES DEVELOPMENT

Based on research question following hypotheses has been developed for the study-

$H_1$ = Word load has an impact on quality of work life of the employees

$H_2$ = Family life affects the quality of work life of the employees

$H_3$ = Transportation facilities affect quality of work life of the employees

$H_4$ = Compensation and benefits affects quality of work life of the employees

$H_5$ = Colleagues and supervisor relationship affects quality of work life of the employees

$H_6$ = Working environment has an impact over quality of work life of the employees

$H_7$ = Working condition and career growth opportunities affects quality of work life of the employees

## VII. RESEARCH METHODOLOGY

The type of research used in this article is of descriptive nature. Through this descriptive research, the article sought to determine the answers to why,

what, where and how questions of the existing employees in public sector of Bangladesh and their expectations. It also involves collecting information that explain people's beliefs, knowledge, attitude and behavior (Fink, 1995, Sommer & Sommer, 1996). Primary data was collected through telephone and online survey for analysis and secondary data was be used as a support tool.

A total of 100 sample size considered to be adequate for my study. Each and every response is checked thoroughly for incomplete and missing response. The questionnaire has two parts in were the first part contains some demographic information. Table 1 gives a proper summary of this sort of information. In the second part, the questionnaire contains 32 items to construct the seven independent variables along with a dependent variable in my study. The selected independent variables are: work load, compensation and benefits, colleagues and supervisor, working environment, working condition and career growth, family life and transportation. A five point Likert scale (1= Strongly Disagree to 5= Strongly Agree) was used to collect data from the respondents. The questionnaire was outlined in English and understandable. Reliability analysis was done to identify the reliability of my study. Beside this, regression analysis, hypothesis testing was done for a proper justification and to draw an appropriate recommendation in my study.

## VIII. DATA ANALYSIS AND FINDINGS

### a) Demographic Data Analysis

My study contains 69% male respondent and 31% female respondent (Table 1). Among them 94% respondent's age is in between 21-30 years and rest of 6% respondents is under 31-40 years of age. However, 44% respondents already have 2-3 years of professional experience in where 27% respondents have 3-5 years of experience. Moreover, some fresher's are having 1-2 years of experiences are also included in my study and the percentage is 23%.

### b) Secondary Data Analysis

A reliability analysis is commonly used to identify the internal consistency of the variables. However, Cronbach's alpha is commonly used to test the reliability and the range of alpha coefficient value is in between 0 to 1. The higher value indicates the higher reliability (Hair, et al., 1992). A value more than .70 is significantly good measure for sufficient scale of reliability (Cronbach, 1951, Nunnally, 1987). According to the Cronbach's alpha test the value of alpha in my study is 0.732 (Table 2 & Table 3) which is higher than minimum acceptable value. Therefore, 73.20% of data are reliable in my study. This reliable analysis has been done for all dependent and independent variables and so far I am satisfied. Besides, this reliability test contains 32 items based on which I make my hypothesis test. A

mean scores of the factors of QWL with standard deviation also shown (Table 4) in my study.

### i. Hypotheses Testing

To conduct the hypothesis test a regression analysis has been done and seven factors which have an effect in quality of work life are considered. However, details of the influence of independent variable over dependent variable have been shown in Table 7.

First hypothesis was  $H_1$ , Word load has an impact on quality of work life of the employees. According to the analysis, the significance value for the hypothesis is 0.000, which is less than level of significance  $\alpha = 0.05$ . So, null hypothesis is rejected and  $H_1$  is accepted. Second hypothesis was  $H_2$ , Family life affects the quality of work life of the employees. According to the analysis, the significance value for the hypothesis is 0.000, which is less than level of significance  $\alpha = 0.05$ . So, null hypothesis is rejected and  $H_2$  is accepted. Third hypothesis was  $H_3$ , Transportation facilities affect quality of work life of the employees. In this case, the significance value for the hypothesis is 0.007, which is less than level of significance  $\alpha = 0.05$ . So, null hypothesis is rejected and  $H_3$  is accepted. My fourth hypothesis was  $H_4$ , Compensation and benefits affects quality of work life of the employees. Here, the significance value for the hypothesis is 0.000, which is less than level of significance  $\alpha = 0.05$ . So, null hypothesis is rejected and  $H_4$  is accepted. My fifth hypothesis was  $H_5$ , Colleagues and supervisor relationship affects quality of work life of the employees. According to the analysis, the significance value for the hypothesis is 0.332, which is greater than level of significance  $\alpha = 0.05$ . So, null hypothesis is accepted and  $H_5$  is rejected. Sixth hypothesis was  $H_6$ , working environment has an impact over quality of work life of the employees. The significance value for the hypothesis is 0.014, which is less than level of significance  $\alpha = 0.05$ . So, null hypothesis is rejected and  $H_6$  is accepted. Final hypothesis was  $H_7$  working condition and career growth opportunities affects quality of work life of the employees. The significance value for the hypothesis is 0.009, which is less than level of significance  $\alpha = 0.05$ . So, null hypothesis is rejected and  $H_7$  is accepted.

### ii. Regression Analysis

From the regression analysis (Table 5), I found the R square value to be 0.425 meaning 42.5% of the variability in the quality of work life of employees in the private limited companies in Bangladesh can be explained by these seven independent factors. In this case the independent variables are work load, family life, transportation, compensation policy and benefits, colleagues and supervisor, working environment and working condition and career growth. From the ANOVA table we see that the significance value is 0.000 (Table

6), thus proving that the model is valid and significant. However, among 7 factors six of them (work load, family life, transportation, compensation policy and benefits, working environment, working condition and career growth) have positive and significance influence on quality of work life. Only single factor named colleagues and supervisor has no significance impact on quality of work life. Probably, respondents have given less notice on it.

### iii. *Limitation*

This research study has some limitation and the major limitation factor for this report is complexity of the topic. Since the survey will be conducted on questionnaire therefore it is a great challenge to ensure the actual validity of the response. In some cases, the topics were not understood by the employees who have minimal idea about the quality of work life. Respondents are selected only from Dhaka city; therefore this research does not reflect the perception of employees of each corner of Bangladesh. However unwillingness of respondents was another limitation of my study. Moreover, R Square (0.425) is comparatively low which means that other factors can also influence the quality of work life of employees in private limited companies of Bangladesh.

## IV. CONCLUSION AND RECOMMENDATION

This research study is tried to examine the factors that have an impact on quality of work life of employees of private limited companies in Bangladesh. The seven factors are work load, family life, transportation, compensation policy and benefits, colleagues and supervisor, working environment and working condition and career growth. The outcome of the research indicates that six out of seven factors (work load, family life, transportation, compensation policy and benefit, working environment and working condition and career growth) have significant influence on quality of work life and the remaining factor (colleagues and supervisor) has no significant influence on quality of work life.

From the finding, it can be recommended that quality of work life is such a critical concept that might be disturbed due to dissatisfaction of mind set. However, the companies can focus on their employee's welfare by providing them a better and attractive compensation policy, optimum work load and by providing a superior work environment. The private companies should create a career growth opportunity within their environment that may lead to a better performance and therefore a better productivity. Moreover, participation management will increase the enthusiasm of employees as they will have an opportunity to participate with their ideas. So the private companies of Bangladesh can focus on it. On the other

hand, transportation is such a factor which is seriously involve in mental satisfaction. Therefore, if the companies can provide a transportation facility then they might grab a positive impression from employees and the employees may not need to harass by external environment. However, the government of Bangladesh can take some steps to provide adequate and affordable transportation facilities for the local people. Finally, I think if the company could manage our work life along with the transportation facility, our family or private life could be managed as we will be mentally happy.

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Figure 1 : A Conceptual frame work of Factors affecting Quality of Work Life.

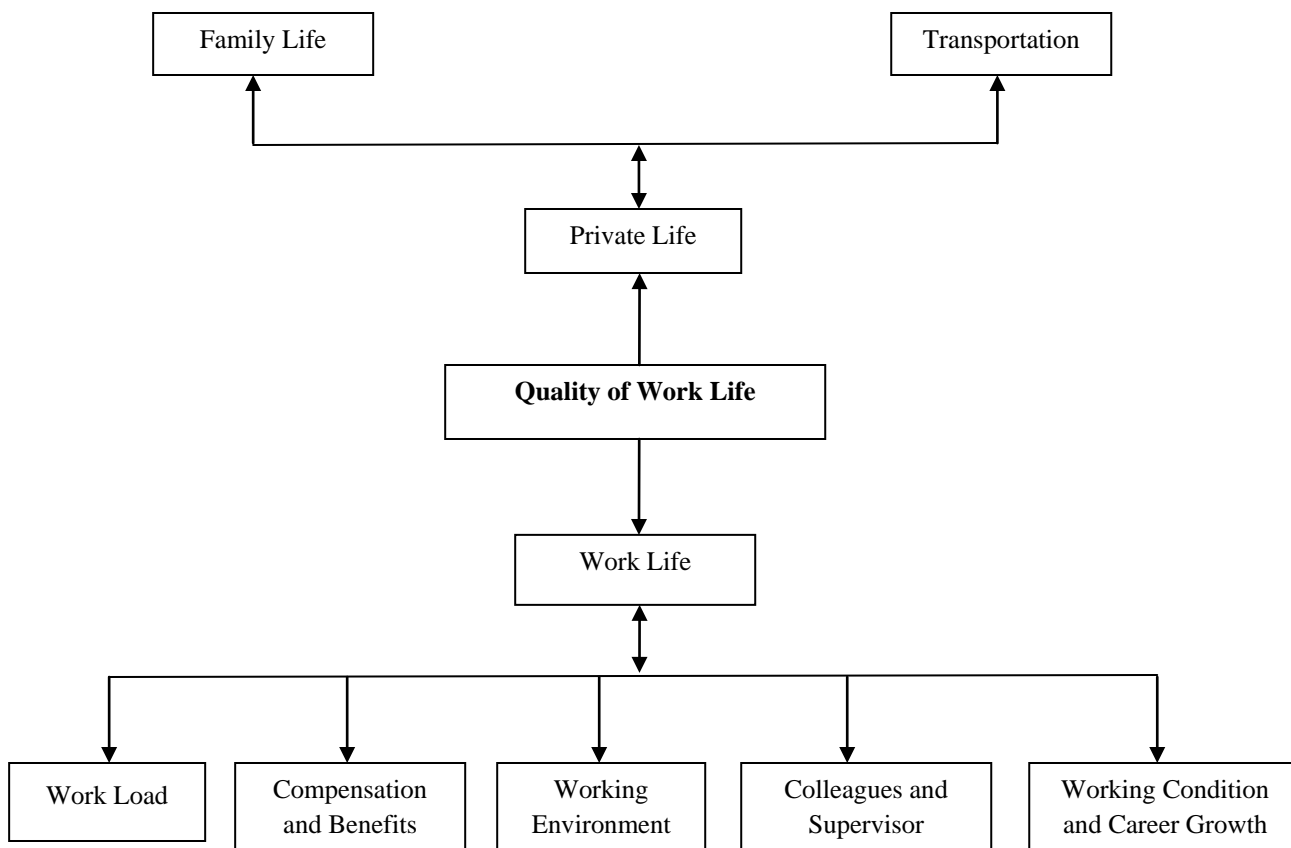


Table 1 : Demographic Profile of Respondent.

Gender	(%)	Age	(%)	Position	(%)	Year of	(%)
Male	69.00	21-30 years	94.00	Executive	48.00	1-2 Years	23.00
Female	31.00	31- 40 years	6.00	Sr. Executive	4.00	2-3 Years	44.00
		40 years an	0.00	Officer	19.00	3-5 Years	27.00
				Sr. Officer	4.00	5-7 Years	4.00
				Asst. Manager	6.00	8 Years and	2.00
				Manager	2.00		
				Merchandiser	2.00		
				Asst. Territory Officer	3.00		
				Territory Manager	3.00		
				Management Trainee	2.00		
				Teacher	4.00		
				Specialist	3.00		
<b>Total</b>	<b>100.00</b>	<b>Total</b>	<b>100.00</b>	<b>Total</b>	<b>100.00</b>	<b>Total</b>	<b>100.00</b>

Table 2 : Reliability Statistics.

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.732	.786	32

Table 3 : Reliability Tests.

Factor's Name	Items	Values
Quality of Work Life (Dependent)	4	0.796
Work Load (Independent)	4	0.60
Family Life ((Independent)	4	0.825
Transportation (Independent)	4	0.526
Compensation Policy and Benefits (Independent)	4	0.821
Colleagues and Supervisor (Independent)	4	0.927
Working Environment (Independent)	4	0.809
Working Condition and Career Growth (Independent)	4	0.471

Table 4 : Mean Scores of the Factors of QWL.

Factors	Mean	Std. Deviation
Workload	3.0800	.50861
Family Life	3.4350	.94054
Transportation	3.4900	.86524
Compensation Policy	2.5325	1.02473
Colleagues and Supervisor	4.0325	.74845
Working Environment	3.8700	.76581
Working Condition and Career Growth	3.4850	.64630

Table 5 : Regression Analysis.

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.652(a)	.425	.381	.48606

a. Predictors: (Constant), Working Condition and Career Growth, Work Load, Transportation, Compensation Policy, Family Life, Colleagues and Supervisor, Working Environment

Table 6 : ANOVA.

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	16.072	7	2.296	9.718	.000(a)
	Residual	21.735	92	.236		
	Total	37.807	99			

a. Predictors: (Constant), Working Condition and Career Growth, Work Load, Transportation, Compensation Policy, Family Life, Colleagues and Supervisor, Working Environment  
 b. Dependent Variable: QWL

Table 7: Hypothesis Testing.

Coefficients (a)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.425	.604		5.668	.000
	Work Load	.577	.123	.475	4.705	.000
	Family Life	.287	.073	.436	3.943	.000
	Transportation	-.218	.078	-.305	-2.782	.007
	Compensation Policy	-.245	.058	-.407	-4.206	.000
	Colleagues and Supervisor	-.104	.107	-.126	-.974	.332
	Working Environment	.309	.123	.382	2.518	.014
	Working Condition and Career Growth	-.308	.115	-.322	-2.682	.009

a. Dependent Variable: QWL



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# Determinant Factors of Decision Making Process in Higher Education Institution (A Case of State University of Gorontalo, Indonesia)

By Ikhfan Haris

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**Abstract** - What factors influence decision-making process in higher education institution? This paper presents the results of a case study of State University of Gorontalo, Indonesia that addressing to the question. The aims of this study were to identify and to analyse factors that influence decision-making process at the State University of Gorontalo. The study used descriptive quantitative method and data was collected using survey method. Sample of the study were 174 participants; consist of 129 lecturers and 45 administration staffs (n = 520).

The quota of the sample was 25% from the population. Data were analysed using descriptive analysis. The result indicates that the five variable-factors have significant contribution to influence decision-making process at the State University of Gorontalo. The mean number of these five factors was 68.20%. The state of organization (with diversity value of 75.78%) was the dominant factor, followed by personality and skill of decision maker, which contributes up to 73.67%. Availability of Information provides to 73.30% and external condition to 63.98%. Other factors such as, type of problem within organization; the goal of decision-making and type of decision develop a total contribution of 54.29%.

**Keywords** : *Influence factors, decision-making, process, organisation, State University of Gorontalo.*

**GJMBA Classification** : *FOR Code : 150305,150304 JEL Code : O15, I23*



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# Determinant Factors of Decision Making Process in Higher Education Institution (A Case of State University of Gorontalo, Indonesia)

Ikhfan Haris

**Abstract** - What factors influence decision-making process in higher education institution? This paper presents the results of a case study of State University of Gorontalo, Indonesia that addressing to the question. The aims of this study were to identify and to analyse factors that influence decision-making process at the State University of Gorontalo. The study used descriptive quantitative method and data was collected using survey method. Sample of the study were 174 participants; consist of 129 lecturers and 45 administration staffs (n = 520). The quota of the sample was 25% from the population. Data were analysed using descriptive analysis.

The result indicates that the five variable-factors have significant contribution to influence decision-making process at the State University of Gorontalo. The mean number of these five factors was 68.20%. The state of organization (with diversity value of 75.78%) was the dominant factor, followed by personality and skill of decision maker, which contributes up to 73.67%. Availability of Information provides to 73.30% and external condition to 63.98%. Other factors such as, type of problem within organization; the goal of decision-making and type of decision develop a total contribution of 54.29%.

**Keywords** : Influence factors, decision-making, process, organisation, State University of Gorontalo.

## I. INTRODUCTION

Decision-making is a routine management activity happens at all levels in an organisation. A decision should be made in order to execute activities and to achieve goals. Inability to make a quality decision may affects every aspect of the organization (Nik Muhammad et al 2009; Al Medlej 1997). However in the decision making process there are several factors that could influence the decision. Individual and organisational are the two "nature" factors influencing the decision making process. Blackmore and Berardi (2006) argue that there are at least seven factors, which can influence decision. They are decision makers (Individual or personal), decision situation (environment or condition), thinking in terms of a problem or an opportunity, decision criteria (single or multi-criteria), time and people affected by the decision as well as decision support theories, models, tools, strategy and techniques.

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Atmosudirjo (1982) described two important factors that influence the process of decision-making: nature of organization and personal capabilities of decision-maker. Decision maker, which covered their personality characteristic and individual differences, such as gender and age differences, past experience, cognitive biases and belief in personal relevance, could also be an influencing factor for decision-making (Bruin, Parker, & Fischhoff 2007; Sanz de Acedo & Cardelle-Elawar et al. 2007; Juliusson, Karlsson, & Gärling 2005; Stanovich & West 2008; Acevedo & Krueger 2004).

The Individual or personal factor is considered as the most difficult to control or to predict in the decision-making process, because there are many variables might involved this factor. Arroba (1998) mentioned five factors affecting the decision making process, which related to the decision-maker (person), namely: (1) Information that was known concerning to the concrete problem, which need to be solved, (2), the level of education, (3) personality, (4) coping, in this context can be experience related to the problem (the adaptation), and (5) culture.

Factor of individual or personal mostly corresponds to psychological aspect of decision-maker, whereas organisational factor deals more with environment or condition in the organisation. Furthermore, organisation behaviour and dynamics are multi-determined and relatively complex. Thus, it needs ways of examining and understanding the situation in organization (Cremona 2012).

Syamsi (2000) identified four factors that influenced the process of decision-making. These factors are (1) state of organization, (2) availability of information, (3) external condition/ environment, and (4) personality and skill of decision maker. The first three factors are included by organisational factor, which influencing the decision making process.

The dynamic of organisation is also considered as one important factor, which can influence decision-making process. Siagian (1987) explained the dynamics in the organization in three categories: (1) the dynamics of individuals within the organization, (2) group dynamics in the organization, and (3) dynamics of the organizational environment.

## II. DECISION MAKING IN HIGHER EDUCATION INSTITUTION

In the context of Higher Education Institution (HEIs), like in any other organization, the execution of decision is normally done by the top management level of HEIs. Therefore, the management must have skill in term of making and taking the decisions. They have to understand "the core of decision question". This question is formulating in 4W (what, who, why and when) - 1H (how). *WHAT* must to do? This refers to definition of the decision to be made or what is the issue, problem, or choice, and finally assess the impact of the decision on organisation and on people, *WHO* will implement the decision (the person, who will responsible to make decision). *WHY* it must be carried out, or why a decision is necessary (this question deals with the reason of a decision to be made - the answer to this question can be found through define, identify and classify of the problem with more quantifiable reason). The question, *WHEN* does the decision need to be made has to do with timing (Bovay 2002) and *HOW* will lead to the strategy taken in making decision (Which strategy will be use?).

Apart from the skills of decision maker, the fundamental aspect of an already taken decision is the implementation of the decision itself. In the organisational theory, the hierarchy of decision's responsibility lays on the decision maker, usually in top-management-levels while for the implementation of the decision is on the staff or decision takers or people who have to execute the decisions. For this reason, management needs specific skill and approach. The management is expected to use participatory approach and should not be done using force or violence (both physical and non-physical) in a decision making process.

The approach and step in the implementation of the decision should be materialized through good leadership from management. Through right approach, the people, who have to implement the decision or who will be affected, could carry out the decision that was given to them well and happily, without force and pressure. According to statement of Copeland (1998, cited by Syamsi, 2000) *"for each decision action must be taken and the primary responsibility for making sure that action is taken rest on however makes the decision. Action is inducted however, not by the exercise of physical force, not by the threat of corporal punishment, not even by a threat of any kind except under extreme circumstances. Action is inducted rather by leadership.* The essence of the statement is that the implementation of a decision emphasizes the personality character of the people who make decisions (decision maker).

The topic of agility, accuracy, and effectiveness of decision making sometimes grow to be a dilemma.

This is partly due to the management gap between the abilities and skills of decision-makers with perception of the decision taker or staff. Consequently, frictions or conflict, due to difference in accepting and interpreting a decision, will follow this situation sometime.

In order to make a quick, accurate and effective decision, it needs to be supported by data and information. Therefore, availability of information plays important role in decision making process. It assumes that only with adequate information a decision can be taken accurately. Brinckloe (1977 cited by Salusu, 2000; 65) argued that facts and information can guide the decision maker to make an accurate and effective decision. Drummond (1993: 129) noted that one of the biggest problems faced by decision makers is how to obtain information, which will use to support their decision. This information covers at least three criteria, i.e. reliable, relevant, and up to date. Srinivas (2011) also agreed with Drummond statement about the criteria of information in a decision-making process. Srinivas put some question regarding to information in decision-making. These questions are: from where information needed for decision-making can be obtained, what information needs to be taken?, who has that information?, why is that information being collected by the source?, which component of the information will help to make a decision, and which source can provide the best information, as well as which information is available and presented?

Due to important function of information in decision-making, it is not surprising that in organizational theory, there are specific topics, which focused on information and decision making, such as Management Information System (MIS) and more specific is Decision Support System (DCS). DCS itself nowadays is considered as the next evolutionary step after MIS in the development of management theory. Both, MIS and DCS provide information for the managerial activities in an organization. These allow the manager to make available accurate and timely information necessary to facilitate decision-making process and enable the organization's planning, control, and operational functions to be carried out effectively (Reddy et.al 2011).

In terms of quality and implementation of decision, it could also be influenced by four factors, which mentioned above by Syamsi (2000). It assumes, a good or sound decision has positive impact on the implementation. A quality decision has more possibilities to accept and to implement by the decision taker. On the other hand, a bad or wrong decision tends to have lower acceptance and has low impact in the implementation. Fig. 1 (below) illustrates the linkage between the decision making process, factors that influence, the quality of decisions and the implementation or execution of decisions.



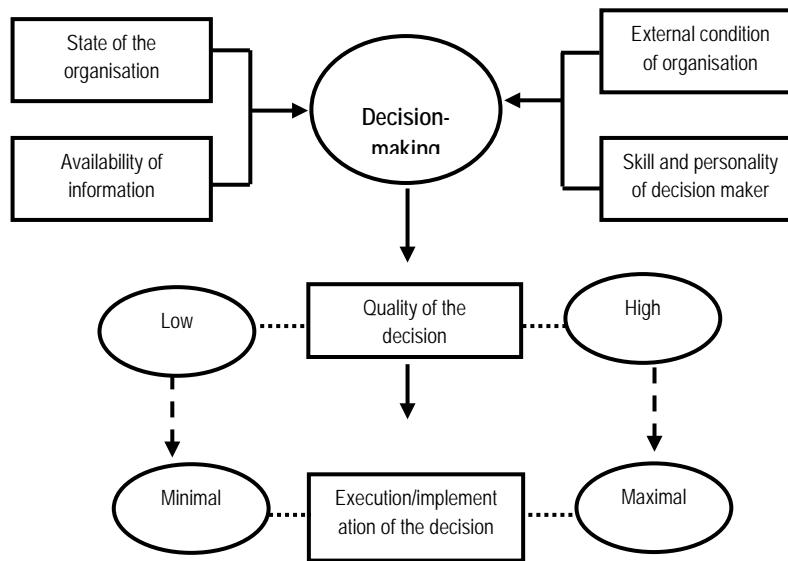


Figure1 : Factor influence decision-making process.

### III. DECISION MAKING PROCESS

Decision-making begins with presence of problems or issues that must be solved in order to achieve the goals of organization. Identification and understanding of a problem considered as the basis for determining the next steps to be taken in decision making process.

The theory of decision-making process in the literature is mostly base on a “traditional” model from Mintzberg. Mitzberg et al (1976) defined a decision making process as the set of actions beginning with the identification of a stimulus for action and ending with the specific commitment to action. As Mintzenberg elaborated, there are three important steps of the decision making process formulated: the problem identification, development of alternative solution, and selection of the best alternative. Baker et al. (2001) divided a general/formal decision-making process into an eight series of steps. The first step is defining the problem, the second, determining the requirements that the solution to the problem must meet. Followed by establishing goals that solving the problem should accomplish, then identifying alternatives that will solve the problem, develop valuation criteria based on the goals, select decision-making tools, apply the tool to select a preferred alternative and check the answer to make sure it solves the problem. However the core of “natural” process of decision-making (Masch 2004) can be specified in four steps: problem identification/recognition, searching and gathering of information, selection and evaluation of alternatives, execute/implement the decision and evaluate the result. During the process of decision-making, starting from

identification of the problem to a decision taking, there are many factors that could influence a decision. They could be the personality of decision maker, the state of organisation, internal and external situation in organization as well as availability of information. These entire factors can be classifying as individual and organisational factor and as controllable and uncontrollable conditions (Ozer 2005).

Understanding how important these factors which influence decision making process can be the best “strategy” to improve timely, reliable, accuracy, effectively and accountability of the decisions, which will be made.

### IV. METHODOLOGY

The paper identifies factors influences decision-making process. Research was designed using survey method and data was collected through distributing questionnaire. The questionnaire designed to use the four factors mentioned by Syamsi (2000) as the variable for this study plus a “Diverse” factor. These four variables are state of the organisation, availability of information, external condition, and personality and skill of decision maker. The reason to use these four factors as research variable was because these factors are common influencing factors in decision-making process within organisation. Other factors such as, type of problem that the organization deals with; the goal of decision-making, and type of decision to make are classified under “Diverse” factors.

The questionnaire was developed base on the research variables. The total item of questionnaire was 48 items with the following indicator: state of

organization (10 items); availability of information (9 items); external factor (9 items) and skill and capability of decision maker (11 items) as well as "Diverse" factor, covered the type of problem within organization; the goal of decision-making, and type of decision, etc (9 items).

A total number of 174 samples consisting of 129 lecturers and 45 administrative staffs were selected randomly by using proportional random sampling from the population for study. The quota of the sample was 25% from the population (Table 1).

Table 1 : Sample of the study.

Nr	Faculty	Number of population	Sample
1	Faculty of Education	80	20
2	Faculty of Letter	71	18
3	Faculty of Science and Mathematics	106	27
4	Faculty of Social Science	104	25
5	Faculty of technology	90	23
6	Faculty of Agricultural	69	17
7	Administrative Staff	180	45
	Total	520	174

The data was analysed in to two stages using:

1. Simple mean percentage:

$$P = \frac{f}{n} \times 100\%$$

Where:

*P* = Percentage

*F* = Frequency

*N* = number of sample

(Sudjana, 1996;45)

2. Descriptive percentage. To describe the score from each variable into the form of descriptive percentage was employed following formula:

$$P = \frac{Sr - Smin}{R} \times 100\%$$

Where:

*P* = Percentage

*Sr* = Score of indicator/respondent score

*Smin* = Minimal score

*R* = Difference between maximal score and minimal score

(Sugiyono, 2002)

The total of scores obtained for each indicator shows the degree of influence of each factor in the decision making process at the State University of Gorontalo. The degree of influence classified as follows:

- 81% - 100% = high influence
  - 61% - 80% = moderately high influence
  - 41% - 60% = relatively low influence
  - 21% - 40% = very little influence
  - 0% - 20% = not influence
- Arikunto (2000;57)

## V. RESULT AND DISCUSSION

This study provides important information regarding the factors influencing the decision making process in Higher Education Indonesia; in this context is the State University of Gorontalo. The result of data analysis helps to provide a "small" picture of the various facts, information, and justification in process of decision-making in an organization.

There are five factors, which can be settled in decision-making process at the State University of Gorontalo, namely state of organization, skill and personality of decision maker, availability of information, external condition of the organization as well as the miscellaneous factor. These five factors have significance influencing roles in process of making a decision. The cumulative average percentage of these five factors is 68.20% (see Table 2 below)

Table 2 : Summary result of the five research variables.

Nr.	Variable	Mean of respondent's scores	Percentage	Category (level of influence)
1	Internal condition of the organization	280	75.78	moderately high influence
2	Availability of information	275	73.30	moderately high influence
3	External condition of the organization	249	63.98	moderately high influence
4	Personality and skill of decision maker	276	73.67	moderately high influence
5	"Diverse" factors (type of problem, goal of decision and type of decision )	158	54.29	relatively low influence
	Total	<b>247</b>	<b>68.20</b>	<b>moderately high influence</b>

Research finding shows that state of the organizational in this context is internal condition in organization dominantly influences factor in the decision-making process at the State University of Gorontalo (75.78%). Personality and skill of decision maker considered as the second most influenced factor and has given contribution of 73.67%, followed by availability of information with percentage of contribution of 73.30%. The external condition of the organization also gives significant contribution to decision-making process with the mean percentage of 63.98% and while the rest 54.29% is the result of "diverse" factors.

The state of the organization is the dominant factor, it gives information that internal condition in origination plays important role in the process of decision-making. Internal conditions are physical and intangible factors inside of the organization that influence the decision-making behaviour of individuals in the organization (Duncan, 1972; Lindsay & Lue, 1980).

It is important to note, that in internal condition of organization there are many "inter-related" element, which support the existence of organization. Each element could contribute in decision-making process, such as budget, personnel and physical infrastructure as well as organizational structure, size, instrument and bodies.

Theoretically, it is sometimes not easy to deal with internal condition in a decision making process because internal conditions are not amenable to change (Benveniste 1974), even though this factor generally controllable. The challenge to develop a solid internal condition in organization considered as a strategy in order to produce a quality decision, which is the use of all potential in internal condition to support decision maker in decision making process.

Identifying, assessing, and managing factor which influence decision-making process are important for decision maker in order to produce a quality decision. Furthermore, critical point to minimize a wrong or not sound decision due to the important of quality of decision making, which could improve organizational performance.

Regarding variable of the availability of information, the result showed that this factor also has significant contribution in the decision-making process. Base on the data analysis, it found that there were many decisions in State University of Gorontalo, used and supported by data and information. On the other hand, there are number of decisions that always considering input and suggestions from the staffs.

Furthermore, it can be concluded that data and information in decision-making process in any organisation were taken into account to be an important factor. Data and information can be obtained through the facts and experience possessed by the organization in solving organizational problems or issues. Due to lack

of information and poor data supporting system, many were often failing to produce a quality decision. This case also indicated as one of the result of this study.

However, the availability of data and information is not a guarantee to produce a quality decision. Even when decision makers have sufficient information, which could be used as a basis to make a decision, still this is not a warranty to make an effective decision. This is due to the fact that data and information, which in-putted or supplied by staffs sometimes not relevant with what the decision makers need. The problem for this case is that the required information often so abundant and complex.

Furthermore, decision makers (manager, executive, or directors) sometimes do not explain, what kind of data or information that they need. As consequent, even there are available data and information for decision maker, still they cannot use that and the data also are not able to assist them. The result is they would not be able to grasp all of the information because the provided information is inappropriate in order to produce a quality decision. Such a common situation is well known as "garbage in, garbage out" and to be considered as one of failures in human decision-making due to faulty, incomplete, or inaccurate of the data (Brooks et.al. 1981).

In the practice of organisational activities, it is the demands of data and information that always been a part of the decision making process. Therefore, several decisions often must be delayed due to lack of the complete data or because only inadequate information that is available.

The third variable in this study is external condition of the organisation. This variable or factor also has significant contribution in influencing the decision-making process. However when compared with another variables (state of organisation availability of information and skill and personality of decision maker), external condition of the organisation has the smallest percentage of contribution with 63.98%, whereas the variable of state of organisation (75.78%), availability of information (73.30%) and the skills and personality of the decision maker (73.67%).

Although the percentage of contribution of external conditions is not as high as another variable, this factor remains important aspect in decision-making process and considered as influencing factor in particular for the strategic decision-making.

In addition, some important decisions related to the stakeholders were informed to public and some circumstances that occurred outside of the organisation were also taken into account.

Related to the external condition, it is important to note, that this may cover local, regional, national and international levels. Because the impact of a decision or policy is sometimes not only experienced by the

organization itself, but is also exposure to those in outside of the organization.

Factor of personality and skill of decision maker, which covered their ability and capability, is more complex because it is directly related to the person who will take or make a decision. This factor plays important role in determining whether a decision maker will produce a quality or a bad or a wrong decision. Moreover, this also closely related to subjective factors of decision maker. Personality and skill of decision maker is one fundamental factor in decision-making process. The skill is necessary to ensure that the locus of knowledge and the locus of decision-making authority are matching in order to produce a sound decision (Jensen 1995).

It is also important to note that one goal of decision making is to ensure the performance of activities in organisation running properly. Decision-making can serve as a "bridge", which has function to connect between the maintenance of performance activities and the achievement of the goal of organisation. This relates to (Richard et.al 2007) statement that organizations could only function efficiently when those who have the knowledge necessary for decisions also have the authority to make those decisions.

In relation to the indicator of personality and skill of decision-maker, the result of study shows that there is a significant contribution of this variable. As a human factor in decision-making process, it is not a surprise, that this variable has the mean of 73.67%, because the people who make decisions (decision makers) can never be separated from their personality and skill attribute. These attributes covers experience, personal qualities, position, and authority in organisation, level of intelligence, accountability, empowerment, or authority to delegate a decision, decision style, as well as knowing and understanding of the vision and mission of the organization / institution.

Type of decision also provides significant contribution in influencing the decision-making process. The research result shows that most of decisions at the State University of Gorontalo are programmed decision. Programmed decision means a decision that usually use to deal or to solve routine and repetitive problems within organisation. Because the decision in the State University of Gorontalo are dominantly programmed decision, it can be concluded that the decision-making process has its established policies, rules and procedures and stem from prior experience or technical knowledge about what works or does not work in a given situation. In addition, this decision making process could be based on organisational habit in the State University of Gorontalo. Interestingly, the research findings also indicates that most of problem in the State University of Gorontalo, which need decision in order to

solve it, can be categorized as structured problems or well-structured problems. The characters of this problem are logical, well known and easily to identify. These findings give important information that there are significantly relation between the type of decision and the type of problem in organisation.

Since programmed decision is rated as dominant type of decision in State University of Gorontalo and it is faced routinely in everyday organisation activities, it affects the decision-making process. The decision makers are not being put in a special context whilst the problem descriptions are clear and the information needed to solve them is well provided in the problem statement (Chi & Glaser, 1985). Thus, the context and situation of programmed decision is relevant to the setting of structured problems.

However, research has shown that the goal of decision affects the process of decision-making. Furthermore, research findings in this area indicate that there are two type of decision goal in the State University of Gorontalo. First is decision, which has main purpose to achieve of the goal in term of problem solving. The second type is decision that has to make as respond to the pressure from the environment. It could be an internal or external pressure in the organisation.

As the research finding, the three factors namely type of problem; the goal of decision-making and type of decision have given significant contribution in decision-making process at the State University of Gorontalo with the percentage value of 54.29%.

## VI. CONCLUSION

By considering the findings of this study, it is informed that the five variables have significantly contribution in decision-making process at the State University of Gorontalo. In general, information that can be obtained from the research results is that there is no significant different across variable which affected the decision-making process. The state of organization (75.78%) is dominantly factor that affected decision-making process at the State University of Gorontalo, followed by personality and skill of decision maker, which contributes up to 73.67%. Availability of Information has a contribution of 73.30% and external condition contributes to 63.98%. Other factors such as, type of problem within organization; the goal of decision-making, and type of decision, etc. brings a total contribution of 54.29%.

The findings require further research to be done in the area of decision-making process, especially the determinant factors of multiple viewpoints or variables using other type of research approach such as qualitative research.

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# A Development and Empirical Validation of the Consumer Response Towards Sponsored Search Advertising (SSA) Model

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**Abstract** - Dramatic structural changes are taking place within the rapidly growing Web advertising sector; the most notable being the rise to prominence of Sponsored Search Advertising (SSA) which developed because of the need to find solutions to the increased market demand for more consumer-oriented and targeted advertising and non-intrusive Web Advertising format (Weidlich, 2002). Moreover, SSA offered advertisers the ability to more precisely target Web users, as well as making the advertisements more relevant and meaningful to the consumers (Dou et al., 2001). However, very little attention has been given to SSA in terms of how consumers respond to such advertising within the Web context, and what particular factors drive consumers to attend to, and respond to, SSA. To address this gap in the marketing literature, the current study sought to, firstly present a theoretical Model of Consumer Response Towards SSA by incorporating variables synthesized from the advertising and consumer behaviour literature. Secondly, this study empirically validated the model from the consumer's perspective.

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A DEVELOPMENT AND EMPIRICAL VALIDATION OF THE CONSUMER RESPONSE TOWARDS SPONSORED SEARCH ADVERTISING SSA MODEL

*Strictly as per the compliance and regulations of:*



# A Development and Empirical Validation of the Consumer Response Towards Sponsored Search Advertising (SSA) Model

Dr. Mohammad Hamdi Al Khasawneh

**Abstract** - Dramatic structural changes are taking place within the rapidly growing Web advertising sector; the most notable being the rise to prominence of Sponsored Search Advertising (SSA) which developed because of the need to find solutions to the increased market demand for more consumer-oriented and targeted advertising and non-intrusive Web Advertising format (Weidlich, 2002). Moreover, SSA offered advertisers the ability to more precisely target Web users, as well as making the advertisements more relevant and meaningful to the consumers (Dou et al., 2001). However, very little attention has been given to SSA in terms of how consumers respond to such advertising within the Web context, and what particular factors drive consumers to attend to, and respond to, SSA. To address this gap in the marketing literature, the current study sought to, firstly present a theoretical *Model of Consumer Response Towards SSA* by incorporating variables synthesized from the advertising and consumer behaviour literature. Secondly, this study empirically validated the model from the consumer's perspective. The result was the development and empirical validation of the *Consumer Response Towards SSA Model*. This empirical validation of the research model has made a significant theoretical contribution to our knowledge base. We believe it provided the first empirical analysis of the effect of consumer related factors on consumer attention towards SSA, the outcomes of such attention along with the perceived credibility of SSA, as characterised by attitude toward SSA and intention to click on Sponsored Search Advertisements. This major contribution for the current study was achieved through the extension of previous theoretical advertising and consumer behaviour models to the emerging advertising format on the Web, and the inclusion of a larger set of determinants involving the consumer's point of view. In addition, the findings of the current research are significant and have provided a number of practical implications related to the determinants and outcomes of consumer's attentional, attitudinal and behavioural responses toward SSA.

**Keywords** : *Web Advertising, Sponsored Search Advertising, Consumer behaviour, Consumer attention, and Consumer attitudes.*

## 1. INTRODUCTION

The Internet is the fastest growing communications medium of all time (Danaher and Mullarkey, 2003; Ko et al., 2005; Yoon and Lee, 2007) of which the Web with its text, audio and video flexibility is the most important tool (Berners-Lee, 2006; Eighmey, 1997;

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Gallagher, Foster, and Parsons, 2001; Ghose and Dou, 1998; Palanisamy and Wong, 2003; Yaveroglu and Donthu, 2008). Thus, many organisations have begun to consider the Web as having more marketing potential than other Internet tools in the promotion of their products and services, at lower cost and the greater ability to target consumers precisely (Leong, Huang, and Stanners, 1998; Palanisamy and Wong, 2003; Robinson et al., 2008). Consequently, Web advertising revenues are growing quickly and are expected to reach US\$ 103 billion worldwide in 2015 (MagnaGlobal, 2010). Additionally, dramatic structural changes are taking place within this rapidly growing Web advertising sector; the most notable being the rise to prominence of SSA which developed because of the need to find solutions to the increased market demand for more consumer-oriented and targeted advertising and non-intrusive Web Advertising format (Weidlich, 2002). Moreover, SSA offered advertisers the ability to more precisely target Web users, as well as making the advertisements more relevant and meaningful to the consumers (Dou et al., 2001). However, very little attention has been given to SSA in terms of how consumers respond to such advertising within the Web context, and what particular factors drive consumers to attend to, and respond to, SSA. To address this gap in the marketing literature, the current study sought to, firstly present a theoretical *Model of Consumer Responses Towards SSA* by incorporating variables synthesised from the advertising and consumer behaviour literature. Secondly, this study empirically validated the model from the consumer's perspective. The result was the development and empirical validation of the *Consumer Response Towards SSA Model*.

Therefore, the following research objectives were considered worthy of investigation, with the broader primary research objective, addressed in this study, being:

*To identify the consumer related factors that influence consumer responses towards Sponsored Search Advertising?*

To advance our current understanding of SSA from the consumers' perspective, the focus here is on examining a range of consumer behaviour variables that may determine how they respond to SSA. Therefore, it is proposed that such an examination will advance the



understanding of consumer behaviour within the context of SSA. As such, the primary focus of this research is on the consumer and those associated consumer related factors that determine their responses to SSA. Extending Rodgers and Thorson's (2000) contentions, consumer responses to SSA may be viewed as comprising three elements: *determinants, process and outcomes*. Determinants are those factors that may determine consumers' attentions towards SSA. Process element stands for the consumer's initial processing of the SSA (Webb, 1979) which is represented in this research by consumer attention to SSA. The final element, consumer responses, involves outcomes, namely those factors that result from consumer attending to SSA. These factors may be characterised as the consumer's attitude towards SSA and intention to click on Sponsored Search Advertisements. Therefore, the broader research objective is further elaborated into a number of research questions which are presented below.

**RQ1:** *What are the consumer related factors that account for consumer attention towards SSA and to what extent do they influence attention towards SSA?*

**RQ2:** *To what extent does consumer attention towards SSA influence consumer attitude towards SSA?*

**RQ3:** *To what extent does consumer attitude towards SSA influence consumer intentions to click on SSA?*

**RQ4:** *To what extent does credibility of SSA influence consumer attitude towards SSA?*

## II. WEB ADVERTISING

Web advertising began in 1994 with the presentation of banner advertisements on the Hotwired Website (Barnes, 2003; Kaye and Medoff, 2001; Robinson, Wysocka, and Hand, 2007). Since then, advertisers have considered the Web as one of the most important marketing communication channels because of its distinctive features of interactivity, flexibility, customisation, accessibility and tracking capabilities (Bush, Bush, and Harris, 1998; Chatterjee et al., 2003; Li and Leckenby, 2004; Palanisamy and Wong, 2003; Richard and Chandra, 2005; Robinson et al., 2007; Yaveroglu and Donthu, 2008). The term Web advertising covers many types of advertising from electronic advertisements, that are similar to traditional advertisements (e.g. billboards, banner advertisements), to formats that are distinct from traditional advertisements (e.g. pop-up advertising) (Schlosser, Shavitt, and Kanfer, 1999). In addition, Web advertising formats include the original banner advertising, skyscrapers, pop-up advertising, interstitials, online video advertising, rich media, corporate websites, and keyword search advertising (Briggs, 1999; Chandon, Chtourou, and Fortin, 2003; Cho and Cheon, 2004; Choi and Rifon, 2002; Flores, 2001; Li and Leckenby, 2004; Robinson et al., 2007; Yao and Lin, 2006).

Although banner advertisements have been the dominant format of Web advertising for several years, the revenue from banner advertisements has declined steadily since the advent of other Web advertising formats, such as Keyword Search Advertising (KSA) (Li and Leckenby, 2004). Recently, KSA has proven to be the main, and fastest growing, form within the Web advertising market, growing from one percent in 2002 to 41 percent in 2006 (Maddox, 2006). Simply put, KSA is a process by which search engines place advertising in the search results pages of certain keywords and advertising companies pay fees to the search engine providers when users click on a link to their web sites (Burns, 2005; Schmidt and Patel, 2004).

### a) *Sponsored Search Advertising*

Of the various forms of KSA, Sponsored Search Advertising (SSA) has been identified as the most effective form (Delaney, 2004; Harrison, 2005). SSA represents an advertising technique in which a fee is paid for specific keywords to guarantee priority placement on search engine results pages (Feng et al., 2003; Jerath & Sayedi, 2011; Lu and Chau, 2006; Overture, 2005). SSA has become a critical component of companies' marketing campaigns (Jerath & Sayedi, 2011), with a global annual growth rate predicted to be 46 percent and have accounted for more than US \$ 44.5 billion of industry revenue in 2011 (Arnold et al., 2012; Ghose and Yang, 2007; Feng et al., 2007; Jansen et al., 2009; Jatarzadeh, Aurum, & D'Ambra, 2011; Rashtchy et al., 2007). Consequently, Sponsored Search Advertising had become the most prominent format of Web advertising by 2003 in terms of revenues (IAB, 2004), as well as the major source of revenues for Web search engines (Jansen and Resnick, 2006). For example, 67 percent of Google's 2008 revenue came from SSA (Google, 2008). However, the success of search engines in generating revenues using SSA depends mainly on the number of users (consumers) who click on Sponsored Search Advertisements (as advertisers are only required to pay when users click) (Vragov, 2009). For this reason, online users need to notice and pay attention to SSA, so that the desired communication goal of such advertising (click through behaviour) may be achieved (Lu and Chau, 2006). More specifically, as suggested by Jansen and Spink (2007a), SSA may be improved and become more effective by gaining a greater understanding of consumer behaviour in such advertising contexts.

For the online user, SSA offers highly relevant search results (Kiritchenko and Jiline, 2008), which are based on the consumer's own queries and, thus, they are considered less intrusive than banner advertisements or pop-ups advertising (Ghose and Yang, 2007). In addition, SSA reduces online user search costs (Jansen and Mullen, 2008) and increases the accessibility to useful information within a limited

time frame (Lu and Chau, 2006). Consequently, SSA has become an important element of online users browsing and information searching experiences on the Web (Richardson, Dominowska, and Ragno, 2007).

### III. LITERATURE REVIEW

As an aim of the current research is to understand the factors that influence consumers' responses towards SSA, the literature related to SSA was reviewed. However, much of this research is largely based on practitioners' views and anecdotal studies with only a small number of scholarly studies being available. Previous research relating to SSA has focused primarily on the advertisers' perspective. For example, SSA and search engine performance (Bradlow and Schmittlein, 2000; Telang, Boatwright, and Mukhopadhyay, 2004), quality uncertainty and adverse selection in SSA (Animesh, Ramachandran, and Viswanathan, 2006), SSA ranking strategies (Feng, Bhargava, & Pennock, 2003), and the implementation of SSA strategies (Weber and Zheng, 2003). Another area of SSA research has focused on SSA auction mechanisms, from the economic perspective (Edelman et al., 2007; Edelman and Ostrovsky, 2007), for example, the best bidding strategies for advertising companies to maximise profits (Animesh et al., 2006; Chakrabarty, Zhou, and Lukose, 2007; Coy, 2006; Feng, 2008; Feng et al., 2003; Kitts and LeBlanc, 2004; Mehta et al., 2005; Varian, 2006), as well as decentralising and finding alternative mechanisms for SSA auctions (Khare and Sittler, 2005). However, recently, academicians have called for further research into specific aspects of SSA, especially research related to the consumers' point of view (Animesh et al., 2006; Li and Leckenby, 2004). Moreover, this need to establish a new direction for future SSA research was identified by Ghose and Yang (2007), Barry and Charleton, (2009), and Li and Leckenby (2004), who suggest that little understanding currently exists on, the major factors influencing consumers behaviour towards such online advertising form.

According to Vine (2004), consumers depend on Web search engines to find information on the Web prior to making online or offline purchase-decisions. However, despite the phenomenal growth of the SSA market, limited research has been undertaken to investigate the implication of such advertising upon consumer behaviour. As mentioned previously, SSA has, in the main, been investigated from advertisers' perspectives, which appears not to provide an encompassing understanding of their effectiveness (Feng et al., 2003; Jatarzadeh et al., 2011; Weber and Zheng, 2003). Further, the consumer behaviour perspective has been largely overlooked (Yao and Male, 2008). In support of this view, Ghose and Yang (2007)

indicate that there is a little understanding of how consumers respond to SSA.

Some research has identified: that online users respond more favourably to natural free results displayed on the search results page in comparison to SSA (Greenspan, 2004; Marble, 2003); that online users tend to be distrustful in relation to the viability of Sponsored Search Advertisements, which are perceived as less relevant than the natural free results (Greenspan, 2004; Fallows, 2005; Jansen and Resnick, 2007; Jansen and Resnick, 2006); that online users have a limited understanding of the nature of SSA, with few were able to recognise SSA (Marble, 2003). More specifically, Animesh (2005) suggests that the consumer knowledge of SSA mechanism may foster the click through rates for highly positioned search results. Support for this view is provided by anecdotal evidence suggesting that companies need to be positioned on the first page and within the top search results to match online users' behaviours (Miller, 2006; Newsome, 2006; Schwarz, 2005). Interestingly, Yao and Male (2008) have found that consumers who engage in more search and clicking behaviour on the Web tend to be more responsive to SSA than others. In brief, despite the emerging stream of literature on SSA, consumer behaviours associated with this type of Web advertising are still not fully understood. Thus more research is required to fill this gap. Most research on SSA has generally explored the topic from a practitioner's perspective or anecdotal studies. Further, there has been scant research within the consumer behaviour domain in relation to how consumers respond to SSA. As a consequence, examining factors influencing consumer responses towards advertising, based on offline traditional advertising literature, may assist in achieving a more cohesive understanding of how consumers process and respond to SSA.

Based on a revision of a number of studies related to consumer responses to offline traditional advertising, as well as Web advertising and most importantly, based on Rodgers and Thorson's (2000) findings, that Web advertising effectiveness relies on how consumers respond to such advertising, and that it may be examined using determinants, process and outcomes, it is apparent that process focuses on the consumer's tendency to pay attention to advertising and, moreover, this process could be determined by a range of variables related to the consumers. Further, the outcomes appear to reflect consumers' attitudes and behaviour upon attending to advertisements. Interestingly, consumers' tendency to pay attention to Web advertisements has witnessed a decline since it was first introduced due to such factors as their intrusiveness and irritation level (Li et al., 2002; Yaveroglu and Donthu, 2008). However, given that SSA has proved to be the most effective form of Web

advertising (Mack, 2004; Mara, 2004), it would seem there is an opportunity to examine consumer attention to SSA and the related determinants of such response. Li and Leckenby (2004) asserted that this research is needed as there have been few studies into understanding the factors and determinants of how consumers attend to, and respond to such advertising. Therefore, a number of focal constructs relevant to this research are discussed, in terms of consumer responses towards SSA and the determinants of such attention (prior experience with SSA, subjective knowledge of SSA, familiarity of brands (or websites) included in the SSA, and perceptions of SSA relevancy and credibility) and the outcomes associated with attention towards SSA (attitudes towards SSA and behavioural intentions).

Thirdly, the consumer's *motivation* to process the advertising message is largely determined by consumers' findings cues in the advertisement that are recognisable (Batra and Ray, 1986; Celsi and Olson, 1988; Hallahan, 2000; MacInnis et al., 1991), for example, *familiar brands and relevancy of the advertisement*. As such, *familiarity of brands (or websites) included in the SSA* was selected as an aspect of the current research, due to its importance in influencing advertising effectiveness (Campbell and Keller, 2003) and consumer attention toward advertising (Chun and Wolfe, 2001; Keller, 1991; MacKenzie and Spreng, 1992; Rayner et al., 2001; Rosbergen et al., 1997; Yantis, 2000). In addition, it was found that online users tend to check Sponsored Search Advertisements if they are perceived as relevant (Jansen and Spink, 2007a, Jansen and Resnick, 2006). Thus, perception of SSA relevancy appears to be an important factor influencing consumer response to SSA. It is also suggested that relevancy of SSA is also influenced by brand familiarity as finding familiar brands (or websites) within the content of SSA message may result in perceiving such advertising as relevant. Finally, Moore and Rodgers (2005) suggest that consumers are more likely to ignore advertisements because of less perceived credibility. Fourthly, another important aspect covered in the offline advertising literature is that the extent of perceived credibility is based upon an accumulation of information and consumers' experiences with advertisements (MacKenzie and Lutz, 1989). Maloney (1994) supported this view by asserting that advertising credibility is based on the interaction of the advertisement with the consumer memories are accumulated from prior experiences. Therefore, it appears that online users with positive previous experiences with SSA will be more likely to consider SSA as credible and, so consider processing or engaging with these types of advertisements. Furthermore, attention to SSA is expected to have an influence on SSA credibility. The reason for this is that a greater attention paid to SSA results in higher perceived credibility of SSA. Similarly, within a social marketing context, Griffin and O'Cass (2005) found that the more attention paid to social advertising, the more credibility is associated with those advertisements. Accordingly, those online users who pay more attention to SSA may be more likely to positively evaluate those advertisements, resulting in higher advertising credibility.

Although much of the offline traditional advertising literature has confirmed that a positive relationship exists between consumer attention and attitude towards advertising, such relationship has received scant attention in the Web advertising context. For example, outcomes of consumers' attention in the Web context may operate into different directions depending on the type of exposure to Web advertising. For example, forcing online users to be exposed to Web

#### IV. HYPOTHESES DEVELOPMENT

It appears that consumers' attention is strongly influenced by their motivations, abilities, and opportunities to process advertisements. For example, the *ability* to pay attention to advertising may be conceptualised by aspects related to experience with, and knowledge about, the related environment (Batra and Ray, 1986; Celsi and Olson, 1988; Hallahan, 2000; MacInnis, Moorman, and Jaworski, 1991). If this is so, then, aspects of prior experience with advertising (negative or positive) are likely to influence an individual's ability to attend to, and process, advertisements (Batra and Ray, 1986; Celsi and Olson, 1988; MacInnis et al., 1991). Therefore, *prior experience with SSA* was deemed pertinent to the current research as a determinant of consumer attention towards SSA. This position is consistent with the view that consumer attention is mainly dependent on prior experience and that prior experience is an important determinant of consumer behaviour (Fazio and Zanna, 1981; Jarvelainen, 2007). A number of researchers suggest that the *ability* to attend to advertising messages may result from the amount and type of knowledge an individual possesses regarding the advertising, for example, subjective knowledge (Batra and Ray, 1986; Celsi and Olson, 1988; Hallahan, 2000; MacInnis et al., 1991). Therefore, *subjective knowledge* is another important determinant factor that influences consumer attention and processing behaviour towards SSA (Bettman and Park, 1980; Claxton, Fry, and Portis, 1974; Brucks, 1986; Pingol and Miyazaki, 2005; Raju, Lionel, and Mangold, 1995). However, within the online environment, it appears that online users have limited knowledge of the approaches employed by search engines to rank, retrieve and prioritise Sponsored Search Advertisements (Greenspan, 2004; Hotchkiss, 2004; Marble, 2003). This being the case, it may be that consumer *subjective knowledge of SSA* could influence attention towards this type of Web advertising.

advertising messages (such as the case with pop-up advertising) may generate negative attitudes towards such advertising. This view is consistent with the argument of Rust and Varki (1996) who advocate that Web advertising should be less intrusive because forcing consumers to be exposed to advertisements may generate negative attitudes towards advertising. Many other Web advertising studies have provided support for this view by showing that consumers tend to ignore intrusive and annoying Web advertisements and, more, tend to hold negative attitudes towards such advertisements (Brackett and Carr, 2001; Cho and Cheon, 2004; Li *et al.* 2002; Reed, 1999). Alternatively, consumers are expected to pay more attention and hold more positive attitudes towards unintrusive and targeted Web advertisements such as SSA (Bloem, 2003; Mehta and Sivadas, 1995).

Finally, the attitude and behavioural intention relationship was originally advocated by Fishbein and Ajzen (1975). More recent advertising research supports this theory, where it is suggested that the attitude toward the object (in this case the SSA) will influence the intention to use the object (intention to click on SSA) (MacKenzie *et al.*, 1986). More specifically, support for this relationship is found in some Web advertising studies which have reported a significant effect of attitude towards Web advertising on intention to click on Web advertisements (Burns and Lutz, 2006; Cho, 1999; Jin and Jun, 2007; Shamdasani *et al.*, 2001). However, to the best of our knowledge, limited studies have examined such relationship in the SSA context. Given the above discussion, it appears plausible that consumers' attitudes towards SSA are related to their behavioural intentions of clicking on Sponsored Search Advertisements.

Based on the preceding literature review, a theoretical model of *Consumer Response Towards SSA* (Figure 1.1) and research hypotheses (Table 1.1) have been provided to address the research objective and associated research questions, of the study. In doing so, the theoretical model conceptualises SSA from a consumer behaviour perspective. Overall, it was found that several factors act upon and influence consumers' attention to, subsequent attitudes towards, and clicking behaviour on SSA. These factors, identified as consumer related factors, incorporated prior experience with SSA, subjective knowledge of SSA, familiarity with brands (or websites) included in the SSA, and perceptions of SSA relevancy and credibility.

Table 1 : Research Hypotheses

No.	Hypotheses
H1	Prior experience with SSA has a significant positive effect on attention to SSA.
H2	Subjective knowledge about SSA has a significant positive effect on attention to SSA.
H3	Familiarity of brands (or websites) included in the SSA has a significant positive effect on attention to SSA.
H4	SSA relevancy has a significant positive effect on attention to SSA.
H5	Familiarity of brands (or websites) included in the SSA has a significant positive effect on SSA relevancy.
H6	Prior experience with SSA has a significant positive effect on SSA credibility.
H7	Attention to SSA has a significant positive effect on SSA credibility.
H8	Credibility of SSA has a significant positive effect on attitude towards SSA.
H9	Attention to SSA has a significant positive effect on attitude towards SSA.
H10	Attitude toward SSA has a significant positive effect on intention to click on SSA.

Source : Developed for this research.

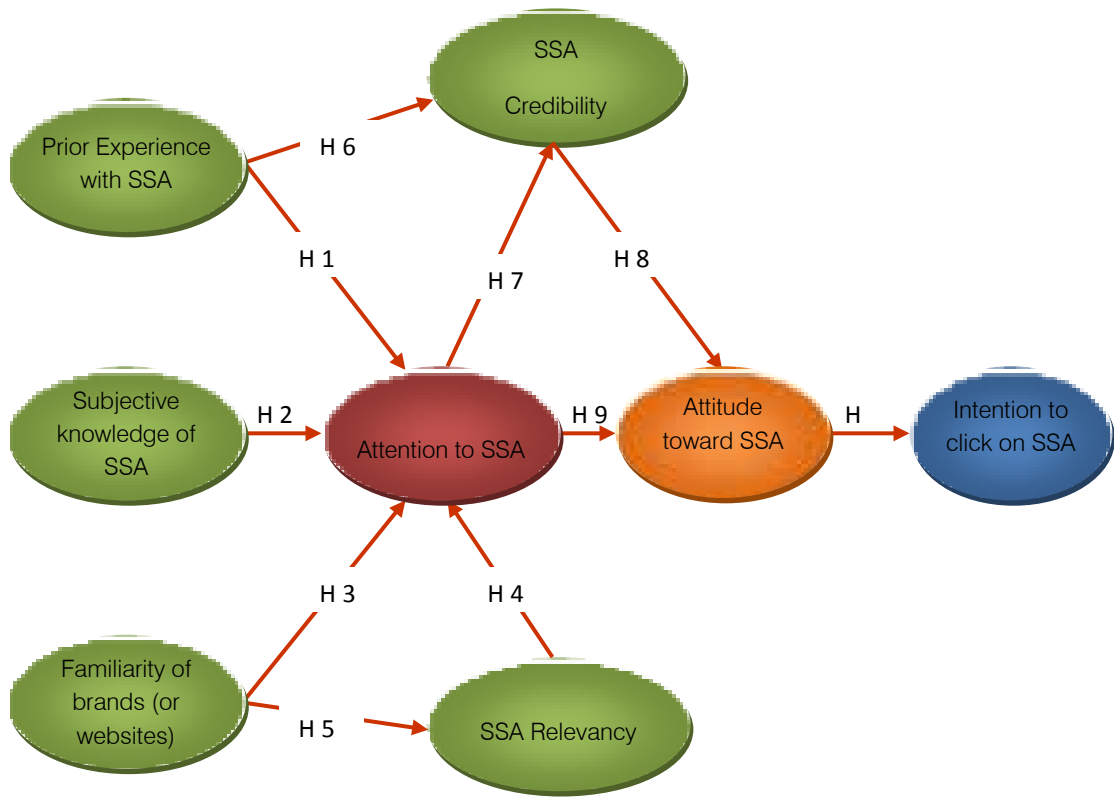


Figure 1 : A Conceptual Model of Consumer Response Towards Sponsored Search Advertising (SSA).

## V. METHODOLOGY

A quantitative approach was used in this research. An examination of the literature assisted in the development of a conceptual model of Consumer responses towards SSA. A convenience sample of 325 respondents from the Australian population (who have online access and who have searched or purchased online) were surveyed using an online self-administered survey. The resultant data were analysed to test the model of consumer response towards SSA. The administration of the survey followed a Web-based self-administered method. The data collection involved the researcher employing an Australian market research company (The Final Prospect Company) to send an email, on behalf of the researcher, to Australian online users inviting them to participate in the study. The email included a link to a unique Web site location to access the survey. In addition, the email informed potential respondents about the purpose of the research, the length of the survey, and provided assurance that the collected information would be treated confidentially and would be used only for the purposes of the research.

## VI. RESULTS ANALYSIS

Analysis of the data was conducted via correlation analysis, exploratory factor analysis, reliability analysis and Partial Least Squares (PLS) regression analysis. Based on the preliminary analysis, the evaluation of the data via factor analysis and reliability estimates indicated that all scale items were

appropriate and valid for further statistical analysis. Additional testing of the quality of the scales was conducted, which established the convergent and discriminant validity. Further testing for the common method variance, via Harmon's one factor test, provided evidence of the non-existence of common variance problem, indicating that the data were ready for subsequent analysis. PLS was considered as the most appropriate approach for the current study as it has several advantages over other SEM techniques. In particular, PLS allows the assessment of the psychometric properties of the measures and the exploration of the hypothesised relationship among the constructs (Chin, 1998; Hulland, 1999). Moreover, PLS facilitates simultaneous tests of the measurement models and structural models (Barclay et al., 1995); it is also compatible with interval-style data and can assess a model with a relatively small sample size (Chin, 1998; Gefen et al., 2000; Thompson et al., 1995). In consideration of these points, and due to its increasing acceptance within consumer behaviour and marketing domains PLS was chosen to evaluate the research model and test the hypotheses. Table 1.2 highlights the hypotheses of the study, and shows the path coefficient between the exogenous and endogenous variables; the average variance accounted for,  $R^2$  and bootstrap critical ratios. The bootstrap critical ratios determined the stability of the estimates and were acceptable at ranges between -1.96 and +1.96 (Chin, 1998). Alternatively, the Average Variance Accounted for (AVA) represented the mean of  $R^2$  of the structural model and

indicated the overall predictive power of the model (Fornell and Bookstein, 1982). In the current study, the AVA for the endogenous variables was .46 and the R<sup>2</sup> values for the predicted variables were all greater than the Falk and Miller's (1992) recommended level of .10; therefore, it was appropriate to examine the significance of the paths associated with these variables. All of the paths were above the recommended level of 0.015 as advocated by Falk and Miller (1992), and all variables had bootstrap critical ratios above the acceptable level (greater than 1.96,  $p < .05$ ).

Table 2 : Partial Least Squares Results for the Theoretical Model.

Predicted Variable	Predictor Variables	Hypothesis	Path	Variance due to path	R <sub>2</sub>	Critical Ratio
Attention to SSA	Prior experience	H1	.419	.291	.59	7.89
	Subjective Knowledge	H2	.232	.082		6.45
	Familiarity of brands	H3	.148	.071		2.84
	SSA relevancy	H4	.248	.148		5.34
SSA relevancy	Familiarity of brands	H5	.499	.249	.25	6.89
SSA Credibility	Prior experience	H6	.373	.269	.65	16.56
	Attention to SSA	H7	.504	.384		26.84
Attitudes toward SSA	SSA Credibility	H8	.545	.413	.60	10.03
	Attention to SSA	H9	.279	.193		6.16
Intention to click	Attitudes toward SSA	H10	.452	.204	.20	7.60
AVA					.46	

The PLS results, as shown in Table 1.2, indicate that prior experience with SSA has a significant positive effect on online users (consumers) attention towards SSA ( $\beta = 0.419, t = 7.89, p < 0.01$ ), indicating that online users with prior positive experience with SSA, will pay greater attention to SSA, thereby, supporting H1. As proposed in H2, subjective knowledge of SSA has a significant positive effect on attention to SSA ( $\beta = 0.232, t = 6.45, p < 0.01$ ), suggesting that those online users who have more knowledge about the nature and benefits of SSA are more likely to pay attention to SSA. This finding supports H2. Consistent with H3, familiarity of brands (or websites) included in the SSA, has a significant positive effect on online users' attention towards SSA ( $\beta = 0.148, t = 2.84, p < 0.01$ ), implying that those Sponsored Search Advertisements that include familiar brands (or websites) are more likely to be noticed and attended by online users, thereby supporting H3. The result for H4 indicate that SSA has a significant positive effect on online users' attention towards SSA ( $\beta = 0.248, t = 5.34, p < 0.01$ ); thus, the higher the relevancy of SSA, the greater the attention paid to the advertisement. This finding supports H4. As shown in Table 1.2, familiarity of brands (or websites) included in the SSA has a significant positive effect on the level of the relevancy of SSA ( $\beta = 0.499, t = 6.89, p < 0.01$ ) suggesting that Sponsored Search Advertisements that include familiar brands (or websites) are more likely to be considered as relevant to online users, thereby, supporting H5. Prior experience with SSA has a significant positive effect on the credibility of SSA in general ( $\beta = 0.373, t = 10.85, p < 0.01$ ) suggesting that online users who have positive prior experience with SSA are more likely to perceive SSA as credible and believable, providing support for H6. Further, attention to SSA was found to be related to the degree of perceived credibility of SSA ( $\beta = 0.504, t = 26.85, p < 0.01$ ), implying that the more attention paid to a Sponsored Search Advertisement, the greater the credibility of the SSA thereby supporting H7. Credibility of SSA has a significant positive effect on attitude towards SSA ( $\beta = 0.545, t = 10.03, p < 0.01$ ), suggesting the greater the credibility of SSA the more positive the attitude toward the Advertisement supporting H8.

As shown by the PLS results, attention towards SSA has a significant positive effect on attitude towards SSA ( $\beta = 0.279, t = 6.16, p < 0.01$ ) suggesting that the higher level of attention paid to a Sponsored Search Advertisement the greater the positive attitude towards SSA, thereby supporting H9. Consistent with H10, attitude toward SSA has a significant positive effect on intention to click on Sponsored Search Advertisements ( $\beta = 0.452, t = 7.60, p < 0.01$ ) implying that the more positive the attitude toward SSA the greater the intention to click on Sponsored Search Advertisements supporting H10. Thus, the results from the current study

show that all the hypotheses (H1, H2, H3, H4, H5, H6, H7, H8, H9, and H10) were supported.

As shown in Table 1.2, the average variance accounted (AVA) for in the endogenous variable by the exogenous variables was 0.46 (46 %). In addition, the data indicates that 65% of the variance in SSA credibility is explained by prior experience with SSA and attention towards SSA, whereas 25% of the variance in SSA relevancy is explained by familiarity of brands included in the SSA. Additionally, 59% of the variance in attention towards SSA is explained by prior experience with SSA, subjective knowledge of SSA, familiarity of brands (or websites) included in the SSA, and SSA relevancy. Furthermore, SSA credibility and attention to SSA account for 61% of the variance in attitude towards SSA. Finally, attitude towards SSA accounts for 20% of the variance in intention to click on Sponsored Search Advertisements.

## VII. CONCLUSION

The findings provided useful insights into a nomological network explicating the determinants, process, and outcomes of consumer responses towards SSA, from a consumer behaviour perspective. In particular, the findings provided empirical support for *Consumer Response Towards SSA Model*, revealing that a number of consumer related variables (prior experience with SSA, subjective knowledge of SSA, familiarity of brands (or websites) included in the SSA and SSA relevancy) act as determinants of consumer attention towards SSA. As posited in the findings, online users (consumers) who had positive prior experience with SSA are more likely to notice and pay attention to SSA. In addition, the findings provided support for the positive relationship between online users' subjective knowledge of SSA and attention paid to Sponsored Search Advertisements. Furthermore, the proposed relationship between familiarity of brands (or websites) and attention to SSA was supported. In the context of the relationship between familiarity of brands (or websites) and SSA relevancy, it was found that those Sponsored Search Advertisements that include familiar brands (or websites) are more likely to be considered as relevant, and those relevant Sponsored Search Advertisements influence attention towards such advertisements.

The proposed research model also identified that particular factors determine the credibility of SSA. For example, the findings indicate that the nature of the prior experience with SSA is a factor in determining the credibility of SSA. Accordingly, those online users (consumers) who experienced a positive prior experience with SSA are more likely to consider SSA as a credible form of Web advertising. In addition, the findings show that attention towards SSA positively influences the credibility of SSA. This implies that those

online users who pay more attention to SSA are also more likely to perceive such advertising as credible.

In relation to the outcomes of *Consumer Responses Towards SSA Model*, online users who pay attention to SSA appear to have more positive attitudes towards SSA. Further, as proposed in this research model, SSA credibility was found to influence a consumer's attitude towards SSA, and that attitude impacted upon their intention to click on Sponsored Search Advertisements.

The current results confirmed the proposed conceptual *Model of Consumer Response Towards SSA* to be a valid representation of the determinants, process and outcomes associated with consumer responses toward SSA. Firstly, in terms of determinants, the model assists in understanding the role of consumer related factors (comprising prior experience with SSA, subjective knowledge about SSA, familiarity of brands (or websites) included in the SSA, SSA relevancy, and SSA credibility) as determinants of consumer responses to Sponsored Search Advertisements. Secondly, in relation to process, the model acknowledges that online users either pay attention (or not) to SSA based on a number of consumer related factors mentioned previously. Finally, in terms of outcomes, the model acknowledges that attitude toward SSA and intention to click on Sponsored Search Advertisements as outcomes of consumers' responses to SSA.

The empirical testing provided validation of the theory from the consumer's standpoint, within the context of SSA, which appears not to have been attempted previously. As such, the current research is advantageous in that it both integrates earlier advertising research associated with consumer behavioural aspects. In doing so, the *Consumer Response Towards SSA Model* provides a valuable theoretical example for Web advertising effectiveness models (from a consumer behaviour perspective) by highlighting the determinants that affect consumer attention towards advertising and the outcomes of both attention and perceptions of advertising credibility characterised by consumer's attitude towards, and intention to click on, Sponsored Search Advertisements. For this reason, the proposed model offers a broad perspective on how an individual perceives, processes, and responds to SSA. The process begins with consumers who are conducting a search activity in order to collect information about an issue, product or service. As consumers are exposed to two different types of search results (SSA and natural free results), the immediate process will be to attend to those search results that give consumers positive outcomes and lead to the previously proposed outcomes. Accordingly, the current research has advanced our knowledge within the advertising and consumer behaviour domains, as well as contributing to the use of SSA in practice.

The value of research in the area of marketing lies in its ability to be applied in practice. In this sense, the value of this research, in terms of the *Consumer Response Towards SSA Model* is that it expands our understanding of SSA by identifying and synthesising the determinants and outcomes of consumer responses towards such advertising. The practical implications of these findings are that they add to the understanding of SSA from a consumer's behaviour perspective and, therefore, act as a valuable base for SSA practitioners. The current study provides practitioners with insights into consumers and the factors that influence their intention to click on Sponsored Search Advertisements when they use Web search engines. The findings identify what type of consumer (according to their experiences, subjective knowledge, familiarity with brands (or websites), and perceptions of credibility and relevancy) are more likely to attend and process SSA, and what are the outcomes of consumer response towards SSA, that is, attitude to SSA and intention to click on Sponsored Search Advertisements.

## VIII. FUTURE RESEARCH

As the data collection process has focused on Australian online users, it could be suggested that the results may lead to different findings for online users in other countries. As such, the model of this study could be tested in other developed countries such as the United States of America, Canada and the United Kingdom, and in developing countries such as Jordan. This replication would allow examining whether the findings hold true in other regions, and thus provide greater support for the generalisability of the findings of the study. Future research could also extend the model to examine what the most likely actions to be taken by consumers after clicking on Sponsored Search Advertisements such as gathering more information, requesting e-mail updates, subscribing or registering an interest, downloading documents, and purchasing products or services. These responses after clicking on Sponsored Search Advertisements are expected to be greatly influenced by the design and performance of the landing page.

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# Productivity Growth and Its Influence on the Dollar/Euro Real Exchange Rate

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*Abstract* - This paper examines the evidence for a productivity based model of the dollar/euro real exchange rate for the period 1985-2007 period. Cointegrating relationships between the real exchange rate and productivity, real price of oil and government spending are estimated using the Johansen and Stock-Watson procedures. The findings show that for each percentage point in the US-Euro area productivity differential there is a three percentage point change in the real dollar/euro valuation. These findings are robust to the estimation methodology, the variables included in the regression, and the sample period.

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*Strictly as per the compliance and regulations of:*



# Productivity Growth and Its Influence on the Dollar/Euro Real Exchange Rate

Ordean Olson

**Abstract** - This paper examines the evidence for a productivity based model of the dollar/euro real exchange rate for the period 1985-2007 period. Cointegrating relationships between the real exchange rate and productivity, real price of oil and government spending are estimated using the Johansen and Stock-Watson procedures. The findings show that for each percentage point in the US-Euro area productivity differential there is a three percentage point change in the real dollar/euro valuation. These findings are robust to the estimation methodology, the variables included in the regression, and the sample period.

## I. INTRODUCTION

The euro greatly depreciated against the dollar during the period 1995-2001. This decline has often been associated with relative productivity changes in the United States and the euro area over this time period. During this time period in particular, average labor productivity accelerated in the United States, while it decelerated in the euro area. Economic theory suggests that the equilibrium real exchange rate will appreciate after an actual or expected shock in average labor productivity in the traded goods sector. Such an equilibrium appreciation may be influenced in the medium term by demand side effects. Thus, productivity increases raise expected income, which leads to an increased demand for goods. However, the price of goods in the traded sector is determined more by international competition. By contrast, in the non-traded sector, where industries are not subject to the same competition, goods prices tend to vary widely and independently across countries.

The work of Harrod (1933), Balassa (1964), and Samuelson (1964) show that productivity growth will lead to a real exchange rate appreciation only if it is concentrated in the traded goods sector of an economy. Productivity growth that has been equally strong in the traded and non-traded sectors will have no effect on the real exchange rate.

This paper analyses the impact of relative productivity developments in the United States and the euro area on the dollar/euro exchange rate. This paper then provides evidence on the long-run relationship between the real dollar/euro exchange rate and productivity measures with and without the oil prices and government spending variables. Importantly, to

the extend that traders in foreign exchange markets respond to the available productivity data stresses the importance of reliable models.

From the first to the second half of the 1990's, average productivity accelerated in the United States, while it decelerated in the euro area. This relationship has stimulated a discussion on the relationship between productivity and appreciation of the dollar during this time period. Also, of equal importance is the depreciation of the dollar during the early part of the 2000's (United States productivity increased slowly while the euro area productivity increased more rapidly). Bailey and Wells (2001), for instance, argue that a structured improvement in US productivity increased the rate of return on capital and triggered substantial capital flows in the United States, which might explain in part the appreciation of the US dollar during the early part of the 2000's. Tille and Stoffels (2001) confirm empirically that developments in relative labor productivity can account for part of the change in the external value of the US dollar over the last 3 decades. Alquist and Chinn (2002) argue in favor of a robust correlation between the euro area United States labor productivity differential and the dollar/euro exchange rate. This would explain the largest part of the euro's decline during the latter part of the 1990's.

This paper presents the argument that the euro's persistent weakness in the 1995-2001 period and its strength during the 2001-2007 period can be partly explained by taking into consideration productivity differentials. In particular, the study analyses in detail the impact of relative productivity developments in the United States and the euro area on the dollar/euro exchange rate.

The paper is organized with the first part being the introduction. The next section explains the relationship between productivity advances and the real exchange rate from a theoretical perspective along with the data gathering process. Section 3 deals with the estimation, the structural VECM and impulse response analysis. Section 4 deals with tests for nonnormality and forecast error variance decomposition. Section 5 deals with a discussion of results.

## II. THE REAL EXCHANGE RATE AND PRODUCTIVITY DEVELOPMENTS

The theoretical relationships that link fundamentals to the real exchange rate in the long-run

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center around the Balassa-Samuelson model, portfolio balance considerations as well as the uncovered (real) interest rate parity condition. This study will focus on the role of productivity differentials in the determination of the dollar/euro exchange rate.

According to the Balassa-Samuelson framework, the distribution of productivity gains between countries and across tradable and non-tradable goods sectors in each country is important for assessing the impact of productivity advances on the real exchange rate. The intuition behind the Balassa-Samuelson effect is rather straight-forward. Assuming, for instance of simplicity, that productivity in the traded goods sector increases only in the home country, marginal costs will fall for domestic firms in the traded-goods sector. This leads (under the perfect competition condition) to a rise in wages in the traded goods sector at given prices. If labor is mobile between sectors in the economy, workers shift from the non-traded sector to the traded sector in response to the higher wages. This triggers a wage rise in the non-traded goods sector as well, until wages equalize again across sectors. However, since the increase in wages in the non-traded goods sector is not accompanied by productivity gains, firms need to increase their prices, which do not jeopardize the international price competitiveness of firms in the traded goods sector Harrod (1933), Balassa (1964) and Samuelson (1964).

Tille, Stoffels and Gorbachev (2001) revealed that nearly two-thirds of the appreciation of the dollar was attributable to productivity growth differentials (using the traded and nontraded differentials). However, it is important to note that Engel (1999) found that the relative price of non-traded goods accounts almost entirely for the volatility of US real exchange rates.

Accordingly, there should be a proportional link between relative prices and relative productivity. Labor productivity, however, is also influenced by demand-side factors, though their effect should be of a transitory rather than of a permanent nature. In particular, as the productivity increases raise future

income, and if consumers value current consumption more than future consumption, they will try to smooth their consumption pattern as argued by (Bailey and Wells 2001). This leads to an immediate increased demand for both traded and non-traded goods. The increase in demand for traded goods can be satisfied by running a trade deficit. The increased demand for non-traded goods, however, cannot be satisfied and will lead to an increase in prices of non-traded goods instead. Thus, demand effects lead to a relative price shift and thereby to a real appreciation.

a) *The Asymptotically Stationary Process of the Model*

This section presents evidence in favor of stable long-run relationships between the real dollar/euro exchange rate, the productivity measure, and the other variables. One model specification was estimated for the productivity measure. The sample covers the period from 1985 to 2007. The general model includes all variables discussed above as well as deterministic components.

The results of the autocorrelations and partial autocorrelations in figures 1-3 show that the autocorrelations typically die out over time with increasing time as in the GDP, oil prices and US productivity variables. The dashed lines are just  $\pm 2/\sqrt{T}$  lines; consequently, they give a rough indication of whether the autocorrelation coefficients may be regarded as coming from a process with true autocorrelations equal to zero. A stationary process for which all autocorrelations are zero is called white noise or a white noise process. Clearly, all of the series are not likely to be generated by a white noise process because the autocorrelations reach outside the area between the dashed lines for more than 50% of the time series. On the other hand, all coefficients at higher lags are clearly between the lines. Hence, the underlying autocorrelation function may be in line with a stationary data gathering process. The partial correlations convey basically the same information on the properties of the time series.

Figure 1 : Gov Spending.

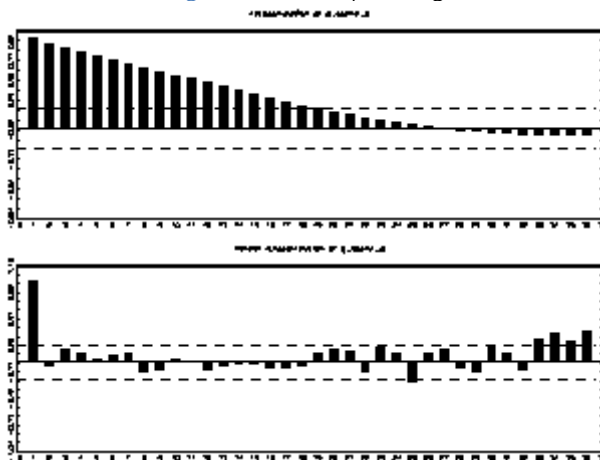




Figure 2 : US Productivity.

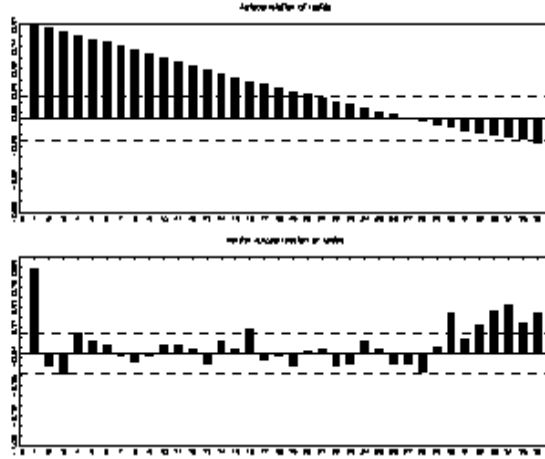


Figure 3 : Oil Prices.

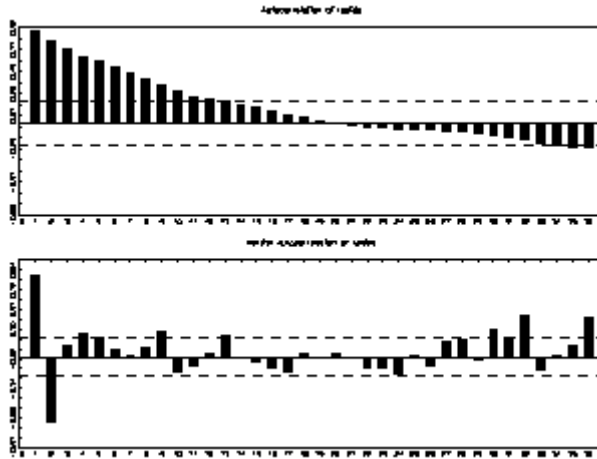
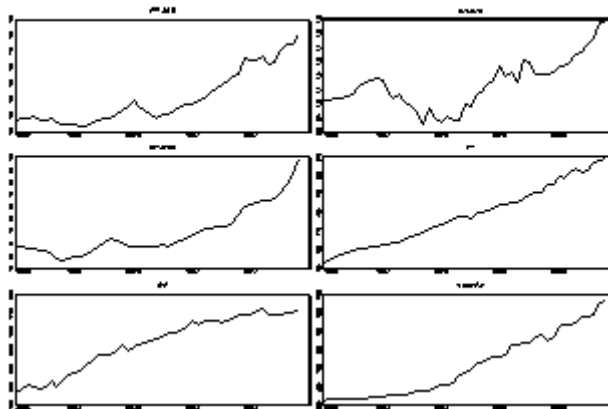


Figure 4 : Time Series

US PPI\_                      US/Euro Exc. Rate  
 Oil prices                      CPI  
 M2                              Gov\_Spending

Plot of Time Series 1996.2-2008.2. T=49



Lutkepohl (2004) states that autocorrelations and partial autocorrelations provide useful information

on specific properties of a data gathering process other than stationarity. Consistency and asymptotic normality

of the maximum likelihood estimators are required for the asymptotic statistical theory behind the tests to be valid. The results of these tests are shown in the appendix (table 6). They consist of an LM test of no error autocorrelation, an LM-type test of no additive nonlinearity, and another LM-type test of parameter constancy.

$$F_y(\Psi) = (2\Pi)^{-1} \sum y/e^{-i\Psi_j} = (2\Pi)^{-1} [y_0 2 \sum y_j \cos(\Psi_j)] \tag{1}$$

Where  $i = \sqrt{-1}$  is the imaginary unit,  $\Psi \in [-\Psi, \Psi]$  is the frequency, that is, the number of cycles in a unit of time measured in radians, and the  $y_j$ 's are the autocovariances of  $y_t$  as before. It can be shown that

$$Y_j = \int F_y(\Psi) d\Psi \tag{2}$$

Thus, the autocovariances can be recovered from the spectral density function integral as follows:

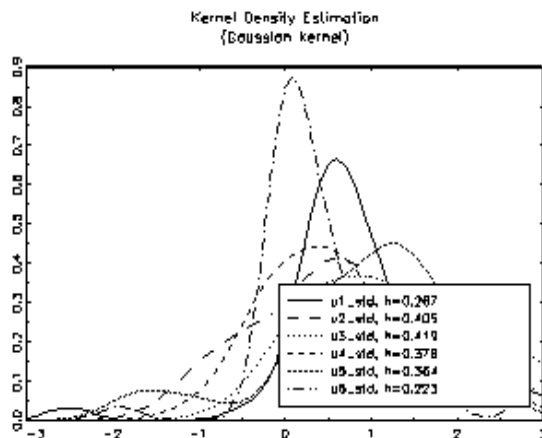
$$Y_0 = \int \sigma_y^2(\Psi) d\Psi \tag{3}$$

Graph 1 shows the log of the smoothed spectral density estimator based on a Bartlett window with window width  $M_t = 20$ .

Bartlett (1950) and Parzen (1961) have proposed spectral windows to ensure consistent estimators. The autocorrelations of a stationary stochastic process may be summarized compactly in the spectral density function. It is defined as

Many economic time series have characteristics incompatible with a stationary data gathering process. However, Lutkepohl (2004) recommends the use of simple transformations to move a series closer to stationarity. A logarithmic transformation may help stabilize the variance. In figure 4 the logarithms of the US productivity, M2, oil prices, US GDP, US/euro exchange rate and government spending are plotted. The logarithm is used as it ensures that larger values remain larger than smaller ones. The relative size is reduced, however. The series has an upward trend and a distinct seasonal pattern. The series clearly has important characteristics of a stationary series

Graph 1



b) Unit Roots.

Fuller (1976) and Dickey & Fuller (1979) proposed the augmented Dickey-Fuller (ADF) test for the null hypothesis of a unit root. It is based on the  $t$

statistic of the coefficient  $\hat{\rho}$  from an OLS estimation (see table 1). Schmidt & Phillips (1992) propose another group of tests for the null hypothesis of a unit root when a deterministic linear trend is present.

Table 1

ADF Unit Root Tests				Schmidt & Phillips		
	Sample Range	Lagged Difference	Critical Values	Test Values	Critical Values	Test Values
US Prod	1985-2008	2	-3.2535	3.13*	-9.9532	18.1**
Euro Prod	1985-2008	2	-4.1978	3.96	-17.3112	18.1**
US GDP	1985-2008	2	-5.4389	3.41	-11.5869	18.1**

Euro GDP	1985-2008	2	-3.2786	3.96***	-11.4467	25.2**
US CPI	1985-2008	2	-5.4851	3.13	-18.5775	25.2**
Euro CPI	1985-2008	2	-3.7792	3.41**	-12.1413	18.1**
US PPI	1985-2008	2	-2.013	2.56***	-5.4734	18.1**
Euro Govt % of GDP	1985-2008	2	-1.0952	1.94**	-15.0563	18.1**
Oil Prices	1985-2008	2	-2.7965	3.96***	-2.5623	25.2**

Significance at the 99%, 95% and 90% levels are noted by \*\*\*, \*\* and \* respectively. The S and L critical values are taken from tables computed by Saikkonen and Lutkepohl.

The empirical analysis employs cointegration tests as developed by Johansen (1995). In the present setting, some variables would theoretically be expected to be stationary, but appear to be near-integrated processes empirically. The presence of the cointegration relationships is tested in a multivariate

setting. Table 2 and 3 show the results of the cointegration tests. Over all, the results suggest that it is reasonable to assume a single cointegration relationship between the variables and suggest being viewed as an order of I(1).

Table 2

Cointegration	Period	Specification	LR Ratios	Critical Ratios & Test Results
Without Oil				
US Prod	1985-2008	2 lags	3.72	16.22***
Euro Prod	1985-2008	2 lags	2.7	12.45**
US GDP	1985-2008	2 lags	2.23	12.53**
Euro GDP	1985-2008	2 lags	3.32	9.14**
US CPI	1985-2008	2 lags	10.59	12.45**
Euro CPI	1985-2008	2 lags	2.48	12.45**

Significance at the 99%, 95% and 90% levels are noted by \*\*\*, \*\* and \* respectively. The S and L critical values are taken from tables computed by Saikkonen and Lutkepohl.

Table 3

Cointegration	Period	Specification	LR Ratios	Critical Ratios & Test Results
With Oil				
US Prod	1985-2008	2 lags	15.34	25.73**
Euro Prod	1985-2008	2 lags	31.68	42.77**
US GDP	1985-2008	2 lags	13.61	16.22***



Euro GDP	1985-2008	2 lags	26.07	30.67***
US CPI	1985-2008	2 lags	17.82	25.73**
Euro CPI	1985-2008	2 lags	16.62	30.67**

Significance at the 99%, 95% and 90% levels are noted by \*\*\*, \*\* and \* respectively. The S and L critical values are taken from tables computed by Saikkonen and Lutkepohl.

c) Data for Variables

For the period prior to 1999, the real dollar/euro exchange rate was computed as a weighted geometric average of the bilateral exchange rates of the euro currencies against the dollar. In addition, the model was estimated controlling for several other variables, which included US productivity, M2, oil prices, government spending and US GDP. As regards the real price of oil, its usefulness for explaining trends in real exchange rates is documented. For example, Amano and Van Norden (1998a and 1998b) found strong evidence of a long-term relationship between the real effective exchange rate of the US dollar and the oil price. As regards government spending, the fiscal balance constitutes one of the key components of national saving. In particular, Frenkel and Mussa (1985) argued that a fiscal tightening causes a permanent increase in the net foreign asset position of a country, and consequently, an appreciation of its equilibrium exchange rate in the long term. This will occur provided that the fiscal consolidation is considered to have a long-run affect.

d) Explaining the Euro Volatility by Productivity Developments during 1995-2001 and 2001-2007.

This study shows how much of the decline of the euro against the US dollar during the 1995-2001 period can be attributed to relative changes in productivity in the United States and the euro area.

While the estimation covers the period 1985-2007, the following analysis concentrates on two distinct periods.

Period 1 (1995-2001) covers the US dollar appreciation against the euro. Moreover, it encompasses the period during which the productivity revival in the United States has taken place. Over this period, the dollar appreciated by almost 41% against the euro area currency. During the first three years (1998-2001) of the euro, it depreciated by almost 30% against the US dollar. Figure 5 shows the impact of a change in relative productivity developments over these periods on the equilibrium real exchange rate. The contribution of the relative developments in productivity on the explanation of the depreciation of the euro against the US dollar since 1995 is significant. However, these developments are far from explaining the entire euro decline. Figures 6 and 7 show the impact of a change in relative US GDP and Euro GDP on the equilibrium dollar/euro real exchange rate.

Period 2 (2001-2007) covers the US dollar depreciation against the euro. Figure 8 also shows the impact of a change in relative productivity developments over these periods on the equilibrium real exchange rate. The impact of productivity on the real exchange rate is significant. The contributions of the oil prices, US GDP, M2 and US government spending on the explanation of the volatility of the euro against the US dollar since 1995 are also shown in Figures 9-12.

Figure 5 : US Prod > USD/EURO Exchange Rate.

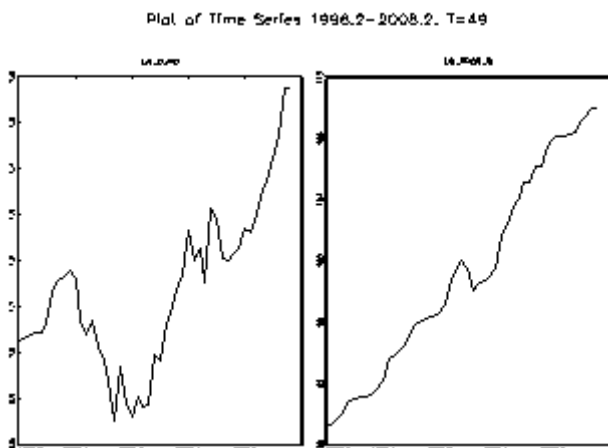


Figure 6 : Euro GDP > USD/EURO Exchange Rate.

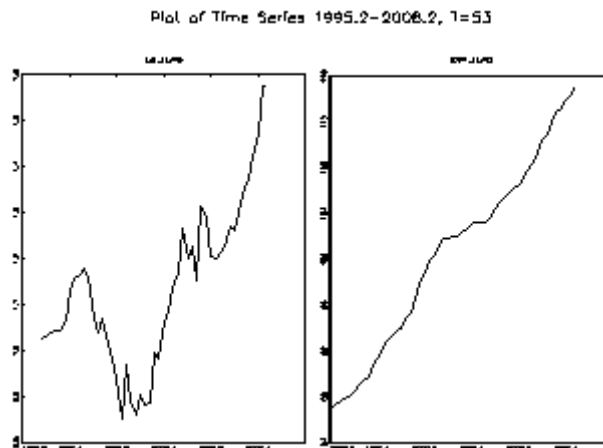


Figure 7 : US GDP > USD/EURO Exchange Rate.

Plat of Time Series 1996.2-2008.2. T=49

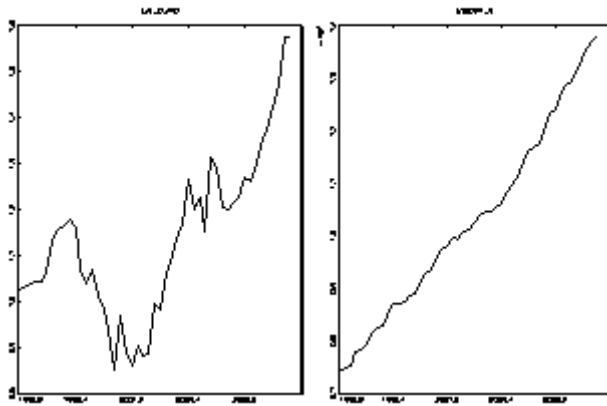


Figure 8 : US Prod > Dollar/Euro Exchange Rate.

Plat of Time Series 1996.2-2008.2. T=49

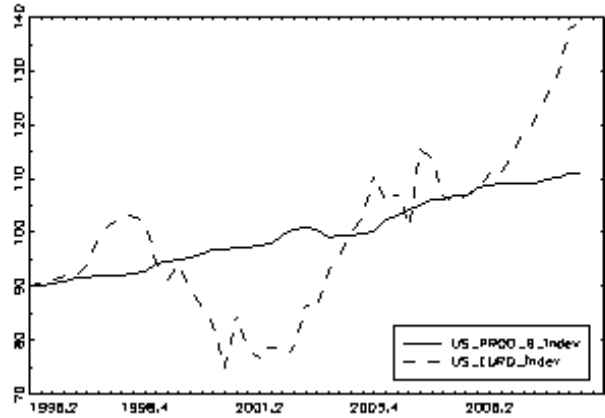


Figure 9 : Oil Prices > dollar/Euro Exchange Rate.

Plat of Time Series 1996.2-2008.2. T=49

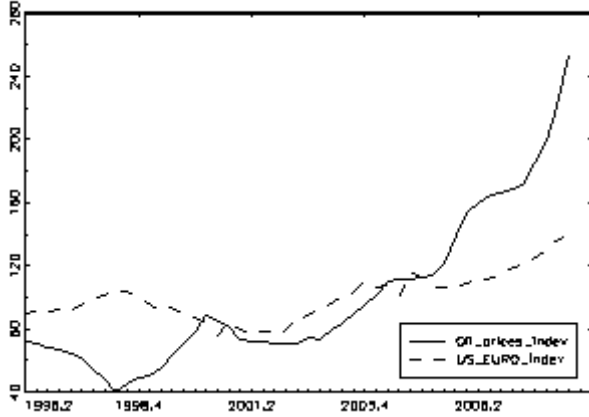


Figure 10 : US Government Spending > Dollar/Euro Exchange Rate.

Plat of Time Series 1996.2-2008.2. T=49

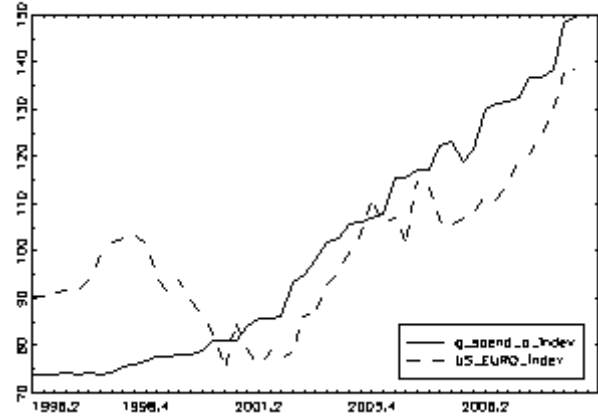


Figure 11 : GDP > Dollar/Euro Exchange Rate.

Plat of Time Series 1996.2-2008.2. T=49

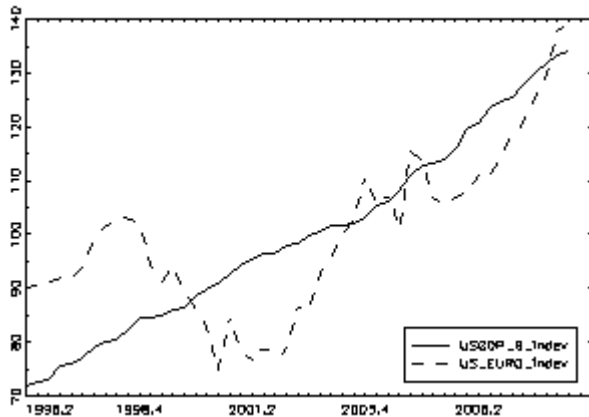
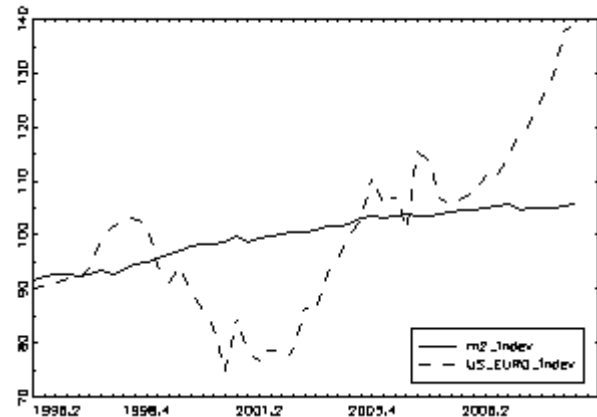


Figure 12 : M2 > Dollar/Euro Exchange Rate.

Plat of Time Series 1996.2-2008.2. T=49



### III. ESTIMATION AND THE STRUCTURAL VECM

Lutkepohl (2004) suggests the following basic vector autoregressive and error correction model (neglecting deterministic terms and exogenous variables):

For a set of K times series variables

$$y_t = A_1 Y_{t-1} + \dots + A_p Y_{t-p} + \mu_t \quad (4)$$

The VAR model is general enough to accommodate variables with stochastic trends, it is not the most suitable type of model if interest centers on the cointegration relations because they do not appear explicitly. The following VECM form is a more convenient model setup for cointegration analysis:

$$y_t = \prod y_{t-1} + I_1 \Delta_{t-1} + \dots + I_{p-1} \Delta_{t-p+1} + \mu_t \quad (5)$$

#### a) Deterministic Terms

Several extensions of the basic model are usually necessary to represent the main characteristics of a data set. It is clear that including deterministic terms, such as an intercept, a linear trend term, or seasonal dummy variables, may be required for a proper representation of the data gathering process. One way to include deterministic terms is simple to add them to the stochastic part,

$$y_t = \mu_t + x_t \quad (6)$$

Here  $\mu_t$  is the deterministic part and  $x_t$  is a stochastic process that may have a VAR or VECM representation.

A VAR representation for  $y_t$  is as follows:

$$y_t = v_0 + v_1 t + A_{y-1} y_{t-1} + \dots + A_p y_{t-p} + \mu_t \quad (7)$$

A VECM<sub>(p-1)</sub> representation has the form

$$y_t = v_0 + v_1 t + \prod y_{t-1} + \Gamma_1 \Delta y_{t-1} + \dots + \Gamma_{p-1} \Delta y_{t-p+1} + \mu_t \quad (8)$$

#### b) Exogenous Variables

Lutkepohl (2004) recommends further generalizations of the model to include further stochastic

$$A \Delta y_t = \alpha^* \beta^* y_{t-1} + \Gamma_1 \Delta y_{t-1} + \dots + \Gamma_{p-1} \Delta y_{t-p+1} + C^* D_t + B^* z_t + v_t \quad (14)$$

As suggested by King et al (1991) the following procedure is used for the estimation of the model: Using economic theory we can infer that all three variables should be I(1) with  $r = 2$  cointegration relations and only one permanent shock. The variables in this model include government spending, US productivity and oil prices. Because  $k^* = 1$ , the permanent shock is identified without further assumptions ( $(k^* - 1)/2 = 0$ ). For identification of the transitory shocks a further restriction is needed. If we assume that the second transitory shock does not have an instantaneous impact

variables in addition to the deterministic part. A rather general VECM form that includes all these terms is

$$y_t = \prod y_{t-1} + \Gamma_1 \Delta y_{t-1} + \dots + \Gamma_{p-1} \Delta y_{t-p+1} + C D_t B z_t + \mu_t \quad (9)$$

where the  $z_t$  are unmodeled stochastic variables,  $D_t$  contains all regressors associated with deterministic terms, and  $C$  and  $B$  are parameter matrices. The  $z$ 's are considered unmodeled because there are no explanatory equations for them in the system.

#### c) Estimation of VECM's

Under Gaussian assumptions estimators are ML estimators conditioned on the presample values (Johansen 1988). They are consistent and jointly asymptotically normal under general assumptions,

$$V^{-1} \text{VEC}([\Gamma_1, \dots, \Gamma_{p-1}] - [\Gamma_1, \dots, \Gamma_{p-1}]) \rightarrow^d N(0, \Sigma_t) \quad (10)$$

Reinsel (1993) gives the following:

$$\text{VEC}(\beta_{k\mu-r}) \equiv N(\text{VEC}(\beta_{k-r}), \{y_{t-1}^2 M Y_{t-1}^2\}^{-1} \Phi \{\alpha' \Sigma_{\mu}^{-1} \alpha\}^{-1}) \quad (11)$$

Adding a simple two-step (S2S) estimator for the cointegration matrix  $\alpha$ .

$$y_t - \prod y_{t-1} - \Gamma x_{t-1} = \prod_2 y_{t-1}^2 + \mu_t \quad (12)$$

The restricted estimator  $\beta_{k-r}^R$  obtained from VEC ( $\beta_{k-r}^R$ ) =  $\prod_2 h$ , a restricted estimator of the cointegration matrix is

$$B_R = [I_r : B_{k-r}]. \quad (13)$$

#### d) Estimation of Models with more General Restrictions and Structural Forms.

The first stage estimator  $\beta^*$  is treated as fixed in a second-stage estimation of the structural form because the estimators of the cointegrating parameters converge at a faster rate than the estimation of the short-term parameters (Lutkepohl-2004). In other words, a systems estimation procedure may be applied to

of the first one, we can place the permanent shock in the  $e_t$  vector. These restrictions can be represented as follows in this framework:

$$\Xi B = \begin{bmatrix} *00 & B [***] \\ *00 & [**0] \\ *00 & [***] \end{bmatrix}$$

Asterisks denote unrestricted elements. Because  $\Xi B$  has rank 1, the new zero columns represent two independent restrictions only. A third

restriction is placed on B, and thus we have a total of  $K(K-1)/2$  independent restrictions as required for just-identification.

The Breusch-Godfrey test for autocorrelation (Godfrey 1988) for the  $h^{\text{th}}$  order residual autocorrelation

$$\mu_t = \alpha\beta y_{t-1} + \Gamma_1 \Delta y_{t-1} + \dots + \Gamma_{p-1} \Delta y_{t-p+1} + CD_t + B_t \mu_{t-1} + \dots + B_h \mu_{t-h} + e_t \quad (16)$$

*e) Impulse Response Analysis-Stationary VAR Processes*

Following Lutkepohl (2004), if the process  $y_t$  is  $I(0)$ , the effects of shocks in the variables of a given system are most easily seen in its Wold moving average (MA) representation as follows:

$$y_t = \phi_0 \mu_t + \phi_1 \mu_{t-1} + \phi_2 \mu_{t-2} + \dots, \quad (17)$$

where  $\phi_s = \sum \phi_s \dots A_j$   $S = 1, 2, \dots$ ,

The coefficients of this representation may be interpreted as reflecting the responses to impulses hitting the system. The effect on an impulse is transitory as it vanishes over time. These impulse responses are sometimes called forecast error impulse responses because the  $\mu_t$   $S$  are the 1-step ahead forecast errors. Occasionally, interest centers on the accumulated effects of the impulses. They are easily obtained over all periods. The total long-run effects are given by

$$\phi_s = \sum \phi_s = (I_k - A_1 - \dots - A_p)^{-1} \quad (18)$$

This matrix exists if the VAR process is stable.

Lutkepohl (2004) criticizes the forecast error impulse response method in that the underlying shocks are not likely to occur in isolation if the components of  $\mu$  are instantaneously correlated. Therefore, orthogonal innovations are preferred in an impulse response analysis. One way to get them is to use a Choleski decomposition of the covariance matrix  $\Sigma_\mu$ . If B is a lower triangular matrix such that  $\Sigma_\mu = B^{-1} \mu$ , we obtain the following:

$$y_t = \phi_0 e_t + \phi_1 e_{t-1} + \dots, \quad (19)$$

Sims (1981) recommends trying various triangular orthogonalizations and checking the robustness of the results with respect to the ordering of the variables if no particular ordering is suggested by subject matter theory.

*f) Impulse responses analysis of nonstationary VAR's and VECM's*

Although the Wold representation does not exist for nonstationary cointegrated processes, it is easy to see that the  $\phi$  impulse response matrices can be computed in the same way based on VAR's with integrated variables or the levels version of a VECM as proposed by Lutkepohl (1991) and Lutkepohl & Reimers (1992). In this case, the  $\phi$  may not converge to zero as  $S \rightarrow \infty$ ; consequently, some shocks may have permanent effects. Of course, one may also consider orthogonalized or accumulated responses. However,

assumes this model.

$$V_t: B_t \mu_{t-1} + \dots + B_h \mu_{t-h} + \text{error}_t \quad (15)$$

For the purpose of this model the VECM form is as follows:

from Johansen's (1998a) version of Granger's Representation Theorem it is known that if  $y$  is generated by a reduced form VECM

$$\Delta y_t = \alpha\beta' y_t + \Gamma_1 \Delta y_{t-1} + \dots + \Gamma_{p-1} \Delta y_{t-p+1} + \mu_t \quad (20)$$

it has the following MA representation

$$y_t = \Xi \sum \mu_i + \Xi^*(\mathcal{L}) \mu_t + y^*_0 \quad (21)$$

VI. TESTS FOR NONNORMALITY

Given the residuals  $\mu_t$  ( $t = 1, \dots, T$ ) of an estimated VECM process, the residual covariance matrix is therefore estimated as

$$\Sigma_\mu = T^{-1} \sum (\mu_t - \mu^\lambda)(\mu_t - \mu^\lambda)' \quad (22)$$

and the square matrix  $\Sigma_\mu^{1/2}$  is computed.

The standardization of the residuals used here was proposed by Doornik & Hansen (1994) and Lutkepohl (1991). An alternative way of standardization is based on a Choleski decomposition of the residual covariance matrix.

Refer to the appendix (table 6) for tests for nonnormality, which include the Chow tests, Portmanteau test, LM-type test for autocorrelation, Jarque & Bara test, Multivariate ARCH-LM test, the Kernel Density Estimation and the CUSUM test.

*a) Forecasting VECM Processes*

Once an adequate model for the data gathering process of a system of variables has been constructed, it may be used for forecasting as well as economic analysis. The concept of Granger-causality, which is based on forecast performance, has received considerable attention in the theoretical and empirical literature. Granger (1969) introduced a causality concept whereby he defines a variable  $y_{2t}$  to be casual for a time series variable  $y_{1t}$  if the former helps to improve the forecasts of the latter.

In Table 5 the test for Granger-Causality reveals none of the  $p$ -values are smaller than 0.05. Therefore, using a 5% significance level, the null hypothesis of noncausality cannot be rejected. However, in the test for instantaneous causality there is weak evidence of a Granger-causality relation from US productivity differentials  $\rightarrow$  dollar/euro exchange rate because the  $p$ -value of the related test is at least less than 10%.

Table 5

Lutkepohl (2004)

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TEST FOR GRANGER-CAUSALITY: H0: "US\_PROD Differentials" do not Granger-cause "US\_EURO

Test statistic  $F = 0.9604$  pval-F ( $F$ ; 1, 86) = 0.3298

TEST FOR INSTANTANEOUS CAUSALITY:

H0: No instantaneous causality between "US\_PROD Differentials" and "US\_EURO"

Test statistic:  $c = 3.3221$  pval-Chi ( $c$ ; 1) = 0.0684

This procedure can be used if the cointegration properties of the system are unknown. If it is known that all variables are at most  $I(1)$ , an extra lag may simply be added and the test may be performed on the lag-augmented model. Park & Phillips (1989) and Sims et al (1990) argue that the procedure remains valid if an intercept or other deterministic terms are included in the VAR model. Forecasting vector processes is completely analogous to forecasting univariate processes. It is assumed the parameters are known.

The identification of shocks using restrictions on their long-run effects are popular. In many cases, economic theory suggests that the effects of some shocks are zero in the long-run. Therefore, the shocks have transitory effects with respect to some variables. Such assumptions give rise to nonlinear restrictions on the parameters which may in turn be used to identify the structure of the system.

$$l_c(a, B) = \text{constant} + T/2 \log[A]^2 - T/2 \log \{B\} - T/2 m (A'B^{-1} A \Sigma_{\mu}) \quad (24)$$

where  $\Sigma_{\mu} = \tau^{-1}(Y - A^{-1}Z)(Y - AZ)$  is just the estimated covariance matrix of the VAR residuals as argued by Breitung (2001).

Lutkepohl (2004) recommends that continuation of the algorithm stops when some prespecified criterion are met. An example would be a relative change in the log-likelihood and the relative change of the parameters. The resulting ML estimator is asymptotically efficient and normally distributed, where the asymptotic covariance matrix is estimated by the inverse of the information matrix. Moreover, the ML estimator for  $\Sigma_{\mu}$  is

$$\Sigma_{\mu} = A^{-1} B^{-1} B A^{-1} \quad (25)$$

$$l_c(A, B) = \text{constant} + T/2 \log[A]^2 - T/2 \log \{B\} - T/2 m (A'B^{-1} A \Sigma_{\mu}) \quad (27)$$

can be used for estimating the structural parameters  $A$  and  $B$ . If no restrictions are imposed on the short-run parameters, the  $\Sigma_{\mu}$  matrix represents the residual covariance matrix obtained from a reduced rank regression. If the short-run parameters are restricted or restrictions are placed on the cointegration vectors, some other estimator may be used instead of the ML estimator, and  $\Sigma_{\mu}$  may be estimated from the corresponding residuals.

The impulse responses obtained from a structured VECM usually are highly nonlinear functions of the model parameters. This should be considered when drawing inferences related to the impulse responses.

b) Estimation of Structural Parameters

Following the procedure recommended by Lutkepohl (2004), the estimation of the SVAR model is equivalent to the problem of estimating a simultaneous equation model with covariance restrictions. First, consider a model without restrictions on the long-run effects of the shocks. It is assumed that  $e_t$  is white noise with  $e_t \sim N(0, I_k)$  and the basic model is a VAR; thus the structural form is

$$A y_t = A[A_1, \dots, A_p] Y_{t-1} + B e_t \quad (23)$$

The concentrated log-likelihood is as follows:

Where  $A^{-1}$  and  $B^{-1}$  are estimators of  $A$  and  $B$ , respectively. Note that  $\Sigma_{\mu}$  only corresponds to the reduced-form estimate  $\Sigma_{\mu}$  if the SVAR is exactly identified. In the presence of over-identifying restrictions, an LR test statistic for these restrictions can be constructed in the usual way as

$$LR = T(\log | \Sigma_{\mu}^* | - \log | \Sigma_{\mu} |) \quad (26)$$

For VECM'S the concentrated likelihood function

Generally, if long-run identifying restrictions have to be considered, maximization of the above formula is a numerically difficult task because these restrictions are typically highly nonlinear for  $A$ ,  $B$ , or both. In some cases, however, it is possible to express these long-run restrictions as linear restrictions, and maximization can be done using the scoring algorithm defined above. When considering a cointegrated VECM where  $A = I_k$  it follows that the restrictions on the system variables can then be written in implicit form as



$$R\text{Vec}(\Xi B) = 0 \tag{28}$$

Where  $R\Xi$  is an appropriate restriction matrix. Following the suggestions of Vlaar (1998) we can reformulate these restrictions as

$$R_{\Xi}(I_k \otimes \Xi \text{vec}(B) = R\text{Vec}(\Xi B) = 0 \tag{29}$$

Replacing  $\Xi$  by an estimator obtained from the reduced form we obtain  $R_{B,i} = R\Xi(I_k \otimes \hat{\Xi}$ , which is a stochastic restriction matrix. These implicit restrictions can be derived. Here  $t^*_{y/2}$  and  $t^*_{1-y/2}$  are the  $y/2$  and  $(1 - y/2)$  equations, respectively, of the empirical distribution of  $(\hat{\varnothing}^* - \varnothing)$

*c) Impulse Responses*

Figures 13-17 display the impulse responses of the dollar/euro exchange rate to a one standard deviation change in the US productivity, M2, oil prices, and government spending. The responses are significant at the 95% level. Table 8 ( in the appendix) displays the point estimates of the impulse responses of the real exchange rate to the one-standard deviation US productivity shocks. Also note that the results are

relatively robust with the individual impulse responses falling within the 5% significant tests. Figure 13 shows that for the exchange rate these shocks have a highly significant impact over the 10-year time period and the correlation between these impulse responses is high. They show that productivity shocks have a very significant long-run impact on the dollar/euro exchange rate. The results follow those of Clarida and Galf (1992). The point estimates in table 8 show that for each percentage point in the US-Euro area productivity differential there is a three percentage point real change in the dollar/euro valuation. This suggests that fundamental real factors are significant in the long-run fluctuations in real exchange rates.

Refer to the appendix (figures 31-44) for the US and Euro productivity differentials. Figure 31 shows the long-run impact of productivity shocks on the dollar/euro real exchange rate. Figure 35 shows the significance of large gaps in the euro and US productivity differentials especially around the years 2000-2001 when the dollar started to depreciate against the euro.

Figure 13 : US Productivity → US/EURO Exchange Rate.

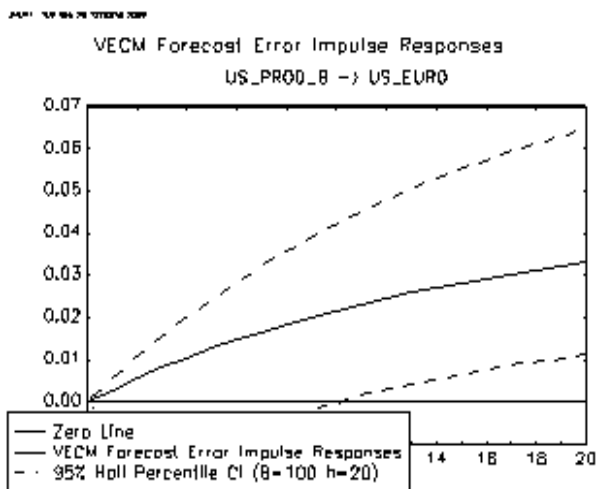


Figure 14 : Government Spending → US/EURO Exchange Rate

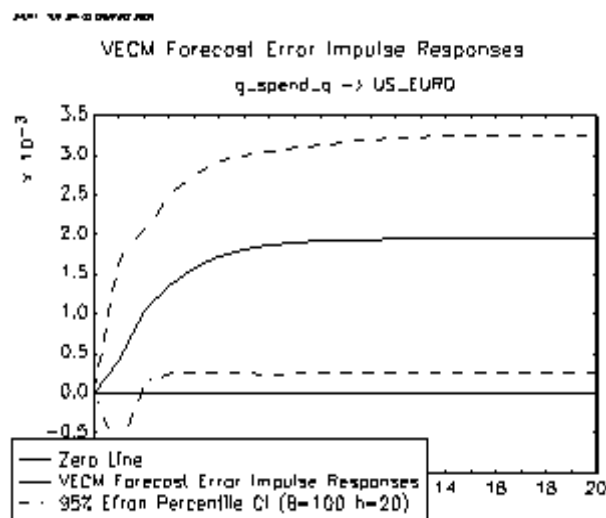


Figure 15 : US GDP → US/EURO Exchange Rate.

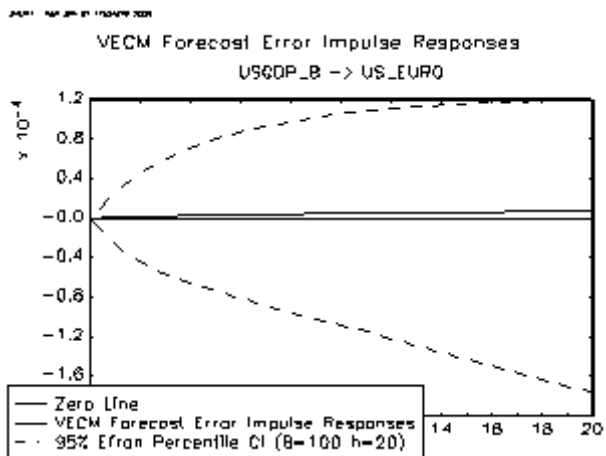


Figure 16 : M2 → US/EURO Exchange Rate.

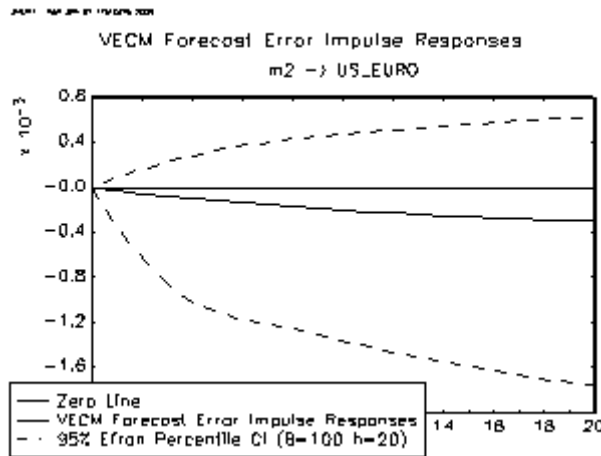


Figure 17 : Oil Prices → US/EURO Exchange Rate.

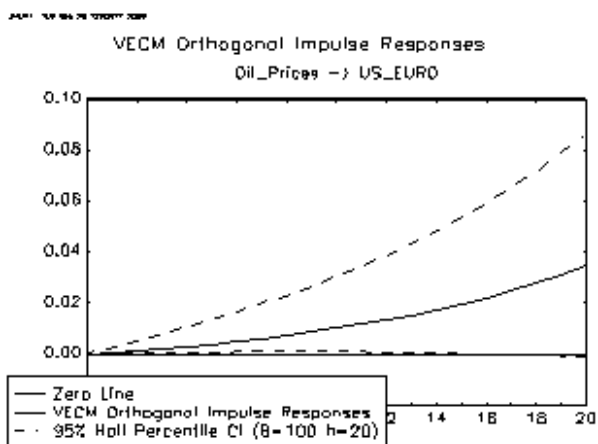
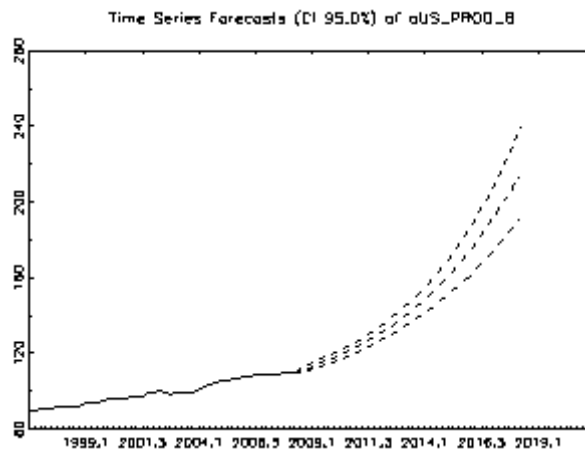


Figure 18 : Time Series Forecast- US Productivity.



d) Forecast error variance decomposition

Forecast error variance decomposition is a special way of summarizing impulse responses. Following Lutkepohl (2004) the forecast error variance decomposition is based on the orthogonalized impulse responses for which the order of the variables matters. Although the instantaneous residual correlation is small in our subset VECM, it will have some impact on the outcome of a forecast error variance decomposition.

Lutkepohl (2004) suggests the forecast error variance as

$$\partial^2_k(h) = \sum(\Psi^2_{k1,n} + \dots + \Psi^2_{k,n}) = \Psi^2_{kjo} + \dots \Psi^2_{kh-1} \quad (30)$$

The term  $(\Psi^2_{k1,n} + \dots + \Psi^2_{k,n})$  is interpreted as the contribution of variable j to the h-step forecast error variance of variables k. This interpretation makes sense if the  $e_{\mu s}$  can be viewed as shocks in variable i. Dividing the preceding by  $\partial^2_k(h)$  gives the percentage contribution of variable j to the h-step forecast error of variable h.

$$(\theta)_j(h) = \Psi^2_{kjo} + \dots \Psi^2_{kh-1} / \partial^2_k(h) \quad (31)$$

Chart 1 shows the proportion of forecast error in the dollar/euro accounted for by US productivity, government spending, M2, oil prices and US GDP. The US productivity accounts for 28% over the 20 year time interval with a sharp rise of 21% during the first 5 years. This shows that productivity shocks have a very significant short-run impact on the dollar/euro exchange rate while the long-run impact is more transitory in nature. Figures 23-26 show the time series forecasts of the system for the years 2007-2011 with 95% forecast intervals indicated by dashed lines. That all observed variables are within the approximately 95% forecast intervals is viewed as an indication of model adequacy for forecasting purposes.

Chart 1

\*\*\* Fri, 30 Oct 2009 10:11:31 \*\*\*  
 VECM FORECAST ERROR VARIANCE DECOMPOSITION  
 Proportions of forecast error in "bUS\_EURO"  
 accounted for by:

forecast horizon	aUS_PROD_B	bUS_EURO	cOil_prices	dm2	g_spend_q
1	0.10	0.90	0.00	0.00	0.00
2	0.11	0.89	0.00	0.00	0.00
3	0.11	0.89	0.00	0.00	0.00
4	0.12	0.88	0.00	0.00	0.00
5	0.13	0.87	0.00	0.00	0.00
6	0.13	0.87	0.00	0.00	0.00
7	0.14	0.86	0.00	0.00	0.00
8	0.14	0.85	0.00	0.00	0.00
9	0.15	0.84	0.00	0.00	0.00
10	0.16	0.83	0.00	0.00	0.00
11	0.16	0.82	0.01	0.01	0.01
12	0.17	0.81	0.01	0.01	0.01
13	0.18	0.80	0.01	0.01	0.01
14	0.19	0.79	0.01	0.01	0.01
15	0.19	0.78	0.01	0.01	0.01
16	0.20	0.76	0.01	0.01	0.01
17	0.21	0.75	0.01	0.01	0.01
18	0.22	0.74	0.02	0.02	0.02
19	0.22	0.72	0.02	0.02	0.02
20	0.23	0.71	0.02	0.02	0.02

Figure 19 : Time Series Forecast Oil Prices.

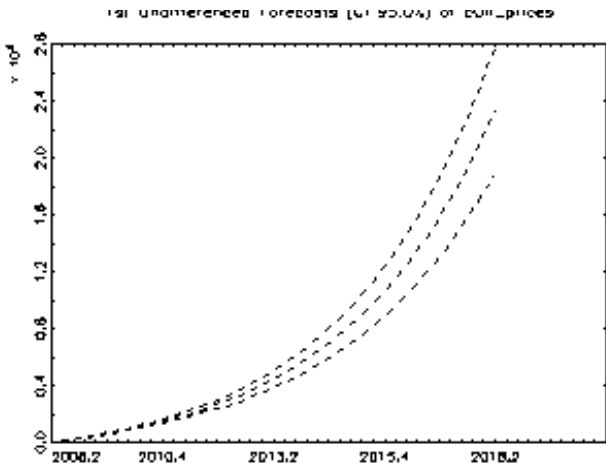


Figure 20 : Time Series Forecast Gov Spending.

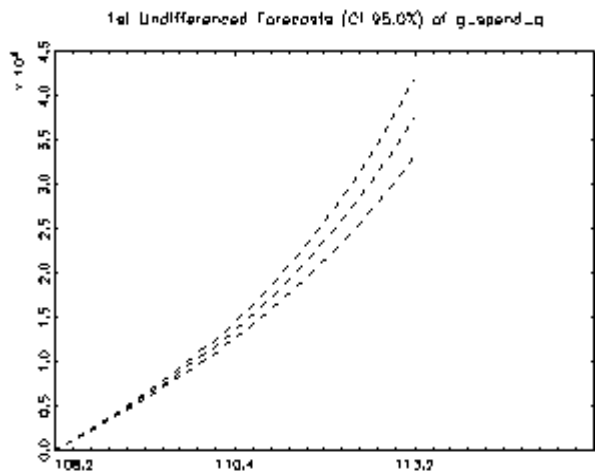


Figure 21 : Time Series Forecast Dollar/Euro Exchange Rate

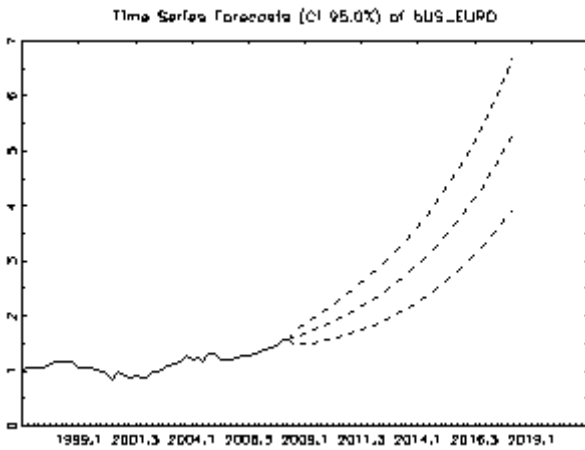


Figure 22

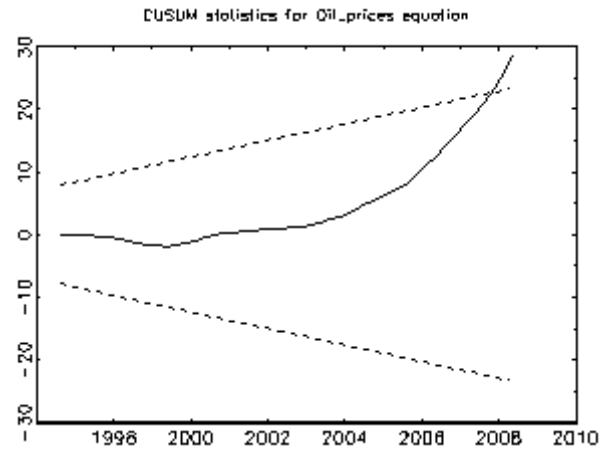


Figure 23

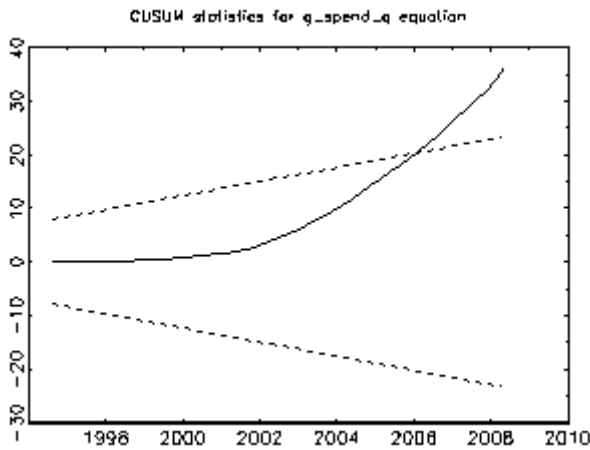


Figure 24

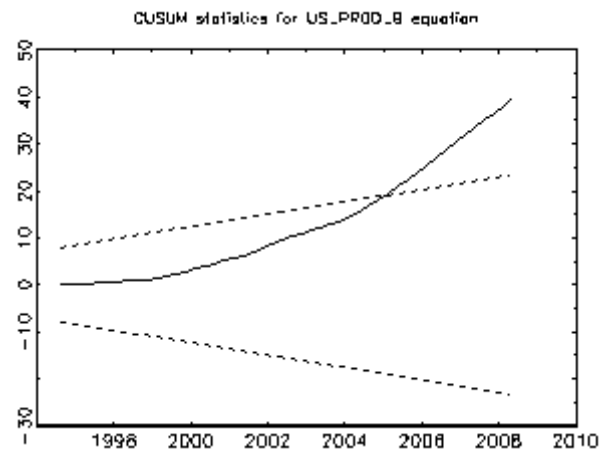


Figure 25

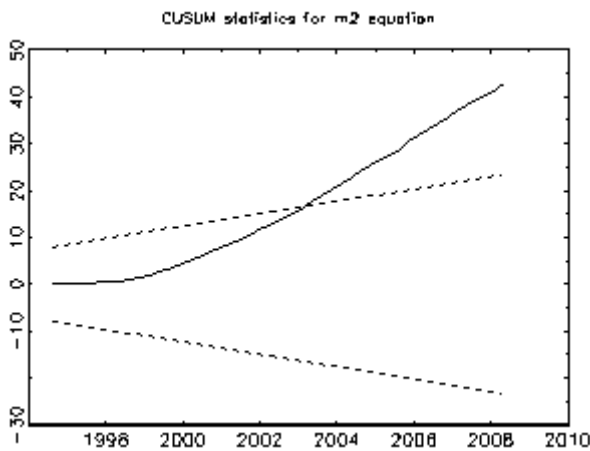
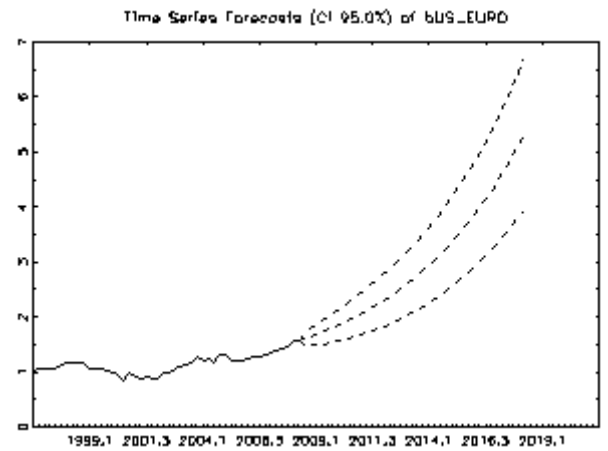


Figure 26



## V. DISCUSSION OF THE RESULTS

This paper provides evidence on the long-run relationship between the real dollar/euro exchange rate and productivity measures, controlling for the real price of oil, relative government spending and M2. However, the results imply that the productivity measure can explain only about 27% of the actual amount of depreciation of the euro against the US dollar for the period 1995-2001. This outcome is confirmed by a specification in this study. Figure 18 shows that the productivity can explain only about 28% of the appreciation of the euro during the period 1995-2007 (appendix table 6 for point estimate).

Evidently, productivity is not the only variable affecting the real exchange rate in the model specified. The other variables identified also affected the dollar/euro exchange rate. In particular, the surge in oil prices since early 1999 seems to have contributed to the weakening of the euro. The magnitude of the long-run impact of changes in the real price of oil on the dollar/euro exchange rate is certainly significant. Between 1997 and 2001, the model indicates on the average that the equilibrium euro depreciation related to oil prices developments could have been around 20% (refer to table 8 for point estimate and figure 21). These results are based on long-term relationships.

Overall, the model is surrounded by significant uncertainty, reflecting the inherent difficulty of modeling exchange rate behavior. While we find that in 1995-2001 the euro traded well below the central estimates derived from these specifications, this uncertainty precludes any quantification of the precise amount of over or under valuation at any point in time. This point is also made clear by Detken and Dieppo (2002), who employed a wide range of modeling strategies to show that the deviation from the estimated equilibrium differs widely across models and is surrounded by some uncertainty. Moreover, the results provided by Maeso-Fernandez and Osbat (2001) find various reasonable but non-encompassing specifications leading to different exchange rate equilibria. Again, this suggests a very cautious interpretation of the magnitude of over/under valuation.

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## APPENDIX

The data for this study was collected from the following sources:

Economic Data Base (FRED) of the Economic Research Department of the *Federal Reserve Bank of St. Louis*. The PPI and CPI are used as proxies for tradable and nontradable goods.

Data Bases and Tables of the *Bureau of Labor Statistics*.

The source of all of the graphs, figures and charts was the Software JMulTi. available from Lutkepohl, Helmut. Applied Time Series Econometrics. 2004, Cambridge University Press.

Table 5

\*\*\* Sun, 2 Aug 2009 06:51:29 \*\*\*  
 VAR Orthogonal Impulse Responses

Selected Confidence Interval (CI):  
 a) 95% Hall Percentile CI (B=100 h=20)

Selected Impulse  
 Responses: "impulse variable -> response  
 variable"

time Oil\_prices  
 ->US\_EURO

point estimate 0.0000  
 CI a) [ 0.0000, 0.0000]

1 point estimate -0.0354  
 CI a) [ -0.0653, -0.0469]

2 point estimate -0.0174  
 CI a) [ -0.0401, -0.0183]

3 point estimate -0.0111  
 CI a) [ -0.0322, -0.0085]

4 point estimate -0.0027  
 CI a) [ -0.0187, 0.0035]

5 point estimate 0.0017  
 CI a) [ -0.0113, 0.0109]

6 point estimate 0.0086  
 CI a) [ 0.0030, 0.0251]

7 point estimate 0.0054  
 CI a) [ -0.0036, 0.0243]

8 point estimate 0.0290  
 CI a) [ 0.0263, 0.0608]

9 point estimate 0.0344  
 CI a) [ 0.0456, 0.0733]

10 point estimate 0.0483  
 CI a) [ 0.0652, 0.0991]

11 point estimate 0.0729  
 CI a) [ 0.1027, 0.1433]

12 point estimate 0.0895  
 CI a) [ 0.1267, 0.1738]

13 point estimate 0.1251  
 CI a) [ 0.1767, 0.2385]

14 point estimate 0.1593  
 CI a) [ 0.2316, 0.3070]

15 point estimate 0.1827  
 CI a) [ 0.2614, 0.3526]

16 point estimate 0.2337  
 CI a) [ 0.3360, 0.4495]

17 point estimate 0.2849  
 CI a) [ 0.4044, 0.5560]

18 point estimate 0.3500  
 CI a) [ 0.4926, 0.6721]

19 point estimate 0.4260  
 CI a) [ 0.5973, 0.8246]

20 point estimate 0.5119  
 CI a) [ 0.7118, 0.9910]

Candelon and Lutkepoh (2001) recommended using bootstrap versions for the Chow tests to improve sample properties. The bootstrap is set up with modifications to allow for residual vectors rather than univariate residual series. Table 9 shows the results of a possible break date for 2001 in which the government changed to the euro.

On the basis of the appropriate *p*-values, the bootstrap findings of the sample-split. Chow tests do not reject stability in the model even with the structural break in 2001.

### TEST FOR NONNORMALITY

The following test for residual autocorrelation is known as the Portmanteau test statistic. The null hypothesis of no residual autocorrelation is rejected for large values of  $Q_h$  (test statistic). The *p*-value is relatively large: consequently, the diagnostic tests indicate no problem with the model.

Lomnicki (1961) and Jarque & Bera (1987) propose a test for nonnormality based on the skewness and kurtosis for a distribution. The Jarque & Bera tests in table 9 show some nonnormal residuals for two

variables (oil prices and government spending (u4 and u6).

Lutkepohl (2004) states that if nonnormal residuals are found, this is often interpreted as a model defect. However, much of the asymptotic theory on which inference in dynamic models is based works also for certain nonnormal residual distributions. Still nonnormal residuals can be a consequence of neglected nonlinearities. Modeling such features as well may result in a more satisfactory model with normal residuals. Sometimes, taking into account ARCH effects may help to resolve the problem. With this in mind a multivariate ARCH-LM test was performed. The results shown in Table 10 indicate the *p*-value is relatively large: consequently, the diagnostic tests indicate no problem with the model.



Table 6

\*\*\* Sun, 26 Jul 2009 07:38:32 \*\*\*  
 PORTMANTEAU TEST (H0:Rh=(r1,...,rh)=0)

tested order: 16  
 test statistic: 419.1197  
 p-value: 1.0000  
 adjusted test statistic: 505.9513  
 p-value: 0.9746  
 degrees of freedom: 570.0000

\*\*\* Sun, 26 Jul 2009 07:38:33 \*\*\*

LM-TYPE TEST FOR AUTOCORRELATION with 5 lags

LM statistic: 301.5520  
 p-value: 0.0000  
 df: 180.0000

\*\*\* Sun, 26 Jul 2009 07:38:33 \*\*\*  
 TESTS FOR NONNORMALITY

Reference: Doornik & Hansen (1994)

joint test statistic: 89.2009  
 p-value: 0.0000  
 degrees of freedom: 12.0000  
 skewness only: 42.7256  
 p-value: 0.0000  
 kurtosis only: 46.4753  
 p-value: 0.0000

Reference: Lütkepohl (1993),  
 Introduction to Multiple Time  
 Series Analysis, 2ed, p. 153

joint test statistic: 59.1903  
 p-value: 0.0000  
 degrees of freedom: 12.0000  
 skewness only: 27.2345  
 p-value: 0.0001  
 kurtosis only: 31.9558  
 p-value: 0.0000

\*\*\* Sun, 26 Jul 2009 07:38:33 \*\*\*  
 JARQUE-BERA TEST

variable	teststat	p-Value(
u1	1.3867	0.4999
u2	0.6571	0.7200
u3	1.7748	0.4117
u4	35.4963	0.0000
u5	8.6994	0.0129
u6	33.7747	0.0000

\*\*\* Sun, 26 Jul 2009 07:38:33 \*\*\*

MULTIVARIATE ARCH-LM TEST with 2 lags

VARCHLM test statistic: 908.0688  
 p-value(chi<sup>2</sup>): 0.2642  
 degrees of freedom: 882.0000

Table 7

\*\*\* Sun, 26 Jul 2009 07:10:23 \*\*\*  
 CHOW TEST FOR STRUCTURAL BREAK  
 On the reliability of Chow-type tests.  
 ..., B. Candelon, H. Lütkepohl, Economic  
 Letters 73 (2001), 155-160

sample range: [1996 Q3,  
 2008 Q2], T = 48  
 tested break date: 1999 Q4  
 (13 observations before break)

break point Chow test: 83.7823  
 bootstrapped p-value: 0.0000  
 asymptotic chi<sup>2</sup> p-value: 0.0000  
 degrees of freedom: 27

sample split Chow test: 9.3234  
 bootstrapped p-value: 0.2500  
 asymptotic chi<sup>2</sup> p-value: 0.1562  
 degrees of freedom: 6

Chow forecast test: 1.3188  
 bootstrapped p-value: 0.0000  
 asymptotic F p-value: 0.2388  
 degrees of freedom: 210, 20

### CUSUM TESTS

The standardization of the residuals used in this model was proposed by Doornik & Hansen (1994) and Lutkepohl (1991). An alternative way of standardization is based on a Choleski decomposition of the residual covariance matrix.

Lutkepohl (2004) recommends checking the time invariance of a model by considering recursively estimated quantities. Plotting the recursive estimates together with their standard or confidence intervals can give useful information on possible structural breaks. The recursive estimates of the model are shown in Figures 27-30. They appear to be somewhat erratic at the sample beginning which would reflect greater uncertainty. However, even when taking this into account one finds that the recursive estimates do not indicate parameter uncertainty. The erratic behavior of the recursive estimates at the beginning could be attributed to the change over to the euro in 2001.

The results of the CUSUM tests of the system with 99% level critical bounds (for sample periods 1985-2007) also indicate that government spending, GDP, US productivity, oil prices and M2 recursive estimates are all outside the critical bounds for the CUSUM statistics. This would suggest some stability problems even though they are only outside the critical bounds for the years of 2005-2008. They are all well within the uncritical region for the years up to 2005. For VECMs with cointegrating variables, Hansen & Johansen (1999) have recommended recursive statistics for stability analysis. Figure 35 shows the eigenvalue with a cointegrating rank  $r = 1$ . The recursive eigenvalue



appears to be within the 95% confidence intervals. Also, the tau statistic  $T(\lambda)$  is plotted in Figure 36 and the results indicate that the eigenvalue is stable. Therefore, there is no indication of instability of the system

Table 8

\*\*\* Mon, 2 Nov 2009 11:22:23 \*\*\*  
 VECM Orthogonal Impulse Responses

Selected Confidence Interval (CI):

a) 95% Hall Percentile CI (B=100 h=20)

Selected Impulse Responses: "impulse variable -> response variable"

time aUS\_PROD\_B  
 ->bUS\_EURO

point estimate	-0.0174
CI a)	[-0.0310, -0.0021]
1 point estimate	-0.0185
CI a)	[-0.0336, -0.0037]
2 point estimate	-0.0197
CI a)	[-0.0356, -0.0040]
3 point estimate	-0.0209
CI a)	[-0.0381, -0.0044]
4 point estimate	-0.0221
CI a)	[-0.0412, -0.0041]
5 point estimate	-0.0234
CI a)	[-0.0446, -0.0035]
6 point estimate	-0.0248
CI a)	[-0.0482, -0.0027]
7 point estimate	-0.0263
CI a)	[-0.0519, -0.0029]
8 point estimate	-0.0278

CI a)	[-0.0556, -0.0031]
9 point estimate	-0.0294
CI a)	[-0.0594, -0.0036]
10 point estimate	-0.0310
CI a)	[-0.0634, -0.0042]
11 point estimate	-0.0327
CI a)	[-0.0676, -0.0050]
12 point estimate	-0.0345
CI a)	[-0.0720, -0.0059]
13 point estimate	-0.0364
CI a)	[-0.0765, -0.0070]
14 point estimate	-0.0384
CI a)	[-0.0812, -0.0083]
15 point estimate	-0.0405
CI a)	[-0.0862, -0.0085]
16 point estimate	-0.0426
CI a)	[-0.0915, -0.0083]
17 point estimate	-0.0449
CI a)	[-0.0973, -0.0076]
18 point estimate	-0.0472
CI a)	[-0.1034, -0.0069]
19 point estimate	-0.0497
CI a)	[-0.1103, -0.0060]
20 point estimate	-0.0523
CI a)	[-0.1175, -0.0051]

Figure 29

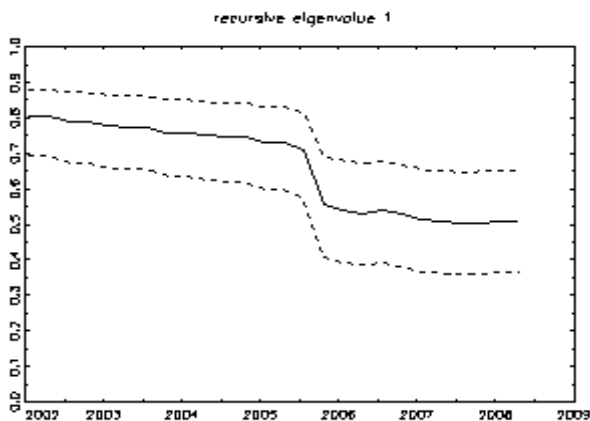


Figure 30

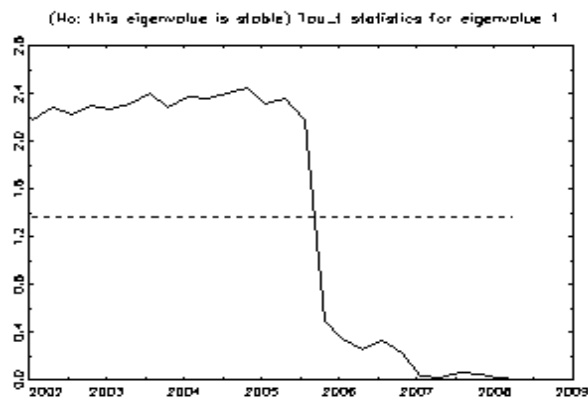
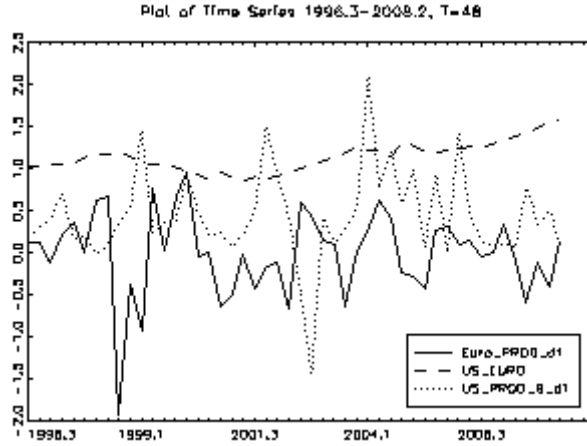


Figure 31 : Time Series Euro Productivity and US Productivity Dollar/Euro Real Exchange Rate.



Year 2012

74

Figure 32 : Time Series Euro Traded and Nontraded Goods.

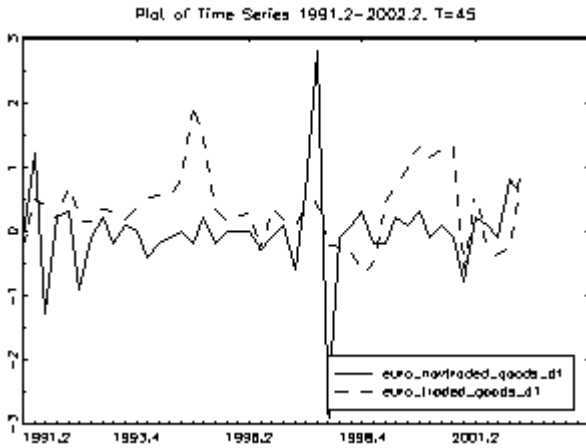


Figure 33 : Time Series US Productivity Differentials

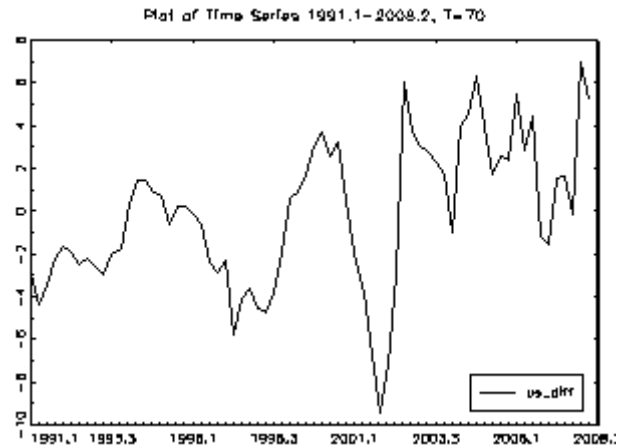


Figure 34 : US Traded Goods US Nontraded Goods.

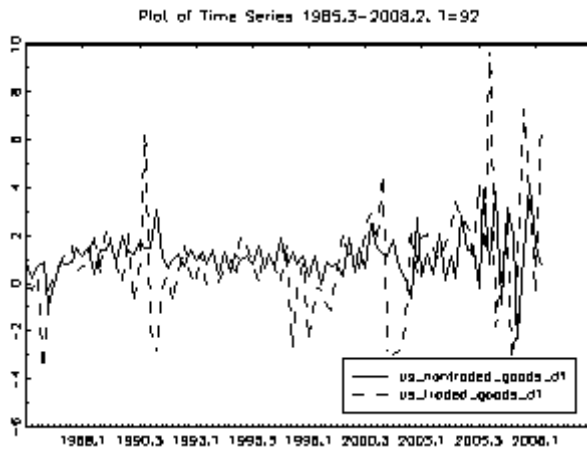
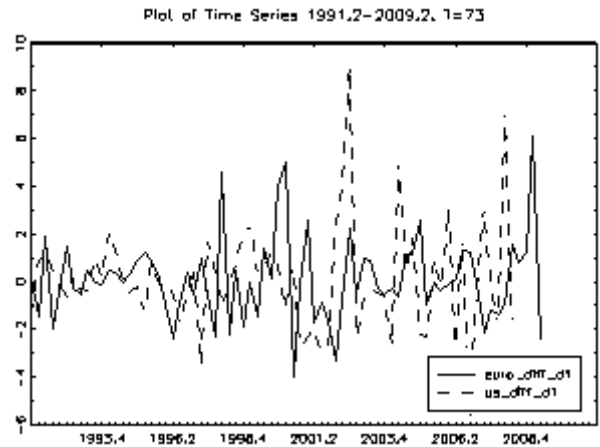


Figure 35 : Time Series Euro and US Productivity Differentials



Global Journal of Management and Business Research Volume XII Issue XVIII Version I



Figure 37 : Time Series Euro Productivity Differentials.

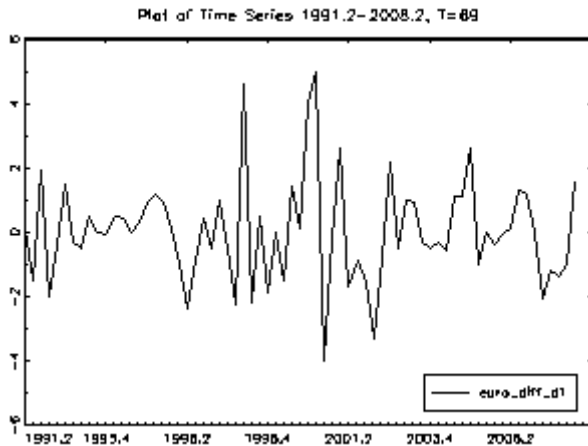


Figure 38 : Time Series Euro PPI and CPI.

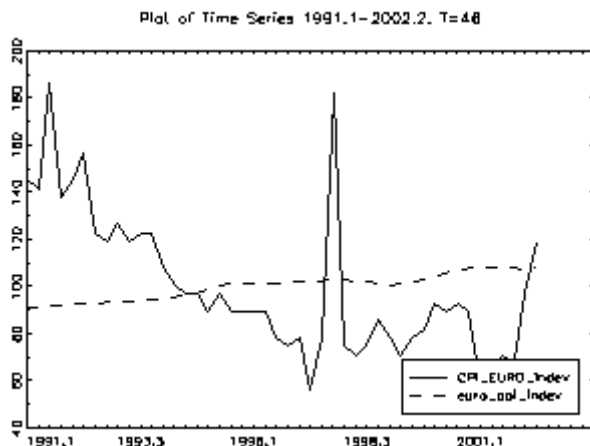


Figure 41 : Time Series Euro and US Productivity Differentials

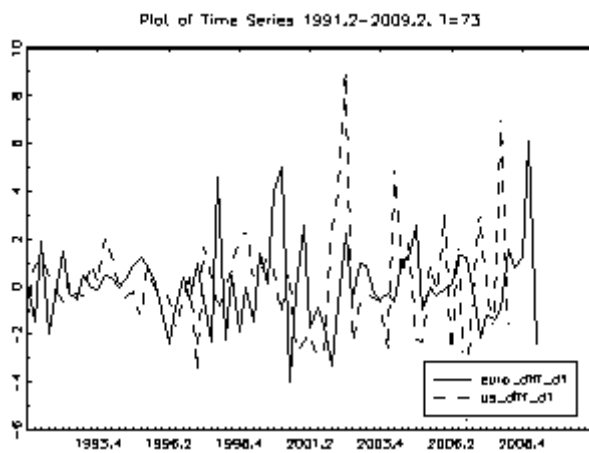


Figure 36 : Time Series US PPI and CPI.

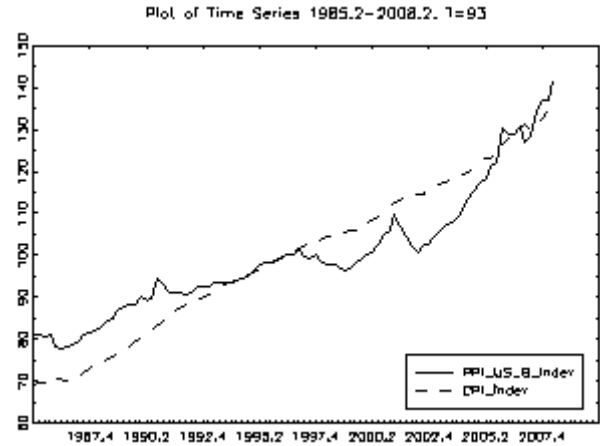


Figure 40 : Euro Productivity US Productivity.

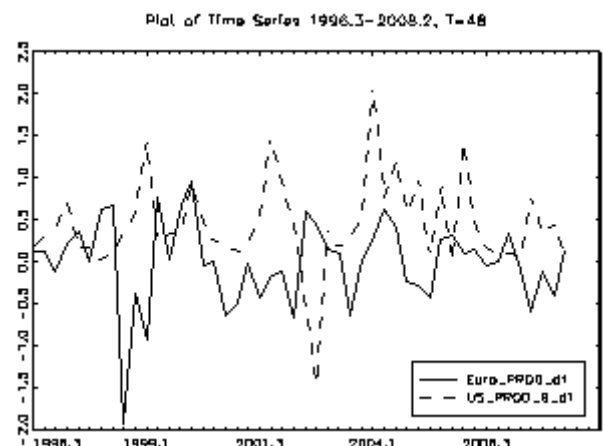


Figure 39 : US PPI and CPI.

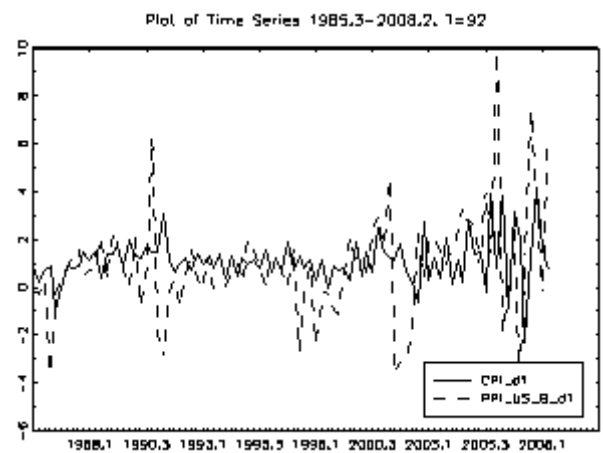


Figure 42 : Time Series US PRI and CPI (Index).

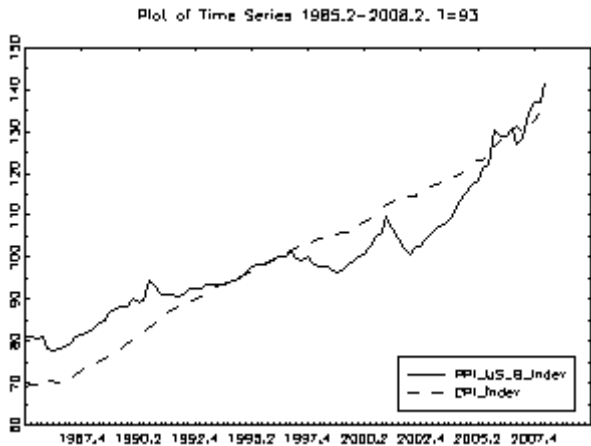


Figure 43 : Time Series Euro Productivity Differentials.

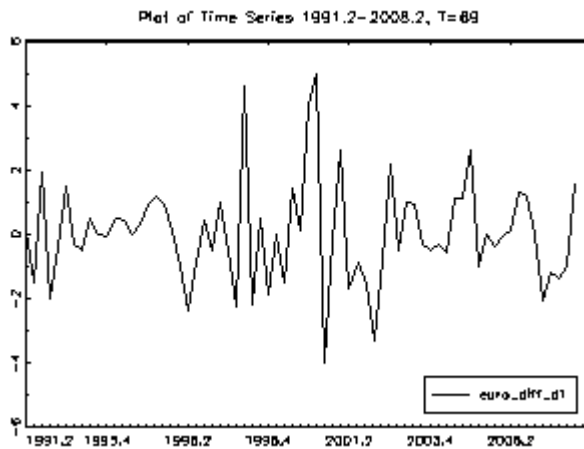
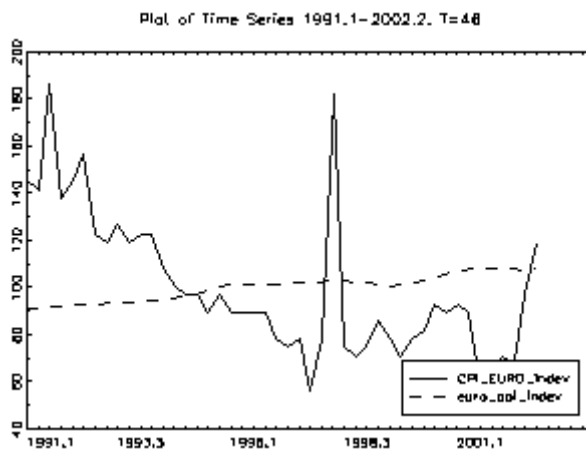


Figure 44 : Time Series Euro PPI and CPI.





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# Modelling Millennium Development Goals' Indicators: A Comparative Analysis

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*Abstract* - This research was triggered by enthusiasm to conduct a comparative models experiment of indicators of Millennium Development Goals (MDGs) interaction with economic growth. To achieve the objectives of this research, three sets of econometric model were developed and thoroughly subjected to statistical analysis to determine MDGs models efficiency. The methodology employed is experimental approach to MDGs' indicators in the economy. The research revealed that, the second model is the best, more robust and contributes more in explaining the relationship between MDGs indicators and the economic growth. The third model was rated poor, while the first model was rated moderate in explaining MDGs indicators influence in the economy. The paper concludes that, this short run dynamic analysis can be extended to a long run analysis. It further provides policy makers in developing countries with unique analytical relationship between real growth rate of the economy and MDGs modelling.

*Keywords* : Comparative Models, MDGs' Models, Indicators, Experimental Approach.

*GJMBR-A Classification* : FOR Code : 150312 JEL Code : O21



*Strictly as per the compliance and regulations of:*



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# Modelling Millennium Development Goals' Indicators: A Comparative Analysis

Dr. Bello Malam Sa'idu <sup>α</sup> & Dr. Roslan Abdul Hakim <sup>σ</sup>

**Abstract** - This research was triggered by enthusiasm to conduct a comparative models experiment of indicators of Millennium Development Goals (MDGs) interaction with economic growth. To achieve the objectives of this research, three sets of econometric model were developed and thoroughly subjected to statistical analysis to determine MDGs models efficiency. The methodology employed is experimental approach to MDGs' indicators in the economy. The research revealed that, the second model is the best, more robust and contributes more in explaining the relationship between MDGs indicators and the economic growth. The third model was rated poor, while the first model was rated moderate in explaining MDGs indicators influence in the economy. The paper concludes that, this short run dynamic analysis can be extended to a long run analysis. It further provides policy makers in developing countries with unique analytical relationship between real growth rate of the economy and MDGs indicators.

**Keywords** : Comparative Models, MDGs' Models, Indicators, Experimental Approach.

## I. INTRODUCTION

It is a known fact that the Millennium Development Goals are outcomes of United Nations series of international conferences in the 1990s. This new development paradigm has come to stay, we are witnessing over a decade of the signing of Millennium Development Goals declaration. The declaration was endorsed in September 2000, at the United Nations Millennium Summit, world leaders agreed to a set of time bound and measurable goals and targets for combating poverty, hunger, disease, illiteracy, environmental degradation, discrimination against women and so on. The Millennium Development Goals contained eight goals, eighteen targets and forty-eight indicators.

The overall theme of the MDGs as a whole is poverty alleviation. This can be seen from the emphasis on the reduction of poverty and hunger in the first and most prominent goal, and also from the copious documentation that accompanied the MDGs' issuance. For example, in presenting the MDGs to the General

Assembly for consideration, the former United Nations Secretary General Kofi Annan (Annan, 2000) advocated their adoption and said, we must spare no effort to free our fellow men and women from the abject and dehumanizing poverty in which more than 1 billion of them are currently confined. In a similar vein, the United Nations press release on the edited 2001 goals referred to their major focus as being on eliminating poverty (<http://www.un.org/News/Press/docs/2001/pil380.doc.htm>, p. 2).

The World Bank's press release quoted Bank President James Wolfensohn expressing support for them as concrete targets for everyone to rally around in the global fight against poverty (see Gwatkin, 2002) and the presentation of the goals on the United Nations Development Programme website refers to them *an ambitious agenda for reducing poverty* (<http://www.undp.org/mdg/>). One may deduce from the foregoing statements that the improvement of conditions among the poor is the intent underlying all of the MDGs, accompanying targets and indicators. The goals, targets and indicators vary greatly in the degree to which they are expressed in specific terms to the circumstances of population group.

Furthermore, short run econometric analysis has not been studied by the previous researches found in the area, namely; Black and White (2004), Fukuda-Parr (2004), Agenor *et al* (2005; 2006), UNDP (2005) and others. But, Logfren and Diaz-Bonilla (2005), focus on economy-wide simulations analysis of Ethiopian MDG Strategies, while, James (2006) showed only loose links between the goals and their ultimate impacts on human functionings such as gender equality or freedom from illness. Also, Martin (2011) work dwelled on national focus State of the Future Index (SOFI) and did not capture the synthetic analysis of modelling like this research. More so, Rodriguez (2010) concentrated in analyzing water supply and sewage disposal which by implication is only two MDG indicators that pertain to the environment. Additionally, Habib *et al.* (2012) focused on Malaria control in India and analyzed the efficiency of programme interventions. Therefore, it is important to study the econometric analysis of MDGs of a developing economy like Nigeria. Work of this kind will certainly contribute to knowledge and will spur other related researches.

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The questions that pertinent to this paper are therefore; is there any relationship between MDGs indicators and the height or weight of the economy? How is this relationship (if any) does translate into the economy? Can we determine MDGs interaction with economic growth? What is the implication of the relationship? Do MDGs indicators improve or impede the rate of economic growth? What are the implications to policy issues? Thus, the broad hypothesis is; MDGs indicators have no significant effects on the economy ( $H = 0$ ) and the alternative hypothesis is; MDGs indicators have significant effects on the economy ( $H \neq 0$ ). Thus, the objectives of this research are; to establish the relationship between MDGs indicators and their effect on the economy; to develop three MDGs' models base on sector-like indicators and determine their interactions with real growth rate of the economy; to ascertain MDGs models of indicators improve the rate of economic growth and to assess the implications of the findings to policy issues.

The rest of the paper is structured as follows; section two contains a brief literature review. Section three provides the methodology and comparison of three models, viz; Core MDGs, Health MDGs, and Envi-partnership MDGs. This is followed by data analysis in section four and conclusions drawn from the findings are presented in section five.

## II. LITERATURE REVIEW

The MDGs endorsed by the UN preceded three 'development decades' of the 1960s, 1970s and 1980s, during which the emphasis was on structural economic and social change as the primary definition of 'development' (see Fukuda-Parr, 2004). It was the reassessment of these approaches during the 1990s that led to the 1996 espousal of the 'International Development Targets' by OECD countries, comprising seven quantifiable goals in the areas of economic wellbeing, social development and environmental sustainability and regeneration (Black and White, 2004). During the UN conferences in the late 1990s the MDGs were uphold as their successors, and adopted as such by 189 countries at the UN Millennium Summit in September 2000 and in the 'Millennium Declaration'. This committed its signatories to jointly reduce poverty and to build a secure and peaceful world conducive to human development. The partnership between rich and poor countries was reaffirmed at the November 2001 launch of the Doha round on international trade and the March 2002 International Conference on Financing for Development in Monterrey, Mexico (UNDP, 2005; Clemens *et al*, 2004; Bezemer and Eggen, 2007).

In September 2005 the UN Member States gathered at the 2005 World Summit to review progress against the goals, and all members reaffirmed the Millennium Declaration. The eight MDGs are to halve the

proportion of people living in poverty and suffering from hunger, ensure gender equality in education, reduce under-five mortality by two-thirds and maternal mortality by three quarters, and to halt and reverse the spread of HIV/AIDS, malaria and other diseases – all to be achieved between 1990 and 2015.

The proponents of the new MDGs paradigm include Fukuda-Parr (2004), who argued that, in comparison to earlier approaches, they put human development at the centre of the global development agenda, provide a framework for accountability, and address not only development outcomes but also inputs from rich countries, thus forming a compact that holds both rich and poor governments accountable. Likewise Devarajan *et al* (2002) favoured the MDGs for their results orientation, emphasis on quantitative analysis, and their role in donor coordination. Moreover, Clemens *et al* (2004) made a critical assessment, they argued base on historical evidence that many of the MDGs are unrealistic, foster an excessive focus on donor resources, and hypothesize a risk of 'development disillusion' among the public if their realisation fails. Furthermore, White (2004) noted inconsistencies in the MDG time frame – with most goals for 2015 but some for 2005 – and observes that several envisaged MDG 'outputs' are not the products of 'investment', and not all outcomes are measures of welfare. This prevents valid performance monitoring and taking the steps necessary to achieve the outcomes.

Similarly, White (2004) further observed, definitional defects; access to reproductive health is not measured; the proxy for contraceptive prevalence is problematic; the child survival terminology is flawed demographically. Consequently, Agenor *et al* (2005; 2006) address this problem by proposing a macroeconomic monitoring framework that explicitly connects MDG indicators to policies such as aid and debt relief, and apply it empirically to Sub Saharan Africa. In another study, James (2006) points to evidence showing only loose links between the goals and their ultimate impacts on human functionings such as gender equality or freedom from illness. Notwithstanding, Vandermoortele (2004) questioned the feasibility of the MDGs project, including its monitoring. In a review of progress towards the MDGs during the 1990s he found an uneven pattern across regions and countries and between different socioeconomic groups within countries. This highlights the possibility of global success masking widespread local failure. Also, Vandermoortele (2004) further found evidence that, disadvantaged groups are often by-passed by 'average' progress that is the cheapest way to satisfy MDG standards, but this need not be pro-poor.

### III. METHODOLOGY

#### a) Definition of Variables and Data Sources.

The data used in this study are annual data for the period 1990-2008. The data were obtained from various issues of Central Bank of Nigeria for the LGDP and LYUR. Other variables were obtained from various issues of United Nations statistics division, UN Millennium Development Goals database, MDG Office Nigeria, UNICEF, World Fact Book, National Bureau of Statistics and UNDP. In addition, to obtain the data real values of the variables which were originally in percentages were converted into natural logarithm.

LRGDP defined as the log of real gross domestic product. To arrive at this, data was obtained on GDP at 1990 constant basic prices (in million Naira), this was converted to percentages so as to be in harmony with MDGs variables which were already in percentages.

*LPPL defined as the log of population below poverty line.*

*LUWC defined as the log of underweight children (< 5 years of age).*

*LNEP Log of net enrolment in primary education (both sexes).*

*LPSC described as the log of primary school completion rate (both sexes).*

*LGPI defined as the log of gender parity index (as a ratio of women to men).*

*LWNP termed as the log of seat held by women in national parliament.*

*LIMR defined as the log of infant mortality rate (0-1 year) per 1,000 live births, to coordinate the data, the values were converted to percentages.*

*LCIM identified as the log of proportion of children immunized against measles (1 year old).*

*LMMR defined as the log of maternal mortality rate (per 100,000 live births). The 100,000 live birth values were transformed to percentages for data synchronization.*

*LHIV is the log of human immune virus prevalence rate (proportion of people living with HIV).*

*LPTB described as the log of prevalence of Tuberculosis (per 100,000 people). This was converted to percentages to harmonize the data.*

*LASW is the log of access to safe water.*

*LABS identified as the log of access to basic sanitation.*

*LIUS defined as the log of internet users (per 100 people).*

*LYUR is the log of youth unemployment rate (both sexes).*

#### b) Method of Estimation

To conduct experiment on the relationship between MDG indicators and real Gross Domestic Product of the economy, three set of multiple regression models were developed, viz: Core MDGs, Health MDGs, and Envi-partnership. Next, each model was subdivided into two, separating the years (one takes from 1990-1999; the other takes from 2000-2008). Preliminary studies of the scatter plots of the data showed curvilinearity, thus, we convert them into natural logarithms and use econometric analysis.

The three set of models can be specified as follows:

*Model 1 : Core MDGs*

$$LRGDPI = \alpha + \beta_1 LPPLi + \beta_2 LUWCi + \beta_3 LNEPi + \beta_4 LPSCi + \beta_5 LGPIi + \beta_6 LWNPi \quad i = 1, \dots, 19 \quad (1)$$

*Model 2 : Health MDGs.*

$$RGDPi = \alpha + \beta_1 IMRi + \beta_2 CIMi + \beta_3 MMRi + \beta_4 HIVi + \beta_5 PTBi \quad i = 1, \dots, 19 \quad (2)$$

*Model 3 : Envi-partnership.*

$$RGDPi = \alpha + \beta_1 ASWi + \beta_2 ABSi + \beta_3 USi - \beta_4 YURi \quad i = 1, \dots, 19 \quad (3)$$

### IV. EMPIRICAL RESULTS AND THEIR IMPLICATIONS

The intercept coefficient of model 1 in Table 1 is directly related to the dependent variable. The coefficients of LPPL, LUWC, LNEP, and LWNP have correct signs. But, LPSC, and LGPI are supposed to be

directly related to RGDP on theoretical grounds. But LNEP, LPSC, and LWNP were found to be statistical significant, indicating a rejection of null hypothesis, meaning that MDGs have significant effect on economic growth, whereas other t-ratios are not different from zero. The R-square and adjusted R-square are 0.95 and 0.92 respectively, both high in terms of regression fit and when adjusted for degree of



freedom. The F-test suggests a rejection of null and acceptance of alternative hypothesis that these MDGs indicators have significant effect on the rate of growth of the economy. The Durbin-Watson (DW) statistics is 2.37 meaning that, there is presence of negative autocorrelation.

The first part of the separated equation one, shows correct signs for five (LPPL, LUWC, LNEP, LGPI and LWNP) coefficients of the variables, while coefficient of LPSC show wrong sign. But, the intercept is positive and insignificant at 5% level. The t-ratios for the variables were also statistically not significant at 5% except coefficient of LNEP that is significant. R-square is 0.88 while adjusted R-square is 0.65 portraying very high explanatory powers. F-Statistic is 3.72 less than the tabular value of 6.26, therefore we accept null

hypothesis that MDGs have no significant impact on economic growth. DW is inconclusive with a value of 1.96.

Whereas, the second part of the separated model 1 (2000-2008) shows only the coefficients of LPSC and LGPI have wrong signs while others have correct signs on theoretical grounds. The coefficient of intercept exerts positive effect on dependent variable and is the only one that is significant, whereas the t-ratios of the six independent variables were found to be statistically insignificant at 5%. Thus, the R-square is 0.985, having very high explanatory powers on the dependent variable. Overall significance shows a rejection of null hypothesis at a value of 21.85, which means MDGs have significant effect on economic growth. DW is 2.55, still within inconclusive region.

Table 1 : Core MDGs

RESULTS OF CLASSICAL LEAST SQUARES ESTIMATES  
(REAL GROSS DOMESTIC PRODUCT AS DEPENDENT VARIABLE)

	1990-1999	2000-2008	All obs
$\alpha$ (Intercept)	2.87 (0.3)	14.18 (3.05)*	1.49 (0.56)
$\beta_1$ (Poverty Level)	-0.58 (-1.53)	-1.28 (-1.54)	-0.08 (-0.9)
$\beta_2$ (Underweight Children)	-0.87 (-0.55)	-1.71 (-0.92)	-0.11 (-0.27)
$\beta_3$ (Net Enrolment in Primary)	1.7 (3.02)*	0.26 (0.47)	0.88 (4.6)***
$\beta_4$ (Primary School Completion)	-0.73 (-0.63)	-0.66 (-1.85)	-0.76 (-2.54)**
$\beta_5$ (Gender parity Index)	0.92 (0.76)	-1.06 (-0.77)	-0.84 (-1.77)
$\beta_6$ (Women in Parliament)	0.45 (1.77)	0.17 (1.29)	0.24 (5.96)***
N	10	9	19
R <sup>2</sup>	0.88	0.985	0.95
Adjusted R <sup>2</sup>	0.65	0.94	0.92
F <sup>c</sup>	3.72	21.85	35.4
DW	1.96	2.55	2.37

Source: Authors computations from Gretl Computer Package. Figures in parentheses are t-ratios, not standard errors. \* Significance at 1%; \*\* Significance 5%; \*\*\* Significance 10%.

From Table 2, the intercept coefficient of model 2 is negative and significant. Coefficients of three variables (LIMR, LCIM, and LPTB) carrying the wrong signs contradicting theoretical postulation. The t-ratios are statistically significant except that of LHIV, which is statistically insignificant. The results of the five t-ratios implied that MDGs have significant effect on economic growth. Thus, R-square is 0.92 and adjusted R-square is 0.88, DW is 1.77, still inconclusive. Also, we reject null hypothesis with F-test of 28.12. Therefore, MDGs have significant effect on economic growth.

Table 2 : Health MDGs

RESULTS OF CLASSICAL LEAST SQUARES ESTIMATES  
(REAL GROSS DOMESTIC PRODUCT AS DEPENDENT VARIABLE)

	1990-1999	2000-2008	All obs
$\alpha$ (Intercept)	-10.75 (-1.45)	5.04 (13.52)***	-3.8 (-3.1)***
$\beta_1$ (Infant Mortality Rate)	0.25 (1.34)	-0.09 (-3.45)**	0.28 (3.26)***
$\beta_2$ (Children Immunized against Measles)	0.67 (1.23)	0.02 (0.32)	1.17 (7.2)***
$\beta_3$ (Maternal Mortality Rate)	-0.86 (-2.88)**	0.78 (14.15)***	-0.61 (-4.98)***
$\beta_4$ (Prevalence of HIV)	0.45 (0.99)	0.04 (1.66)	-0.01 (-0.08)
$\beta_5$ (Prevalence of Tuberculosis)	-1.06 (-1.07)	-0.01 (-0.46)	0.22 (2.78)**
N	10	9	19
R <sup>2</sup>	0.78	0.999	0.92
Adjusted R <sup>2</sup>	0.5	0.998	0.88
F <sup>c</sup>	2.8	1118.62	28.12
DW	2.69	2.79	1.77

Source: Authors computations from Gretl Computer Package. Figures in parentheses are t-ratios, not standard errors. \* Significance at 1%; \*\* Significance 5%; \*\*\* Significance 10%.

Again, when we reduce the data to a decade (1990-1999), only coefficients of LIMR, LCIM and LHIV are having the wrong signs and the intercept exert a negative influence on the dependent variable. Fascinating discovery, all the t-ratio of this sample were statistical not different from zero except that of LMMR. The R-square is high at 0.78, but when the fit is adjusted for degree of freedom it indicates low at 0.5. Surprisingly, both values are lower than the 9 years observation and all observations when compared. The DW statistics is 2.8 showing negative autocorrelation. Joint significance of this sample shows that we accept null hypothesis that, MDGs have no significant effect on economic growth.

The third column contains data (2000-2008) of the same model; the coefficient of the intercept shows a direct relationship with the dependent variable. The coefficients of LCIM, LMMR, and LHIV are holding wrong signs base on theoretical *a priori*, while the coefficient of LIMR and LPTB have correct signs. In the sample only LIMR and LMMR are statistically significant, implying that MDGs have significant effect on economic growth. Furthermore, R-square is 0.999 suggesting a very high fit. The DW is inconclusive at 2.79. When the parameters are join together to observe the overall significance, it was found that F-statistics is extremely high at 1118.62, suggesting that alternative hypothesis is accepted, but it does not say which variables is important. This implied that MDGs have significant effect on economic growth.

In model 3, the coefficients of variables, were consistent theoretically except LABS and LYUR,

whereas coefficients of LIUS and LYUR are statistically significant. The regression fit is high at R-square 0.86. The coefficient of LYUR shows a positive value, this empirical discovery invalid the theoretical *a priori*. Probably, additional explanatory variable may resolve the problem. F- Test indicates rejection of null hypothesis and acceptance of alternative that, MDGs have significant effect on economic growth. There is inconclusiveness in autocorrelation decision because DW is 1.44.

The coefficient of the intercept of the separated model 3 (2000-2008), shows negative value, meaning that it exerts negative influence on the dependent variable. It is also statistically not significant at 5% level. A possible explanation for this is that, government policies on basic sanitation and employment has not yielded desire results, also internet users and possession of personal computers were very low couple with saturated labour market in recent years.

First part of the separated model 3 (1990-1999) shows positive coefficient of intercept, while LASW and LYUR contradicts theoretical postulation about their signs. The coefficients of LABS and LIUS have the correct sign. All the t-ratios of this sample are statistically insignificant at 5% level. Again, it has very low explanatory powers, because R-square is 0.18 and when it is adjusted for degrees of freedom it assumes negative value of -0.47. The DW is 1.53, within the inconclusive region. According to F-test, we accept null hypothesis that, MDGs have no effect on economic growth.

Table 3 : Envi-Partnership MDGs

RESULTS OF CLASSICAL LEAST SQUARES ESTIMATES  
(REAL GROSS DOMESTIC PRODUCT AS DEPENDENT VARIABLE)

	1990-1999	2000-2008	All obs
$\alpha$ (Intercept)	2.65 (0.58)	-0.75 (-1.08)	0.55 (0.48)
$\beta_1$ (Access to Safe Water)	-0.38 (-0.37)	0.53 (3.08)**	0.29 (1.04)
$\beta_2$ (Access to Basic Sanitation)	0.05 (0.13)	0.04 (0.64)	-0.08 (-0.58)
$\beta_3$ (Internet Users)	0.02 (0.24)	0.05 (4.73)***	0.03 (2.31)**
$\beta_4$ (Youth Unemployment Rate)	0.23 (0.66)	0.17 (3.26)**	0.19 (2.89)**
N	10	9	19
R <sup>2</sup>	0.18	0.987	0.86
Adjusted R <sup>2</sup>	-0.47	0.976	0.83
F <sup>c</sup>	0.28	80.81	22.13
DW	1.53	2.96	1.44

Source: Authors computations from Gretl Computer Package. Figures in parentheses are t-ratios, not standard errors. \* Significance at 1%; \*\* Significance 5%; \*\*\* Significance 10%.

The second part of the separated Model 3 (2000-2008) has correct signs for coefficients of LASW, LABS, and LIUS. The coefficient of LYUR is positive; this empirical evidence contradicts the theoretical expectation. Also, intercept exert inverse effect with the dependent variable. R-square and adjusted R-square are both very high at 0.987 and 0.976 respectively, which indicates the fit of the regression line and adjustment for degrees of freedom. The F- Test indicates rejection of null hypothesis and acceptance of alternative that, MDGs have significant effect on economic growth, while DW is 2.96 suggesting a strong negative autocorrelation.

When the above are observe cumulatively, R-square is 0.86 and adjusted R-square is 0.83, though lower than the second part. Again, on the whole F-test of 22.13 (recall  $F^* > F^a$ ) confirms a rejection of null hypothesis that model 3 variables have impact on economic growth in Nigeria. Also, DW statistic of 1.44 values is inconclusive.

## V. CONCLUSIONS AND FURTHER RESEARCH

The paper concludes that second model is the best, more robust and contributes more in explaining the relationship between MDG indicators and the economic growth of Nigeria. The results revealed that model 2 in Table 2 has nine significant t-ratios, R-square all high and F-test indicated two rejection of Null hypothesis; model 3 in Table 3 has five t-ratios significant, two R-square high and two F-test were rejected. Whereas, model 1 in Table 1 also showed five t-ratios significant, R-square all high and two F-tests were rejected. Therefore, in the entire analysis, model 1 is moderate in explaining MDGs indicators influence in

the economy, model 3 is poor and model 2 turns out to be the best in the analysis in explaining the interaction. Generally, the implication of the results of the three models is that MDGs have significant effect on economic growth (F- test was rejected twice by each model), implying that government and international community should continue to support this new development paradigm so as to boost economic growth of Nigeria via improvements in social and economic indicators of MDGs.

The analysis presented in this paper can be extended in various directions and it would be important, for instance, to account for the effects of MDG office Nigeria on economic growth which is a qualitative factor by using a dummy variable and observe the behaviour of other independent variables as well. Another issue worth investigating is the possibility of extending this short run dynamic analysis to a long run analysis. In addition, several other effects could be envisioned. Finally, this work provides policy makers in developing countries especially Nigeria with unique analytical relationship between economic growth and Millennium Development Goals indicators.

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# Determinants of Foreign Direct Investment in Africa: A Panel Data Analysis

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**Abstract** - This study provides panel data evidence on the determinants of foreign direct investment (FDI) for a sample of 45 African countries over the period 1980 to 2009. Using dynamic panel data estimation techniques, the study identifies a number of factors that affect FDI flows in Africa, including, agglomeration economies, natural resources, real GDP growth, and international investment agreements. The study also shows that the Africa-wide environment has become more conducive to FDI since the year 2000.

*GJMBR-A Classification : FOR Code :150202, 150205 JEL Code : G32, G24*



*Strictly as per the compliance and regulations of:*



# Determinants of Foreign Direct Investment in Africa: A Panel Data Analysis

Moses Muse Sichei<sup>α</sup> & Godbertha Kinyondo<sup>σ</sup>

**Abstract** - This study provides panel data evidence on the determinants of foreign direct investment (FDI) for a sample of 45 African countries over the period 1980 to 2009. Using dynamic panel data estimation techniques, the study identifies a number of factors that affect FDI flows in Africa, including, agglomeration economies, natural resources, real GDP growth, and international investment agreements. The study also shows that the Africa-wide environment has become more conducive to FDI since the year 2000.

## I. INTRODUCTION

Foreign direct investment (FDI) entails an investor acquiring substantial controlling interest in a foreign firm or sets up a subsidiary in a foreign country [1]. FDI flows in the world have increased dramatically from \$ 13.3 billion in 1970 to \$ 2.1 trillion in 2007 before declining to \$1.1 trillion in 2009 due to the global financial crisis in 2008-2009. However, Africa, as a region, has not benefited from the FDI boom since the volume of FDI inflows to the continent is not only low as a share of global FDI but is also on a downward trend for the last three decades. Specifically, Africa's share of global FDI inflows declined from 9.5 per cent in 1970 to 5.3 per cent in 2009 [2].

Africa's inability to attract FDI is troubling because it presents a potential solution to the continent's growth and development challenges. FDI provides the needed capital for investment, brings with it employment, managerial skills and technology and at the end accelerate growth and development [3, 4]. The role of FDI is quite critical in Africa given the fact that poverty levels are generally high while domestic savings and income remain extremely low as income is mainly channeled to consumption expenditure. These factors coupled with the unpredictability of foreign aid flows, the low share of Africa in world trade and the high volatility of short-term capital flows calls for the need to attract different forms of FDI inflows.

Most countries in Africa have undertaken significant steps to attract FDI. First, countries in the region have adopted FDI-specific regulatory frameworks to support their investment related objectives. As pointed out by UNCTAD [2, 5], by 1998 45 out of 53 countries in Africa had established FDI - specific

regulatory framework. The changes included the setting up of investment promotion agencies and facilities, and establishment of specialized schemes to attract investment such as export processing zones (EPZs). Second, countries also took steps at the international level through signing of international investment agreements (IIAs) such as bilateral investment treaties (BITs) and double taxation treaties (DTTs). BITs signed in Africa increased from 41 in 1970 to 772 in 2009. Similarly, DTTs signed increased from 68 in 1970 to 516 in 2009.

There are three different types of FDI. The first type of FDI is called market-seeking (horizontal) FDI, where investor's purpose is to serve local markets. The reason for market-seeking FDI is market size and market growth. The second type of FDI is asset-seeking or resource-seeking FDI and takes place when a company's purpose is to gain access or acquire the resources in the host country which are not available in home country such as raw materials, natural resources or low-cost labour. The third type of FDI is efficiency-seeking FDI, which take place when the company can gain when there is a common governance of geographically dispersed activities and presence of economies of scope and scale.

Despite the efforts, FDI inflows to Africa have been to countries that are classified by the World Bank as oil and mineral dependent: South Africa, Angola, Nigeria, Equatorial Guinea, and Egypt, among others. This phenomenon raises the questions as to whether Africa has been attracting one form of FDI or not.

This paper seeks to assess and quantify empirically the determinants of FDI using a set of data that covers 45 African countries over the period 1980 to 2009. The novelty of this research is three-fold. First, we use a large dataset that spans 45 African countries, which increases the degrees of freedom and the credibility of the results. Second, we include more recent data, which enable us to test the extent to which the determinants of FDI identified in previous studies are still relevant or not. Finally, we include new variables such as BITs and DTTs in the analysis.

The remainder of the paper is organized as follows: Section 2 presents some stylized facts about FDI in Africa while section 3 reviews the literature on the determinants of FDI in Africa. Section 4 presents the model, the data and estimation methodology. Section 5 presents the estimation results while section 6 presents the conclusion and policy recommendations.

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## II. STYLISTED FACTS ABOUT OF FDI

### a) Africa-Wide Facts About FDI in Africa

In this section we summarise some key stylized facts that motivate our study. First, the volume of FDI inflows to Africa is not only very low compared to other developing regions but is also on the decline. The volume of FDI inflows to developing Africa stood at US \$ 1.3 billion in 1970, which was equivalent to 9.5 per cent of global FDI (Table 1). At the same period, FDI flows to developing Asia stood at US \$ 0.9 billion (Panel A Table 1), which was equivalent to 6.4 per cent of global FDI flows (Panel B Table 1). Africa's share of global FDI has been on a steady downward trend and as at 2009, it

accounted for a paltry 5.3 per cent compared to 27 per cent for developing Asia. The corollary of these trends is that Africa has remained aid-dependent, with FDI lagging behind official development assistance (ODA).

Second, the declining FDI flows to Africa reflects the fact that Africa's share of World output has been declining from 2.6 per cent in 1970 to 1.7 per cent by 2002 before recovering to 2.5 per cent in 2009 (Figure 1). Similarly, Africa's share of World exports trade also fell from a peak of 5.6 per cent in 1980 to 2.9 per cent in 2009. Given the fact that income levels have also stagnated, the levels of FDI to Africa are not surprisingly low.

*Table 1:* FDI flows by region, 1970-2009 (Billions of \$ and percent)

Region	1970	1990	2000	2007	2008	2009
<i>Panel A: FDI in flows in billions of US \$</i>						
World:	13.3	207.7	1401.5	2100	1770.9	1114.2
Developed	9.5	172.5	1138	1444.1	1018.3	565.9
Developing:	3.9	35.1	256.5	564.9	630	478.3
<i>Africa</i>	1.3	2.8	9.8	63.1	72.2	58.6
<i>America</i>	1.6	8.9	97.7	163.6	183.2	116.6
<i>Asia</i>	0.9	22.6	148.7	336.9	372.7	301.4
<i>Oceania</i>	0.1	0.7	0.2	1.3	2.0	1.9
Africa (all)	1.3	3.0	10.2	64.5	73.6	59.4
<i>Panel B: Percentage share in World FDI flows</i>						
Developed	71.1	83.1	81.2	68.8	57.5	50.8
Developing:	28.9	16.9	18.3	26.9	35.6	42.9
<i>Africa</i>	9.5	1.4	0.70	3.0	4.1	5.30
<i>America</i>	12.0	4.3	7.0	7.8	10.3	10.5
<i>Asia</i>	6.4	10.9	10.6	16.0	21.0	27.0
<i>Oceania</i>	1.0	0.3	0.02	0.06	0.1	0.2
Africa(all)	9.5	1.5	0.72	3.1	4.2	5.33

Source : UNCTAD/TNC database ([www.unctad-arg/fdistatistics](http://www.unctad-arg/fdistatistics))

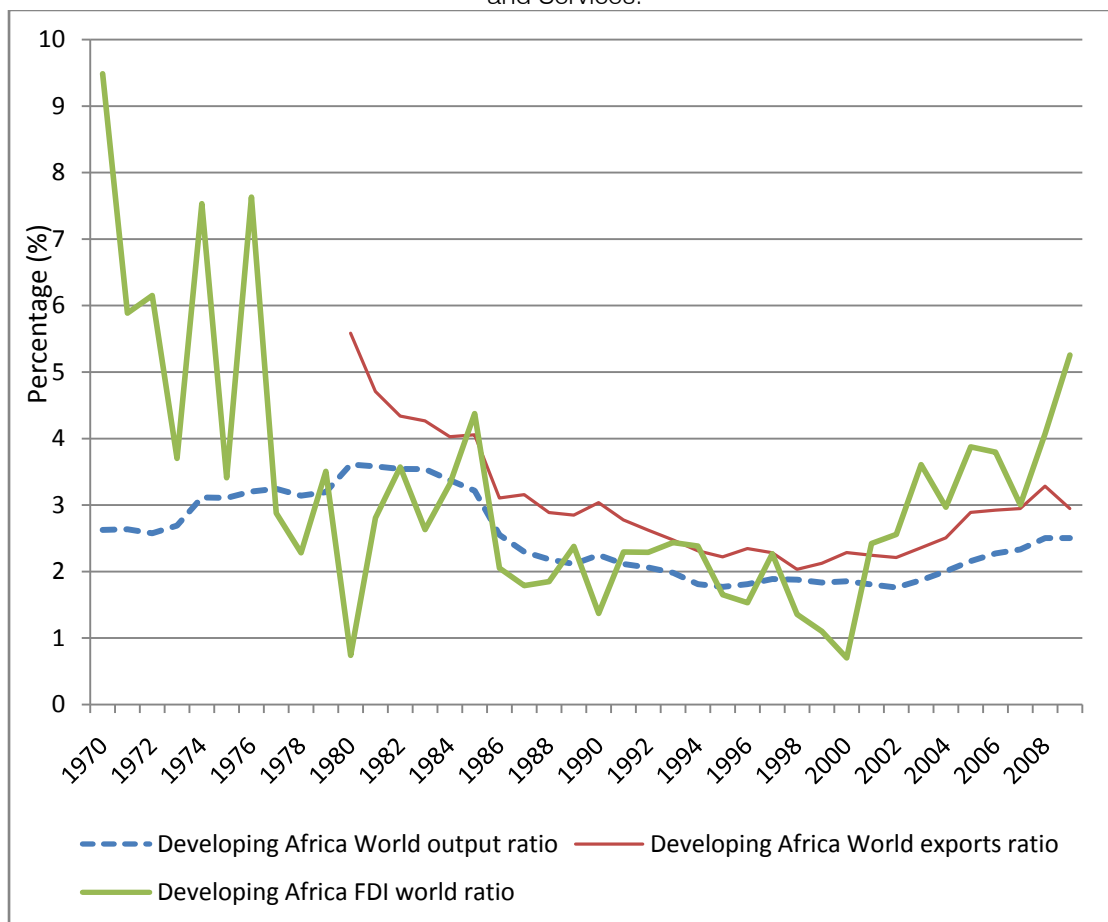
*Table 2 :* Percentage contribution of FDI flows to GDP and GFCF by region, 1970-2009.

Region	1970	1990	2000	2007	2008	2009
<i>Panel A: Percentage share in GDP</i>						
World:	0.5	0.9	4.4	3.8	2.9	1.9
Developed	0.4	1.0	4.6	3.7	2.5	1.5
Developing:	0.9	0.9	3.7	3.8	3.7	2.6
<i>Africa</i>	1.5	0.6	1.7	4.9	4.7	4.1
<i>America</i>	0.9	0.7	4.6	4.4	4.2	2.0
<i>Asia</i>	0.5	1.0	2.8	3.4	3.3	2.7
<i>Oceania</i>	13.8	5.5	1.7	5.3	6.6	Na
<i>Panel B: Percentage share in Gross Fixed Capital Formation</i>						
World	2.3	4.1	20.3	16.8	12.7	
Developed	2.0	4.5	21.9	18.0	12.2	
Developing:	4.4	3.9	13.3	14.1	12.5	
<i>Africa</i>	7.5	3.0	9.8	24.1	23.4	
<i>America</i>	4.3	3.9	24.0	22.2	20.0	
<i>Asia</i>	2.6	4.0	13.3	11.2	9.8	
<i>Oceania</i>	34.3	23.1	8.4	25.5	31.9	

Source: UNCTAD/TNC database ([www.unctad-arg/fdistatistics](http://www.unctad-arg/fdistatistics))



Figure 1 : Developing Africa's FDI, Output and Exports as a Proportion of World FDI, Output and Exports of Goods and Services.

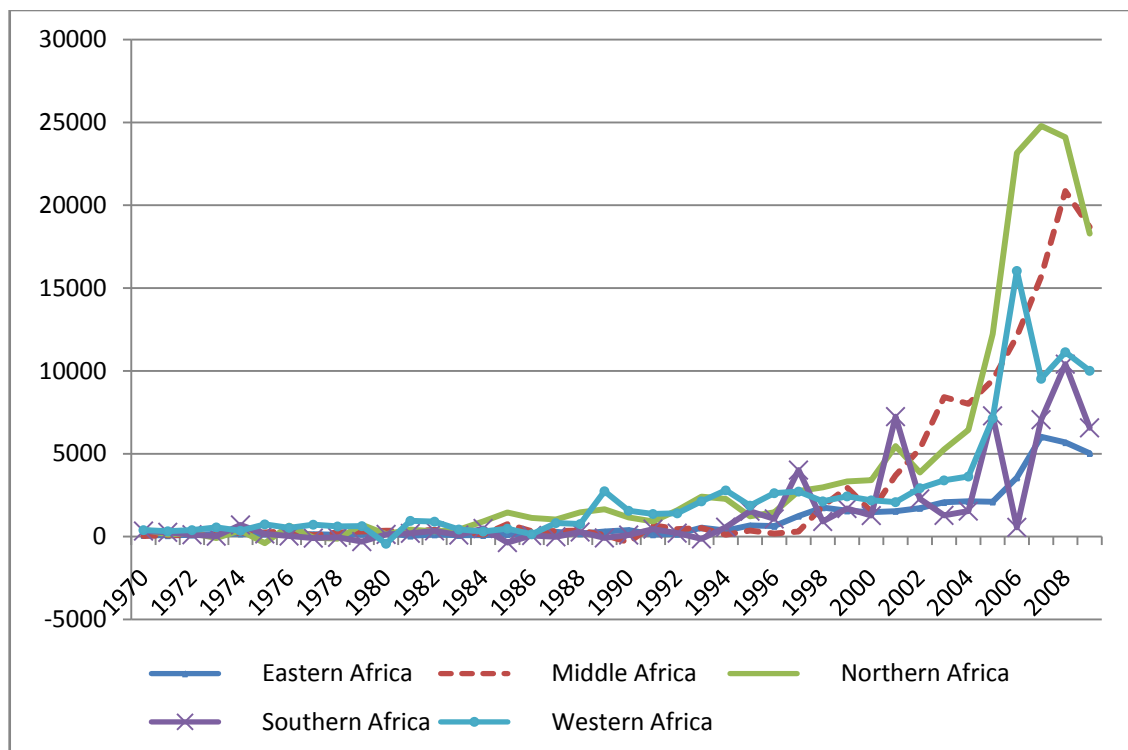


b) *Stylised Facts Regarding Regional Distribution of FDI in Africa*

First, FDI to Africa has been attracted to countries endowed with natural resources. 24 countries classified by the World Bank as oil- and mineral-dependent have, on average, accounted for close to 75 per cent of annual FDI flows to Africa. 10 leading recipients of FDI inflows in 2009 (Angola, Egypt, Nigeria, South Africa, Sudan, Algeria, Libya, Congo, Tunisia, Ghana and Equatorial Guinea) have large mineral and petroleum reserves. The corollary of this is that Africa has attracted resource-seeking FDI flows. However, market-seeking and efficiency-seeking FDI has (e.g. in banking) have also featured prominently.

Second, in terms of regional distribution, much of FDI has gone to North Africa, followed by Middle Africa, Western Africa and Eastern Africa (Figure 2).

Figure 2 : FDI inflows to the different regions of Africa.



Source : UNCTAD database.

### III. LITERATURE REVIEW

#### a) Theoretical Literature Review

The theoretical literature on the determinants of FDI stems from Stephen Hymer's doctoral dissertation [6]. This was followed by the work of Dunning [7, 8] which provide a comprehensive analytical framework based on ownership advantages, location advantages and benefits of internationalization (OLI) paradigm. Past studies can be categorized into two categories. One category focuses on analyzing the determinants that are endogenous to Multinational corporations (MNC) such as the size of the firm, and basically asks why a firm becomes a foreign investor. The second category examines the FDI drivers that are exogenous to investors such as the location advantages of the host country, market size and labour costs. Our focus is on the latter group as the paper examines determinants of FDI that are exogenous to the investor but endogenous to the African host country.

Theoretical literature indicates that the key locational determinants are the classical sources of comparative advantage of the host country highlighted under the Ricardian or Heckscher-Ohlin-Vanek theoretical framework. The key issue here is that foreign firms choose their investment location that minimizes the production costs [1]. The locational factors are market size and relative factor costs (such as natural resources, labour costs and human capital). Other factors that

have been identified in theory include infrastructure availability, agglomeration economies, economic and political environment, and trade openness.

The *market size and growth in the host country* : represents the country's economic conditions and the potential demand for the output/services which is critical for FDI. A large growing domestic market ensures the MNC of a market for its produce and provides scale for economies. Real GDP, real GDP growth [9], GDP per capita have been used as a proxy for market. It is expected that there is a positive relationship with FDI inflows [10].

*Economic stability and growth prospects* : Countries that have stable macroeconomic condition with high and sustainable growth rates will tend to receive high FDI inflows than a more volatile economy. The proxies used to measure economic stability are real GDP growth rate, industrial production index, inflation rates, exchange rates and interest rates.

*Labour costs* : High labour costs imply higher costs of production and is expected to limit the FDI inflows. Labour costs can be proxied by wage rates [10].

*Infrastructure facilities* : Well established and quality infrastructure is an important determinant of FDI inflows. Thus we expect a positive relationship between FDI and infrastructure [3]. The infrastructure is proxied by electricity, water, transportation, telecommunications, public expenditure on capital to acquire fixed capital

assets, land, non-financial and non-military assets for infrastructure.

*Trade openness* : Trade openness, meaning the degree of liberalization of trade regime of the host country, is regarded as a very important factor that promotes FDI. Much FDI is export oriented. It is proxied in most studies by the ratio of export plus imports divided by GDP [10]. A positive relationship is expected with FDI.

*Political stability* : Political instability and frequent occurrence of civil disorder create an unfavourable business climate which seriously erodes the risk-averse foreign investor's confidence [11].

*Human capital* : Foreign investors are concerned with the quality of the labour force in addition to its cost. A more educated labour force can learn and adopt new technology faster and is generally more productive [12, 13]. Higher levels of human capital are a good indicator of the availability of skilled workers, which tends to boost the locational advantages of a country.

*Natural resource endowment* : Countries that are endowed with natural resources would receive more resource-seeking FDI.

*Regional trade agreements (RTAs)* : There are various channels through which RTAs can influence FDI, which include the nature of investment rules, trade rules and other initiatives (See for instance [14]). Investment rules govern investments in regional groupings and may apply to regional investors as well as extra-regional investors. RTAs can decrease horizontal (tariff-jumping) intra-regional FDI because it becomes cheaper to serve other economies in the region through trade rather than establishing an affiliate with production facilities and thus incurring plant-level costs. Vertically motivated regional FDI (efficiency and natural resource seeking FDI) [15] split up the production process across borders to exploit gains from comparative advantage within the firm. Here, the gains from 'outsourcing' of production stages to low-wage countries and the associated trade of intermediate goods within firms are important issues with vertical multinational firms. Therefore, we expect vertical FDI to increase through the implementation of RTAs. This is because lower trade costs will reduce the costs of establishing international production networks across member countries.

Extra-regional FDI can also be affected by RTAs in a number of ways. First, as tariffs among parties to the RTA are removed, it becomes profitable for extra-regional Transnational Corporation (TNC) to serve an effectively larger market (horizontal- market-seeking FDI) from one or more locations in the region. Second, the rule of origin can affect the location decision of FDI. Non-tariff barriers also play a significant role in attracting FDI. Third, some RTAs including COMESA and SADC have cooperation schemes that aim at establishing regional enterprises by promoting joint ventures.

*Bilateral investment treaties (BITS)* : BITS are investment treaties with clear and enforceable rules which reduce the risk the investor might face and that such reduction is, all things being equal, encourages investment [16]. As pointed out by UNCTAD [17], such measures are needed to cover a number of issues that are relevant for foreign investors especially when investing in African countries that are generally considered to involve risks. They cover fair and equitable treatment; most-favoured nation (MFN)-treatment subject to some standardized exceptions; free transfer of payments related to investments; and dispute resolution, among others. The BITS may also capture the quality of infrastructure.

*Double taxation treaties (DTTs)* : As pointed out by UNCTAD [17], DTTs set out allocation rules; contains rules for giving exemption from tax or credit for foreign tax; rules on non-discrimination; mutual agreements to avoid double taxation and provisions on assistance in tax collection.

*Agglomeration economies (AE)* : This arises when there are benefits from locating close to other foreign investors due to positive externalities. This arise from the fact that new foreign investors have less knowledge about host country and its environment, and thus they will view the investment decisions by others as a good signal of favourable investment conditions. This is normally tested using past FDI stock.

#### b) *Empirical literature*

There have been a number of studies that examine the various determinants of FDI in Africa specifically (see table 3). In most of the studies carried out a limited number of African countries are included in the analysis. However, there are a few of these studies that are concentrated on the determinants of FDI in Africa.

Asiedu [3] explored whether factors that affect FDI in developing countries affect countries in Sub-Saharan Africa (SSA) differently. Using data for 32 African countries for the period 1970 to 1999, she found that factors that drive FDI to developing countries have a different impact on FDI in SSA. Specifically, infrastructure development and higher return on capital promote FDI to non-SSA countries and not SSA countries. Openness to trade promotes FDI to both SSA and non-SSA countries.

Rogoff and Reinhart [12] constructed the probability of war for three regions of Africa, Asia and Western Hemisphere (excluding Canada and the United States) over the period 1960-2001 and found that there is a statistical significant negative correlation between FDI and conflicts in Africa.

Onyeiwu and Shrestha [18] use a dataset for 29 African countries over the period 1975 to 1999 and identified economic growth, openness of the economy, international reserves and natural resource availability as

the key FDI determinants. Additionally, contrary to other studies, political rights and infrastructure were found to be unimportant for FDI flows to Africa.

Neumayer and Spess [19] focused on the signaling effect of BITs and found positive effect of BITs on FDI inflow across various model specifications. On the role of BITs operating as substitutes to institutional quality they found limited evidence. They argue that by concluding BITs with developed countries, particularly those that are major FDI exporters, developing countries give up some of their domestic policy autonomy by binding themselves to foreign investment protection, but could expect to receive more FDI in exchange. Their conclusion was that the effect is possibly more evident in countries with weak domestic institutions, especially in countries for which the confidence and credibility inspiring signal to foreign investors following the signing of BITs was most important.

Salacuse and Sullivan [20] find that BITs with the strongest investor protection attracts FDI as

compared to an agreement with weaker standards. In line of this argument their results showed that United States BIT is more likely to induce FDI inflows than those by OECD countries.

Suliman and Mollick [21] use a panel data regression data fixed effect model to identify the determinants of foreign direct investment (FDI) for a large sample of 29 Sub-Saharan African countries from 1980 to 2003. They test whether human capital development defined by either literacy rates or economic freedom, and the incident of war affect FDI flows to these countries. Combining these explanatory variables to several widely used control variables, it was found that the literacy rate (human capital); freedom (political rights and civil rights) and the incident of war are important FDI determinants. The results confirm their expected signs; FDI inflows respond positively to the literacy rate and to improvements in political rights and civil liberties; war event, by contrast, exerts strong negative effects on FDI.

*Table 3 :* The Determinants of FDI to Africa: Selected Empirical Literature.

Study	Sample	Variables		Main Results
		Dependent	Explanatory	
Bhattacharya, Montiel and Sharma(1997)	15 SSA for 1980-1995	Private flows, FDI, private loans all % of GDP	Lag growth rate of GDP, lag gross fixed capital formation to GDP, lag exports plus imports to GDP, lag total debt to GDP, coefficient of variation of monthly real effective exchange rate index, lag dependent variable and US 3 year government bond yield	For private flows, all variables were significant with expected sign except REER variability. For FDI key variables were GDP growth, openness and variability of REER. For private loans key variables were domestic investment and external debt ratios. US interest rate was not significant in any regression
Asiedu (2002)	32 SSA and 39 non-SSA, 1970-1999	(Net FDI flows)/GDP	GDP growth, openness, infrastructure, Return to investment, inflation, Africa dummy, political stability, interactions	Factors that drive FDI to developing countries have a different impact on FDI to SSA. Infrastructure development and a higher return on capital promote FDI to non-SSA countries. In contrast these factors have no effect on FDI to SSA. Openness to trade, promotes FDI in both groups.
Onyeiwu and Shrestha (2004)	29 African countries, 1975-1999		GDP growth, openness, international reserves, natural resource	Found that FDI to Africa is determined by GDP growth, openness, international reserves and natural resources
Krugell (2005)	17 African countries for 1980-1999	FDI inflows/GDP	Past FDI, market size and growth, infrastructure,	Found that FDI is determined by past FDI, market size and infrastructure
Suliman and Mollick(2009)	29 SSA for 1980-2003	FDI inflows/GDP	Adult literacy, Freedom, real GDP, openness, market liquidity, infrastructure, FDI lag,	Literacy rate, freedom(political and civil rights), and incidence of war are important determinants on FDI

## VI. THE MODEL AND ESTIMATION FRAMEWORK

### a) The Empirical Model

In line with the discussions in the previous section, a basic FDI model is specified as follows

$$\begin{aligned} \ln FDI_{it} = & \alpha + \lambda FDI_{it-1} + \beta_1 y_{it} + \beta_2 res_{it} + \beta_3 open_{it} + \beta_4 BITS_{it} + \beta_5 DTTs_{it} + \beta_6 IYOFF_{it} + \beta_7 Invr_{it} + \\ & \beta_8 FIN_{it} + \beta_9 MILIT_{it} + \beta_{10} COMESA_{it} + \beta_{11} EAC_{it} + \beta_{12} ECOWAS_{it} + \beta_{13} ECCAS_{it} + \\ & \beta_{14} CENSAD_{it} + \beta_{15} UMA_{it} + \beta_{16} IGAD_{it} + \phi_1 1990 + \phi_2 2000 + \dots + \phi_{10} 2009 + u_{it} \end{aligned} \quad (1)$$

Where  $\ln FDI_{it}$  is the log of FDI stocks to nominal GDP,  $y_{it}$  is the real GDP growth rate (introduced to proxy for growth potential of the market size),  $res_{it}$  is the existence of natural resources,  $open_{it}$  is the degree of openness,  $BITS_{it}$  is the number of bilateral investment treaties,  $DTTs_{it}$  is the number of double taxation treaties,  $Invr_{it}$  is the existence of FDI-specific regulatory regime,  $IYOFF_{it}$  is log of the number of years the current president has been in power,  $FIN_{it}$  is whether there is a limited period before elections or not,  $MILIT_{it}$  is whether the president is a military officer or not,  $COMESA_{it}$  a Common Market for Eastern and Southern Africa (COMESA) dummy,  $SADC_{it}$  a Southern African Development Community (SADC) dummy,  $EAC_{it}$  is East African Community (EAC) dummy,  $ECOWAS_{it}$  is the Economic Community of West African States (ECOWAS) dummy,  $ECCAS_{it}$  is the Economic Community of Central African States (ECCAS) dummy,  $CENSAD_{it}$  is the Community of Sahel-Saharan States (CENSAD) dummy,  $UMA_{it}$  and  $IGAD_{it}$  is the Intergovernmental Authority on Development (IGAD) dummy. The subscript  $i$  denotes countries and  $t$  denotes the time.

The study utilises a one-way error component disturbances;

$$u_{it} = \mu_i + v_{it} \quad i = 1, \dots, 45 \quad t = 1980, \dots, 2009 \quad (2)$$

Where  $\mu_i$  denotes time-invariant unobservable country effect,  $\lambda_t$  denotes the Africa-wide unobservable time effect and  $v_{it}$  is the remainder stochastic disturbance term that is assumed to be identically and independently distributed.

However, the explicit introduction of year dummy variables introduces time-specific fixed effects.

These effects capture the unobservable characteristics about each year which applies to all countries in the sample.

### b) Description of the Data and Variables

The sample contains the countries shown in table A1 in the appendix. The dependent variable is the log of the ratio of FDI stocks to GDP all obtained from the United Nation Conference on Trade and Development (UNCTAD) web site. The choice of the independent variables was constrained by data availability. For instance data on infrastructure, wages were not available for a number of countries in the sample. Since one of the virtues of our study was the inclusion of many African countries, we were unable to test for these important variables. Below are some of the independent variables.

#### i. Macroeconomic variables.

*Real GDP growth:* This data is collected from the UNCTAD database.

*Openness :* Computed as a ratio of the total exports of goods and services to GDP. The Data is collected from the UNCTAD database.

#### ii. National and International Investment Policy.

*FDI-specific regulatory regime:* Is a dummy variable for countries with FDI-specific regulatory regime including existence of an Investment Promotion Agency. Countries with such a regime are coded as 1 and 0 otherwise.

*Cumulative Bilateral investment treaties (BITs) :* This is extracted from a list of BITs in the UNCTAD database.

*Cumulative Double taxation treaties (DTTs) :* This is extracted from a list of DTTs in the UNCTAD database.

#### iii. Natural resources.

*Natural resources:* Is a dummy variable for countries endowed with natural resources. Countries with natural resources are coded as 1 and 0 otherwise.

#### iv. Political governance variables.

*Years current president has been in power :* This is extracted from Kefer [22] database on political institutions.

*Fixed term before elections are held:* This is extracted from Kefer [22] database on political institutions.

*President being a military officer:* This is extracted from Kefer [22] and is simply a dummy variable for those years/countries when the leader was a military officer.

v. *Regional trade agreement bloc variables*

Dummy variables are used to capture the effects of COMESA, SADC, EAC, IGAD, ECOWAS, ECCAS, CENSAD and UMA. There are some important facts about each of the groups.

First, COMESA has clear investment provisions such as the COMESA Common Investment Agreement (CCIA) and COMESA Regional Investment Agency (RIA). COMESA's 19 member states constitute a huge market with a total population of over 400 million and combined GDP of over US \$360 billion. However, most countries in COMESA are members of more than one regional organization such as SADC, and EAC. All SADC members with the exception of Botswana, Tanzania, Mozambique and South Africa are members of COMESA. Similarly, all EAC members belong to COMESA with the exception of Tanzania.

Second, SADC's 15 member states constitute a huge market (over 258 million people and combined GDP of over US \$472 billion). Additionally, SADC has investment provisions for extra-regional FDI and has regional investment initiatives such as the Southern African regional Power Pool (SAPP), which manages distribution of electricity power.

Third, EAC has a market with combined population of 130 million and a combined GDP of US \$ 45 billion. ECOWAS has a total population of over 287 million with a combined GDP of over US \$ 530 billion. ECOWAS has the West African Power Pool (WAPP). There are also the other regional groupings within ECOWAS such as the West African Economic and Monetary Union (WAEMU), which includes Benin, Burkina Faso, Guinea-Bissau, Senegal and Ivory Coast, and West African Monetary Zone (WAMZ), which includes Ghana, Nigeria, Sierra Leone and the Gambia. Fourth, the 11 members of ECCAS are Angola, Burundi, Cameroon, Central African Republic, Chad, Democratic Republic of the Congo, Equatorial Guinea, Gabon, Republic of the Congo, Rwanda and Sao Tome and Principe. This is a strategic region rich in natural resource, has a total population of over 112 million and combined GDP of over US \$ 176 billion.

Fifth, the 28 members of CENSAD are Burkina Faso, Chad, Libya, Mali, Niger, Sudan, Central African Republic, Eritrea, Djibouti, the Gambia, Egypt, Morocco, Nigeria, Somalia, Tunisia, Benin, Togo, Ivory Coast, Guinea-Bissau, Liberia, Ghana, Sierra Leone, Guinea, Kenya, Mauritania, and Sao Tome and Principe. It is the largest regional grouping in Africa with a total population

of over 485 million and combined GDP of US \$ 790 billion.

Finally, UMA has 5 members, namely Algeria, Morocco, Tunisia, Libya, and Mauritania with a total population of 88.9 million people and combined GDP of US \$ 607.6 billion.

One of the critical issue in this study is the agglomeration effects, which are captured within a dynamic panel data framework. In line with Chen and Kwang [23], past FDI values are used to capture agglomeration economies through a partial stock adjustment process.

c) *The Estimation Framework*

The ordinary least squares (OLS) fixed effects and random effects estimators for Equation 1 are biased and inconsistent for fixed T and as N gets large [24]. However, first differencing Equation 1 removes the country effects ( $\mu_i$ ), thus eliminating the potential source of omitted variables in the estimation. However, differencing variables that are predetermined but not strictly exogenous makes them endogenous. We use Arellano and Bond [25] generalized method of moments (GMM) estimator that instruments the differenced variables that are strictly exogenous with all their available lags in levels.

However, one problem with the Arellano-Bond estimator is that lagged levels are poor instruments for first-differences if the variables are close to a random walk. Arellano and Bover [26] provide another method, which if the original equation in levels is added to the system leading to additional instruments that increase efficiency. In this equation, variables in levels are instrumented with suitable lags of their own first-differences. The assumption needed is that these differences are uncorrelated with the unobserved country effects. Blundell and Bond [27] proposed the use of extra moment conditions that rely on initial observations.

## V. ESTIMATION RESULTS AND DISCUSSION

a) *Descriptive Statistics*

We begin the analysis by conducting univariate exploratory data analysis. Two characteristics are noteworthy from table 4. First, all time-variant variables are positively skewed implying that logarithmic transformation is appropriate. Second, all the variables are not normally distributed, which has implications on statistical inference.

Table 4 : Summary Statistics for the Full Sample (45 Countries).

Variable	Mean	Skewness	Jarque-Bera Normality test
FDI stock to GDP ratio	26.56	8.920	43998(0.000)***
Real GDP growth	3.800	25.948	33162059(0.000)***
Degree of openness	30.26	1.907	3570.1(0.000)***
Bilateral investment treaties	7.718	3.976	23715.1(0.000)***
Number of double taxation treaties	7.338	2.506	3857.36(0.000)***
Existence of special FDI regime	0.766	-1.254	318.89(0.000)***
Existence of natural resources	0.753	-1.753	290.25(0.000)***
Years that president has been in power	10.16	1.065	239.51(0.000)***
Limited Presidential term	0.715	-0.951	237.4(0.000)***
Military government	0.378	0.502	200.14(0.000)***
COMESA dummy	0.344	0.655	206.1(0.000)***
SADC dummy	0.309	0.828	220.1(0.000)***
EAC dummy	0.077	3.151	5055.5(0.000)***
IGAD dummy	0.102	2.623	2530(0.000)***
ECOWAS dummy	0.299	0.876	225.9(0.000)***
ECCAS dummy	0.135	2.131	1213.9(0.000)***
CENSAD dummy	0.507	-0.027	197.0(0.000)***
UMA dummy	0.112	2.465	2017.17(0.000)***

### b) Estimation Results

A number of different specifications of the model are estimated using an unbalanced panel of 45 countries for the period 1980 to 2009. The use of unbalanced panel is motivated by the fact that a number of countries in Africa have incomplete observations for most variables. The model has a standard panel with  $N$  being larger than 7 and the results for the four models are reported in Table 5.

Columns 2 and 3 of Table 5 present static FED and RE panel data models, which exclude FDI agglomeration economies. The FE model does not have time-invariant variables such as natural resources, regional trade agreement since they are wiped out in the demeaning process. In order to check whether the RE model is appropriate or not, we performed a Hausman [28] type test of no correlation between  $\mu_i$  with the regressors. The test returned a  $\chi^2$  value of 18.94 with a p-value of 0.1672, which means that the RE model is the preferred one.

Columns 3 and 4 present models that detect agglomeration effects and are estimated using Arellano and Bond[25] difference GMM and Blundell and Bond [27] system GMM estimators. In the difference GMM (column 3), Real GDP growth, natural resource,  $\ln_{open}$ ,  $\ln_{bits}$ ,  $\ln_{dtts}$ , log of duration in power, special FDI regime, military leader, existence of period

before elections are called, year 2000, year 2001, year 2002, year 2003, year 2004, year 2005 year 2006, year 2007, year 2008 and year 2009) are treated as strictly exogenous and used as instruments to difference equation. The exogeneity of the instruments are not rejected by the difference-in-Hansen test (chi-square statistic of 23.74 with p-value of 1.00). The  $\ln_{fdi\_stock\_1}$  is used as a GMM-style instrument. In the same model, natural resources and FDI-specific regime dummies and constant are dropped because they are time-invariant and wiped out by the differencing process.

The system GMM (column 4) uses identical instruments, but level equations are included in the estimation. Additionally, the system GMM includes moment conditions of both difference and level equations. The difference-in-Hansen test of instrument exogeneity indicates validity of the instruments.

Table 5 : Dynamic Panel Data Results (Dependent Variable=log of FDI stock).

Variable	Without agglomeration effects		With agglomeration effects	
	Static FEM	Static REM	Difference GMM (Arellano-Bond)	System GMM (Blundell-Bond)
Constant	3.211(0.000)***	2.925(0.001)***		
FDI stock(lag)			0.858(0.000)***	0.557(0.000)***
Real GDP growth	0.006(0.130)	0.006(0.108)	0.002(0.006)***	0.005(0.043)**
Openness (log)	0.434(0.000)***	0.439(0.000)***	0.006(0.845)	-0.101(0.444)
Natural resources		0.645(0.090)*		0.743(0.083)*
Special FDI regime		-0.094(0.782)		-0.378(0.205)
BITs(log)	0.308(0.000)***	0.301(0.000)***	-0.010(0.882)	0.111(0.172)
DTTs(log)	0.713(0.000)***	0.754(0.000)***	0.162(0.214)	0.543(0.004)***
Power duration(log)	0.074(0.001)***	0.075(0.001)***	0.035(0.000)***	-0.018(0.527)
Limited term	0.248(0.000)***	0.234(0.001)***	0.226(0.368)	-0.119(0.554)
Military government	-0.063(0.401)	-0.068(0.355)	-0.047(0.447)	0.307(0.134)
Year2000	0.067(0.492)	0.063(0.514)	0.077(0.000)***	0.014(0.719)
Year2001	-0.028(0.778)	-0.032(0.747)	-0.017(0.640)	-0.032(0.503)
Year2002	0.083(0.414)	0.079(0.441)	0.096(0.011)**	0.041(0.450)
Year2003	0.190(0.066)*	0.184(0.076)*	0.150(0.000)***	0.129(0.011)**
Year2004	0.166(0.113)	0.155(0.137)	0.107(0.000)***	0.145(0.018)**
Year2005	0.212(0.713)	0.199(0.058)*	0.041(0.338)	0.159(0.028)**
Year2006	0.387(0.000)***	0.373(0.000)***	0.202(0.000)***	0.328(0.000)***
Year2007	0.616(0.000)***	0.602(0.000)***	0.255(0.000)***	0.427(0.000)***
Year2008	0.737(0.000)***	0.722(0.000)***	0.166(0.008)***	0.439(0.000)***
Year2009	0.939(0.000)***	0.926(0.000)***	0.201(0.009)***	0.472(0.000)***
COMESA dummy		-0.692(0.149)		0.374(0.422)
SADC dummy		-0.014(0.983)		2.991(0.029)**
EAC dummy		-0.453(0.438)		-1.476(0.051)*
IGAD dummy		0.837(0.239)		1.725(0.086)*
ECOWAS dummy		-0.477(0.451)		-2.283(0.191)
ECCAS dummy		0.398(0.581)		3.907(0.012)**
CENSAD dummy		0.171(0.733)		3.002(0.068)*
UMA dummy		-0.170(0.792)		-1.728(0.068)*
<b>Diagnostic tests</b>	<b>Statistics</b>			
Adjusted R-squared	0.6175	0.6977		
Sargan test			606.56(0.000)***	701.44(0.000)***
Hansen test			28.65(1.000)	12.38(1.000)
Difference-in-Hansen			23.74(1.000)	23.08(1.000)
Observations	948	948	871	923

i. *Agglomeration economies*

In all the models, the estimation results show significant (at 1 per cent level) agglomeration effects (lagged dependent variable) and its value is high reflecting the strength of the effect. This means that once the inflow of FDI sets in, it should perpetuate itself and attract further FDI since new investors locate their investment next to other multinationals. The reason for this is that FDI is a long-term capital investment that is irreversible in the short-run. This result is consistent with the work of Krugell [29].

ii. *Macroeconomic variables*

First, the catalytic role played by the market size and macroeconomic stability as captured by growth rate of GDP is evident. The coefficient for *real GDP growth* is positive and statistically significant in the difference and system GMM models. This means that market-seeking FDI is located in countries where the real GDP growth potential is high since it guarantees profitability of the projects. The results are in line with Elbadawi and Mwega [30], Onyeiwu and Shrestha [18], Krugell [29]



and [31] who show that economic growth is an important determinant of FDI flows to the region.

Second, *trade openness* has a positive effect on inward FDI in the static panel data models only. Once agglomeration effects are introduced in the model (columns 3 and 4), trade openness becomes statistically insignificant. This result is contrary to the work of Cheng and Kwan [23], Asiedu [3] and Onyeiwu and Shrestha [18].

Finally, existence of *natural resources* impacts positively on FDI in Africa as shown in the static RE and system GMM models. Countries with natural resources tend to attract resource-seeking FDI than those without. The rationale for this is that a number of resource-abundant countries in Africa neither have the large amounts of capital typically required for resource extraction nor the technical skills needed to extract or sell the raw materials in the world markets. Additionally, the infrastructure facilities for getting the raw materials out of the host country to the final destination need to be created calling for FDI. This result is consistent with the finding in Onyeiwu and Shrestha [18] as well as UNCTAD [2].

### iii. *Domestic and International FDI-Specific Policy*

First, the results in Table 5 show that *special FDI regimes* per se have no effect on FDI to Africa. The insignificance of this factor may be attributed to poor investment climate and inadequate FDI promotion. Most investment promotion agencies in Africa are very small and poorly funded, which implies that they cannot master the minimum critical mass for basic country image-building and offer after-care services, among others.

Second, the signing of *bilateral investment treaties (BITs)* have a positive influence on the FDI in static panel data models only. This means that the signing of BITs (especially with major capital exporting countries) sends out a signal to potential investors that the country is generally serious about the protection of foreign investment. In the dynamic panel data models, BITs has no influence on FDI, which is consistent with the work of Hallward-Driemeier [32] and UNCTAD [17]. These papers find a rather weak correlation between BITs and increase in FDI. The possible reason for the weak evidence may be attributed to the quality of the BITs in terms of the provisions embedded.

Finally, *double taxation treaties (DTTs)* have a positive and statistically significant effect on inward FDI to Africa in all but except difference GMM model. This is consistent with the results of Blonigen and Davis [33] who find a positive relationship between the existing DTTs and FDI.

### iv. *Political governance*

The political governance factors are not quite strong in determining the location of the FDI in Africa. First, in all the models (except the system GMM) the

higher the number of *years the chief executive officer of a country has been in power* the more the FDI to an African country. However, in view of the inconsistency among the models, this variable is inconclusive.

Second, the results on the effect of *constitutional limit on the number of years the president can serve before new elections* are not conclusive. The direction of effect is positive in all the models (except the system GMM) as expected indicating that countries with constitutional limit on the number of years the president/King can serve before new elections are held tend to attract more FDI compared to other countries. However the effect is not statistically significant for the difference GMM.

Finally, the fact that the *president is a military officer* does not affect FDI negatively as expected. However, the effects are not statistically significant. The results are in not in line with the finding in Sullivan and Mollick [21], who show that political and civil rights exert a strong negative effect on FDI.

### v. *Time-specific effects*

The time-specific effects captured by year dummies are reported in table 5 models 1 and 2. In generally time-specific effects are positive have been increasing with time. This means that the environment across all African countries has become increasingly conducive to FDI from 2000.

### vi. *Regional integration agreements (RTAs)*

In general, the RTAs do not seem to have much influence on FDI inflow to Africa.

## VI. CONCLUSION

The paper has examined some key determinants of FDI to Africa. Using dynamic panel data framework, the analysis shows that FDI inflows to Africa depend on agglomeration economies, existence of natural resources, real GDP growth, domestic and international FDI policy, among others. Some specific results are noteworthy. First, agglomeration economies are the most significant determinant of FDI inflows to Africa. This result is robust throughout alternative specifications. Second, real GDP growth positively influences the location of FDI. Third, the existence of natural resources tends to attract resource-seeking FDI. Finally, DTTs are FDI-enhancing in most countries. Finally, the environment across all African countries has become conducive to FDI since 2000. This is not surprising given reforms to attract FDI within their respective countries.

The empirical results have some policy implications on efforts to attract FDI in Africa. First, the results show that FDI to Africa is not solely driven by natural resource endowment and that there is a role for the conscious efforts by national and international institutions in promoting investments to Africa.

Finally, the efforts to attract FDI seem to be yielding dividends as shown by the positive and increasing time-specific effects. This means that the negative perception about Africa (i.e. the famous African dummy) is slowly disappearing.

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## APPENDIX

Table 1 : Countries in the Sample.

Algeria	Angola	Benin
Botswana	Burkina Faso	Burundi
Cameroon	Central African Republic	Chad
Comoros	Congo	Cote d'Ivoire
Democratic Republic of the Congo	Djibouti	Egypt
Equatorial Guinea	Eritrea	Ethiopia
Gabon	Gambia	Ghana
Guinea	Guinea-Bissau	Kenya
Lesotho	Liberia	Libya
Madagascar	Malawi	Mauritania
Mauritius	Morocco	Mozambique
Namibia	Niger	Nigeria
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Somalia	Republic of South Africa	Sudan
Swaziland	Togo	Tunisia
Uganda	Tanzania	Zambia
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**15. Use of direct quotes:** When you do research relevant to literature, history or current affairs then use of quotes become essential but if study is relevant to science then use of quotes is not preferable.



**16. Use proper verb tense:** Use proper verb tenses in your paper. Use past tense, to present those events that happened. Use present tense to indicate events that are going on. Use future tense to indicate future happening events. Use of improper and wrong tenses will confuse the evaluator. Avoid the sentences that are incomplete.

**17. Never use online paper:** If you are getting any paper on Internet, then never use it as your research paper because it might be possible that evaluator has already seen it or maybe it is outdated version.

**18. Pick a good study spot:** To do your research studies always try to pick a spot, which is quiet. Every spot is not for studies. Spot that suits you choose it and proceed further.

**19. Know what you know:** Always try to know, what you know by making objectives. Else, you will be confused and cannot achieve your target.

**20. Use good quality grammar:** Always use a good quality grammar and use words that will throw positive impact on evaluator. Use of good quality grammar does not mean to use tough words, that for each word the evaluator has to go through dictionary. Do not start sentence with a conjunction. Do not fragment sentences. Eliminate one-word sentences. Ignore passive voice. Do not ever use a big word when a diminutive one would suffice. Verbs have to be in agreement with their subjects. Prepositions are not expressions to finish sentences with. It is incorrect to ever divide an infinitive. Avoid clichés like the disease. Also, always shun irritating alliteration. Use language that is simple and straight forward. put together a neat summary.

**21. Arrangement of information:** Each section of the main body should start with an opening sentence and there should be a changeover at the end of the section. Give only valid and powerful arguments to your topic. You may also maintain your arguments with records.

**22. Never start in last minute:** Always start at right time and give enough time to research work. Leaving everything to the last minute will degrade your paper and spoil your work.

**23. Multitasking in research is not good:** Doing several things at the same time proves bad habit in case of research activity. Research is an area, where everything has a particular time slot. Divide your research work in parts and do particular part in particular time slot.

**24. Never copy others' work:** Never copy others' work and give it your name because if evaluator has seen it anywhere you will be in trouble.

**25. Take proper rest and food:** No matter how many hours you spend for your research activity, if you are not taking care of your health then all your efforts will be in vain. For a quality research, study is must, and this can be done by taking proper rest and food.

**26. Go for seminars:** Attend seminars if the topic is relevant to your research area. Utilize all your resources.

**27. Refresh your mind after intervals:** Try to give rest to your mind by listening to soft music or by sleeping in intervals. This will also improve your memory.

**28. Make colleagues:** Always try to make colleagues. No matter how sharper or intelligent you are, if you make colleagues you can have several ideas, which will be helpful for your research.

**29. Think technically:** Always think technically. If anything happens, then search its reasons, its benefits, and demerits.

**30. Think and then print:** When you will go to print your paper, notice that tables are not be split, headings are not detached from their descriptions, and page sequence is maintained.

**31. Adding unnecessary information:** Do not add unnecessary information, like, I have used MS Excel to draw graph. Do not add irrelevant and inappropriate material. These all will create superfluous. Foreign terminology and phrases are not apropos. One should NEVER take a broad view. Analogy in script is like feathers on a snake. Not at all use a large word when a very small one would be





sufficient. Use words properly, regardless of how others use them. Remove quotations. Puns are for kids, not grunt readers. Amplification is a billion times of inferior quality than sarcasm.

**32. Never oversimplify everything:** To add material in your research paper, never go for oversimplification. This will definitely irritate the evaluator. Be more or less specific. Also too, by no means, ever use rhythmic redundancies. Contractions aren't essential and shouldn't be there used. Comparisons are as terrible as clichés. Give up ampersands and abbreviations, and so on. Remove commas, that are, not necessary. Parenthetical words however should be together with this in commas. Understatement is all the time the complete best way to put onward earth-shaking thoughts. Give a detailed literary review.

**33. Report concluded results:** Use concluded results. From raw data, filter the results and then conclude your studies based on measurements and observations taken. Significant figures and appropriate number of decimal places should be used. Parenthetical remarks are prohibitive. Proofread carefully at final stage. In the end give outline to your arguments. Spot out perspectives of further study of this subject. Justify your conclusion by at the bottom of them with sufficient justifications and examples.

**34. After conclusion:** Once you have concluded your research, the next most important step is to present your findings. Presentation is extremely important as it is the definite medium through which your research is going to be in print to the rest of the crowd. Care should be taken to categorize your thoughts well and present them in a logical and neat manner. A good quality research paper format is essential because it serves to highlight your research paper and bring to light all necessary aspects in your research.

## INFORMAL GUIDELINES OF RESEARCH PAPER WRITING

### Key points to remember:

- Submit all work in its final form.
- Write your paper in the form, which is presented in the guidelines using the template.
- Please note the criterion for grading the final paper by peer-reviewers.

### Final Points:

A purpose of organizing a research paper is to let people to interpret your effort selectively. The journal requires the following sections, submitted in the order listed, each section to start on a new page.

The introduction will be compiled from reference matter and will reflect the design processes or outline of basis that direct you to make study. As you will carry out the process of study, the method and process section will be constructed as like that. The result segment will show related statistics in nearly sequential order and will direct the reviewers next to the similar intellectual paths throughout the data that you took to carry out your study. The discussion section will provide understanding of the data and projections as to the implication of the results. The use of good quality references all through the paper will give the effort trustworthiness by representing an alertness of prior workings.

Writing a research paper is not an easy job no matter how trouble-free the actual research or concept. Practice, excellent preparation, and controlled record keeping are the only means to make straightforward the progression.

### General style:

Specific editorial column necessities for compliance of a manuscript will always take over from directions in these general guidelines.

To make a paper clear

- Adhere to recommended page limits

Mistakes to evade

- Insertion a title at the foot of a page with the subsequent text on the next page



- Separating a table/chart or figure - impound each figure/table to a single page
- Submitting a manuscript with pages out of sequence

In every sections of your document

- Use standard writing style including articles ("a", "the," etc.)
- Keep on paying attention on the research topic of the paper
- Use paragraphs to split each significant point (excluding for the abstract)
- Align the primary line of each section
- Present your points in sound order
- Use present tense to report well accepted
- Use past tense to describe specific results
- Shun familiar wording, don't address the reviewer directly, and don't use slang, slang language, or superlatives
- Shun use of extra pictures - include only those figures essential to presenting results

**Title Page:**

Choose a revealing title. It should be short. It should not have non-standard acronyms or abbreviations. It should not exceed two printed lines. It should include the name(s) and address (es) of all authors.

**Abstract:**

The summary should be two hundred words or less. It should briefly and clearly explain the key findings reported in the manuscript-- must have precise statistics. It should not have abnormal acronyms or abbreviations. It should be logical in itself. Shun citing references at this point.

An abstract is a brief distinct paragraph summary of finished work or work in development. In a minute or less a reviewer can be taught the foundation behind the study, common approach to the problem, relevant results, and significant conclusions or new questions.

Write your summary when your paper is completed because how can you write the summary of anything which is not yet written? Wealth of terminology is very essential in abstract. Yet, use comprehensive sentences and do not let go readability for brevity. You can maintain it succinct by phrasing sentences so that they provide more than lone rationale. The author can at this moment go straight to



shortening the outcome. Sum up the study, with the subsequent elements in any summary. Try to maintain the initial two items to no more than one ruling each.

- Reason of the study - theory, overall issue, purpose
- Fundamental goal
- To the point depiction of the research
- Consequences, including definite statistics - if the consequences are quantitative in nature, account quantitative data; results of any numerical analysis should be reported
- Significant conclusions or questions that track from the research(es)

Approach:

- Single section, and succinct
- As a outline of job done, it is always written in past tense
- A conceptual should situate on its own, and not submit to any other part of the paper such as a form or table
- Center on shortening results - bound background information to a verdict or two, if completely necessary
- What you account in an conceptual must be regular with what you reported in the manuscript
- Exact spelling, clearness of sentences and phrases, and appropriate reporting of quantities (proper units, important statistics) are just as significant in an abstract as they are anywhere else

#### **Introduction:**

The **Introduction** should "introduce" the manuscript. The reviewer should be presented with sufficient background information to be capable to comprehend and calculate the purpose of your study without having to submit to other works. The basis for the study should be offered. Give most important references but shun difficult to make a comprehensive appraisal of the topic. In the introduction, describe the problem visibly. If the problem is not acknowledged in a logical, reasonable way, the reviewer will have no attention in your result. Speak in common terms about techniques used to explain the problem, if needed, but do not present any particulars about the protocols here. Following approach can create a valuable beginning:

- Explain the value (significance) of the study
- Shield the model - why did you employ this particular system or method? What is its compensation? You strength remark on its appropriateness from a abstract point of vision as well as point out sensible reasons for using it.
- Present a justification. Status your particular theory (es) or aim(s), and describe the logic that led you to choose them.
- Very for a short time explain the tentative propose and how it skilled the declared objectives.

Approach:

- Use past tense except for when referring to recognized facts. After all, the manuscript will be submitted after the entire job is done.
- Sort out your thoughts; manufacture one key point with every section. If you make the four points listed above, you will need a least of four paragraphs.
- Present surroundings information only as desirable in order hold up a situation. The reviewer does not desire to read the whole thing you know about a topic.
- Shape the theory/purpose specifically - do not take a broad view.
- As always, give awareness to spelling, simplicity and correctness of sentences and phrases.

#### **Procedures (Methods and Materials):**

This part is supposed to be the easiest to carve if you have good skills. A sound written Procedures segment allows a capable scientist to replacement your results. Present precise information about your supplies. The suppliers and clarity of reagents can be helpful bits of information. Present methods in sequential order but linked methodologies can be grouped as a segment. Be concise when relating the protocols. Attempt for the least amount of information that would permit another capable scientist to spare your outcome but be cautious that vital information is integrated. The use of subheadings is suggested and ought to be synchronized with the results section. When a technique is used that has been well described in another object, mention the specific item describing a way but draw the basic



principle while stating the situation. The purpose is to text all particular resources and broad procedures, so that another person may use some or all of the methods in one more study or referee the scientific value of your work. It is not to be a step by step report of the whole thing you did, nor is a methods section a set of orders.

#### Materials:

- Explain materials individually only if the study is so complex that it saves liberty this way.
- Embrace particular materials, and any tools or provisions that are not frequently found in laboratories.
- Do not take in frequently found.
- If use of a definite type of tools.
- Materials may be reported in a part section or else they may be recognized along with your measures.

#### Methods:

- Report the method (not particulars of each process that engaged the same methodology)
- Describe the method entirely
- To be succinct, present methods under headings dedicated to specific dealings or groups of measures
- Simplify - details how procedures were completed not how they were exclusively performed on a particular day.
- If well known procedures were used, account the procedure by name, possibly with reference, and that's all.

#### Approach:

- It is embarrassed or not possible to use vigorous voice when documenting methods with no using first person, which would focus the reviewer's interest on the researcher rather than the job. As a result when script up the methods most authors use third person passive voice.
- Use standard style in this and in every other part of the paper - avoid familiar lists, and use full sentences.

#### What to keep away from

- Resources and methods are not a set of information.
- Skip all descriptive information and surroundings - save it for the argument.
- Leave out information that is immaterial to a third party.

#### Results:

The principle of a results segment is to present and demonstrate your conclusion. Create this part a entirely objective details of the outcome, and save all understanding for the discussion.

The page length of this segment is set by the sum and types of data to be reported. Carry on to be to the point, by means of statistics and tables, if suitable, to present consequences most efficiently. You must obviously differentiate material that would usually be incorporated in a study editorial from any unprocessed data or additional appendix matter that would not be available. In fact, such matter should not be submitted at all except requested by the instructor.

#### Content

- Sum up your conclusion in text and demonstrate them, if suitable, with figures and tables.
- In manuscript, explain each of your consequences, point the reader to remarks that are most appropriate.
- Present a background, such as by describing the question that was addressed by creation an exacting study.
- Explain results of control experiments and comprise remarks that are not accessible in a prescribed figure or table, if appropriate.
- Examine your data, then prepare the analyzed (transformed) data in the form of a figure (graph), table, or in manuscript form.

#### What to stay away from

- Do not discuss or infer your outcome, report surroundings information, or try to explain anything.
- Not at all, take in raw data or intermediate calculations in a research manuscript.

- Do not present the similar data more than once.
- Manuscript should complement any figures or tables, not duplicate the identical information.
- Never confuse figures with tables - there is a difference.

#### Approach

- As forever, use past tense when you submit to your results, and put the whole thing in a reasonable order.
- Put figures and tables, appropriately numbered, in order at the end of the report
- If you desire, you may place your figures and tables properly within the text of your results part.

#### Figures and tables

- If you put figures and tables at the end of the details, make certain that they are visibly distinguished from any attach appendix materials, such as raw facts
- Despite of position, each figure must be numbered one after the other and complete with subtitle
- In spite of position, each table must be titled, numbered one after the other and complete with heading
- All figure and table must be adequately complete that it could situate on its own, divide from text

#### Discussion:

The Discussion is expected the trickiest segment to write and describe. A lot of papers submitted for journal are discarded based on problems with the Discussion. There is no head of state for how long a argument should be. Position your understanding of the outcome visibly to lead the reviewer through your conclusions, and then finish the paper with a summing up of the implication of the study. The purpose here is to offer an understanding of your results and hold up for all of your conclusions, using facts from your research and generally accepted information, if suitable. The implication of result should be visibly described. Infer your data in the conversation in suitable depth. This means that when you clarify an observable fact you must explain mechanisms that may account for the observation. If your results vary from your prospect, make clear why that may have happened. If your results agree, then explain the theory that the proof supported. It is never suitable to just state that the data approved with prospect, and let it drop at that.

- Make a decision if each premise is supported, discarded, or if you cannot make a conclusion with assurance. Do not just dismiss a study or part of a study as "uncertain."
- Research papers are not acknowledged if the work is imperfect. Draw what conclusions you can based upon the results that you have, and take care of the study as a finished work
- You may propose future guidelines, such as how the experiment might be personalized to accomplish a new idea.
- Give details all of your remarks as much as possible, focus on mechanisms.
- Make a decision if the tentative design sufficiently addressed the theory, and whether or not it was correctly restricted.
- Try to present substitute explanations if sensible alternatives be present.
- One research will not counter an overall question, so maintain the large picture in mind, where do you go next? The best studies unlock new avenues of study. What questions remain?
- Recommendations for detailed papers will offer supplementary suggestions.

#### Approach:

- When you refer to information, differentiate data generated by your own studies from available information
- Submit to work done by specific persons (including you) in past tense.
- Submit to generally acknowledged facts and main beliefs in present tense.

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<i>Introduction</i>	Containing all background details with clear goal and appropriate details, flow specification, no grammar and spelling mistake, well organized sentence and paragraph, reference cited	Unclear and confusing data, appropriate format, grammar and spelling errors with unorganized matter	Out of place depth and content, hazy format
<i>Methods and Procedures</i>	Clear and to the point with well arranged paragraph, precision and accuracy of facts and figures, well organized subheads	Difficult to comprehend with embarrassed text, too much explanation but completed	Incorrect and unorganized structure with hazy meaning
<i>Result</i>	Well organized, Clear and specific, Correct units with precision, correct data, well structuring of paragraph, no grammar and spelling mistake	Complete and embarrassed text, difficult to comprehend	Irregular format with wrong facts and figures
<i>Discussion</i>	Well organized, meaningful specification, sound conclusion, logical and concise explanation, highly structured paragraph reference cited	Wordy, unclear conclusion, spurious	Conclusion is not cited, unorganized, difficult to comprehend
<i>References</i>	Complete and correct format, well organized	Beside the point, Incomplete	Wrong format and structuring



# INDEX

---

## *A*

Acquisition · 1, 9, 10  
Assumptions · 1

---

## *C*

Civilization · 11, 13  
Comprehensive · 26

---

## *D*

Demonstrated · 1, 35, 44, 86

---

## *E*

Entrepreneurial · 89  
Entwicklungen · 23  
Equilibrium · 5, 8, 9, 10, 53  
Equivalent · 33, 85  
Establishment · 21

---

## *F*

Firstrequirement · 43

---

## *H*

Homogeneity · 69, 75

---

## *I*

Infrastructural · 11

---

## *M*

Macroeconomic · 41, 94, 95  
Multicollinearity · 39

---

## *O*

Obligations · 11, 13, 15, 16, 18, 20, 21, 23  
Operationalized · 30, 34, 35, 36, 37

---

## *P*

Patronized · 3  
Phenomenon · 1, 43, 89, 92  
Pilgrimage · 11, 12, 13, 14, 16, 18, 21, 22, 23

---

## *R*

Reexamine · 1

---

## *S*

Simultaneously · 8, 9, 10  
Sophistication · 1

---

## *T*

Theoretically · 1

---

## *U*

Unprecedented · 11

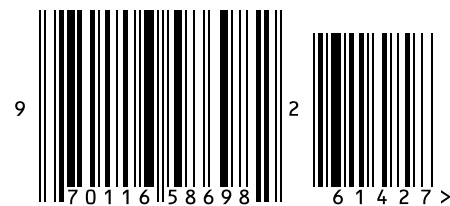




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