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Performance Evaluation of Faculties at a Private University A Data Envelopment Analysis Approach

By Azlina Shaikh Awadz, Ravindran Ramasamy, Romiza Md Akhir & Chong Kim Loy

University of Management and Technology

Abstract - This research explores the performance efficiency of faculties at a Malaysian university using data envelopment analysis. The method applies a multiple of input and output variables approach in assessing performance efficiency, which is an added advantage to other approaches using simple performance ratios. Inputs like number of students, number of academic staff working and budgetary allocations and outputs like number of graduates and number of research articles published have been applied in data envelopment analysis to get the performance efficiency of a faculty in a university. Data analysis reveals that all faculties except for one, was found to be efficient when compared to the composite faculty. This research contributes significantly in evaluating each faculty's performance in relation to a hypothetical composite faculty and ultimately contributes to the overall performance of a university in the education sector.

Keywords : *Data Envelopment Analysis, Education, Efficiency, Performance Evaluation.*

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Performance Evaluation of Faculties at a Private University A Data Envelopment Analysis Approach

Azlina Shaikh Awadz [α], Ravindran Ramasamy [σ], Romiza Md Akhir [ρ] & Chong Kim Loy [ω]

Abstract - This research explores the performance efficiency of faculties at a Malaysian university using data envelopment analysis. The method applies a multiple of input and output variables approach in assessing performance efficiency, which is an added advantage to other approaches using simple performance ratios. Inputs like number of students, number of academic staff working and budgetary allocations and outputs like number of graduates and number of research articles published have been applied in data envelopment analysis to get the performance efficiency of a faculty in a university. Data analysis reveals that all faculties except for one, was found to be efficient when compared to the composite faculty. This research contributes significantly in evaluating each faculty's performance in relation to a hypothetical composite faculty and ultimately contributes to the overall performance of a university in the education sector.

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I. Introduction

Assessment of performance is a crucial component of the management process in any type of organization (Flegg, 2004). Performance measurement is becoming an essential tool for addressing questions of productivity measurement in terms of efficiency, effectiveness and accountability. Meanwhile, Holloway and Mallory (1995) observed that performance is seen as the overall status of an organization in relation to its competitors, or against its own or external standards, and should generally be gauged across a host of measures, namely economy, efficiency and effectiveness. The concept of efficiency refers to the measurement of relationship between inputs and outputs. Hatry (1999) defined efficiency in performance as "the ration of the amount of input (dollar expenditure, personnel time or other physical input) to the amount of product or output produced by the input". In other words, efficiency measures how good an organization or decision making unit (DMU) fully utilizes its resources to produce outputs within a given set of limitations. The efficiency of organizations has been studied by many researchers in different industries, including university departments (Köksal & Nalçaci, 2006).

Assessing the performance of an educational system is an important task but difficult to accomplish since it utilizes multiple inputs to produce multiple outputs most of which are challenging to quantify. Despite the difficulties involved, educational system performance assessment could be made and used to set performance targets, to make resource allocation decisions and to improve overall performance (Soterious et.al, 1998).

II. Literature Review

Measuring the efficiency of a DMU is as easy as comparing its outputs to its input. But when multiple inputs and multiple outputs are involved, the measurement of efficiency becomes difficult. The complex nature of the relationships between multiple inputs and multiple outputs involved in the efficiency analysis of DMUs requires sophisticated techniques which can handle large number of variables and constraints. In 1978, Charnes et al. developed data envelopment analysis (DEA) which was first conceived by Farrell in 1957. Data envelopment analysis is a mathematical programming approach that utilizes multiple inputs and multiple outputs to evaluate the relative efficiencies of DMUs within an organisation and to compare each DMU with other DMUs. The relative efficiency is defined as the ratio of multiple weighted outputs to multiple weighted inputs. According to Nunamaker (1985), the principal strength of DEA "lies in its ability to combine multiple inputs and outputs into a single summary measure of efficiency without requiring specification of any priori weights".

DEA is an attractive tool for performance evaluation due to its unique characteristics, such as, among others, being able to handle multiple inputs and multiple outputs simultaneously, does not require weights of each factor to be assigned in advance, inputs and outputs can be compared against each other without the need to standardize the data and weights used for each DMU are those which maximize the ratio (Chang & Chen, 2008).

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DEA was originally developed to examine the efficiency of public schools (Charnes et al., 1978) and has since been applied to various sectors. DEA in education studies focused more on university performance in a specific country for the right allocation of resources, to enhance efficiency of resource utilization (Fernando & Cabanda, 2007). In 2010, Agasisti and Perez-Esparrells used DEA model to compare the efficiency of Italian and Spanish state universities. Köksal and Nalçaci studied the relative efficiency of departments in Turkish engineering universities (Köksal and Nalçaci, 2006). Tajniker and Debevec applied DEA to study technical efficiencies of all secondary schools in UK and estimated models to examine the determinants of efficiency in a particular year and the change of efficiency over the period (Bradley et al, 2001). Other examples of using DEA as an evaluation tool for efficiency university departments are Tomkins and Green (1988), who studied the overall efficiency of British universities; Beasly (1995) compared chemistry and physics departments; Johnes (1995) studied UK economics departments; and Taylor and Harris (2004) compared the relative efficiency of ten South African universities. DEA is most useful in cases where accounting and financial ratios are of little value and when multiple outputs are produced especially when the relationships are not known (Charnes et al, 1978).

III. Methodology

Data envelopment analysis (DEA), a linear programming model, is used as a non-parametric technique for efficiency measurement. Any decision making unit or a division in an organisation whether it is manufacturing or service provider should perform well not only in finance but also in non financial measures. The basic concept of DEA is to form a line of optimal production by efficient DMUs and to spread all inefficient DMUs below that line, referred to as the 'envelop' (Tajnikar & Debevec, 2008). The performance at par or below average is the real measurement especially in service organisation because the service levels are difficult to quantify and fix a numerical target. Therefore if a DMU in an organisation is to be efficient it should provide service at par of the weighted average of the entire organisation as whole. This weighted average is crucial and it is the composite weighted average of all inputs and outputs of an organisation and named as hypothetical organisation.

The aim of this study is to develop a system to measure the efficiency of these faculties and guide the inefficient ones by showing how faculties should improve their teaching and research to be at least the same level as the efficient faculties. There are two different categories of DEA model, input oriented and output oriented. In input oriented models minimizes the usage of input while maintaining the same level of output while in output oriented models, DMUs maximizes the level of output at the same level of input given. It is obvious that the difference between the two models consists of the ability of each faculty to control the quantity of input or output. In this study, output oriented DEA model is found to be more appropriate as the number of faculties is very small, it requires less computational process and it is easier to control inputs than outputs (Thuy Linh Pham, 2011). The efficiency measure of the output oriented model reflects the ability of a faculty to obtain maximum output from a given set of inputs.

a) Hypothetical Composite Faculty

To illustrate the DEA modelling process, a linear program is formulated to determine the relative efficiency of various faculties operate in a private university in Malaysia. Using the linear programming model, a hypothetical composite faculty will be constructed, based on the inputs and outputs for all faculties with the same goals. Three input measures and two output measures of each DMU are considered to generate a hypothetical composite faculty. This composite faculty's parameters are computed by using weights to compute a weighted average of the corresponding inputs of all DMUs of an organisation.

b) Objective function and Efficiency Index

In any optimisation model there will be an objective function which may be maximised or minimised depending upon the nature of variable being studied. If it is about costing, downtime or waiting time, it is to be minimised. If it is profit, quality or output, it is to be maximised. Similarly in DEA model also the objective function is there, normally E will be used to denote the objective function. The E is the efficiency index of the composite faculty. The efficiency index of the composite faculty is be minimised which means to minimize the input resources available to the composite faculty. Naturally the faculties which are efficient will have a score of 1 and the inefficient faculties will have a score of less than 1.

E = the fraction of Faculty of Business Administration's input available to the composite faculty.

The decision rule is as follows:

$$E_i = \begin{cases} 1, & \textit{Faculty is efficient} \\ < 1, & \textit{Faculty is not efficient} \end{cases}$$

The composite faculty requires as much input as the faculty does. There is no evidence that the faculty is inefficient.

The composite faculty requires less input to obtain the output achieved by the faculty. The composite faculty is more efficient; thus, the faculty can be judged as relatively inefficient.

The University under consideration has four faculties, Faculty of Business Administration (FBA), Faculty of Information Technology (FIT), Faculty of Education and Social Science (FESS) and Faculty of Hospitality and Tourism Management (FHTM).

c) Equality Constraint

DEA model requires that the sum of all weights equal 1, thus the first constraint is

$$wba + wit + wss + wtm = 1 \quad (1)$$

wba – weight applied to inputs and outputs for FBA
wit – weight applied to inputs and outputs for FIT
wss – weight applied to inputs and outputs for FESS
wtm – weight applied to inputs and outputs for FHTM

d) Input Constraints

The relationship between the inputs of specific and the composite faculty are to be given in the form of constraints for the DEA model to solve. The resources available for the composite faculty should be less than the inputs available for specific faculties. The analogy is to compare each specific faculty to the composite faculty for measuring composite faculty's efficiency by giving the same input given to the specific faculty being tested. If composite faculty's efficiency index is less than 1, it can be concluded that the specific faculty is weak and vice versa. Each input constraint requires an equation to accommodate all faculties' inputs. The general form for the input constraints is as follows:

Weighted input of all faculties (Composite Faculty) ≤ Input of specific faculty being tested

For each input measure, the input for the composite faculty is substituted by using the same input of the specific faculty being tested. Assuming the comparison is between FBA and composite faculty.

Number of students (first input)

$$waba + wait + wass + watm \leq \alpha ba \quad (2)$$

α = *number of students studying in each faculty*

Number of staff working (second input)

$$w\beta ba + w\beta it + w\beta ss + w\beta tm \leq \beta ba \quad (3)$$

β = *number of staff working in each faculty*

Budgetary allocation (third input)

$$wyba + wyit + wyss + wytm \leq \gamma ba \quad (4)$$

γ = *Budget allocation for each faculty*

e) Output Constraints

A constraint, for each of the two output measures, need to be written in such a way that the output for composite faculty is greater than or equal to the output of the faculty being tested.

Weighted output of all faculties (Composite Faculty) ≥ Output of specific faculty being tested

For each output measures, the output for the composite faculty is determined by computing a weighted average of the corresponding outputs for all four faculties. Constraints in the linear programming model require all outputs for the composite faculty to be greater than or equal to the outputs of individual faculties involved in this research. If the inputs for the composite unit shown to be less than the inputs of a particular faculty, the composite faculty is said to have the same or more output for less input. In other words, the faculty being evaluated is less efficient than the composite faculty. Since the composite faculty is based on all four faculties, the faculty being evaluated can be judged as relatively inefficient when compared to composite faculty.

Number of graduates (first output)

$$w\delta ba + w\delta it + w\delta ss + w\delta tm \geq \delta ba \quad (5)$$

δ = *number of graduates from each faculty*

Number of research activities (second output)

$$w\varphi ba + w\varphi it + w\varphi ss + w\varphi tm \geq \varphi ba \quad (6)$$

φ = *number of research activities carried out in each faculty*

f) Composite Faculty Constraints

Composite faculty (CF) is an imaginary faculty. It is the weighted average faculty of all faculties operating in a university. CF is taken as the bench mark for comparison of each DMU or faculty in an organisation. CF takes the same inputs and outputs of different faculties in a weighted way. This is like testing whether a DMU or a faculty is at par or below the CF. If it is equal to average, the faculty is treated as efficient and vice versa. To complete the formulation, right-hand-side values for each constraint must be given. In DEA approach, these right-hand-side values are of the input and output values of CF will be the same that of the faculty being tested or compared. Therefore the CF will have the same constraints of a faculty which is being tested. For instance, if FBA is to be tested against the CF, FBA constraints will be the constraints of CF. The models are given in the next section.

IV. Results and Discussion

As per previous studies, the above inputs and outputs of the faculties were chosen. The choice of adequate variables for inputs and outputs is still debated, and no unique solutions were definitively suggested (Johnes, 2004). For inputs, number of students, number of academic staff and budgetary allocation are being considered. As outputs, this research considers number of graduates as a proxy for teaching performance (production of human capital) and the number of research articles published as proxy

for research performances. The most recent data is from the year 2009, therefore, data used to apply DEA model for evaluation is from 2009 of each faculty.

Table 1 : Input and Output Variables

	FBA	FIT	FESS	FHTM
Input Measures				
Number of students studying	621	134	421	428
Number of academic staff working	38	16	21	33
Budgetary allocation (in RM)	28,221	14,870	7700	54,260
Output Measures				
Number of graduates	879	135	559	557
Number of research activities	18	9	2	4

a) Faculty of Business Administration (FBA)

The following DEA model is designed for the composite and FBA to evaluate the FBA against the CF.

Table 2 : Composite Faculty versus FBA - DEA Model

	CF		FBA		FIT		FESS		FHTM		
Minimise	E										
Subject to											
Total weights			wba	+	wit	+	wss	+	wtm	=	1
Number of graduates			879wba	+	135wit	+	559wss	+	557wtm	≥	879
Number of research activities			18wba	+	9wit	+	2wss	+	4wtm	≥	18
Number of students	- 621E	+	621wba	+	134wit	+	421wss	+	428wtm	≤	0
Number of academic staff	-38E	+	38wba	+	16wit	+	21wss	+	33wtm	≤	0
Budgetary allocation	-28,221E	+	28,221wba	+	14,870wit	+	7700wss	+	54,260wtm	≤	0

E, wba, wit, wss, wtm ≥ *0*

The above DEA model comprises four sections. First section gives the efficient index portrayed in the form of E, the objective function, which is to be minimised. Section two gives the total weight constraint. This is an equality constraint which should be always one. Section three gives the output constraints in the form of equal to or greater than. The CF draws the values from the faculty to be tested. There are two outputs namely graduates and number of research articles published. Section four gives the input constraints. The inputs are the number of students studying presently in each faculty, number of academic staff working and budgetary allocation for each faculty. The CF draws the figures from FBA as right hand side values. But since they are placed in the left hand side they appear with minus sign which is appropriate in algebra. The final section is the non-negative constraint. If these constraints are not given while minimising they may appear with negative values which are to be prevented as there is no negative values for these parameter.

The result after running the solution for the above model as follows:

Table 3 : DEA Results – Composite Faculty versus FBA

	Efficiency Index	Surplus or Slack	Reduced Cost Shadow prices	Allowable Increase	Allowable Decrease
Composite faculty	1	1	0	0	1
FBA	1	1	0	0.035	0
FIT	0.000	0	0	0.046	0
FESS	0.000	0	0	0	0.029
FHTM	0	0	0	0	0.060
Weights	1	0	0.101	0	0
Graduates	879	0	0.001	0	0
Research activities	18	0	0	0	1E+30
Students studying	0.000	0	-0.001	0	0
Academic staff	0.000	0	-0.005	0	0
Budgetary allocation	0.000	0	0	0	0

The efficiency index shows 1 for CF and FBA. This result reveals that both CF and FBA are working on the same level of efficiency. The surplus and slacks are zero. The surplus are the right hand side values when the faculty produces more output than CF and similarly slack variable will show the unutilised resources not used by the particular faculty when compared to CF. Since all slack values are zero it is concluded that FBA uses the same inputs and produces the same outputs as CF. Reduced cost is related to objective function while shadow prices are related to constraints. Reduced costs have no role here as this paper evaluates efficiency only. In case of linear programming the values are useful. The shadow prices give the indication that if the right hand side increases by this quantity the efficiency index will change suitably. For output variable graduates if right hand side increases by 0.001 the efficiency index also will increase. For the input variables if the students studying and academic staff decreases by 0.001 and 0.005 will improve the efficiency index. This shows that the department is over staffed and have more students for every academic staff. This requires some realignment in student and staff strength.

b) Faculty of Information Technology (FIT)

The following DEA model is framed to evaluate efficiency of Faculty of Information Technology's performance. A closer observation will reveal that there is no change in objective and equality weight constraint. But the right hand side values of output constraints have been replaced with that of FIT output values. Similarly the input constraints values are replaced by input values of FIT which are placed below the CF with minus sign.

Table 4 : Composite Faculty versus FIT - DEA Model

	CF		FBA		FIT		FESS		FHTM		
Minimise	E										
Subject to											
Total weights			wba	+	wit	+	wss	+	wtm	=	1
Number of graduates			879wba	+	135wit	+	559wss	+	557wtm	≥	135
Number of research activities			18wba	+	9wit	+	2wss	+	4wtm	≥	9
Number of students	- 134E	+	621wba	+	134wit	+	421wss	+	428wtm	≤	0
Number of academic staff	-16E	+	38wba	+	16wit	+	21wss	+	33wtm	≤	0
Budgetary allocation	-14,870E	+	28,221wba	+	14,870wit	+	7700wss	+	54,260wtm	≤	0

E, wba, wit, wss, wtm ≥ 0

The results for the FIT DEA model are as follows.

Table 5 : DEA Results – Composite Faculty versus FIT

	Efficiency Index		Surplus or Slack	Reduced Cost Shadow prices	Allowable Increase	Allowable Decrease
Composite faculty	1		1	0	1E+30	1
FBA		0.000	0	0	1E+30	3.634
FIT	1		1	0	2.708	1E+30
FESS	0		0	4.968	1E+30	4.968
FHTM	0		0	4.213	1E+30	4.213
Weights	1		0	-2.634	0	0.500
Graduates	135		0	0	0	1E+30
Research activities	9		0	0.404	9	0
Students studying	0.000		0	-0.007	0	1E+30
Academic staff	0.000		0	0	1E+30	0
Resources available	0.000		0	0	1E+30	0

FIT is also efficient as the composite faculty and FIT having the efficiency index of one. This implies that the CF uses the same inputs from all faculties and produces the same efficiency index as FIT. The slack, reduced costs and the shadow prices all have the same interpretation as in FBA. This paper's concern is whether the FIT is efficient or not, which is very clear that it s performance is as equal to CF.

c) Faculty of Education and Social Sciences (FESS)

The FESS DEA model is as follows. As usual the output constraints right hand side and input values of FESS are substituted in the place of FIT values.

Table 6 : Composite Faculty versus FESS - DEA Model

	CF		FBA		FIT		FESS		FHTM		
Minimise	E										
Subject to											
Total weights			wba	+	wit	+	wss	+	wtm	=	1
Number of graduates			879wba	+	135wit	+	559wss	+	557wtm	≥	559
Number of research activities			18wba	+	9wit	+	2wss	+	4wtm	≥	2
Number of students	- 421E	+	621wba	+	134wit	+	421wss	+	428wtm	≤	0
Number of academic staff	-21E	+	38wba	+	16wit	+	21wss	+	33wtm	≤	0
Budgetary allocation	-7,700E	+	28,221wba	+	14,870wit	+	7700wss	+	54,260wtm	≤	0

E, wba, wit, wss, wtm≥ 0

The DEA model analysis produces the following results for FESS.

Table 7 : DEA Results – Composite Faculty versus FESS

	Efficiency Index		Surplus or Slack	Reduced Cost Shadow prices	Allowable Increase	Allowable Decrease
Composite faculty	1		1	0	1E+30	1
FBA	0		0	0.537	1E+30	0.537
FIT		0.000	0	0	0.235	0.931
FESS	1		1	0	0.931	0.417
FHTM	0		0	5.781	1E+30	5.781
Weights	1		0	0.734	0	0
Graduates	559		0	0	0	1E+30
Research activities	2		0	0.133	0	0
Students studying	0.000		0	0	1E+30	0
Academic staff	0.000		0	0	1E+30	0
Resources available	0.000		0	0.000	0	1E+30

FESS also produces an efficiency index of one which indicates that this faculty also as efficient as the other two faculties. The surplus and slack values are nil. The reduced costs and shadow prices have no interpretation in DEA model for this paper. Once CF produces the results it is interpreted as how much output the CF produces with the same inputs given to FESS. Here CF produces the same output as FESS by taking all faculties composite input.

d) Faculty of Hospitality and Tourism Management

The following DEA model is applied for FHTM to assess the efficiency.

Table 8 : Composite Faculty versus FHTM - DEA Model

	CF		FBA		FIT		FESS		FHTM		
Minimise	E										
Subject to											
Total weights			wba	+	wit	+	wss	+	wtm	=	1
Number of graduates			879wba	+	135wit	+	559wss	+	557wtm	≥	557
Number of research activities			18wba	+	9wit	+	2wss	+	4wtm	≥	4
Number of students	- 428E	+	621wba	+	134wit	+	421wss	+	428wtm	≤	0
Number of academic staff	-33E	+	38wba	+	16wit	+	21wss	+	33wtm	≤	0
Budgetary allocation	-54,260E	+	28,221wba	+	14,870wit	+	7700wss	+	54,260wtm	≤	0

E, wba, wit, wss, wtm≥ 0

As usual the input and outputs are adjusted suitability with the values of FHTM. The results are as follows.

Table 9 : DEA Results – Composite Faculty versus FHTM

	Efficiency Index	Surplus or Slack	Reduced Cost Shadow prices	Allowable Increase	Allowable Decrease
Composite faculty	0.958	0.958	0	1E+30	1
FBA	0.567	0.567	0	0.039	1.138
FIT	0.433	0.433	0	0.051	1E+30
FESS	0	0	0.022	1E+30	0.022
FHTM	0	0	0.042	1E+30	0.042
Weights	1	0	0.107	0.371	0.366
Graduates	557	0	0.002	322	150.784
Research activities	14.105	10.105	0	10.105	1E+30
Students studying	0.000	0	-0.002	40.871	1E+30
Academic staff	-3.151	3.151	0	1E+30	3.151
Resources available	-29564	29564	0	1E+30	29564

CF shows that the efficiency index as 0.958, which means the composite faculty is able to obtain only an output of 0.958 with the resources available to all faculties. In other words to produce the outputs of FHTM the CF requires only 98.5% of inputs. The FHTM either wastes the resources or it is unable to produce as much output as required for this given level of resources. The composite faculty is more efficient than FHTM and the data envelopment analysis has identified FHTM as relatively inefficient. The academic staff and resources available to it are in surplus by 3.151 and 29,564 respectively. These figures suggest either the FHTM should reduce these figures or it should improve the output for these given level of inputs.

V. Conclusion

Universities are an important component of human capital formation in a country. The DEA model takes all DMUs resources and outputs produced as the basis and evaluate the DMUs on individual basis. This DEA model does not take outside variables into account while evaluating the DMUs. It compares within the organisation. This controls the exogenous variables in assessing the efficiencies of DMUs. This DEA model was applied on the data collected from a Malaysian private university on four faculties (DMUs) to assess their efficiency. It is found that out of four faculties, one faculty is not functioning as other faculties. This may be an indication to the top management to realign the faculty or to control the expenditure or to improve the efficiency. The inefficient faculty could learn from the efficient faculties and conduct a self audit and identify the causes of its own inefficiency. More administrative attention may be needed to the unit since it performs poorly.

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Cautious Buying: Differences between Rural and Urban Households

By Jagwinder Singh
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Abstract - Rural markets in India are blossoming. Very few studies have been carried out in rural India for understanding the behaviour of the rural consumer and then customizing the products in accordance to their needs. A comparative study has been carried out to understand how rural and urban consumers buying behavior differ with respect to different types of influences on their buying behavior. The study was based on the sample of 411 (204 from urban and 207 from rural areas) households across the state selected on the basis of non-probability convenience sampling. Three durable goods from three different product categories Television (entertainment product), Refrigerator (home appliance), and an Automobile (two-wheeler, motorcycle and car/jeep) have been selected for study. Overall there are significant differences between rural and urban consumers for all the select products.

Keywords : *Rural, urban, cautious, buying.*

GJMBR-B Classification : *FOR Code: 150503, 150504, 150505*

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Cautious Buying: Differences between Rural and Urban Households

Jagwinder Singh

Abstract - Rural markets in India are blossoming. Very few studies have been carried out in rural India for understanding the behaviour of the rural consumer and then customizing the products in accordance to their needs. A comparative study has been carried out to understand how rural and urban consumers buying behavior differ with respect to different types of influences on their buying behavior. The study was based on the sample of 411 (204 from urban and 207 from rural areas) households across the state selected on the basis of non-probability convenience sampling. Three durable goods from three different product categories Television (entertainment product), Refrigerator (home appliance), and an Automobile (two-wheeler, motorcycle and car/jeep) have been selected for study. Overall there are significant differences between rural and urban consumers for all the select products.

Keywords : *Rural, urban, cautious, buying.*

I. Introduction

Eight good monsoons, doubling the minimum support price of primary crops by government of India, the growth of non-farm sector in the rural areas, and a fifty six per cent contribution to country's income are both the manifestation and testimony of the fact that rural India is blossoming. There are more graduates in rural areas as compared to urban areas. Many of these are employed in nearby urban areas and in this way they earn urban incomes and stay at their own homes in rural areas. Thus they have considerable consuming power (Kashyap, 2012).

In spite of tremendous potential in the rural areas, the marketers of national and international corporations have not been able to take full advantage of it probably because of their failure to understand distinctness of the rural consumer in terms of social, psychological and economic aspects. They are significantly different in terms of their lifestyle than their urban counterparts. Therefore, rural India should not be treated as an extension of urban India (Mano Raj and Selvaraj, 2007). Indian rural market is very complex. Very few studies have been carried out in rural India for understanding the behaviour of the rural consumer and then customizing the products in accordance to their needs. Poor literacy rate, seasonal demand for goods, lack of infrastructure (rail, road, communication etc.), traditional life, different dialects and languages, and cautious buying are the obstacles for the marketers in promoting their products in the rural areas (Krishnamoorthy, 2000).

There is considerable amount of data on the urban consumers regarding who is the influencer, who is the buyer, how do they go and buy, how much money do they spend on their purchases, etc. On the rural front the efforts have started only recently and will take time to come out with substantial results. So the primary challenge is to understand the buyer and his behaviour.

II. Literature Review

Consumers are adaptive decision makers. The consumers besides maximizing decision exactness and minimizing cognitive attempt are also concerned with minimizing negative feeling and maximizing their ease of justification. The decision makers first use less cognitively demanding strategies to eliminate unacceptable alternatives till they are left with few alternatives. Then they adopt highly cognitive decision making strategies to choose between the residual alternatives. In the changing decision, there is more than one decision and even within a single decision, there are multiple decisions. (Kim *et al,* 2002).

Durable purchases by and large are group decisions for the three reasons: one it involves the significant expenditure of the family; second the user may not necessarily be the one who actually pays for it; and third it is bought for the use of several members of the family. However, in certain cases, unilateral decisions for the buying of durable item are taken by one member of the household, but it is not common. These decisions are not taken frequently and the buyings of such items are generally irrevocable (Downham and Treasure, 1956).

Individuals tend to compete and compare with one another through wealth that determines supremacy and prestige. Modern society acknowledges status through the ownership of status products instead of traditional determinants such as personal, occupational, or family reputation. Thus the individuals display their social power through the possessions of material objects. The individuals who are price sensitive are more likely to be cautious buyers (Roberts and Jones, 2001). Mittal (1989) describes that some items are attitudinal, some hedonic, and others with no considerable effect on purchase decision involvement. He argued that essential products cause less purchase decision

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involvement than unessential luxury products. Zaichkowsky (1985) ascribes involvement as a person's perceived relevance of a product based on inbuilt needs, values and interests.

Different buyers seek different degrees of information before purchasing consumer durables and the increased information seeking activity is associated with longer decision times (Newman and Staelin, 1972). When a product is perceived as high involvement, consumers engage in a more active information search and generally consider a greater variety of alternatives in their decision-making. On the other hand, when a product is perceived as low involvement, consumers will perceive relatively less differentiation between alternatives (Lastovicka, 1979). Keil and Layton (1981) in their study on information seeking behaviour of Australian new family car buyers examined three dimensions of information seeking-a source of information dimension, a brand dimension and a time dimension. The source of information dimension can be further divide into retailer search, media search and interpersonal search. The cluster analysis classified consumers into three categories-high information seekers and selective information seekers. The low information seekers were found making purchases more quickly than selective and high information seekers. Search activity had been found to be positively related to least self-confidence, price, and educational level for all indices except retailer search.

Martinez *et al* (1998) carried out a study in Spain that classified the households in different categories as a function of moment in time at which they acquired various consumer durables such as refrigerator, washing machine, dishwasher, oven and vitroceramic-hob. The percentage for innovators was very low for all the products varying from 0.4 per cent for dishwasher and vitroceramic-hob to 1.7 per cent for refrigerators. Early adopters for products vitroceramic-hob, microwave oven and dishwasher were about 20 per cent whereas these were 7.3 per cent and 7.2 per cent for refrigerators and washing machine respectively. For vitroceramic-hob and dishwasher, the introduction was relatively slow, as these were adopted by early adopters after six years. However in next five years, these were adopted by early and late majority. The refrigerator and washing machine though had similar introduction, but had much slower diffusion. The laggards were not adopting refrigerator even after 24 years and washing machine after 31 years.

Cognitive innovativeness refers to the tendency to enjoy new experiences that stimulate the mind. They seek novel or challenging cerebral experiences and psychological activities, such as thinking, problem solving etc. Sensory innovativeness on the other hand is related to tendency to engage in stimulating activities that arouse senses. Sensory innovators tend to enjoy experiences (Luna and Gupta, 2001). All innovations are not diffused at the same speed. The speed of diffusion not only depends upon the nature of the product but also on the characteristics of those whom it is directed for. Based on the moment of entry of the product into the household, the households can be classified. The behaviour of the households can be differentiated by taking into account the demographic and socio-economic characteristics of their members (Martinez *et al*, 1998).

Rogers (1983) classified the adopters into five categories – innovators, early adopters, early majority, late majority and laggards. Innovators and early adopters play an especially important role in the life-cycle of a new product. They are instrumental in promoting products through word-of-mouth communication to early and late majority. Schutte and Ciarlante (1998) found that Asian consumers are less prepared to take the social risk to try new products. Therefore, the innovation curve among Asians is, therefore, steeper and negatively skewed. The Asian consumers have smaller percentage of innovators and early adopters, and larger percentage of early and late majority. Asian consumers are initially reluctant to accept new products and once they accept, they switch brands very frequently. The demographic factors such as age, education, income, occupation and social class too influence the adoption of new products.

III. Methodology Adopted

A comparative study has been carried out to in Punjab state (India) to understand how rural and urban consumers buying behavior differ with respect to different types of influences on their buying behavior. Three durable goods from three different product categories Television (entertainment product), Refrigerator (home appliance), and an Automobile (two-wheeler, motorcycle and car/jeep) have been selected for study. A sample of 411 (204 from urban and 207 from rural areas) households across the state have been selected on the basis of non-probability convenience sampling. The data about current ownership or likelihood of purchases in the next 24 months on the select durable goods (television, refrigerator and any type of automobile) were obtained. In case of additional purchase/replacement or their likelihood in near future about the select items, the respondents were asked to give their responses only to the latest/likely buying. All respondents had been found possessing at least one item of each select product. Ordinal scale (5 point) has been used for data analysis.

The study has been based on both primary as well as secondary data. In-depth interviews have been conducted to look into insights of the consumers' behaviour with the help of a pre-tested bilingual questionnaire that was served to the respondents to obtain important information as regards to the prime objectives of the study.

H_1 Rural and urban consumers' differ in terms of their cautiousness towards buying.

The hypotheses have been constructed on the basis of literature reviewed and the observations of the researcher. The p-values have been calculated for all the variables / statements and on comparing with central value (3 representing indifference to the statement) their significance has been checked at 95% confidence level. Similarly p-values have also been calculated to observe the significance (95% confidence level) of differences between the responses of rural and urban consumers.

Discriminant analysis has also been carried out to observe the differences between rural and urban consumers. Two-way ANOVA (Analysis of Variance) has been applied to test the independent effects and the interaction effects of habitat (rural or urban) and income, and habitat and select durables.

IV. Limitations of The Study

The sample size is too small to generalize the findings. Moreover only three products (only one product from three categories) have been selected. However there are large number of consumer durables such as washing machines, water purifiers, air conditioners, generator sets, and kitchen appliances etc. There is again a variety of items within a product category and they carry different utilities at different values for different strata of consumers. Also only those households have been considered for study that had either all the three items or they were likely to buy in near future. There are many households which may have not any one or more of these select items and they were also not likely to buy in near future. Some households had possessed some of the select durables for a long time. The consumers' considerations since then might have changed and the behaviour particularly as regards to the influences within the household might be different as compared to the time of acquisition of that durable. Therefore, the likely buying of next 24 months has been made the part of the study to minimize the impact of this limitation.

V. Data Analysis

a) Television

Table T 1 : Cautious Buying (Mean Values)

S. No.	Variables	U	p (1 t) U	R	p (1 t) R	U-R	p (2 t)
X 1	Buying without much planning.	3.29	0.0001	2.55	<0.0001	0.75	<0.0001
X 2	Consideration of its importance of to one's life.	3.80	<0.0001	3.94	<0.0001	-0.14	0.0937
X 3	Careful search for the model of your choice.	3.60	<0.0001	4.22	<0.0001	-0.62	<0.0001
X 4	Thinking before buying would not make much difference in your long run expectations.	3.34	<0.0001	2.69	<0.0001	0.66	<0.0001
X 5	Carefully watching of amount spent.	3.22	0.0036	4.04	<0.0001	-0.82	<0.0001
X 6	Not to buy a new unfamiliar product till others use.	3.14	0.0399	3.89	<0.0001	-0.75	<0.0001
X 7	Not to buy a new unfamiliar, if well known are available.	3.48	<0.0001	4.09	<0.0001	-0.62	<0.0001
X 8	Desire to try a new product on learning of the same.	3.85	<0.0001	3.05	0.2345	0.79	<0.0001

U = Mean Urban, R = Mean Rural, p (1 t) = p value one tailed, and p (2 t) = p value two tailed.

In terms of cautious buying (X1 to X8), the urban consumers did not plan much before buying their television sets (X1) whereas; the rural consumers planned before the buying of the same. Both the groups of consumers had significantly considered the importance of the television set to their life (X2) and they had carefully searched the models the television sets (X3). On comparing with urban consumers, the rural consumers had been found significantly more careful in terms of searching the models of the television sets.

Urban consumers had belief that thinking before buying the television set would not make any difference to their long term expectations of the product (X4), whereas; the rural consumers did not think so. Both urban and rural consumers had tendencies to carefully watch the amount to be spent on the television set (X5), not to buy unfamiliar brand till others use the same (X6) or when well-known brands are available (X7).

Table T 1.1: Cautious Buying (F ratio)

S. No.	Variables	F ratio R/U (df =1)	IG (df =4)	R/U*IG (df =4)
X 1	Buying without much planning.	33.157*	1.728	0.556
X 2	Consideration of its importance of to one's life.	0.949	0.482	1.323
X 3	Careful search for the model of your choice.	26.846*	0.792	0.348
X 4	Thinking before buying would not make much difference in your long run expectations.	20.305*	0.812	0.322
X 5	Carefully watching of amount spent.	37.643*	2.406*	1.200
X 6	Not to buy a new unfamiliar product till others use.	45.858*	0.989	3.437*
X 7	Not to buy a new unfamiliar, if well known are available.	33.496*	0.232	0.636
X 8	Desire to try a new product on learning of the same.	40.598*	0.059	0.541

*R/U = Rural-Urban, IG = Income Group, and R/U*IG= Two-way interaction between R/U and IG.*

The rural consumers had given significantly greater consideration to these variables than the urban consumers. Urban consumers had a significant while the rural consumers had a moderate desire to try a new model of television set on learning about it (X8). There had been significant differences between the behaviours of rural and urban consumers groups for all the select variables except X2 (Table T 1).

Two-way ANOVA reveals no interaction between income and habitat of consumers for all other select variables except variable X6, where there had been significant interaction. No differences could be observed among different income groups for all other select variables except X5. There had been significant differences between rural and urban consumers for all other select variables except X2 with the highest F value for X6 (Table T 1.1).

The structure matrix of the discriminant analysis had revealed X5 as the most discriminating variable followed by X8. The classification results revealed that 81% of original groups and 80% of cross-validated groups have been correctly classified (Table T 1.2).

Table T 1.2 : Cautious Buying (Discriminant Analysis)

S. No.	Variables	Standardized Canonical Discriminant Function Coefficients	Unstandardized Canonical Discriminant Function Coefficients	Structure	Matrix
1	X 1	0.416	0.381	X 5	-0.516
2	X 2	-0.028	-0.034	X 8	0.462
3	X 3	-0.080	-0.090	X 6	-0.430
4	X 4	0.358	0.321	X 3	-0.397
5	X 5	-0.307	-0.340	X 1	0.388
6	X 6	-0.402	-0.406	X 7	-0.367
7	X 7	-0.271	-0.285	X 4	0.334
8	X 8	0.550	0.564	X 2	-0.094
	Constant		0.198		

b) Refrigerator

In terms of cautious buying (X1 to X8), the urban consumers did not plan much before buying their refrigerators (X1) whereas; the rural consumers significantly planned before the buying of the same. Both the groups of consumers had significantly considered the importance of the refrigerator to their life (X2) and they had carefully searched the models of their choice (X3). The rural consumers had given greater considerations to the variables X2 and X3 than their urban counterparts. Urban consumers had belief that thinking before buying the refrigerator would not make any difference to their long term expectations of the product (X4), whereas; the rural consumers did not think so.

Table R 1: Cautious Buying (Mean Values)

S. No.	Variables	U	p (1 t) U	R	p (1 t) R	U-R	p (2 t)
X 1	Buying without much planning.	3.26	0.0005	2.35	<0.0001	0.91	<0.0001
X 2	Consideration of its importance of to one's life.	3.91	<0.0001	4.25	<0.0001	-0.34	<0.0001

X 3	Careful search for the model of your choice.	3.63	<0.0001	4.31	<0.0001	-0.69	<0.0001
X 4	Thinking before buying would not make much difference in your long run expectations.	3.29	0.0001	2.57	<0.0001	0.72	<0.0001
X 5	Carefully watching of amount spent.	3.18	0.0121	4.08	<0.0001	-0.90	<0.0001
X 6	Not to buy a new unfamiliar product till others use.	3.17	0.0198	4.00	<0.0001	-0.83	<0.0001
X 7	Not to buy a new unfamiliar, if well known are available.	3.55	<0.0001	4.21	<0.0001	-0.66	<0.0001
X 8	Desire to try a new product on learning of the same.	3.85	<0.0001	3.05	0.2345	0.79	<0.0001

U = Mean Urban, R = Mean Rural, p (1 t) = p value one tailed, and p (2 t) = p value two tailed.

Table R 1.1: Cautious Buying (F ratio)

S. No.	Variables	F ratio		
		R/U (df =1)	IG (df =4)	R/U*IG (df =4)
X 1	Buying without much planning.	43.727*	1.010	0.415
X 2	Consideration of its importance of to one's life.	7.698*	0.077	2.243
X 3	Careful search for the model of your choice.	36.764*	0.695	0.261
X 4	Thinking before buying would not make much difference in your long run expectations.	23.153*	0.994	0.310
X 5	Carefully watching of amount spent.	46.733*	2.641*	1.101
X 6	Not to buy a new unfamiliar product till others use.	50.052*	0.809	2.732*
X 7	Not to buy a new unfamiliar, if well known are available.	38.988*	0.327	0.618
X 8	Desire to try a new product on learning of the same.	40.598*	0.059	0.541

Both urban and rural consumers had tendencies to carefully watch the amount to be spent on the refrigerator (X5), not to buy unfamiliar brand till others use the same (X6) or when well-known brands are available (X7). These tendencies had been found significantly greater among rural consumers than their urban counterparts. Urban consumers had a significant while the rural consumers had a moderate desire to try a new model of refrigerator on learning about it (X8). There had been significant differences between the behaviours of rural and urban consumers groups for all the select variables (Table R 1).

Two-way ANOVA reveals no interaction between income and habitat of consumers for all the select variables except X6, where there had been significant interaction between these factors. No significant differences could be observed among different income groups for all other select variables except X5.

Table R 1.2 : Cautious Buying (Discriminant Analysis)

S. No.	Variables	Standardized Canonical Discriminant Function Coefficients	Unstandardized Canonical Discriminant Function Coefficients	Structure Matrix	
1	X 1	0.434	0.375	X 5	-0.526
2	X 2	-0.139	-0.152	X 8	0.429
3	X 3	-0.085	-0.093	X 6	-0.419
4	X 4	0.350	0.307	X 1	0.415
5	X 5	-0.313	-0.347	X 3	-0.393
6	X 6	-0.360	-0.346	X 7	-0.356
7	X 7	-0.278	-0.286	X 4	0.334
8	X 8	0.531	0.545	X 2	-0.198
	Constant		0.771		

*R/U = Rural-Urban, IG = Income Group, and R/U*IG= Two-way interaction between R/U and IG.*

There had been significant differences between rural and urban consumers for all the select variables with the highest F value for variable X6 followed by X5 (Table R 1.1). The structure matrix of the discriminant analysis had also revealed X5 as the most discriminating variable followed by X8. The classification

results revealed that 83.9% of original groups and 81.8% of cross-validated groups have been correctly classified (Table R 1.2).

c) Automobile

Table A 1: Cautious Buying (Mean Values)

S. No.	Variables	U	p (1 t) U	R	p (1 t) R	U-R	p (2 t)
X 1	Buying without much planning.	3.18	0.0171	2.21	<0.0001	0.96	<0.0001
X 2	Consideration of its importance of to one's life.	4.05	<0.0001	4.29	<0.0001	-0.23	0.0086
X 3	Careful search for the model of your choice.	3.85	<0.0001	4.34	<0.0001	-0.49	<0.0001
X 4	Thinking before buying would not make much difference in your long run expectations.	3.05	0.2737	2.42	<0.0001	0.63	<0.0001
X 5	Carefully watching of amount spent.	3.50	<0.0001	4.17	<0.0001	-0.67	<0.0001
X 6	Not to buy a new unfamiliar product till others use.	2.99	0.4536	3.69	<0.0001	-0.70	<0.0001
X 7	Not to buy a new unfamiliar, if well known are available.	3.39	<0.0001	4.21	<0.0001	-0.83	<0.0001
X 8	Desire to try a new product on learning of the same.	3.89	<0.0001	3.01	0.4203	0.87	<0.0001

U = Mean Urban, R = Mean Rural, p (1 t) = p value one tailed, and p (2 t) = p value two tailed.

In terms of cautious buying (X1 to X8), the urban consumers did not plan much before buying their automobiles (X1) whereas; the rural consumers significantly planned before the buying of the same. Both the groups of consumers had significantly considered the importance of the automobile to their life (X2) and they had carefully searched the models of their choice (X3). The rural consumers had given significantly greater consideration to these aspects as compared to their rural counterparts. Urban consumers moderately whereas; the rural consumers significantly believed that thinking before buying the automobile would make the difference to their long term expectations of the product (X4).

Both urban and rural consumers had tendencies to carefully watch the amount to be spent on the automobile (X5), and not to buy unfamiliar brand when well-known brands are available (X7). The rural consumers had relatively greater tendencies as compared to their urban counterparts. Urban consumers had a significant while the rural consumers had a moderate desire to try a new automobile on learning about it (X8). Similarly the urban consumers had moderate whereas; the rural consumers had significant propensity for not buying an unfamiliar automobile till others use the same (X6). There had been significant differences between the behaviours of rural and urban consumers groups for all the select variables (Table A 1).

Table A 1.1: Cautious Buying (F ratio)

S. No.	Variables	F ratio R/U (df =1)	IG (df =4)	R/U*IG (df =4)
X 1	Buying without much planning.	43.498*	5.377*	0.962
X 2	Consideration of its importance of to one's life.	3.669	0.385	1.165
X 3	Careful search for the model of your choice.	23.314*	0.481	2.123
X 4	Thinking before buying would not make much difference in your long run expectations.	17.378*	0.485	0.163
X 5	Carefully watching of amount spent.	26.927*	2.689*	1.576
X 6	Not to buy a new unfamiliar product till others use.	10.632*	5.395*	4.497*
X 7	Not to buy a new unfamiliar, if well known are available.	57.008*	0.348	2.407*
X 8	Desire to try a new product on learning of the same.	50.438*	0.164	0.439

*R/U = Rural-Urban, IG = Income Group, and R/U*IG= Two-way interaction between R/U and IG.*

Table A 1.2 : Cautious Buying (Discriminant Analysis)

S. No.	Variables	Standardized Canonical Discriminant Function Coefficients	Unstandardized Canonical Discriminant Function Coefficients	Structure Matrix	
1	X 1	0.503	0.437	X 8	0.478
2	X 2	-0.166	-0.187	X 1	0.448
3	X 3	-0.053	-0.059	X 7	-0.437
4	X 4	0.283	0.248	X 5	-0.423
5	X 5	-0.183	-0.214	X 6	-0.329
6	X 6	-0.276	-0.244	X 4	0.298
7	X 7	-0.476	-0.472	X 3	-0.296
8	X 8	0.576	0.590	X 2	-0.139
	Constant		0.565		

Two-way ANOVA reveals no interaction between income and habitat of consumers for all other select variables except variables X6 and X7. No significant difference could be observed between different income groups for all other select variables except variables X1, X5 and X6. There had been significant differences between rural and urban consumers for all other select variables except variable X2 with the highest F value for variable X7 (Table A 1.1).

Both the standardized canonical discriminant function coefficients and the structure matrix of the discriminant analysis had revealed X8 as the most discriminating variable followed by X1. The classification results revealed that 83.2% of original groups and 81.5% of cross-validated groups have correctly classified (Table A 1.2).

VI. Discussion

The urban consumers do not plan much before buying their durables whereas; the rural consumers significantly planned before the buying of the same. In case of automobiles, the differences also persist among different income groups. Both the groups of consumers significantly consider the importance of all the select products to their lives. In case of refrigerators and automobiles, such consideration is relatively greater among rural consumers than their urban counterparts whereas; in case of televisions, this consideration is equal among both the groups. This is probably due to the indispensability of both refrigerator and automobile in the household. Both the groups carefully search for the models of their choice for all the select products. However this tendency is greater among the rural consumers than their urban counterparts. Urban consumers believe that thinking before buying the television or refrigerator would not make any difference to their long term expectations of the product whereas; the rural consumers do not think so for all the three products. This is probably due to income disparities between rural and urban consumers; and the greater tendency of rural consumers to use the items for longer durations. However the urban consumer moderately thinks the same in case of buying an automobile. This is so because of the high value of an automobile. Both urban and rural consumers have greater tendencies to; carefully watch the amount to be spent on these products, or not to buy an unfamiliar brand when well-known brands are available. These tendencies are greater among rural consumers as compared to their urban counterparts. This concludes that rural consumer is more cautious buyer than the urban consumer. In case of an automobile, the differences between rural and urban consumers differ among different income groups. In terms of careful spending of amount, there are differences between income groups of these consumers' categories for all the select products.

The urban consumers have a moderate and the rural consumers have a greater tendency in terms of not buying an unfamiliar brand of automobile till others use the same. These differences differ among different income levels for this consideration in case of an automobile. This is so because among the particular income group, pioneering in buying the new brand of automobile provides greater psychological satisfaction due to greater social visibility. In case of other products such as television and refrigerator, both the groups have greater such tendencies. These tendencies are further greater among rural consumers than their urban counterparts. However the differences between rural and urban consumers in these tendencies also differ among their different income groups for all the select products. Urban consumers have a significant while the rural consumers have a moderate desire to try a new product on learning about it. Considering all the select products, there have been differences between rural and urban consumers for all the select variables. Product based differences also exist for all other variables except; not buying an unfamiliar brand in case of availability of well known brands and desire to try a new product on learning about it. *Overall there are significant differences between rural and urban consumers for all the select products.*

VII. Managerial Implications

The rural consumers plan their buying to greater extent as compared to urban counterparts. They

carefully search for the models of their choice and at the same time they remain careful in terms of amount being spent on an item. Therefore, marketing offerings should be designed very cautiously keeping in view their explicit as well as latent needs within their budget constraints.

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Factors Affecting Students' Academic Performance

By Irfan Mushtaq & Shabana Nawaz Khan
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Abstract - Many practical studies are carried out to investigate factors affecting college students' performance. The focus of this research is that student performance in intermediate examination is linked with students' outline consisted of his approach towards communication, learning facilities, proper guidance and family stress. The research is based on student profile developed on the bases of information and data collected through assessment from students of a group of private colleges.

Keywords : *Students performance, communication, learning facilities, proper guidance and family stress.*

GJMBR-A Classification : *FOR Code: 140204 JEL Code: I21, I25.*

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Irfan Mushtaq[α] & Shabana Nawaz Khan[σ]

Abstract - Many practical studies are carried out to investigate factors affecting college students' performance. The focus of this research is that student performance in intermediate examination is linked with students' outline consisted of his approach towards communication, learning facilities, proper guidance and family stress. The research is based on student profile developed on the bases of information and data collected through assessment from students of a group of private colleges.

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I. Introduction

School, colleges and universities have no worth without student. Students are most essential asset for any educational institute. The social and economic development of the country is directly linked with student academic performance. The students' performance (academic achievement) plays an important role in producing the best quality graduates who will become great leader and manpower for the country thus responsible for the country's economic and social development (Ali et.al, 2009). Student academic performance measurement has received considerable attention in previous research, it is challenging aspects of academic literature, and science student performance are affected due to social, psychological, economic, environmental and personal factors. These factors strongly influence on the student performance, but these factors vary from person to person and country to country.

From the last few years in Pakistan literacy rate and education improved and most of the instituted in Pakistan improving the educational level and produce well educated, competitive and skilled person, those meet dynamic growing market requirement. That's a reason the researcher find out such factors that effecting student performance, especially in rural areas where student face lot of problem.

Previously mostly study of student academic performance conducting on such issues like gender difference, teacher's education and teaching style, class environment, socio economic factor and family education background. The finding of this study varies from region to region and their results differ in cities and rural areas.

This research is focuses on the private colleges in Pakistan. Students of private colleges of Rawalpindi and Islamabad are taken as population and focuses on the result of the student performance and their achievements in the academic year.

We measure the student academic performance through several ways like CGPA, GPA and their test result. Most of the researcher around the word used the GPA to measure the student performance (Galiher, 2006; Darling, 2005; Broh, 2000; Stephen & Schaban, 2002). They used GPA to measure student performance in particular semester. Some other researcher, they measure student performance through the result of particular subject or the previous year result (Hijazi & Naqvi, 2006; Hake, 1988; & tho.1994).

II. Significance

Previous studies focuses on different factors such class schedules, class size, English text books, homework, environment of the class, technology used in the class and exams systems, extracurricular activities, family and work activities, financial, and etc. The study may helpful for both college's policy makers and parents of the students. It helps the college administration to design and implement the policies to improve the students' performance and the quality of education by changing the attitude of students towards learning, facilitating students and improving the teaching procedures. Parents can use the outcomes of the study to solve the students' problems especially financial problems and to look after them. It may also create awareness among students about their rights and responsibilities to achieve quality education.

III. Research Question

What are the important factors that affect students' academic performance?

IV. Research Objectives

The objective of this research paper is to explore the important factors that affect the academic performance of the students.

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V. Contribution

Previously a lot of research has been done on this topic. Different researchers researched on various variables and a lot of different variables were studied. This research is different in a way that it is the first research in which a variable "proper guidance" is studied, moreover in Pakistan only one research was carried out on this topic and it was conducted by Abid Hussain in 2006 and that too was based on the findings of school's whereas this research is conducted on colleges.

Our contribution to this study is that we explore the four factors that affect students' academic performance. These factors are students' communication skills, learning facilities, proper guidance and family stress. In Pakistan scenario, many researchers have done a lot of work on communication, learning facilities and family stress.

This research will be helpful for the parents as well as the teachers of the students to guide them properly and as per their abilities.

VI. Literature Review

a) *Student Performance*

Galiher (2006) and Darling (2005), used GPA to measure student performance because they main focus in on the student performance for the particular semester. Some other researchers used test results or previous year result since they are studying performance for the specific subject or year (Hijazi and Naqvi, 2006 and Hake, 1998).

b) *Communication*

Many researchers has been discussed the different factors that affects the student academic performance in their research. There are two types of factors that affect the students' academic performance. These are internal and external classroom factors and these factors strongly affect the students' performance. Internal classroom factors includes students competence in English, class schedules, class size, English text books, class test results, learning facilities, homework, environment of the class, complexity of the course material, teachers role in the class, technology used in the class and exams systems. External classroom factors include extracurricular activities, family problems, work and financial, social and other problems. Research studies shows that students' performance depends on many factors such as learning facilities, gender and age differences, etc. that can affect student performance (Hansen, Joe B., 2000). Harb and El-Shaarawi (2006) found that the most important factor with positive effect on students' performance is student's competence in English. If the students have strong communication skills and have strong grip on English, it increases the performance of the students. The performance of the student is affected by communication skills; it is possible to see communication as a variable which may be positively related to performance of the student in open learning. A major distinction of this study from previous studies is that it focuses on open learning (Abdullah AL-Mutairi, 2011).

H1: There is a positive relationship between communication and student performance.

c) *Learning Facilities*

Karemera (2003) found that students' performance is significantly correlated with satisfaction with academic environment and the facilities of library, computer lab and etc. in the institution. With regard to background variables, he found a positive effect of high school performance and school achievement he found no statistical evidence of significant association between family income level and academic performance of the student.

Robert & Sampson (2011), found that the member of educational board will be educated and their impact on school is positive, for professional development it is essential for student learning.

The students who are actively engage in the learning process are observed to have a positive correlation with the CGP. A Study effort from student and the proper use of the facilities provided by the institution to the student, a good match between students' learning style and are positively affect the student's performance (Norhidayah Ali, et. al., 2009)

Young (1999), held the view that student performances are linked with use of library and level of their parental education. The use of the library positively affected the student performance.

The academic environment is the effective-variable for students and has positive relationship with fathers' education and grade level (Kirmani & Siddiquah, 2008).

H2: There is a positive relationship between learning facilities and student performance.

d) *Proper Guidance*

Noble (2006), students' academic accomplishments and activities, perceptions of their coping strategies and positive attributions, and background characteristics (i.e., family income, parents' level of education, guidance from parents and number of negative situations in the home) were indirectly related to their composite scores, through academic achievement in high school.

The students face a lot of problems in developing positive study attitudes and study habits. Guidance is of the factor through which a student can improve his study attitudes and study habits and is directly proportional to academic achievement. The students who are properly guided by their parents have performed well in the exams. The guidance from the

teacher also affects the student performance. The guidance from the parents and the teachers indirectly affect the performance of the students (Hussain, 2006).

H3: There is a positive relationship between proper guidance and student performance.

e) Family Stress

Socio-economic factors like attendance in the class, family income, and mother's and father's education, teacher-student ratio, presence of trained teacher in school, sex of student and distance of school are also affected the performance of the students. (Raychauduri et al., 2010)

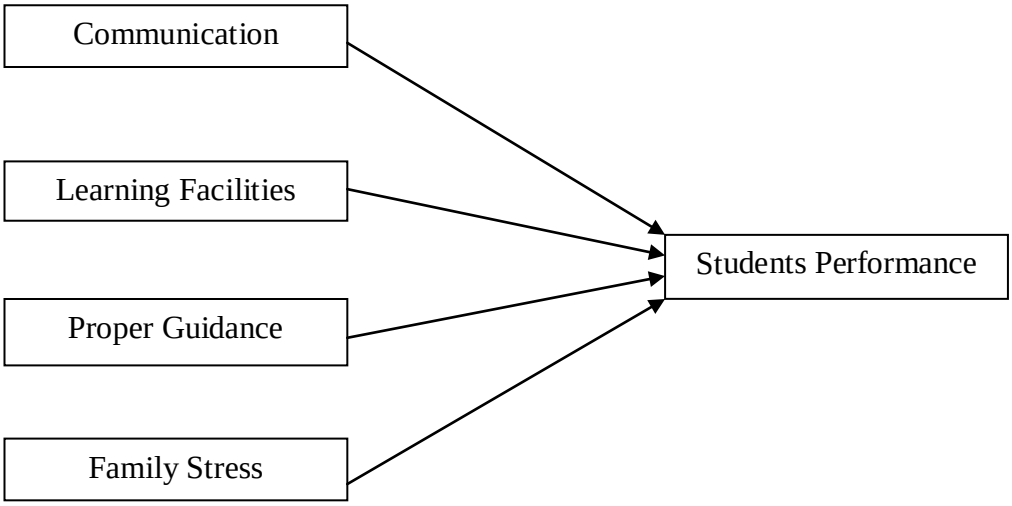
Kernan, Bogart & Wheat (2011), academic success of graduate student will be enhanced if the optimal health related barriers are low. There is negative relationship between college credit and stress but weak relationship between GPA (Grade Point Average) and stress. (Zajacova, Lynch and Espenshade, 2005)

Amitava Raychaudhuri, et. al., (July 2010), found that numerous studies have been done to identify those factors which are affecting student's academic performance. The students' academic performance depends on a number of socio-economic factors like students' attendance in the class, family income, mother's and father's education, teacher-student ratio, presence of trained teacher in school, sex of the student, and distance of schools.

Hijaz and Naqvi (2006) observed that there is a negative relationship between the family income and students' performance and they focus on the private colleges in Pakistan.

H4: There is a negative relationship between family stress and student performance.

VII. Theoretical Framework



VIII. Methodology

This section discusses the sample selection procedure, variables selection, the model used for the research and the statistical techniques.

a) Measures

The extent of existence for all variables in the research area was measured on a five-point likert scale ranging from, strongly disagree to Strongly Agree.

Ranging from 1 to 5 Strongly Disagree (1), Disagree (2), Neutral (3), Agree (4), Strongly Agree (5).

b) Data Set

The source of data for this study is primary data acquired through questionnaire. 175 questionnaires were distributed.

c) Statistical Tools

Mean, Standard deviation, correlation and regression analysis are used through appropriate statistical package.

IX. Results and Conclusion

Findings of the study are discussed as under.

a) Data Analysis and Discussion

In order to meet the purpose of the study, this section has five parts for analyzing the data collected for the study. The

Five parts are: (a) data sample information, (b) descriptive analysis, (c) correlation analysis, (d) regression analysis and (e) Hypothesis testing.

b) Reliability of the Scale

Reliability of total Items is 0.710 in Table 1 which shows its significance.

c) Reliability of Total Items

Table 1 : Reliability Statistics

Cronbach's Alpha	N of Items
.710	20

Reliability of Individual Items is shown in Table 2.

d) Reliability of Individual Items

Table 2

Variables	Cronbach's Alpha	No.of Items
Student Performance	.716	2
Communication	.497	5
Learning Facilities	.735	4
Proper Guidance	.806	3
Family Stress	.258	6

Descriptive Analysis

Descriptive statistics represents the calculated means and standard deviations for the dependent variables, communication, learning facilities, proper guidance and family stress and independent variable, student performance.

Study shows that mean of student performance is 3.7903 and standard deviation is .98672.

Mean of communication, learning facilities, proper guidance and family stress are 4.1626, 4.2597, 4.1462 and 4.28172 respectively, which shows that respondent are agree that these variables effect student performance and standard deviation for these independent variables are 0.50390, 0.67713, 0.89659 and 0.396398 respectively., which is shown in Table 3:

Table 3 : Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Student Performance	155	1.00	5.00	3.7903	.98672
Communication	155	1.20	5.00	4.1626	.50390
Learning Facilities	155	1.25	5.00	4.2597	.67713
Proper Guidance	155	1.00	5.00	4.1462	.89659
Family Stress	155	3.167	5.000	4.28172	.396398
Valid N (listwise)	155				

Demographic Analysis: Demographic results were obtained. The total sample size was 155.

Gender	No	%age
Male	97	62.6%
Female	58	37.4%

Correlation Analysis

There is a degree of association between communication and student performance i.e. 13 percent and also shows negative value and probability of error is also low.

There is degree of association between learning facilities; proper guidance and family stress with student performance are 13 percent, 20 percent and 2 percent respectively as shown in Table 6.

Table 6 : Correlations

		Student Performance	Communication	Learning Facilities	Proper Guidance	Family Stress
Student Performance	Pearson Correlation	1	.132**	.137*	.200*	-.020
	Sig. (2-tailed)		.002	.040	.013	.809
	N	155	155	155	155	155
Communication	Pearson Correlation	.132**	1	.157	.176*	.139
	Sig. (2-tailed)	.002		.051	.028	.085
	N	155	155	155	155	155
Learning Facilities	Pearson Correlation	.137*	.157	1	.571**	.245**
	Sig. (2-tailed)	.040	.051		.000	.002
	N	155	155	155	155	155
Proper Guidance	Pearson Correlation	.200*	.176*	.571**	1	.055
	Sig. (2-tailed)	.013	.028	.000		.498
	N	155	155	155	155	155
Family Stress	Pearson Correlation	-.020	.139	.245**	.055	1
	Sig. (2-tailed)	.809	.085	.002	.498	
	N	155	155	155	155	155

**. Correlation is significant at the 0.05 level (2-tailed).*

***. Correlation is significant at the 0.01 level (2-tailed).*

e) Regression Analysis

It includes Model Summary and ANOVA and Coefficient.

f) Model Summary

Model summary is shown in Table. Value of R-Square is .0553 shows that 55% variation in student performance due to the independent variables communication, learning facilities, proper guidance and family stress.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.229[a]	.553	.427	0.0021

a. Predictors: (Constant), Family Stress, Proper Guidance, Communication, Learning Facilities

Table 7 : ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	7.889	4	1.972	20.083	.026[a]
	Residual	142.046	150	.947		
	Total	149.935	154			

a. Predictors: (Constant), Family Stress, Proper Guidance, Communication, Learning Facilities
b. Dependent Variable: Student Performance

F-statistics were carried out to find the overall strength of the model. The value of F-Statistic 20.083 shows that the model is highly significant shown in Table 8.

Table 8

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.514	1.038		2.423	.017
	Communication	.204	.160	.104	1.279	.003
	Learning Facilities	.160	.146	.041	.413	.020
	Proper Guidance	.177	.108	.161	1.642	.103
	Family Stress	-.132	.207	-.053	-.638	.524

a. Dependent Variabl e: Student Performance

g) Coefficient & Hypothesis Testing

On the basis of Beta coefficients the model shows that communication causes 20% positive variation in student performance and t -value is also significant. . So we accept H1 which states that "there is positive relationship between communication and student performance.

Learning facilities causes' 16% variation in student performance but the direction is positive direction. Here t-value is also significant. So we accept H2 which states that that "there is positive relationship between learning facilities and student performance

Proper guidance causes 17% variation in student performance in positive direction and t – value is also significant. So we accept H3 which states that that "there is positive relationship between proper guidance and student performance

Family stress causes 13% variation in student performance but in opposite direction or negative direction and t – value is insignificant. So we reject H4 which states that "there is negative relationship between family stress and student performance.

X. Discussion

This study was conducted to explore the important factors that affect the students' academic performance. Research was conducted on private colleges in Rawalpindi and Islamabad. Four hypothesis used in the study to check the effect of independent variables on dependent variables. By using the appropriate statistical package it is found that communication, learning facilities, proper guidance and family stress are the factors that affect the student performance. Our three hypotheses are accepted and one hypothesis is rejected. Communication, learning facilities and proper guidance shows the positive impact on the student performance and the family stress shows the negative impact on the student performance but the significant level is high. So, it is indicated that the communication is more important factor that affect the student performance and the learning facilities and proper guidance are also affect the student performance. Family stress also affects the student performance and reduces the performance of the student and affects negatively the student performance.

a) Limitations

- There are certain limitations of this study. Firstly, the sample size taken in this study was very small that is only 155. If this study is being carried out again with large sample size the result might be improved than existing study.

- Second limitation of the study was that study conducted on only thein the 2 cities of Pakistan i.e., Rawalpindi and Islamabad.
- Including more others relative factors that affect the student performance can improve the results.

b) Suggestions and Recommendations

- The student performance should be improve if the administration of the college provides proper leaning facilities to the students and also improve the environment of the college.
- The student performance should be improve if the students have good and effective communication skills and have good competence in English. For this the administration should take steps to arrange the class for the English language.
- The student should perform well if they are properly guided by the parents and also by their teacher. If the student should know well about their abilities and their competences then he performs well.

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Relationship between B2B E-Commerce Benefits, E-Marketplace Usage and Supply Chain Management

By Laith Alrubaiee, Hameed Alshaibi & Yasir Al-bayati

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Abstract - The Internet technology has enabled companies to create a new market space that facilitates electronic interactions among multiple buyers and sellers. It is believed that the perceived benefits of e-commerce have a great impact on e-marketplaces usage. However, research shows that supply chain management (SCM) influenced by ecommerce. The purpose of this study is to investigate the relationship between B2B e-commerce benefits, supply chain management and e-marketplace usage. The proposed model was tested on managers of companies in different Industries in Amman – Jordan. Structural equation modeling technique was employed using AMOS 7.0 to verify the reliability and validity of the multi-item scales and to test the hypothesized relationships.

Keywords : *E- commerce; E-marketplace; Supply chain management (SCM).*

GJMBR-A Classification : *FOR Code:150505, 150309 JEL Code: M15, L84, L81, L84, L86*

Strictly as per the compliance and regulations of:

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Laith Alrubaiee[α], Hameed Alshaibi[σ] & Yasir Al-bayati[ρ]

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Keywords : E- commerce; E-marketplace; Supply chain management (SCM).

I. Introduction

In recent years, the exponential growth in information and communication technologies and the resulting rapid emergence of electronic commerce have drastically been reshaping the business world. It was pointed out that e-commerce now has reached a phase of change where a revolutionary ideas becomes more evolutionary in nature (Kaynak et al., 2005). E-commerce has fundamentally changed sales and marketing strategies, the economy and the way business is conducted as well. It has forced companies to find new ways to expand the markets in which they compete, to attract and retain customers by tailoring products and services to their needs, and to restructure their business processes to deliver products and services more efficiently and effectively. E-commerce researchers reported tremendous growth in e-commerce all over the globe, according to International Data Corporation (IDC) (2010), By 2013, worldwide e-commerce transactions will be worth more than $16 trillion(Alam et al,2011). B2B e-commerce covers a broad range of applications that allows companies to form electronic relationships with their distributors, resellers, suppliers, and other partners. Today, the Internet technology allows B2B e-commerce users to link their companies to the digital markets with other companies easily and inexpensively (Chen, 2010). Today, studying the value and impact of B2B e-commerce is of great interest to both academic researchers and IS practitioners. The current vision for e-commerce is that it is a universal and ubiquitous electronic marketplace relevant to all commercial activities and trading partners. As such, e-commerce has been defined as the process of buying and selling or exchanging products, services, and information through computer networks, such as the Internet (Turban, McLean, and Wetherbe 2002). However, e-commerce is more than simply buying and selling goods electronically (Gregory et al., 2007). McIvor and Humphreys (2004) indicated that effective use of B2B e-commerce has the potential to improve the management of materials for both the buyer and the supplier by reducing inventory, delivery-lot size, purchase orders, and invoices. The Internet technology has enabled companies to create a new market space that facilitates electronic interactions among multiple buyers and sellers. However, e-marketplaces proposed to increase the efficiency and effectiveness of procurement activities by replacing traditional manual processes with automated electronic procedures and by expanding the number of available trading partners (Koch 2003; Chong et al., 2010). Therefore, several empirical studies have examined the role of the Internet in supply chains (e.g., Lancioni, Smith, and Oliva 2000). On the other hand, the perceived contributions of e-marketplace to supply chain management are also examined by Eng (2004). It is suggested that buyers

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may expect two different types of benefits when using e-marketplaces: market efficiency and supply chain efficiency (Le, 2002).According to Rao et al. (2006), participants can gain benefits from e-marketplaces through search cost efficiency and market liquidity. However, collaboration enables market participants to build and deepen their business relationships for the purposes of improving individual business processes and overall supply chain performance. E-commerce technically made the supply chain management viable and facilitated SCM use in different industries (Shen et al., 2004). Nevertheless, despite the growth in application of e-marketplaces, there is still a need for closer examination the role of these markets in supply chain management. Therefore, the lack of studies in this area has prompted the authors to look closely at the perceived benefits of B2B e-commerce as major determinant and antecedents of e-marketplace usage and supply chain management. Accordingly, this study essentially aims at investigating the relationship between B2B e-commerce benefits, e-marketplace usage and supply chain management in the context of Jordanian companies. More specifically, study aims to empirically investigate the mediating effect of e-marketplace usage in B2B e-commerce benefits - supply chain management relationship. However, this study certainly strengthens the existing body of knowledge about the perceived contributions of e-marketplace to supply chain management by providing some empirically tested insight in the context of Jordanian companies.

II. Literature Review

a) *E-commerce*

Basically, e-commerce is commerce enabled by Internet technologies, including pre-sale and post-sale activities (Whiteley, 2000; Chaffey, 2004). Many businesses around the world have introduced an electronic commerce channel as part of their operations, seeking the many advantages that the online marketplace can provide (Laudon and Traver, 2007). Since the late 1990s, e-commerce's rapid growth is obvious in the developed world. (AlGhamdi et al.,2011).Today, e-commerce has been widely used and many businesses have moved from the offline to the online world in order to serve the global Internet population (Rachjaibun, 2007).Therefore, many large companies continue to set up e-commerce extensively in their enterprise value chains and develop Internet-enabled initiatives to manage inventory using electronic links to suppliers, to strengthen online integration with distributors and business partners, to design and customize products and services, and to attempt to serve customers more effectively (Zhu & Kraemer, 2002). Basically, e-commerce defined as an Internet technology that provides the capability to buy and sell online including market creation, ordering, supply chain management, and transfers through opening protocol (Hoffman & Novak, 2000). While Turban et al., (2010) defined e-commerce as the process of buying, selling, or exchanging products, services, or information via computer. Grandon and Pearson (2004) considered three major variables as sources of strategic value of e-commerce: ‘‘operational support" which measures how e-commerce can reduce costs, improve customer services and distribution channels, provide effective support role to operations, support linkages with suppliers, and increase ability to compete. "Managerial productivity" suggests how e-commerce can enhance access to information, provides a means to use generic methods in decision-making, improves communication in the organization, and improves productivity of managers. Finally, "strategic decision aids" defines how e-commerce can support strategic decisions of managers, support cooperative partnerships in the industry, and provide information for strategic decisions (Grandon & Pearson, 2004, p 197). Standing (2001) affirmed that more than ten e-commerce benefits for both buyer and seller. Such as cost savings and speed in selling and purchasing, exposure to new customers (global reach), convenience and transparency to users, better quality of product/service (global reach), reduce need for office space and fewer resources required.

b) *E-marketplace*

Unlike the traditional market in which the meeting place is a physical location, an electronic marketplace refers to a virtual space on an electronic network (Malone, Yates, & Benjamin, 1987). E-marketplaces provide an electronic method to facilitate transactions between buyers and sellers that potentially provide support for all of the steps in the entire order fulfillment process(Rao et al.,2007). The unique feature of an e-marketplace is that it brings multiple buyers and sellers together (in a ‘‘virtual’’sense) in one central market space(Grieger,2003). Basically, the e-marketplace provides a mechanism for companies to control, coordinate, and economies on transaction costs, as it improves information flows and helps reduce uncertainty (Eng,2004).However,

e-marketplace is an innovative business-to-business (B2B) transaction model that covers many functions – including auctions, procurement, catalogue sales, and clearance of excess stock (Fu et al., 2006). Nevertheless, all transactions are done in a specific virtual place called electronic marketplaces. These marketplaces bring together businesses buying and selling goods and services in an online buying community. E-marketplaces proposed to increase the efficiency and effectiveness of procurement activities by replacing traditional manual processes with automated electronic procedures and by expanding the number of available trading partners (Koch 2003; Chong, et al., 2010). Dou & Chou (2002) defined e-marketplace as an

online business transaction platform for buyers and sellers. According to Kaplan and Sawhney (2000) e-marketplace ''is a meeting-point where suppliers and buyers can interact online''. Turban et al.,(2010) outlined three main functions for e-marketplaces: (1) Matching buyers and sellers, (2) Facilitating the exchange of information, goods, services, and payments associated with market transactions, and (3) Providing an institutional infrastructure, such as legal and regulatory framework, that enables the efficient functioning of the market. An e-marketplace effectively brings players together in a real-time market space to perform basic exchange transactions, such as price and production specifications, and strategic supply chain collaboration, such as forecasting demand and new product development. The primary objectives are to streamline complex business processes and gain efficiencies (Eng 2004). However, Rao et al.(2007) suggest that buyers may expect two different types of benefits when using e-marketplaces: "market aggregation" and "inter-firm collaboration". Market aggregation refers to usefulness of e-marketplaces in overcoming market fragmentation, affording buyer with more choices, information about product availability, price transparency, and lower transaction costs. Inter-firm collaboration refers to usefulness of e-marketplaces that enables market participants to build and deepen their business relationships for the purposes of improving individual business processes and overall supply chain performance. Therefore, e-marketplaces have been suggested as one of the most central developments in recent years. Interestingly, based on the results of literature review, Grieger (2003), described seven different e-marketplace categories: (1)Buyer-oriented, seller-oriented or neutral; (2)iVertical or horizontal; (3) Fix or variable pricing mechanism; (4) Manufacturing or operating inputs; spot or system sourcing; (5) Open or closed; (6) Supported transactions phases; (7) Aggregation or matching mechanism.

c) Supply chain management (SCM)

In today's customer-focused marketplace, supply chain management has become a key to competitive advantage (Grieger,2003). Supply chain management defined as the set of entities, including suppliers, logistics services providers, manufacturers, distributors and resellers, through which materials, products and information flow (Kopczak ,1997). While, Christopher (1992) defined supply chain management as network of organizations that are involved, through upstream and downstream linkages, in the deferent processes and activities that produce value in the form of products and services in the hands of the ultimate consumer. However, Turban et al., (2010) defined SCM as a complex process that requires the coordination of many activities so that the shipment of goods and services from supplier right through to costumer is done efficiently and effectively. Whereas Chaffey (2009) defined supply chain management as the coordination of all supply activities of an organization from its suppliers and partners to its customers. He also classified supply chain management to upstream supply chain: transactions between an organization and its suppliers and intermediaries, equivalent to buy-side e-commerce, and downstream supply chain: transactions between an organization and its costumers and intermediaries, equivalent to sell-side e-commerce. The lack of a universal definition of supply chain management is in part due to the way the concept of supply chain has been developed. In fact the concept of supply chain has been considered from deferent points of view in deferent bodies of literature (Croom et al..2000). However ,the benefit of supply chain management can be attained through the electronic linkage among various supply chain activities utilizing information technologies and the construction of integrated supply chain information systems (Bowersox & Daugherty, 1995). Christopher (1998) also notes that the goal of supply chain management is to link the marketplace, the distribution network, the manufacturing process, and the procurement activity in such a way that customers are serviced at higher levels and yet at a lower total cost(Eng 2004). Nevertheless, supply chain management was originally developed as a way to reduce costs. It focused on very specific elements in the supply chain and tried to identify opportunities for process efficiency. Today, supply chain management is used to add value in the form of benefits to the ultimate consumer at the end of the supply chain. This required more view of the entire supply chain than had been common in the early days of supply chain management (Schneider, 2006). However, B2B supply chain collaboration involves a group of manufacturers, retailers, and suppliers using the internet to exchange business information and work jointly at forecasting demand for their products, developing production schedules, and controlling inventory flow. The main challenge is to establishing trust among partners to share sensitive business information and upgrading business applications that will advance collaboration. The ultimate goal of supply chain management is to achieve a higher-quality or lower-cost products at the end of the chain (Awad, 2004; Schneider, 2006).Internet capabilities have a profound impact on organization's supply chains. Increasingly, companies are recognizing that the efficient flow of information and material along their supply chain is a source of competitive advantage and differentiation. Electronic supply chain management (E-SCM) is the collaborative use of technology to enhance B2B processes and improve speed, agility, real time control, and costumer satisfaction. It involves the use of information technologies to improve the operations of supply chain activities, as well as the management of supply chains .E-SCM is not about

technology change alone; it involves changes in management policies, organizational culture, performance metrics, business processes, and organizational structure across the supply chains (Turban et al, 2010). Organization can gain different benefits from supply chain management such as; higher sales, reduce order-to-delivery time, reduce costs of manufacturing, manage inventory more efficiently, improve demand forecasting, reduce time to introduce new products, improve aftermarket/post-sales operational, share information about costumer demand fluctuations, receive rapid notification of product design changes and adjustments, provide specifications and drawings more efficiently, increase the speed of processing transactions, reduce the cost of handling transactions and reduce errors in entering transaction data (Awad, 2004; Schneider, 2006; Chaffey; 2009).

d) Relationship among study variables

Delfmann et al., (2002) proposed that the logistical implications of e-commerce can be differentiated into two main categories: the rise of e-marketplaces; and the elimination of supply chain elements (disintermediation). By analyzing these two categories and their major logistical implications in detail the researchers deduct strategic consequences for logistics service providers. Rudberg et al., (2002) defined three collaborative supply chain planning scenarios. It is shown how collaborative supply chain planning typically could be implemented on an electronic marketplace by the means of a Web-based demonstration. As such, the study indicated how electronic marketplaces can be used to enable supply chain integration. Grieger (2003) exposes the importance of supply chain management within e-marketplaces. Also the relevancy of supply chain management for an e-marketplace is analyzed by examining the type of relationship within different e-marketplace categories. Larsen, Kotzab and Grieger (2003) discussed the interrelation between Internet-driven e-marketplaces and supply chain management from a procurement portfolio perspective. Study proposed that different types of buyer–supplier relationships require different types of Internet-driven e-marketplaces. Eng (2004) posited that e-marketplaces that use Internet protocols as communication standards have gained widespread application in supply chain management . He indicated that full participation in e-marketplaces requires companies to integrate their internal and external supply chain activities and share strategic information. The perceived contributions of e-marketplace to SCM are examined by Eng,(2004) in three dimensions: unit cost reduction, increased efficiency, and streamlined operations. Shen et al., (2004) revealed that e-commerce and supply chain management are complementary in nature and need to be studied together. Their study confirmed that one of the factors in supply chain structure, supply chain management integration level , was significantly related to e- commerce adoption level. Murtaza, et al., (2004) discussed the opportunities and challenges facing e-marketplaces today, and also the concerns facing potential participants in these e-marketplaces who are trying to weigh the risks presented by such participation and the possible benefits that can be reaped by streamlining supply chain processes. (Greyet al.(2005) explored the difficulties faced by e-marketplaces and discuss potential sources of value that will encourage their adoption by preserving and complementing long-term B2B relationships. The study focus on the role of e-marketplaces in B2B transactions, where long-term relationships between buyers and sellers are important, as is the case in many supply chains. The main objective of Rao, et al., (2007) study was to investigate how buyers' usage of e- marketplaces was influenced by their perceived risks and expected benefits associated with such markets. Results indicated that buyers' perceived risks and expected benefits had an influence on their usage extent of e-marketplaces. In addition, buyers' e-business readiness moderated the relationship between expected benefits and usage of e-marketplaces. By surveying websites, Wang & Archer, (2007) identified five types of horizontal collaboration (buying groups) and four kinds of vertical supply chain collaboration in e-marketplaces. The findings suggest that supply chain collaboration tends to be supported more than buying groups by existing e-marketplaces, and a high percentage of e-marketplaces now offers supply chain coordination and integration. Among online buying groups, the exchange-catalogue model is the most popular, possibly since it puts fewer burdens on members and coordinators. Liu, et al., (2010) study investigates how institutional pressures motivate the firm to adopt Internet-enabled Supply Chain Management systems (eSCM) and how such effects are moderated by organizational culture. The results suggest that the dimensions of institutional pressures (i.e., normative, mimetic, and coercive pressures) have differential effects on eSCM adoption intention. While mimetic pressures are not related to eSCM adoption intention, normative and coercive pressures are positively associated with eSCM adoption intention.

III. Conceptual Framework and Hypotheses Development

a) Conceptual framework

It is now possible to develop an overall model summarizing the hypotheses and reflects a causal ordering derived from the literature reviewed above. The proposed structural model guiding this research is depicted in Figure 1. It builds on core linkages between study variables: B2B e-commerce benefits, e-marketplace usage and supply chain management. As

can be seen in the figure, the e-marketplace usage as mediator in B2B e-commerce benefits- supply chain management relationship.

The research hypotheses are represented in the Figure 1. An E-commerce benefit is believed to have a positive relationship with e-marketplace usage and supply chain management (H1and H2). It is suggested also that e-marketplace usage have a positive influence on supply chain management (H3). Finally, as for indirect effects, e-marketplace usage are proposed as the key mediators that connect or bridge e-commerce benefits with supply chain management (H4).

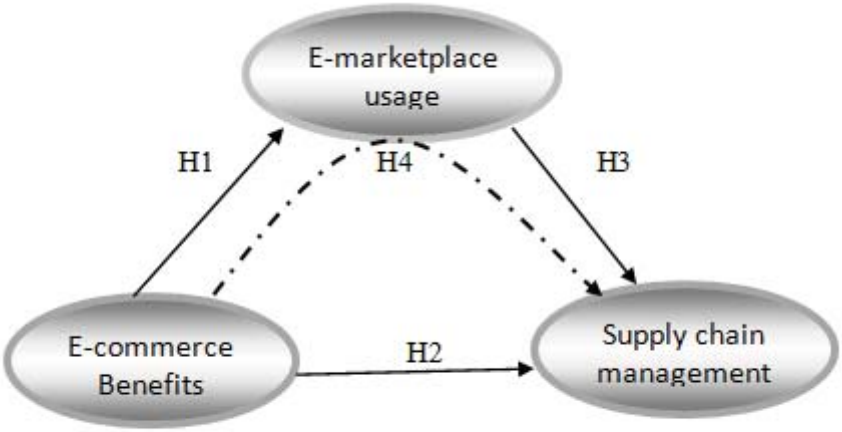

Figure 1. The conceptual model

b) Research hypotheses

The hypothesized relationships of the proposed structural model guiding this research are illustrated in Figure 1. Therefore, to examine these relationships the following hypotheses are formulated:

H1: E-commerce benefits have a positive effect on e-marketplaces usage.

H2: E-commerce benefits have a positive effect on supply chain management.

H3: E-marketplaces usage has a positive effect on supply chain management.

H4: E-marketplaces usage mediates the effect of e-commerce benefits on supply chain management.

IV. Research Methodology

This study is exploratory, quantitative in nature, aiming to develop a better understanding of the relationships among the B2B e-commerce benefits, e-marketplaces usage and supply chain management. More specifically, the study intends to empirically investigate the direct and indirect effect of B2B e-commerce benefits on supply chain management through e-marketplaces usage as mediator.

a) Selection of sample and respondents demographics

The proposed research model is tested in the context of Jordanian companies in different industries. Accordingly, the study is empirical based on the primary data collected from a sample of companies operating in different industries involved in e- commerce carried out in 2011 in Amman – Jordan (Albayati,2011). To collect information of the study variables from respondents with corresponding positions in the organization (the most knowledgeable informant) to reduce systematic measurement error, information on e-commerce, e-market places and supply chain management can be obtained from executive manager, senior purchasing managers, senior marketing managers, because they should be the most knowledgeable involved about e-commerce activities of their firms. A list of (66) organizations involved in e- commerce in Amman – Jordan was compiled from the Chamber of Commerce and Industry in Amman. Only (47) Organizations across different industries were initially responded In total (130) self administered questionnaires were distributed to the managers in the responded organization. The number of satisfactory completed questionnaires returned was only (82), giving a response rate of 63%. Since the questionnaire was administered in Arabic, the questionnaire was drafted in English and translated into Arabic thereafter. The respondents and the sample firms were described in term of the following: most of respondents were males (74.4 percent), majority (67 percent) of the respondents held the senior purchasing managers. 47 percent of the respondents reported great extent of use e-marketplaces to purchase needed products. Finally (43 percent) of the respondents deal with more than ten e-marketplaces. Based on the completed surveys, statistical analysis was carried out and the results are presented in the next section.

b) Data analysis

The statistical package SPSS (version 19.0) was used for data analysis. A two-step detailed statistical analysis of data was involved. First, factor analysis was

performed to extract the underlying factor of study variables. Second; a structural equation modeling was conducted using AMOS 7 to test the hypotheses in order to understand the direct and indirect effect of B2B e-commerce benefits on e-marketplace usage and supply chain management.

c) Measures and scales

The research instrument was developed using measures from the extant literature. However, these multi items scales have previously demonstrated validity and reliability in other studies. B2B e-commerce benefits was measured using the 8-item scale proposed by Lin et al.,(2007) and adopted by Chen (2010). E-marketplace usage was assessed with 15 items derived from Naidoo (2007), and Rao et al., (2007). In addition, supply chain management was assessed with 21 items developed by Eng (2004) and adopted by Rao et al.,(2007) . for all the scales,. respondents were asked to indicate their agreement or disagreement with several statements using a five-point Likert-type scale ranging from (1) strongly disagree to (5) strongly agree.

d) Measures assessment: reliability and validity

Examination of instrumental validity of the scale employed for this study was carried out in two forms, testing content validity and construct validity. As a result of discussions with academic scholars and reviews of existing studies, the scales used in the current study were concluded to have adequate content validity. Following Anderson and Gerbing's (1988), the measures were purified by assessing their reliability, validity, and unidimensionality. Reliability initially was evaluated using Cronbach's alpha. Therefore, the data analysis was conducted in three steps. First, an exploratory factor analysis (EFA) with Varimax rotation was performed to determine the underlying dimensions of the three constructs. However, exploratory factor analysis was employed to assess the scale items individually for each construct (checked for poor factor loadings, and high cross-loadings). Gerbing and Hamilton (1996) suggest that principle components analysis performs as well as other methods in detecting underlying models. Second step involved testing of the measurement model for the constructs using confirmatory factor analysis (CFA) in order to determine if the extracted dimensions in step 1 offered a good fit to the data. Finally, we examine the interrelationships among e-commerce benefits, e-marketplace usage and supply chain management. Composite reliability assesses the internal consistency, which is estimated using Cronbach'salpha. Typically, reliability coefficients of 0.7 are considered adequate (Cronbach 1971; Nunnally, 1978; Hair et al., 1998). As can be seen from Table 1, all the three scales e-commerce benefits, e-marketplace usage and supply chain management achieved an alpha above 0.7. : E-commerce benefits 0.972, e-marketplace usage 0.945 and supply chain management 0.983. These results suggest that the theoretical constructs exhibit high Composite reliability.

Table 1 : Cronbach's Alpha Coefficient of study variables

No.	Dimension	Items Number	Coefficient
1	E-commerce benefits	15	0.972
2	E-market place usage	8	0.945
3	Supply chain management	21	0.983
All Dimensions		44	0.989

i. *Exploratory factor analysis*

Construct validity is the extent to which the items on a scale measure the abstract or theoretical construct. The threshold employed for judging the significance of factor loadings was 0.50 (Hair et al., 1992; Kerlinger, 1986). However, unidimensionality of each construct must be checked. Therefore, items in each multi-item scale were factor analyzed separately using principal component factor analysis with Varimax rotation. The criteria for choosing variables are based on Kaiser's (1996) suggestions: an eigenvalue greater than 1 after Varimax rotation, absolute values of factor loadings greater than .50 (Hair, Anderson, Tatham, & Black, 1998). As shown in Table 2, 3, and 4, results indicate that in all case a single factor emerged, i.e. there is one factor derived from each variable: e-commerce benefits (eigenvalue =10.831); e-marketplace usage (eigenvalue =5.800); and supply chain management (eigenvalue =15.655) and explaining 72.21 , 72.49 and 74.54 percent of the total variance for e- commerce benefits , e-marketplace usage and supply chain management consequently. In addition, all items were loaded on these three factors and all the loadings are well above 0.7. The results imply the statistical significance of the relationships between the items and constructs suggesting homogeneity within each factor and the reliability of individual items. These results suggest that the theoretical constructs exhibit good psychometric properties.

Table 2 : The factor analysis and reliability analysis of e-commerce benefits

Kaiser-Meyer-Olkin -KMO Measure of Sampling Adequacy: .911 Bartlett's Test of Sphericity: Sig: .000	Component Extraction
q1 E-commerce has enhanced the corporate image of your organization	.883
q2 The design and development of an e-commerce system has helped us achieve our business objectives	.912
q3 Our e-commerce projects have helped us meet our corporate business objectives	.870
q4 Our e-commerce strategy is consistent and is aligned with our company's business strategy	.804
q5 Our e-commerce plans are integrated with our corporate business plan	.737
q6 E-commerce has reduced our business process costs	.818
q7 E-commerce has improved our business processes	.817
q8 E-commerce has increased our employees' productivity	.822
q9 E-commerce has increased our company's profitability	.881
q10 E-commerce has increased our return on investment	.881
q11 E-commerce has increased our company's annual sales	.899
q12 E-commerce has increased our company's market shares and/or growth	.911
q13 E-commerce has enhanced our business competitiveness	.833
q14 E-commerce has improved the relationships with our trading partners	.852
q15 E-commerce has improved our company's overall Business performance	.809
Extraction Method: Principal Component Analysis. One component extracted. The solution cannot be rotated	
Cronbach's Alpha: 0.972 , Eigen values: 10.831, TVE % 72.210	

Table 3 : The factor analysis and reliability analysis of e-marketplace usage

Kaiser-Meyer-Olkin -KMO Measure of Sampling Adequacy: .880 Bartlett's Test of Sphericity: Sig: .000	Component Extraction
q16 Using e-marketplace (EM) gives the organization greater control in carrying out the tasks	.894
q17 Using EM saves the organization's time and effort over other means of performing the same task	.885
q18 Using EM is a more effective way of servicing the organization's needs	.899
q19 Overall, the organization finds the EM very useful	.897
q20 Our organization uses EM for announcing purchasing requirements	.866
q21 Our organization uses EM for placing orders on supplier's website	.896
q22 Our organization uses EM for tracking payment information	.680
q23 Our organization uses EM for sharing design information with our suppliers	.767
Extraction Method: Principal Component Analysis. One component extracted. The solution cannot be rotated	
Cronbach's Alpha: 0.972 , Eigen values: 5.800, TVE % 72.496	

Table 4 : The factor analysis and reliability analysis of supply chain management

Kaiser-Meyer-Olkin -KMO Measure of Sampling Adequacy: .944 Bartlett's Test of Sphericity: Sig: .000	Component Extraction
q24 Improved logistics management	.825
q25 Lower procurement costs	.896
q26 Dynamic and global sourcing	.913
q27 Reduced time between billing and payment	.875
q28 Efficient exchange of information	.885
q29 Improved order accuracy	.855
q30 Unloading excess inventory	.882
q31 Faster time to market	.933
q32 Reducing stock outs	.851
q33 Improving service levels	.906
q34 Improving consumer information	.851
q35 Improved internal and external communications	.829
q36 Efficient product introduction	.867
q37 Streamlined electronic processes	.866
q38 Increased customer satisfaction	.882
q39 Forecast accuracy	.708
q40 Increased profitability	.870
q41 Improved store assortment	.866
q42 Improved replenishment	.851
q43 Efficient promotion	.853
q44 Improved relationship with trading partners	.846
Extraction Method: Principal Component Analysis. One component extracted. The solution cannot be rotated	
Cronbach's Alpha: 0.983 , Eigen values:15.655 , TVE % 74.546	

ii. *Confirmatory factor analysis*

Construct validity was confirmed using the confirmatory factor analysis. Convergent and discriminant validity of the scales were verified through confirmatory factor analysis to substantiate the assumption that the scaled variables are correlated with the construct to be assessed and not with other constructs (Bagozzi and Yi, 1988; Anderson and Gerbing ,1988). The confirmatory factor analysis (CFA) revealed that all psychometric properties were satisfactory. Table 5 summarizes the measurement model for e- commerce benefits, e-marketplace usage and supply chain management and shows the standardized regression weight for each variable. The standardized regression weights for all variables that are shown in Table 5 are significant at the 0.001 level. The confirmatory factor analysis showed a good fit. The Chi-square x 2 statistic was 406.844 (d f 149, p, 0.000), with the x 2/df ratio having a value of 2.73 that is less than 5.0 (it should be between 0 and 5 with lower values indicating a better fit). The goodness of fit index (GFI) was 0.812 and the comparative fit index (CFI) was 0.921. These indices are close to a value of 1.0 (a value of $>$ 0.90 indicates perfect fit), indicating that the measurement models provide good support for the factor structure determined through the exploratory factor analysis (Anderson and Gerbing, 1988; Hair et al.,2006).

Table 5 : Confirmatory Factor Analysis: Measurement property
Standardized Regression Weights: (Group number 1 - Default model)

			Estimate	S.E.	C.R.	P
E _ Marketplace Usage	<---	E - Commerce Benefits	.948	.112	9.394	***
Supply Chain Management	<---	E _ Marketplace Usage	.709	.163	4.187	***
Supply Chain Management	<---	E - Commerce Benefits	.266	.169	1.690	.091
q15	<---	E - Commerce Benefits	.861			
q14	<---	E - Commerce Benefits	.882	.111	9.476	***
q13	<---	E - Commerce Benefits	.848	.112	8.779	***
q12	<---	E - Commerce Benefits	.919	.098	10.332	***
q11	<---	E - Commerce Benefits	.931	.099	10.651	***
q10	<---	E - Commerce Benefits	.910	.100	10.123	***
q9	<---	E - Commerce Benefits	.884	.109	9.534	***
q8	<---	E - Commerce Benefits	.809	.103	8.066	***
q7	<---	E - Commerce Benefits	.819	.090	8.249	***
q6	<---	E - Commerce Benefits	.811	.102	8.101	***
q5	<---	E - Commerce Benefits	.698	.102	6.377	***
q4	<---	E - Commerce Benefits	.839	.097	8.607	***
q3	<---	E - Commerce Benefits	.915	.106	10.238	***
q2	<---	E - Commerce Benefits	.939	.115	10.865	***
q1	<---	E - Commerce Benefits	.937	.114	10.801	***
q16	<---	E _ Marketplace Usage	.921			
q17	<---	E _ Marketplace Usage	.930	.073	12.959	***
q18	<---	E _ Marketplace Usage	.931	.081	13.007	***
q19	<---	E _ Marketplace Usage	.940	.072	13.445	***
q20	<---	E _ Marketplace Usage	.846	.083	9.903	***
q21	<---	E _ Marketplace Usage	.883	.074	11.071	***
q22	<---	E _ Marketplace Usage	.578	.100	5.108	***
q23	<---	E _ Marketplace Usage	.802	.084	8.782	***
q24	<---	Supply Chain Management	.852			
q25	<---	Supply Chain Management	.922	.108	10.193	***
q26	<---	Supply Chain Management	.929	.108	10.372	***
q27	<---	Supply Chain Management	.892	.105	9.526	***
q28	<---	Supply Chain Management	.920	.103	10.135	***
q29	<---	Supply Chain Management	.929	.102	10.355	***
q30	<---	Supply Chain Management	.935	.097	10.500	***
q31	<---	Supply Chain Management	.945	.092	10.770	***
q32	<---	Supply Chain Management	.882	.091	9.309	***
q33	<---	Supply Chain Management	.940	.085	10.619	***
q34	<---	Supply Chain Management	.905	.093	9.808	***
q35	<---	Supply Chain Management	.842	.099	8.549	***
q36	<---	Supply Chain Management	.923	.104	10.223	***
q37	<---	Supply Chain Management	.896	.102	9.608	***
q38	<---	Supply Chain Management	.919	.102	10.113	***
q39	<---	Supply Chain Management	.748	.099	7.022	***
q40	<---	Supply Chain Management	.904	.093	9.789	***
q41	<---	Supply Chain Management	.883	.089	9.341	***
q42	<---	Supply Chain Management	.914	.083	10.005	***
q43	<---	Supply Chain Management	.900	.091	9.704	***
q44	<---	Supply Chain Management	.886	.088	9.405	***

V. Hypothesis Testing: Structural Model

In order to verify the proposed hypothetical relationships among the three latent variables used for this research, a structural equation model was developed using AMOS7.0 as follows (Figure 2).

As a result of the analysis, the structural model's fitness was found to be adequate according to a relative measure of fitness which takes into

consideration both sample size and model's simplicity (Jo¨reskog and So¨rbom, 1993). Although the goodness-of-fit-index GFI (0.812) and normal fit index NFI (0.881), an absolute index of fitness, was somewhat short of acceptable level of > 0.90, the comparative fit index CFI, a relative fitness index, was above acceptable level with 0.921.The chi square x 2/df was 2.73 within acceptable level (< 5) and root mean square error of approximate RMSEA was 0.09, somewhat short of acceptable level of (< 0.08) (Hair et al.,2006). Considering overall values of the indices, it is appropriate to estimate the structural model. The structural equation model incorporating the hypotheses is depicted in Figure 2.

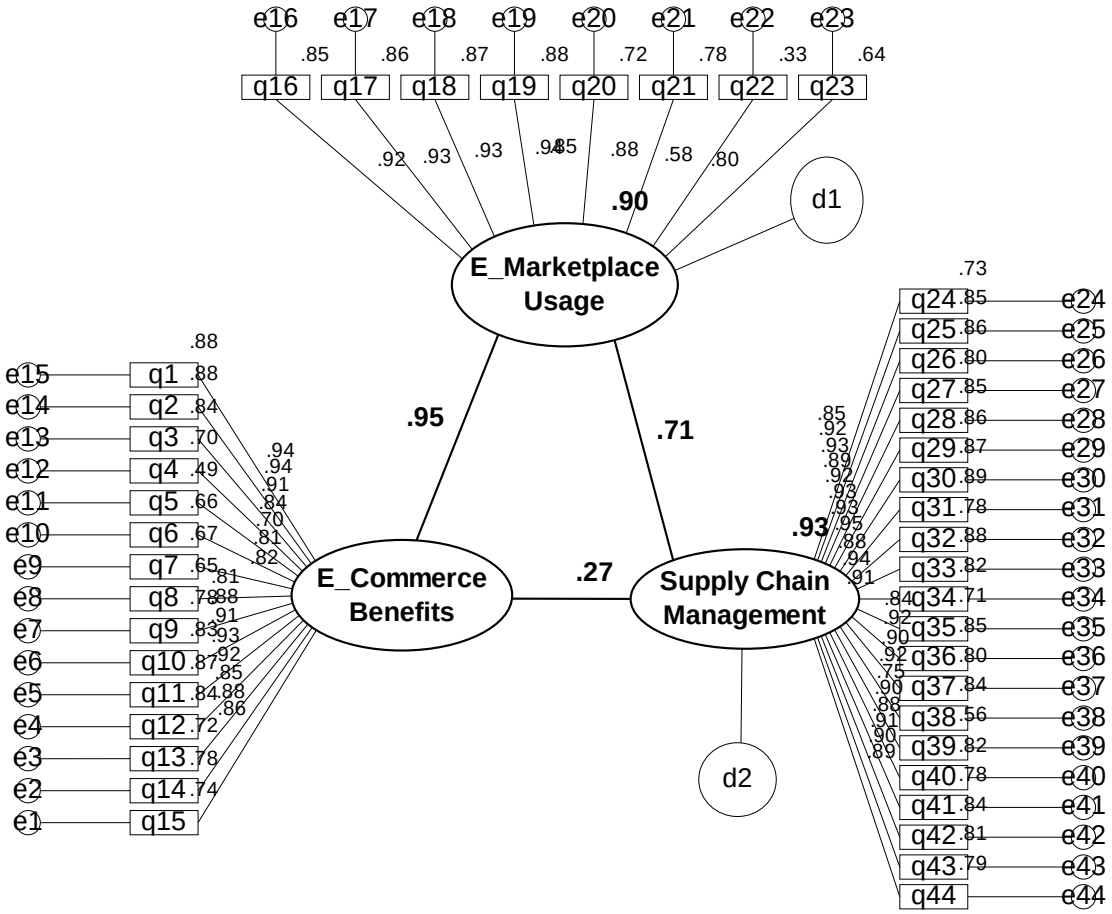

Figure 2 : Result of structural equation modeling

In order to examine the hypotheses, the authors utilized the effect decomposition, in which the total effect of an independent variable on a dependent variable was categorized into indirect and direct effects (e.g., Brown, 1997;Tabachnick and Fidell, 1996). A significant indirect effect indicates that a significant amount of the independent variable's total effect on the dependent variable occurs via the mediator. The direct and indirect effects for all the paths hypothesized in the model are depicted in Table 6.

Table 6 : Result of structural equation modeling: standardized direct, indirect and overall effects

	Direct Effect		Indirect Effect		Total Effect	
From / To	E-commerce benefits	E-marketplace usage	E-commerce benefits	E-marketplace usage	E-commerce benefits	E-marketplace usage
E-marketplace usage	.948	.000	.000	.000	.948	.000
supply chain management	.266	.709	*.672*	.000	.938	.709

The analysis then proceeded to examine the causal relationships between these variables. The results were as expected and provided support for hypotheses 1, 3, and 4. Properties of the causal paths, including standardized path coefficients of the research model was shown in Table 6. Figure 2 illustrates path analysis of the structural model. Standardized path coefficients are provided; numbers on the construct indicate total variance explained (R2). Standardized structural path coefficients and R 2 values are presented in Figure 2. In this model the path from e-commerce benefits to e-marketplaces usage and supply chain management was calculated, and the standardized coefficient that obtained from e-commerce benefits to e-marketplaces usage was positive and highly significant (Standardized coefficient = .948; $p < .001$). Thus, there is support for H1. Unfortunately, the standardized coefficient that obtained from e-commerce benefits to supply chain management was positive but not significant (Standardized coefficient = .266; $p > .05$). Therefore, there is no support for H2. As predicted by H3, the standardized coefficient that obtained from e-marketplaces usage to supply chain management was also positive and highly significant (Standardized coefficient = .709; $p < .001$).Thus, there is support for H3. However, the indirect effects of e-commerce benefits on supply chain management was positive and highly significant, therefore the effect flow only through e-marketplaces usage (indirect standardized coefficient = .672; $p < .001$). Therefore H4 supported. The results concerning the testing of hypotheses are summarized in Table 7. As depicted in figure 2 , coefficient of determination (R2) values show that, e-commerce benefits account for 90% of variance in e-marketplaces usage; e-commerce benefits and e-marketplaces usage, account for 93%of variance in supply chain management. The results are depicted in Figure 2, which show a structural equation modeling. These results suggest that the model is a reasonable basis upon which to test the research hypotheses.

Table 7 : Hypotheses testing results of the structural equation model

Hypothesis	causal path	Standardized Coefficients	Test result
H1	E_ Commerce Benefits → E _ Marketplace Usage	.948***	supported
H2	E - Commerce Benefits → Supply Chain Management	.266	Not supported
H3	E-Marketplace Usage: → Supply Chain Management	.709***	supported
H4	Indirect effect E - Commerce Benefits → Supply Chain Management through E-Marketplace usage as mediator	*.672***	supported

*Note: * ** indicates p<0.001*

VI. Conclusions And Implications

Based on theoretical considerations, a structural model was proposed to investigate the links among the three constructs: e-commerce benefits, e-marketplace usage and supply chain management. More specifically, main thrust of the study was to examine the mediating impact of e-marketplace usage on the relationship between e-commerce benefits and supply chain management within the context of different industries using covariance-based structural equation modeling. Exploratory and confirmatory factor analyses were employed to produce empirically verified and validated underlying dimensions of e-commerce benefits, e-marketplace usage and supply chain management constructs drawing on a sample of organizations held in different industries. E-commerce benefits were significant predictor of e-marketplace usage and supply chain management. The findings of structural equation modeling indicated that while e-commerce benefits had a strong and positive effect on e-marketplaces usage, no significant direct link was found between e-commerce benefits, and supply chain management. Also a strong and positive relationship was noted between e-marketplace usage and supply chain management. The empirical finding of this study i.e. the interrelationship between e-commerce benefits ,e-marketplace usage and supply chain management is consistent with previous study (e.g. Eng,2004; Delfmann et al., 2002; Rudberg et al., 2002; Larsen et al., 2003; Murtaza, et al., 2004; Greyet et al.,2005; Rao, et al., 2007; Wang & Archer, 2007; Liu et al., 2010). This research provides some insights for understanding why most organizations today realize benefits from their B2B e-commerce involvement. This study provides also an empirical evidence for the importance of using an organization e-marketplace to utilize its existing capabilities and processes to obtain business value in the context of B2B e-commerce. E-commerce provides many benefits to both sellers and buyers; e.g. Napier et al. (2001) pointed out that by implementing and using e-commerce sellers can access narrow markets segments that are widely distributed while buyers can benefit by accessing global markets with larger product availability from a variety of sellers at reduced costs. Improvement in product quality and the creation of new methods of

selling existing products are also benefits. Also, Rutner et al.(2003) indicate that companies that have successfully implemented logistics information systems are significantly more likely to have also implemented some form of e-commerce than those who have not. Based on our findings we also recommend that manager of organizations should focus on making B2B e-commerce as well as e-marketplace usage an integral part of their business strategy.

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Srilankan Tourism (SLT): A Forecast of Foreign Tourists (FFT)

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Abstract - Tourism has become a popular global leisure activity. Srilankan tourism has beaches, Archeological Sites, National Parks, Elephants, Adventure Sports and Precious stone mining. Sri Lanka has 39 tourist attractions all over the island. The International media reports published about the improvements in tourism industry of January 2008 by 0.6%, March 2008 by 8.6% when comparing to last year's (2007) figures. The 2004 Indian Ocean Tsunami and the past civil war have reduced tourist arrivals but Sri Lanka received over half a million tourists in 2006. Number of tourists' arrival was 559600 in the year 2006. From secondary data analysis and literature review, research problem exists on two important variables such as period (year) and tourist (number of tourists' arrivals to Sri Lanka).

Keywords : *Srilankan Tourism, Forecast.*

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Strictly as per the compliance and regulations of:

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Ismail, M.B.M [α], Velnampy.T [σ] & Mustafa, A.M.M [ρ]

Abstract - Tourism has become a popular global leisure activity. Srilankan tourism has beaches, Archeological Sites, National Parks, Elephants, Adventure Sports and Precious stone mining. Sri Lanka has 39 tourist attractions all over the island. The International media reports published about the improvements in tourism industry of January 2008 by 0.6%, March 2008 by 8.6% when comparing to last year's (2007) figures. The 2004 Indian Ocean Tsunami and the past civil war have reduced tourist arrivals but Sri Lanka received over half a million tourists in 2006. Number of tourists' arrival was 559600 in the year 2006. From secondary data analysis and literature review, research problem exists on two important variables such as period (year) and tourist (number of tourists' arrivals to Sri Lanka). Objectives of this research are to know the relationship between years and number of tourists' arrivals and to forecast number of tourist arrivals during the next five years. Target population are those who visit to Sri Lanka as foreign tourist. Number of foreign tourists is known from secondary data. Since the study involved entire target population there was no need to select sample of foreign tourists visiting Sri Lanka. Researcher concentrated on all foreign tourists as a target population study. Data were collected using secondary source. SPSS with the version of 16.0 and Excell 2007 were used as an analytical tool fordata presentation & analysis. Scatter plot showed that number of tourists who visited to Sri Lanka have increased from early 2001 to 2004. There were a slight declined number of tourists in the year 2005 than year 2004. A further decline started from 2006 to 2008. Number of tourists increased from 2009 onwards. Minimum and maximum tourists who visited to Sri Lanka were 336800 and 654477during the last decade. Totally, 5,340,977 tourists have arrived Sri Lanka. 486,000 tourists have come to Sri Lanka on an average basis. Pearson Correlation indicates the value of 0.594. This refers to number of tourist increases from 2000 to 2011. A three year simple moving average was calculated for finding the forecasted data from 2011 to 2015. Forecasted number of tourists' arrivals (Dt) during 2011 to 2015 would be more than 510, 000. It would be a positive sign for the growth of tourism industry in Sri Lanka. Peace has helped in increasing number of tourists' arrivals during the last decade. Since forecasted number of tourists' arrivals (Dt) shows a bonafide. Policy makers have to make much more popular Srilankan Tourism for attracting foreign tourists by international promotion along with local infrastructure developmentso as to achieve the goal set by His Excellency.

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Keywords : Srilankan Tourism, Forecast.

I. Introduction

Tourism is travel for recreational, leisure or business purposes. Tourism has become a popular global leisure activity. Tourism industry should be redefined as an export commodity and should be given equal status of export development incentives and inducement, since tourism earns much needed foreign currency for the country, thus induce greater investment in the industry (Source: http://www.tops.lk). In 2008, there were over 922 million international tourist arrivals, with a growth of 1.9 percent as compared to 2007. International tourism receipts grew to US$ 944 billion (Euro 642 billion) in 2008, corresponding to an increase in real terms of 1.8 percent. As a result of the late-2000s recession, international travel demand suffered a strong slow down beginning in June 2008, with growth in international tourism arrivals worldwide falling to 2 percent during the boreal summer months. This negative trend intensified during 2009, exacerbated in some countries due to the outbreak of the H1N1 influenza virus, resulting in a worldwide decline of 4 percent in 2009 to 880 million international tourists' arrivals, and an estimated 6 percent decline in international tourism receipts. Sri Lanka Tourism Authority Chairman, Dr. NalakaGodahewa and Sri Lanka Tourism Bureau Managing Director, MalrajKiriella were welcoming the 600,000 tourist coming to the island who is Mr. Nick Davis, the Chief Executive Officer of Merchant Maritime Welfare Centre of the United Kingdom and his partner LaylaDayani at the Bandaranaike International Airport. A religious ceremony was held on this occasion to mark the second term in office and Dr. NalakaGodahewa, Chairman Sri Lanka Tourism addressed all staff present and requested for their fullest corporation to work towards achieving H.E. the President Rajapake's goal of achieving 2.5 million tourists by the year 2016 (Source: www.sltda.gov.lk). This research is organized into outline of Srilankan tourism, statement of the problem, research gap, research question, research objectives, significance of the research, literature review, researcg framework, operationalization, research design & methodology -RDM-, data presentation & analysis -DPA-, findings and conclusions, limitations and avenues for future research, policy implications, originality and references.

Outline of Srilankan Tourism: The top international destinations in 2009 are, out of a global total of 903 million tourists in 2007, there are the 58 most visited, as of June 2008. A large majority of tourists come from the United States, the United Kingdom, Canada, Australia, Germany, France, Maldives, Japan, The People's Republic of China, and India. In addition to above mixed (culture and nature) sites the ancient cultural site of SeruwilaMangala Raja MahaVihar at the village of Toppur, KoddiyarPattu of Trincomalee District of Eastern Province of Sri Lanka was submitted to UNESCO by the government of Sri Lanka on 30 October 2006. Srilankan tourism has beaches, Archeological Sites, National Parks, Elephants, Adventure Sports and Precious stone mining. Sri Lanka has 39 tourist attractions all over the island. They are Anuradhapura, Arugam Bay, Adam's Peak , Batticaloa, Bentota, Beruwala, Bundala National Park, Colombo, Dambulla, Ella, Galle, Hambantota, Hikkaduwa, Horton Plains, Jaffna, Kalkudah, Kalpitiya, Kandy, Katunayake, Kitulgala, Knuckles Range, Mannar, Matara, Minneriya, Negombo, Nilaveli, NuwaraEliya, Pasikudah, Pinnawela, Polonnaruwa, Puttalam, Ratnapura, Sigiriya, Sinharaja, Trincomalee, Unawatuna, Weligama, Wilpattu National Park and Yala National Park. Today, Sri Lanka offers leisure and business travellers a spectrum of attractions. The commercial cities, Colombo, Kurunegala and Kandy offer business travellers an array of business opportunities and trade options. The sandy white beaches and attractive underwater life that surrounds the island, gives its visitors a chance to unwind and relax in a warm and comfortable setting. The beautiful rain forests, mountain ranges and scenic plantations can be visited within a few hours (approx. 4-5 hours travel time), and visitors can also visit the wildlife sanctuaries that are located in this small miracle.

Statement of the Problem: The International media reports published about the improvements in tourism industry of January 2008 by 0.6%,[13] March 2008 by 8.6%[14] when comparing to last year's (2007) figures. The 2004 Indian Ocean Tsunami[11] and the past civil war have reduced tourist arrivals but Sri Lanka received over half a million tourists in 2006.[12] Number of tourists' arrival was 559600 in the year 2006 (Source: www.sltda.gov.lk/statistics accessed on 24. 08. 2011). Tourist arrivals have been gradually picking up at a healthy pace. In the first three months of 2010 tourist arrivals increased by 50.3 percent over the corresponding period in 2009. The Tourist Hotels Association of Sri Lanka (THASL) described that the first three months as quite positive for tourism with arrival standing at 160,409 while tourism earning for the same period increased by 69 percent to US$141.2 million compared to US$ 83.3 million last year. This is definitely an indication of potential accrual of higher yields in the industry. Tourist arrivals to Sri Lanka reached a new high in 2010 registering a growth of 46.15 % to 654,476 arrivals from the previous year's figures of 447,890. In absolute terms, this amounted to an increase of 206,586 tourist arrivals to Sri Lanka during one single year, which is again unprecedented in the history of tourism in Sri Lanka. Tourist arrivals to Sri Lanka surged to 67.7%, approximately 57,300 arrivals, in February 2010, as compared to 447,890 in 2009 and 44,551 in 2008. Moreover, there has been a steep increase of visitors, namely from India, the United Kingdom, and Germany. In February 2010, visitors from India rose 94.9% (8,383 arrivals), the UK to 46.3% (10,703 arrivals), and Germany to 121.9% (5,656 arrivals). In addition, visitors from Western Europe rose 71.7%, Pakistan up to 34.4% (609), and Japan 50.6% (1,306). This increase is further reflected in the hotel industry, with hotels reporting booked rooms until at least the end of March. This is a positive outlook for Sri Lanka Tourism, one which will bring new opportunities for product development and employment generation. Tourist arrivals to Sri Lanka during the period of January to November was 497,598 a 43.5% marked increase over the same period of last year. It exceeds the last year 's total arrival of 447,890 tourists to Sri Lanka. The total estimated arrival of tourists for this year is 600,000. India continues to be the highest generator of tourists to Sri Lanka this year too. During the month of October this year, tourist arrivals from India were 13,237 an increase of 43.6 % as against October last year.

Research Gap

Task	Example	Symptoms	Year	Nation- wide	Source/Reference
Secondary data	Website	Increased number of tourists	2010 (654,476)	Sri Lanka	www.sltda.gov.lk
Secondary data	The international media report	Improvements in tourism industry	2008 (8.6 %)	Worldwide	12
		Reduced tourists' arrivals due to Indian Ocean Tsunami &the past civil war	2004	-do-	13
		Number of tourists' arrival	2006 (559, 600)	Sri Lanka	14

Table 1 : Research gap

II. Research Question

From secondary data analysis and literature review, research problem exists on two important variables such as period (year) and tourists (number of tourists' arrivals) to Sri Lanka. Researcher raises "is there relationship between year and number of tourists arrivals"?

III. Research Objectives

From the above two research questions, researcher sets two objectives for the study. Objectives of this study are to:

1. know the relationship between years and number of tourists arrivals
2. forecast number of tourist arrivals during the next five years

IV. Significances Of The Research

This research signifies in several ways such as tourism establishments, increased performance of Sri Lanka Tourism, attraction of merchants and explorers, profitability, high demand for hotel rooms, increased foreign exchange earnings, development of hotel infrastructure & increased workforce. The Srilankan Government together with the Sri Lanka Tourism Development Authority (SLTDA) is committed to the development and growth of the local tourism industry. The country's Board of Investment (BOI) offer potential foreign investors lucrative incentives to start up with tourism establishments. The performance of Sri Lanka Tourism in terms of tourist arrivals, foreign exchange earnings, creation of employment opportunities and hotel: occupancy rates is assessed and reported, regularly (Source: Sri Lanka Tourism-Colombo). Sri Lanka is an island to be explored and wondered. Discover its natural beauty and uniqueness so you may enjoy an experience of a lifetime. Sri Lanka has always been a tourist destination. In the past, due to its strategic location, Sri Lanka attracted many merchants and explorers. An overall annual hotel room occupancy rate increased too to an unprecedented level of 70.1 % from the 48.4 % occupancy rate. In US dollar terms, this amounted to an earnings figure of US $ 497.4 million in 2010 as compared to US $ 326.3 million in the previous year; an increase by 52.4 %. Thus, tourism in Sri Lanka was able to regain its position in 2010 as the fourth highest in terms of foreign exchange earnings that was coming into the country. The service sector is the largest of the Sri Lanka economy, employing 45 percent of the workforce and contributing roughly 60 percent of GDP. Tourism, banking, finance and retail trade are the major components of the service sector (Source: HSBC Economic update -2009 report

V. Literature Survey

Foreign visitor opinion and expenditure survey was conducted to know the foreign visitor opinion and expenditure which was carried out at the departure lounge of the Bandaranaike International Airport on departing foreign tourists and transit passengers which commenced in September 2008 (Source: Sri Lanka Tourist Development Authority). Jill Crawshaw, a travel writer for The Times, quotes Marco Polo's description of Sri Lanka as a "jade pendant in the Indian Ocean". Crawshaw and Lyn Hughes, Editor of Wanderlust Magazine, highlight the number of products offered by the island; beaches, wildlife, historical places, world heritage sites, forests, waterfalls, and river rafting (Sourcet:http://www.youtube.com/watch?v=1-WfXSacm84&feature=youtube_gdata to see a clip from the National Geographical Channel). The Domestic Tourism and Resort Management Division of the SLTDA organized a training program for facilitators on October 11th and 12th, 2009. The program was held at the Suisse Hotel Kandy with 120 participants in attendance. Lectures delivered toward on 'Tourism: Past, Present, and Future' by Mr. U.P.S. Pathirana, Former Director, SLTDA; 'Impacts of Tourism' by Mr. P.U. Rathnayaka, Director DTD & RM, SLTDA; Personality Building and Positive Attitude' by Mr. W.P. Dayarthne, Former DIG, Sri Lanka Police; Role of the Tourist Police' by Mr. NayanapriyaEdirisinghe, OIC, Sri Lanka Tourist Police &'Combating Child Sex Tourism in Sri Lanka' by Mr. DheeraHettiarachchi, SLTDA. School awareness programs were organized in Galle and Kandy with lectures delivered by the Domestic Tourism and Resort Management Division of the SLTDA in 2009. Lecturer were on 'Tourism: Past, Present, and Future' – Mr. P.U. Rathnayaka, Director DTD&RM, SLTDA &'Learn to Travel – Travel to Learn' – Mr. DheeraHettiarachchi, SLTDA. Optimizing è Future 2009 – Sri Lanka's first Online Marketing Conference was organized by eMarketingEye. A tourist visitor survey was conducted by the Research Division of the SLTDA in Kandy during EsalaPerahera Session during the 1st week of August 2009.

VI. Research Framewor

This research was approached in two vital ways such as empirical evidences and previous literatures. Two variables have been identified such as period and Tourists.

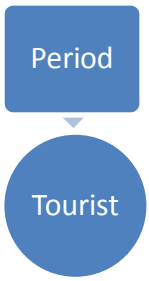

Exhibit 1 : Research framework

VII. Operationalization

The World Tourism rankings are compiled by the United Nations World Tourism Organization (UNWTO) as part of their World Tourism Barometer publication. In the publication World tourism is ranked both by number of visits and by tourism revenue generated.

Construct/ Variable	Indicator	Measures
Dependent	Tourist	Number of tourist arrivals
Independent	Period	Year

Table 2 : Operationalization

VIII. Research Design & Methodology

a) Exploratory research design (ERD) and causal research design (CRD)

Research is designed by exploratory research design (ERD) and causal research design (CRD). Research problem is qualitative in nature. In order to state research problem, researcher used a secondary data and brief literature review. This qualitative research problem was quantified using conclusive research design. Causal research has been designed to know the relationship between two variables.

b) Population & sample

Population refers to target population. Target population are those who visit to as foreign tourist to Sri Lanka. Number of foreign tourists is unknown. It is easy to gather actual and updated number of foreign tourists o visit to Sri Lanka. Sampling frame or list of local tourist is not accessible. But, researcher had access to collect the number of tourist to Sri Lanka. Since the study involved entire target population there was no need to select sample foreign tourist visiting Sri Lanka. Due to this situation, researcher has no need to select sample size and sampling technique. Therefore, researcher concentrated on all number of foreign tourists as a target population study.

c) Data collection method

Data were collected using secondary source. Collected secondary data is tabulated below with source.

Year	Tourist arrival to Sri Lanka
2000	400410
01	336800
02	393170
03	500640
04	566200
05	549310
06	559600
07	494010
08	438470
09	447890
10	654477

www.sltda.gov.lk/statistics accessed on 24. 08. 2011
Source: Sri Lanka tourism

Table 3 : Tourist arrival to Sri Lanka

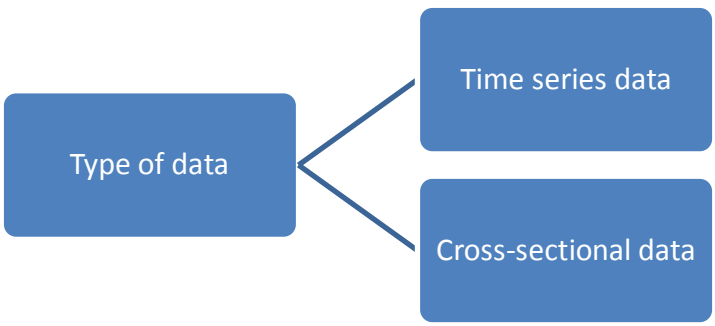

Exhibit 2 : Types of data

Tourists to Sri Lanka are time series data. Time series data are observations on a variable of a given population over time. Population is tourists to Sri Lanka from all parts of the world. Frequency of data refers to data are collected annually. Data have been recorded in order starting from 2000 to 2010.

IX. Data Presentation and Analysis

Objective Number	Objective	Data presentation	Data analysis
1	To know the relationship between years and number of tourists arrivals	Scatter Plot Line graph	Descriptive statistics Pearson Correlation Simple regression
2	To forecast number of tourist arrivals during the next five years	Scatter Plot Line graph	Descriptive statistics Pearson Correlation Simple regression

Table 4 : Data presentation and analysis -DPA-

Data presentation & analysis: SPSS (SPSS) with the version of 16.0 and Excell having the version of 2007 were used for analytical tools.

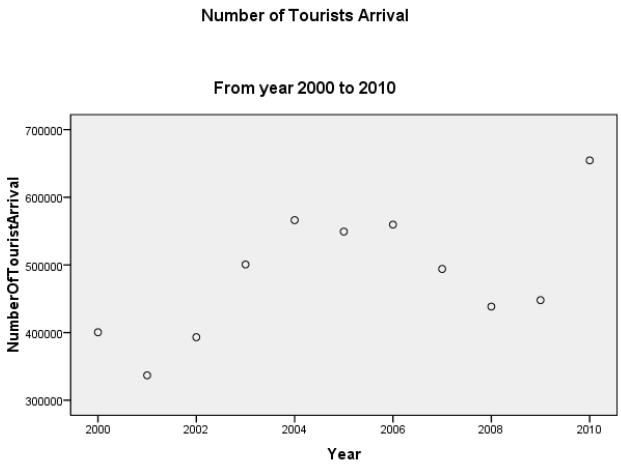

Exhibit 3 : Scatter plot for number of tourists' arrival (2000 to 2010)

a) Descriptive statistics

Minimum and maximum tourists who visited to Sri Lanka are 336800 and 654477. Totally, 5,340,977 tourists have arrived Sri Lanka during the last decade. 486,000 tourists have come to Sri Lanka on an average basis.

Correlation s

		Year	Number Of Tourist Arrival
Year	Pearson Correlation	1	.594
	Sig. (2-tailed)		.054
	N	11	11
Number Of Tourist Arrival	Pearson Correlation	.594	1
	Sig. (2-tailed)	.054	
	N	11	11

Table 5 : Pearson Correlation

Pearson Correlation indicates 0.594 between the year and number of tourists who visited to Sri Lanka. This refers to number of tourist increases from 2000 to 2011.

b) Hypotheses testing using Pearson Correlation test

Null hypothesis: Year is not related to number of tourists visited to Sri Lanka i.e (H0: $p = 0$)

Alternative hypothesis: Year is related to number of tourists visited to Sri Lanka i.e (H1: $p \neq 0$)

Test Statistics Calculated should be greater than the Critical Value of Test Statistics Calculated. In other words, Sig. (p) value should be less than significance value. P value is 0.054. Significance value is 0.05. Since p value is less than 0.05. Researcher rejects Ho and accepts alternative one. This indicates that Year is related to number of tourists visited to Sri Lanka. This refers to number of tourist increases from 2000 to 2011. Hypotheses testing using regression t test & F test also revealed the same results.

Forecasting

Year	Number of Tourist Arrivals (D_t)	3 Year simple smoothing – step one- (S1)	3 Year simple smoothing – step two- (S2)	3 Year simple smoothing –step three- (S3)	3 Year simple smoothing –step four- (S4)	3 Year simple smoothing –step five- (S5)	Method	Final forecast
2000	400410							
2001	336800							
2002	393170							
2003	500640	396793						
2004	566200	410203						

2005	549310	486670						
2006	559600	538716	431222					
2007	494010	558370	478530					
2008	438470	534307	527919					
2009	447890	497360	543798	497223				
2010	654477	460123	530012	516749				
2011		513612	497263	533910			(S1 + S2 + S3)/ 3	514928
2012			490365	523691	515961		(S2 + S3 + S4)/ 3	510006
2013				505880	524783		(S3 + S4)/ 2	515332
2014					521160		S4	521160
2015						520635	S5	520635

Table 6 : Forecasting

3 year simple moving average was calculated for finding the forecasted data from 2011 to 2015. It has been done in five steps. Actual data from year 2000 to 2010 have been used to find out for first step tourist forecasting. Forecasted data from 2003 to 2011 have been used to find out second step tourists forecasting. Latter has been processed until the year 2015.

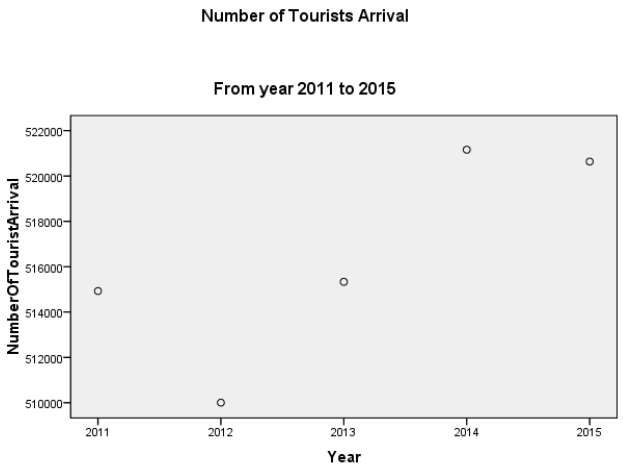

Exhibit 4 : Scatter plot for number of tourist arrival (2011 to 2015)

c) Descriptive statistics

Minimum and maximum tourists who visit to Sri Lanka would be between 510006 to 521160. Totally, 2,582, 061 tourists will have to arrive at Sri Lanka within next five years of the time (2011 to 2015). There would be potentiality of 516,000 tourists who would arrive to Sri Lanka on an average basis.

X. Findings And Conclusions

Objective one : to know the relationship between years and number of tourists' arrivals

Scatter Plot : It shows that number of tourists who visited to Sri Lanka have increased from early 2001 to 2004. There is a slight decline in the year 2005 than year 2004. A further decline starts from 2006 to 2008. Increase starts from 2009 onwards.

Descriptive statistics : Minimum and maximum tourists who visited to Sri Lanka are 336800 and 654477. Totally, 5,340,977 tourists have arrived Sri Lanka during the last decade. 486,000 tourists have come to Sri Lanka on an average basis.

Data analysis using Pearson Correlation : Pearson Correlation indicates 0.594 between the year and number of tourists who visited to Sri Lanka. This refers to number of tourist increases from 2000 to 2011.

Hypotheses testing using Pearson Correlation test : Test Statistics Calculated should be greater than the Critical Value of Test Statistics Calculated. In other words, Sig. (p) value should be less than significance value. P value is 0.054. Significance value is 0.05. Since p value is less than 0.05. Researcher rejects Ho and accepts alternative one. This indicates that Year is related to number of tourists visited to Sri Lanka. This refers to number of tourist increases from 2000 to 2011. Hypotheses testing using regression t test & Hypotheses testing using F test also reveals the same results as at the correlation hypotheses tests.

Objective two : to forecast number of tourist arrivals during the next five years

Forecasting : 3 year simple moving average was calculated for finding the forecasted data from 2011 to 2015. It has been done in five steps. Actual data from year 2000 to 2010 have been used to find out for first step tourist forecasting. Forecasted data from 2003 to 2011 have been used to find out second step tourists forecasting. Latter has been processed until the year 2015. Forecasted number of tourist arrivals (Dt) during 2011 to 2015 would be more than 510, 000. It would be a positive sign for the growth of tourism industry in Sri Lanka.

XI. Policy Implications

Objective one : to know the relationship between years and number of tourists' arrivals

Totally, 5,340,977 tourists have arrived Sri Lanka during the last decade. 486,000 tourists have come to Sri Lanka on an average basis. Pearson Correlation indicates 0.594 between the year and number of tourists who visited to Sri Lanka. This refers to number of tourist increases from 2000 to 2011. Peace has helped in increasing number of tourists' arrivals during the last decade.

Objective two : to forecast number of tourist arrivals during the next five years

Forecasted number of tourist arrivals (Dt) during 2011 to 2015 would be more than 510, 000. It is a positive sign for the growth of tourism industry in Sri Lanka. Totally, 2,582, 061 tourists would arrive at Sri Lanka within next five years of the time (2011 to 2015). Policy makers have to make much more popular Sri Lanka for attracting tourist by international promotion and infrastructure development for tourism so as to achieve the goal set by His Excellency.

Limitations and future research avenues : Number of tourist arrival during next five years has been forecasted. Forecasted number would be more than 510, 000 tourist arrivals. This figure would be higher than in future. Researcher allows other researchers to improve this research area further.

Originality : Secondary data are used to forecast the number of tourists' arrivals. Two regression models have been generated using 10 year actual data and 5 year forecast in tourism industry of Sri Lanka.

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Gouvernance, libéralisation financière et croissance économique: Aperçu théorique et vérification empirique

By Bouzid AMAIRA

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Résumé - L'article examine si le cadre institutionnel d'un pays, mesuré par la corruption, le risque, les lois, l'ethnique, les contrats et la bureaucratie, affecte sa croissance économique; et si l'effet est différent entre les pays émergents. L'étude porte sur 19 pays; pour la période 1990-2005. En utilisant la méthodologie utilisée par plusieurs économistes, qui ont vérifié cette relation dans le cas de PD et de PED, le modèle se base sur une fonction de production générale et emploie la technique de données de panel dynamique. Les resultants obtenus sont similaires à ceux de travaux récents et indiquent une relation positive entre la gouvernance et le taux de croissance pour les pays « goods » gouvernés; et une relation négative pour les pays « buds » gouvernés. Ce type de résultats peut venir influencer les décisions des autorités concernant les politiques économiques à adopter.

Motsclés : *gouvernance, croissance, données de panel dynamique et GMM en système.*

GJMBR-B Classification : *FOR Code: 140210 JEL Code: E22, F36, F32*

Strictly as per the compliance and regulations of:

Gouvernance, libéralisation financière et croissance économique: Aperçu théorique et vérification empirique

Bouzid AMAIRA

Résumé - L'article examine si le cadre institutionnel d'un pays, mesuré par la corruption, le risque, les lois, l'ethnique, les contrats et la bureaucratie, affecte sa croissance économique; et si l'effet est différent entre les pays émergents. L'étude porte sur 19 pays; pour la période 1990-2005. En utilisant la méthodologie utilisée par plusieurs économistes, qui ont vérifié cette relation dans le cas de PD et de PED, le modèle se base sur une fonction de production générale et emploie la technique de données de panel dynamique. Les résultats obtenus sont similaires à ceux de travaux récents et indiquent une relation positive entre la gouvernance et le taux de croissance pour les pays « goods » gouvernés; et une relation négative pour les pays « buds » gouvernés. Ce type de résultats peut venir influencer les décisions des autorités concernant les politiques économiques à adopter.

Motsclés : gouvernance, croissance, données de panel dynamique et GMM en système.

Abstract - This paper aims to present an empirical analysis of the governance effects on economic growth. Our study presents the direct effect of governance on growth by using a dynamic panel model of nineteen emergent countries during 1990-2005 by using macroeconomic and financial variables. This article consists to discuss the direct effect of governance on the growth. It confirms the results of previous studies that show the positive effect of governance on economic growth for the countries adopted goods governance process and a negative relation for the countries adopted buds governance practice. These results can be influence the decisions of authorities on the economics politics approach.

Keywords : governance, economic growth, dynamic panel data and GMM system methods.

I. Introduction

Au cours des dernières années, les économies émergentes ont réalisé des performances macroéconomiques importantes. Pour renforcer ces performances, les autorités de ces pays ont engagé plusieurs réformes institutionnelles touchant le fonctionnement de l'économie d'une manière générale. L'objectif majeur de ces pays est d'atteindre le processus de transition vers la « bonne gouvernance ». En effet, l'amélioration de la qualité des institutions devient fatale pour aboutir un niveau de développement durable et atteindre un taux de croissance économique élevé. D'un point de vue théorique et empirique, plusieurs études montrent l'existence d'une relation limitée entre le cadre institutionnel et la croissance du produit intérieur brut par tête (*Laurent Clerc et Hubert Kempf, 2006*)[1].

Différents économistes ont affirmé, au cours des dernières années, qu'une des raisons principales pour laquelle les taux de croissance sont différents entre les pays est que la qualité de l'environnement économique dans lequel les agents opèrent est différente. Cet environnement comprend les lois, les institutions, les règles, les politiques et les régulations gouvernementales du pays.

De bonnes institutions sont caractérisées par des structures et des lois incitatives qui réduisent l'incertitude et soutiennent l'efficacité. Elles contribuent à une plus forte performance économique. En effet, un environnement favorable à la croissance est celui qui fournit une protection adéquate pour les droits de propriété et qui donne aux agents l'incitation à produire, à investir et à accumuler des compétences.

Parmi les études empiriques consacrées à la relation institutions/croissance, celle de la Banque Mondiale (2003)[2] relative aux pays MENA. L'étude a montré que depuis les années 80, la moyenne annuelle de la croissance économique par habitant dans la région MENA a été de 0,9%, un niveau inférieur à celui de l'Afrique Subsaharienne. L'origine de ce retard dans la croissance dans la région MENA est le fossé en matière de gouvernance. En effet, les simulations montrent que si MENA avait pu atteindre une qualité moyenne d'administration du secteur public comparable à celle d'un groupe de pays performants de l'Asie du Sud-Est, ses taux de croissance auraient été plus élevés, de près d'un point de pourcentage par an.

Conscient de l'importance de la bonne gouvernance dans l'amélioration de l'environnement des affaires, de la compétitivité et de l'attractivité du

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[1] Laurent Clerc et Hubert Kempf (2006) : « Gouvernance et performances macroéconomiques », *Service d'études et de recherche sur la politique monétaire, Banque de France, 37p.*

[2] Banque Mondiale (2003): *Rapport sur le développement dans le monde*, Améliorer les institutions, la croissance et la qualité de vie, 316p.

pays, ainsi que de la gestion efficiente du capital humain, les autorités publics des pays émergents ont inscrit, un ensemble de réformes visant à lancer un nouvel souffle au développement du pays, à ouvrir des perspectives à l'implication des différents partenaires et composantes de la société et à lancer ainsi les bases d'un nouveau mode de gestion du développement.

La mesure de la qualité de la gouvernance est une tâche ardue. La Banque Mondiale en 2003 a élaboré un ensemble d'indicateurs permettant de juger de la qualité de plusieurs aspects de la gouvernance.

Aujourd'hui, les dimensions et les mesures de la gouvernance nous amenons à explorer l'idée de distinguer entre la gouvernance au niveau macroéconomique et la gouvernance au niveau microéconomique.

En terme macroéconomie, la gouvernance signifie « *les traditions et les institutions au travers desquelles s'exerce l'autorité dans un pays* » (*Kaufman, Kraay et Zoido-Lobaton, 1999 a* et *b*)[3]. Cette définition souligne que la mobilisation efficace des ressources, la formulation et l'application des politiques adéquates dépendent de la capacité des dirigeants. La gouvernance est qualifiée « bonne » ou « mauvaise », selon le mécanisme de coordination entre le gouvernement, le marché et la société civile. La bonne gouvernance se définit par la crédibilité basée sur la disponibilité et la transparence de l'information, la responsabilisation des pouvoirs publics et la participation à la prise de décisions pour la société collective. Au contraire, la mauvaise gouvernance s'exprime par le manque des règles de droit, l'existence de la corruption, l'asymétrie de l'information, etc.

En terme microéconomie, la « corporate governance » ou la gouvernance d'entreprise désigne « *l'ensemble des mécanismes organisationnels qui ont pour effet de délimiter les pouvoirs et d'influencer les décisions des dirigeants, autrement dit, qui « gouvernent » leur conduite et définissent leur espace discrétionnaire* » (*Charreaux, 1997, p.1*)[4]. D'après cette définition, la structure de propriété et les divers partenaires de l'entreprise jouent un rôle crucial dans la détermination du cadre et des règles organisationnels.

Cette distinction me semble difficile dans le sens où, la qualité de la gouvernance d'entreprise dépend de la qualité du système de gouvernance institutionnelle qui emporte dans le pays. Ainsi, la construction d'un indice global de gouvernance n'est pas facile puisque, au niveau macroéconomique, la gouvernance dépend des plusieurs variables qualitatives. En effet, la diversité des indicateurs s'explique par le caractère complexe et multidimensionnel de la gouvernance.

L'étude de *Kaufman et al.* fait appel au moins de 250 indicateurs pour mesurer la qualité des institutions dans un pays. Les informations collectées proviennent de vingt cinq sources différentes et sont produites par dix huit organisations internationales. Cette base de données couvre 199 pays pour les années 1996, 1998, 2000 et 2002. Chaque pays obtient un score qui varie entre -2,5 et +2,5. Une valeur plus élevée pour un pays donné à une date donnée correspond à une meilleure gouvernance.

Au total, dans l'étude de *Kaufman, Kraay et Mastruzzi (2003)*[5], l'indice global de gouvernance est calculé comme la moyenne des six mesures suivantes: la participation des citoyens et la responsabilisation; la stabilité politique et l'absence de violence; l'efficacité des pouvoirs publics; le poids de la réglementation; l'état de droit et l'absence de corruption.

- *La participation des citoyens et la responsabilisation (Voice and Accountability)*

Mesure la possibilité des citoyens d'un pays à participer et à choisir le gouvernement. Il est basé sur un certain nombre d'indicateurs mesurant différents aspects du processus politique, des libertés civiles et des droits humains et politiques;

- *La stabilité politique et l'absence de violence (Political Stability)*

Mesure la vraisemblance que le gouvernement en place soit déstabilisé ou renversé par des moyens anti-constitutionnel et/ou violents soit menacé par l'ordre public tel que le terrorisme ;

- *L'efficacité des pouvoirs publics (Government Effectiveness)*

Mesure les aspects liés à la qualité et la disponibilité du service publique, la bureaucratie, la compétence des fonctionnaires de l'Etat, l'indépendance de l'administration de la pression politique ainsi que la crédibilité et la transparence du gouvernement dans ses réformes, ses engagements et ses politiques adoptées;

- *Le poids de la réglementation (Regulatory Quality)*

Concentre sur les politiques elles-mêmes incluant des mesures de l'incidence des politiques anti-marché comme le contrôle des prix ou une supervision et surveillance bancaire inadéquate ainsi que la perception du blocage imposée par une régulation excessive dans des domaines telles que le commerce extérieur et le climat des affaires;

- *L'état de droit (Rule of Law)*

Inclut plusieurs indicateurs qui mesurent la confiance de citoyens dans le respect des lois et règles

[3] Kaufmann D., Kraay A. and Zoido-Lobaton P. (1999): «Institutions, and Growth», *World Bank Working Paper*, N° 2448. September 1, 1999.

[4] Charreaux G. (1997): « Le gouvernement des entreprises, Corporate Governance, théories et faits », Edition Economica.

[5] Kaufmann D., Kraay A., Mastruzzi M. (2003): «Governance Matters III. Governance Indicators for 1996- 2002», *World Bank Policy Research Working Paper*, n° 2772, Washington D.C.

de la société. Ceci inclut les perceptions de l'incidence des crimes, l'efficacité et la prévisibilité du système judiciaire, et l'applicabilité des contrats judiciaires;

- *L'absence de corruption*

Mesure l'étendu de la corruption, définie comme étant l'utilisation du pouvoir public pour des intérêts personnels et des profits privés en termes de richesse et gain corrompu.

Le phénomène de croissance a été développé par différentes théories économiques. Ces théories montrent l'importance de l'accumulation du capital physique dans le processus de développement. Elles se subdivisent en trois courants de pensée différents. Le premier courant inspiré de la théorie keynésienne, dont les principaux partisans *Domar (1946 et 1947)*[6] et *Harrod (1948)*[7]. Le second courant est apparu vers la moitié des années 50 prend l'appellation « néoclassique », était développé essentiellement par *Solow (1956)*[8]. Le troisième courant correspond à la théorie de croissance endogène suite aux travaux réalisés par *Romer (1986)*[9] et *Lucas (1988)*[10].

Après avoir cité les principales considérations théoriques prises par ces trois courants de pensée, notre objectif dans cette section consiste à évaluer si la libéralisation financière a ou non un effet sur la croissance économique à long terme. Nous utilisons un modèle empirique « standard » de croissance.

On organisera notre étude de la manière suivante. La section II présentera des modèles théoriques de la croissance économique; ensuite, la section III couvrira les méthodes économétriques théoriques et empiriques et spécifiera le modèle employé; la section IV présentera les résultats empiriques obtenus et enfin, la section V conclura l'étude.

II. Modélisation Empirique

Le modèle de Solow considère les taux d'investissement, la croissance de la population et le progrès technique comme exogènes. Les deux inputs, le capital et le travail sont rémunérés à leurs productivités marginales. Nous supposons une fonction de production Cobb- Douglas dont la production à l'instant (t) est donnée par :

$$Y_t = K_t^a \left[A_t L_t\right]^{1-a} \qquad \text{Avec } 0 < a < 1 \qquad (2\text{-}1)$$

Y : est le produit, K : le capital, L : le travail et A : le niveau de technologie. L et A sont supposés croître à des taux exogènes (n) et (g):

$$L_t = L_0 e^{nt} \qquad (2\text{-}2)$$

$$A_t = A_0 e^{gt} \qquad (2\text{-}3)$$

Le nombre d'unités de travail effectif $A_t L_t$ croit au taux (n+g). Le modèle suppose qu'une fraction constante (s) du produit est investit. Soit (k) le stock de capital par unité de travail $(k = \frac{K}{AL})$ et (y) le niveau de produit par unité de travail, il est donné par : $y = \frac{Y}{AL}$

L'évolution de K est telle que :

$$K_t^{'} = sy_t - (n+g+\delta)k_t$$

$$K_t^{'} = sk_t^a - (n+g+\delta)k_t \qquad (2\text{-}4)$$

Où δ est le taux de dépréciation. L'équation (2.4) implique que (k) converge vers une valeur stationnaire (k*) définie par $sk^{*a} = (n+g+\delta)k^*$ ou encore :

$$k^* = \left[\frac{s}{(n+g+\delta)}\right]^{\frac{1}{1-a}} \qquad (2\text{-}5)$$

A l'équilibre, le ratio capital - travail est positivement lié au taux d'investissement et négativement au taux de croissance de la population.

Les principales prédictions du modèle de Solow concernent l'impact de l'investissement et de la croissance de la population sur le revenu réel. En remplaçant (k) telle que dans l'équation (2.5) dans la fonction de production et en mettant sous forme logarithmique le revenu par tête on obtient :

$$Log\left(\frac{Y_t}{L_t}\right) = LogA_0 + gt + \left(\frac{a}{1-a}\right)Logs - \left(\frac{a}{1-a}\right)Log(n+g+\delta) \qquad (2\text{-}6)$$

La question essentielle est de savoir si les données sont en accord avec les prédictions du modèle de *Solow* concernant les déterminants du niveau de vie. Ainsi, *Solow* suppose que (g) et (s) sont constants entre les pays, avec (g) qui reflète le niveau d'avancement des connaissances qui n'est pas une spécificité des pays. Le terme (A_0) reflète non seulement la technologie, mais aussi les dotations en ressources, le climat, les institutions. Il sera donc différent entre les pays. (A_0) contient donc certains facteurs spécifiques à chaque pays.

[6] Domar E. (1946): «Capital Expansion, Role of Growth and Employment », *Econometrica,* Vol. 14, n°2, pp: 137-147.
Domar E. (1947): «Expansion and Employment», *American Economic Review,* n°37, pp: 34-35.

[7] Harrod R.F (1948): «Towards a Dynamic Economics», Macmillan, London.

[8] Solow RM. (1956): « A Contribution to theory of Growth », *Quaterly Journal of Economics*, Vol. (70), pp: 65-94.

[9] Romer P. (1986): « Increasing Returns and Long Run Growth», *Journal of Political Economy*, Vol. (94), October, pp: 1002-1037.

[10] Lucas R. (1988): « On the mechanics economics development», *Journal of Monetary Economics*, Vol. (22), July, pp: 3-42.

On suppose que $LogA_0 = \alpha + \varepsilon$

Avec (α) qui est une constante et (ε) est un choc spécifique à chaque pays. De cette façon, le logarithme de revenu par tête est :

$$Log(\frac{Y_t}{L_t}) = \alpha + gt + (\frac{a}{1-a})LogS - (\frac{a}{1-a})Log(n+g+\delta) + \varepsilon \qquad (2\text{-}7)$$

L'équation (5.7) est la spécification empirique de base dans le modèle de Solow. Il suppose que les taux d'investissement et de croissance de la population sont indépendants des facteurs spécifiques qui peuvent affecter la production. Dans ce cas, cette hypothèse implique que l'équation (2.7) peut être estimée par la méthode des moindres carrés ordinaires.

Pour obtenir le modèle généralisé, nous allons intégrer dans le modèle de base l'ensemble des facteurs pouvant affecter la croissance. L'équation (2.1) peut s'écrire :

$$Y_t = K_t^a H_t^b \left[A_t L_t\right]^{1-a-b} \qquad (2\text{-}8)$$

Où (H) représente le stock de capital humain, les autres variables étant définies comme dans l'équation (1.1). (L) et (A) croissent à des taux (n) et (g) tel que :

$$L_t = L_0 e^{nt} \qquad (2\text{-}9)$$

$$A_t = A_0 e^{(gt+X_q)} \qquad (2\text{-}10)$$

Où (X) est un vecteur de politique et autres facteurs pouvant affecter le niveau de la technologie et l'efficacité de l'économie. En outre, (q) représente le vecteur des coefficients relatifs à ces politiques et aux autres variables.

Soit (s_k) et (s_h) les fractions du revenu investis respectivement en capital physique et humain. L'évaluation de l'économie est déterminée par :

$$k_t^{'} = s_k y_t - (n+g+\delta)k_t \qquad (2\text{-}11)$$

$$h_t^{'} = s_h y_t - (n+g+\delta)h_t \qquad (2\text{-}12)$$

Où $y = \frac{Y}{AL}$, $k = \frac{K}{AL}$ et $h = \frac{H}{AL}$ sont les quantités par unités effectives de travail.

Il est supposé que la même fonction de production soit appliquée au capital humain, au capital physique et à la consommation. En outre, on suppose que le capital humain et le capital physique se déprécient au même taux(δ). .

Les équations (2.11) et (2.12) impliquent que l'économie converge vers un équilibre stationnaire défini par :

$$k^* = \left[\frac{s_k^{1-b} s_h^b}{n+g+\delta}\right]^{\frac{1}{1-a-b}} \qquad (2\text{-}13)$$

$$h^* = \left[\frac{s_k^a s_h^{1-a}}{n+g+\delta}\right]^{\frac{1}{1-a-b}} \qquad (2\text{-}14)$$

En remplaçant par les valeurs des équations (2.13) et (2.14) dans la fonction de production, en mettant sous forme logarithmique, et en posant $(a+b=x)$, nous obtenons le revenu par tête d'équilibre:

$$Log(\frac{Y_t}{L_t}) = LogA_0 + gt + X_q - (\frac{x}{1-x})Log(n+g+\delta) + (\frac{a}{1-x})Logs_k + (\frac{b}{1-x})Logs_h \qquad (2\text{-}15)$$

Les termes $\frac{x}{1-x}$, $\frac{a}{1-x}$ et $\frac{b}{1-x}$ sont les élasticités du revenu par tête respectivement par rapport à la croissance de la population, à la fraction du revenu investit dans le capital physique et à la fraction de revenu investit dans le capital humain. Ce modèle prédit que la somme des élasticités par rapport à (sk) et (sh) est égal à l'élasticité par rapport à $(n + g + \delta)$.

De même, le modèle de *Solow* prédit une convergence conditionnelle après contrôle des déterminants de l'équilibre stationnaire. De plus, ce modèle fait des prédictions quantitatives sur la vitesse de convergence. Ainsi, soit (y*) le revenu par tête découlant de l'équation (2-15), la vitesse de convergence est donnée par :

$$\frac{dLogy_t}{dt} = \lambda\left[Logy^* - Logy_t\right] \qquad (2\text{-}16)$$

Avec $\lambda = (n+g+\delta)(1-a-b)$ est la vitesse de convergence, y est le produit par tête actuel. L'équation (2-16) implique :

$$Logy_t = (1-e^{\lambda t})Logy^* + e^{\lambda t} Logy_0 \qquad (2\text{-}17)$$

En soustrayant ($logy_0$) dans les deux membres de l'équation (2-17) et en remplaçant (y*) on obtient :

$$Logy_t - Logy_0 = (1-e^{-\lambda t})\left[\frac{-x}{1-x}Log(n+g+\delta)+\frac{a}{1-x}Logs_k+\frac{b}{1-x}Logs_h+X_q-Logy_0+gt+LogA_0\right] \quad (2\text{-}18)$$

Avec t un indice temporel.

Ainsi, dés qu'on introduit l'indice temporel dans la modélisation, les travaux récents développés par *Berthélemy JC et Varoudakis A.*[11] *(1998)*, montrent que pour obtenir une explication empirique satisfaisante de la croissance réelle, il faut introduire des facteurs explicatifs autres que, simplement, la progression du travail et du capital humain et physique qui apparaissent dans le modèle néoclassique.

A cette fin, le prolongement de modèle de croissance de *Solow (1969)* nous permis de saisir les effets permanents de la gouvernance par le biais de leurs effets sur la productivité totale du facteur.

On considère deux fonctions de production (standard et modifiée) de type Cobb-Douglas avec des rendements d'échelle constants et un progrès technique neutre. Elles sont représentées par les équations (2.19) et (2.20) respectivement:

$$y_t = A_0 e^{gT} k_t^{\alpha} \quad (2\text{-}19)$$

$$y_t = A_0 e^{(g_0+g_1 GOUV_t)T} k_t^{\alpha_0+\alpha_1 GOUV_t} \quad (2\text{-}20)$$

GOUV : est une mesure de gouvernance.

III. Méthodes Économétriques

La majorité des travaux économétriques qui intéressaient aux phénomènes macroéconomiques se limitent à l'utilisation d'une analyse statique. Toutefois, l'attention des études récentes est portée sur le recours à une autre analyse dite « dynamique », pour comprendre les décisions des pays en termes d'instauration d'une politique financière, économique et institutionnelle. Bien que notre modélisation empirique prenne en compte plusieurs variables usuelles, il serait préalable de faire le recours à une analyse dynamique en données de panel. Comme les deux approches (statique et dynamique) sont complémentaires, il nous parait utile de les présenter pour choisir la méthode d'estimation la plus appropriée.

a) Méthode statique

Le modèle statique test l'hypothèse de convergence conditionnelle selon laquelle le niveau de développement est une variable aléatoire. L'estimation par la méthode de moindres carrés ordinaires (MCO) de toutes les données empilées suppose l'homogénéité des pays, ce qui peut conduire à des estimations biaisées. Les différences structurelles de niveau de la productivité entre les pays justifient la source d'hétérogénéité du modèle et par conséquent la non validité de l'hypothèse d'homogénéité. Par ailleurs, il nous parait important d'introduire des variables indicatrices temporelles pour contrôler les fluctuations macroéconomiques qui affectent tous les pays. L'économétrie de panel permet de contrôler l'hétérogénéité des observations dans leurs dimensions individuelles soit par la prise en compte d'un effet spécifique supposé certain (effets fixes) soit par la prise en compte d'un effet spécifique non observable (effets aléatoires). La dimension temporelle est prise en compte par l'introduction de variables muettes. L'estimation par effets fixes qui utilise les écarts aux moyennes individuelles élimine les différences persistantes entre les pays. Cette procédure privilégie la variabilité intra individuelle. En outre, elle présente également l'avantage de pouvoir identifier et mesurer des effets qui ne sont pas directement observables en coupe transversale ou en séries temporelles.

Toutefois, le modèle à effets fixes équivaut à introduire des variables muettes pour chaque individu et il est par conséquent coûteux en terme de degré de liberté (*Greene, 1993)*[12]. Le modèle à effets aléatoires suppose quant à lui l'indépendance entre le terme d'erreurs qui prend en compte l'effet spécifique et les variables explicatives. Deux tests sont donc critiqués pour valider la spécification du modèle. Un test de Chow permet de verifier l'existence d'un effet individuel (*Hsiao, 1986*) et un test de Hausman, permet de valider l'exogénéité de l'effet spécifique par rapport aux variables explicatives (*Hausman, 1978*)[13].

[11] Berthélemy J.C et Varoudakis A., (1998) : « Développement financier, Réformes financières et croissance : une approche en données de panel », *Revue Economique*, Vol. (49), n° 1, pp: 195-206.

[12] Greene W., (1993): «Econométrie», 5ième edition, Edition Française, PEARSON EDUCATION

[13] Hausman, J. (1978): « Specifications tests in econometrics», *Econometrica, Vol.* 46, pp. 1251-1271.

Le modèle statique se présente comme suit :

$$y_{i,t} = \alpha + \beta Z_{i,t} + \varepsilon_i + \gamma_t + e_{i,t} \quad (3\text{-}1)$$

$y_{i,t}$: La variable endogène, qui représente la croissance économique du pays i pour la période t.

$Z_{i,t}$: Le vecteur des variables exogènes.

εi : Effet spécifique permettant de contrôler les différences non observables, qui existent entre les pays.

γt : Effet temporel permettant de contrôler les chocs conjoncturels qui frappent les économies .

ei,t : Erreur aléatoire, identiquement indépendant distribution (iid) et suivant la loi normale d'espérance nulle et de variance σ^2.

Une des principaux problèmes qui peuvent se poser dans le cadre du modèle à effets fixes et à effets aléatoires sont les suivants :

– Pour le modèle à effets aléatoires, le problème provient de l'éventuelle corrélation entre les variables explicatives et les effets individuels α_i. Sur le plan économique, cette corrélation traduit l'influence des spécificités individuelles structurelles (a-temporelles) sur la détermination du niveau des variables explicatives.
– Pour le modèle à effets fixes, le problème provient de la disposition de variables spécifiques à chaque pays qui étaient constantes au cours du temps. C'est le cas de la variable de capital humain et de la variable PIB/tête. Effectuer une régression à effets fixes aurait conduit à sortir arbitrairement ces deux variables de l'ensemble des explicatives (*Bernard Eric, 2000, p 15*)[14].

b) Méthode dynamique

Le modèle dynamique se caractérise par la présence d'une ou de plusieurs variables endogènes retardées parmi les variables explicatives. Dans notre cas, il y a une seule variable endogène retardée.

$$y_{i,t} = \alpha y_{i,t-1} + \beta z_{i,t} + \omega_i + e_{i,t} \quad \forall i \in [1,N] \text{ et } t \in [1,T] \quad (3\text{-}2)$$

Avec $y_{i,t}$, la variable endogène ; $z_{i,t}$, les variables exogènes ; (α,β) les parameters d'estimation; ω_i l'hétérogénéité individuelle $\omega_i \xrightarrow{iid} N(0,\sigma_w^2)$ et $e_{i,t}$, le terme d'erreur $[e_{i,t} \xrightarrow{iid} N(0,\sigma_e^2)]$.

Cette approche à l'avantage par rapport aux données en coupe transversale utilisées dans les études précédentes, de tenir compte de deux effets : l'effet temporel des séries qui permet de contrôler les chocs conjoncturels frappant les économies et l'effet spécifique permettant de surveiller les différences non observables, qui existent entre les pays. De même, cette méthode peut être considérée comme le meilleur moyen pour répondre au phénomène de croissance car elle fournit des informations en dynamique pour un grand nombre de pays.

Nous évaluerons le modèle à l'aide de trois méthodes économétriques : la méthode des moindres carrés ordinaires (MCO) avec effets communs, la méthode « within » avec des effets spécifiques fixes par pays et la méthode des moindres carrés généralisés avec des effets spécifiques aléatoires. Pour tester l'existence des effets individuels, nous effectuerons le test de spécification proposé par Hsiao (1986)[15].

Le recours à l'approche en données de panel, nous amène à vérifier dans un premier temps le degré d'homogénéité ou d'hétérogénéité du processus générateur de données. Pour ce faire, il s'agit tout d'abord de tester l'égalité des coefficients du modèle étudié dans la dimension individuelle c'est-à-dire de vérifier que le modèle étudié est parfaitement identique pour tous les pays, ou au contraire que chaque pays de l'échantillon possède de spécificités particuliers.

Notre objectif est de préciser la nature de relation entre la croissance économique mesurée par le taux de croissance de PIB réel par tête et la gouvernance (GOV) avec l'introduction des variables du contrôle pour N pays émergents et sur une période de T vagues.

Soit $y_{i,t}$ le logarithme du PIB réel par tête, $GOV_{i,t}$ l'indice de gouvernance et $Z_{i,}$ le logarithme des variables du contrôle et que l'on suppose que notre fonction de production de type Cobb-Douglass, le modèle général s'écrit sous la forme :

$$y_{i,t} = \alpha_i + \beta_i GOV_{i,t} + \gamma_i Z_{i,t} + \varepsilon_{i,t} \quad \forall i \in [1,N], \forall t \in [1,N] \quad (3.3)$$

$$\text{Avec } \varepsilon_{i,t} \xrightarrow{iid} N(0,\delta_\varepsilon^2) \quad \forall t \in [1,N]$$

[14] Bernard E. (2000) : « Développement financier, politique monétaire et croissance économique : Validations empiriques en données de panel », *Laboratoire d'Economie à l'université d'Orléans*, Faculté de droit, d'Economie et de Gestion, 29p.

[15] Hsiao, C. (1986): Analysis of panel data. Cambridge University Press, Cambridge, England.

Sur le plan économique, le test de spécification consiste en premier lieu de préciser la possibilité de supposer une fonction de production totalement identique pour tous les pays (modèle pooled). Autrement dit, les élasticités de libéralisation financière et des variables du contrôle sont identiques pour tous les pays $(\beta_i = \beta, \gamma_i = \gamma)$, et la productivité technique des facteurs mesurée par les constantes α_i est identique pour tous les pays $(\alpha_i = \alpha)$. Le modèle s'écrit ainsi :

$$y_{i,t} = \alpha + \beta GOV_{i,t} + \gamma Z_{i,t} + \varepsilon_{i,t} \qquad (3.4)$$

Toutefois, l'utilisation des données agrégées rend la probabilité que la fonction de croissance soit strictement identique pour tous les pays étudiés est assez faible.

Si l'hypothèse d'homogénéité totale est rejetée, il convient alors de tester si les élasticités des différents facteurs sont identiques. Sinon, il n'existe à priori aucune structure de croissance commune entre les pays. Dans ce cas, le recours à l'approche en données de panel ne se justifie pas et peut même conduire à des estimations biaisées et par consequent nos estimations se font pays par pays.

Si on suppose qu'il existe une relation identique entre la croissance économique et les variables explicatives pour tous les pays, le problème d'hétérogénéité du modèle peut provenir des constants α_i. Or, rien ne garantit que les pays étudiés possèdent le meme niveau de productivité technique. Au contraire, certains facteurs structurels comme l'environnement économique, commercial, géographique et politique peuvent mener à des différences au niveau de la productivité entre les pays.

Il est préalable de tester l'hypothèse d'une constante commune à tous les pays. Si cette hypothèse est rejetée, le modèle retenu est un modèle avec effets individuels et prend la forme suivante :

$$y_{i,t} = \alpha_i + \beta GOV_{i,t} + \gamma Z_{i,t} + \varepsilon_{i,t} \qquad (3.5)$$

IV. Estimation GMM En Système : R. Blundell Et S. Bond (1998)

L'estimation que nous présentons ici correspond à l'estimation GMM en système de R. Blundell *et S. Bond (1998)*. Nous nous limitons aux résultats de cette estimation parce qu'elle permet d'éliminer de façon rigoureuse tout biais lié à l'hétérogénéité individuelle non observée et offre, par conséquent, une meilleure efficacité des résultats de l'estimation. Le tableau ci-dessous synthétise les principaux résultats des régressions effectués :

Tableau 4.1 : Estimation en GMM en système: Echantillon total

Variables	Estimateur de R. Blundell *et S. Bond* (deux étapes)
$LOGPIB_{i,t-1}$	-0.223 (-2.56)**
LOGINV	0.130 (3.75)***
LOGINF	-0.0037 (-1.71)*
LOGH	0.070 (0.96)
LOGOUV	0.013 (0.41)
ILF	-0.0626 (-2.94)***
LOGDEPPUB	-0.122 (-2.24)**
Gouvernance	0.0037 (0.60)
constante	-0.383 (-0.89)
AR(1)	-1.735
pvalue	0.0827
AR(2)	-1.3916
pvalue	0.1640
Sargan test	12.414
pvalue	1
Nombre d'ob.	285

*** significatif au seuil de 1% ** significatif au seuil de 5% et * significatif au seuil de 10%

Les valeurs entre parenthèses sont des t de Student

Ce tableau représente les régressions du taux de croissance économique sur la variable endogène retardée et les variables spécifiques à chaque pays. L'échantillon couvre 19 pays émergents sur une base de douze années consécutives minimum pendant la période 1990-2005. Logpibi,t est le logarithme du PIB réel par habitant. A partir de cette variable nous calculons la variable expliquée, à savoir le taux de croissance réel par habitant, en soustrayant le logarithme du PIB à l'instant (t-1) au logarithme du PIB $(\frac{FBCF + \Delta S}{PIB})$. Loginf est le logarithme du taux d'inflation mesuré par l'indice de prix à la consommation. (ILFi,t) est l'indice de libéralisation financière, cette variable est calculée dans le chapitre 3. Logouv comme *Berthélemy et Varoudakis (1998)* on utilise le logarithme de coefficient d'ouverture commerciale mesuré par le ratio $\left(\frac{\exp ortation + importation}{PIB}\right)$. (Logh) est le logarithme de stock de capital humain, cette donnée n'était pas disponible. Nous avons donc choisi à la place une variable approximative. Cette variable a été calculée en multipliant la population totale par (1-le ratio de la population inactive). Ce ratio correspond à la somme de la population de moins de 15 ans et de plus de 65 ans en pourcentage de la population totale. Cette variable ainsi calculée a été déjà utilisée par *Fry (1998)*[16] pour l'estimation de la fonction de croissance de dix pays asiatiques.

Les régressions sont menées avec l'estimateur *d'Arenallo et Bond 1991* qui utilise la méthode des moments généralisés (GMM).

Par ailleurs, les auteurs ont proposé le test de validité des instruments de Sargan. C'est un test de sur-identification des restrictions qui suit asymptotiquement une loi du à (p-k-1) degré de liberté.

Cependant lhypothése de la non autocorrélation des est essentielle pour que l'estimateur "GMM" soit efficace. *Arellano et Bond (1991)* ont proposé un test vérifiant l'absence de l'autocorrélation de premier et de second ordre AR(1) et AR(2) qui suivent asymptotiquement une loi *N(0,1).* Ainsi si la distribution est non autocorrélée, ce test donne une valeur des résidus différenciés négative et significative au premier ordre et non significative au second ordre.

Le tableau 4.1 regroupe les résultats des régressions pour l'échantillon dans sa totalité. Les résultats apparaissent concluants, les trois tests proposés (AR(1), AR(2) et Sargan) confirment la bonne spécification dynamique de la fonction de production des pays émergents de notre échantillon. En effet, les résultats du test de Hansen relèvent que les variables instrumentales sont valides, tandis que le test d'autocorrélation de second ordre d'Arellano et Bond indique une absence d'autocorrélation de second ordre.

Plusieurs interprétations et enseignements peuvent être tirés de ces estimations. Tout d'abord, le coefficient négatif et non significatif de la variable endogène retardée indique le non convergence des PIB de ces pays étudiés.

Les conclusions sont parfaitement cohérentes aux prédictions du modèle. Les coefficients des variables (LINV) et (LINFL) ont chacune le signe prévu et les deux sont fortement significatifs. En effet, l'investissement est considéré comme le moteur de la croissance économique. Pour le paramètre relatif à la variable inflation, il est fortement significatif et exerce un effet négatif sur la croissance. L'introduction du taux d'inflation comme variable explicative de la croissance est le concept de la répression financière. En effet, un taux d'inflation élevée caractérise des économies où la répression financière est forte, afin que le taux d'intérêt réel soit négatif réduisant le poids de la dette publique. Or, une forte inflation défavorise des investissements à long terme et exerce un effet pervers à la croissance. Cela se coïncide avec les différentes analyses théoriques qui considèrent l'inflation comme un facteur nuisible à la croissance économique.

Le paramètre relatif à la variable capital humain (LH), comme étant un facteur direct de croissance, est positif et statistiquement non significatif pour l'échantillon de l'ensemble de pays. Ce résultat suggère que la faible croissance peut être consécutive à un faible capital humain.

En revanche, le degré d'ouverture (LOUV) est doté du signe positif et non significatif, ce qui montre qu'une plus grande ouverture des économies a un effet conditionné sur la croissance. Ce résultat va à l'encontre de ce que précise la théorie à ce sujet. Dans la mesure où cet indicateur n'est pas optimal et n'est pas très robuste.

L'accroissement de la dépense publique LODDEPPUB) est donc une fraction de réduction significative de la croissance économique. Ce résultat est compatible avec celui de Barro (1997)17 et en contradiction avec d'autres travaux (Devarajan, Swaroop et Zou, 199618 ; Caselli, Esquivel et Lefort, 199619). De manière générale, la relation entre la dépense publique et la croissance économique est mitigée et controversée.

[16] Fry (1998): "Saving, Investment, Growth and Financial Distortions in Pacific Asia and other Developing Areas", *International Economic Journal*, volume 12, n°1, 1-25.

[17] Barro R. (1997): « Determinants of Economics Growth, MIT Press, Cambridge, Mass.

[18] Devarajan S., Swaroop V., ZOU H. (1996): The Composition of Public Expenditure and Economic Growth", Journal of Monetary Economics, Vol. 37, Avril 1996, pp: 318-344.

[19] Caselli F., Esquivel G., Lefort F. (1996): « Reopening the Convergence Debate: Anew Look at Cross-country Growth Empirics", Journal of Economic Growth, N°1, Septembre 1996, pp: 363-390.

Le résultat le plus important dans cette régression concerne la variable (ILF). Pour l'échantillon total de l'ensemble de pays cette variable prend un coefficient négatif et significatif au seuil de 1% et 10% comme le montre les régressions indiquées dans le tableau 4.1. Donc, la conclusion qu'on peut tirer à partir de ces estimations est que l'effet positif de la libéralisation financière est conditionné par l'existence d'un cadre institutionnel, un climat des affaires et un environnement macroéconomique capables de transformer les ressources disponibles en projets rentables. Ce résultat semble contradictoire avec les analyses de *Mac Kinnon* de l'impact positif de la libéralisation financière sur l'amélioration du produit dans les pays en développement. Dans le même contexte, l'effet total de la gouvernance sur la croissance est négligeable et non significatif ce qui prouve la fragilité des institutions.

Compte tenu des difficultés liées à la mise en oeuvre des politiques de libéralisation financière, et suite des coûts supplémentaires en termes des crises bancaires et financières, il serait utile de reconsidérer une nouvelle politique financière plus appropriée pour la croissance, qui se fonde sur les dotations institutionnelles.

Selon *Acemoglu (2003)*[20] *et Ball (1999)*[21], la réussite des politiques financières dépend de la qualité et le bon fonctionnement des institutions. Aussi, suite aux critiques théoriques adressées à la libéralisation financière, *Arestis et Steim (2005)*[22] suggèrent que l'échec de cette politique est notamment attaché à des problèmes institutionnels.

Les tentatives, aujourd'hui, d'enrichir ce travail précurseur d'étude du lien « finance-croissance » sont de retenir des variables institutionnelles (respect des contrats, respect des lois, indice de corruption, ethnique, bureaucratie et niveau de risque) dans nos régressions.

Le terme autorégressif (*PIBi,t-1*) est toujours négatif et significatif. Cela dénote le caractère persistant du processus de croissance. A notre surprise, il n'y a aucune variable qui ait une influence sur la croissance économique puisque aucune de ces variables considérées n'est significative, à l'exception de deux variables « *ethnique* » et « *contrat* » qui exercent un effet positif sur la croissance.

- Dans un premier modèle, nous avons introduit l' « *indice de corruption* », plus cet indice est élevé, plus le pays est corrompu. Cette variable est significative et par conséquent elle a un impact sur la dynamique de croissance de ces pays. Cela étant, les analyses de *Gnégné Y. (2009)* ont montré que « *L'effet final de la course pour la rente et de la corruption sur la croissance économique passe par le sous-investissement et les investissements non productifs. Il y a au moins trois raisons qui explique cela : premièrement, la course pour la rente détourne les ressources des investissements qui ont les meilleurs effets sociaux (Auty, 2001b) ; deuxièmement, la corruption réduit les profits et ainsi le montant de ressources qui financent de nouveaux biens, services et technologies (Romer, 1994) ; troisièmement, un environnement ou il règne la corruption est un environnement incertain* »[23].
- Dans le second modèle nous avons ajouté la variable institutionnelle « *loi* », cette variable mesure le degré d'application des lois pour chaque pays émergents, plus cet indice est grand, plus le respect des lois et leurs degré d'application est important. Dans notre cas, cette variable a un signe positif et légèrement petit, elle n'est pas significative. L'on peut noter, aussi, que l'ILF engendre un effet néfaste sur la croissance et augmente la probabilité d'émergence des crises bancaires et des fragilités financières.
- Dans le troisième modèle nous avons introduit la variable « *ethnique* », plus cet indice est élevé, plus les libertés civiles et l'autonomie de médias sont respectées. Le coefficient associé à cette variable est positif et statistiquement significatif au seuil de 5% donc elle a des avantages considérables pour la croissance économique. Ce résultat a été confirmé par Kpodar (2004) : « *la diversité ethnique compte pour environ 28% du différentiel de croissance entre l'Afrique et l'Asie* »[24] .Par contre, Easterly et Levine (1997)[25] montrent qu'un niveau élevé de diversité ethnique est corrélé à un faible niveau de développement financier, qui en retour entraine une faible croissance.
- Dans la quatrième régression nous avons ajouté la variable « *contrat* » qui consiste à honorer les contrats d'ordre économique et financier. Les résultats d'estimation montrent que cette variable à un effet positif sur la croissance et elle est statistiquement significative au seuil de 1%. Ainsi, les pays qui s'engagent à respecter les clauses des contrats et les honorer sont ceux qui vont connaître

[20] Acemoglu, D. and Zilibotti, F. (1997) : « Was Prometeus Unbound by Chance? Risk, Diversification and Growth», *Journal of Political Economy*, Vol 105, pp : 709-755.

[21] Ball R. (1999): « the institutional foundations of monetary commitment: A Comparative Analysis », World Development, Vol. 27, n°10 pp: 1821-1842.

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[23] Gnègnè Y. (2009) : « L'impact de l'épargne véritable sur la croissance à long terme: une analyse empirique », CERDI, CNRS-Université d'Auvergne, 24p. http://www.univ-orleans.fr/deg/masters /DOTE/Gnegne (Epargne ajustee+croissance).pdf

[24] Kpodar K. (2004) : « Le Développement financier et la Croissance: L'Afrique Subsaharienne est-elle Marginalisée ? », http://129.3.20.41 /eps/mac/papers/0502/0502016.pdf, 35p.

[25] Easterly W. And Levine R. (1997): « Africa's Growth tragedy: Policies and Ethnic Divisions», *Quarterly Journal of Economics,* Vol.112, pp: 1203-1250.

un taux de croissance élevé et durable. Plus important encore, ce résultat est très intéressant puisqu'il nous montre le rôle majeur de la réglementation concernant l'application des engagements et des clauses dans les contrats.

- Les deux dernières régressions cinq et six montrent que les variables « risque » et « bureaucratie » ont un rôle important dans l'explication de la croissance économique puisque ces deux variables sont significatives et elles ont un signe positif.

Tableau 4.2 : libéralisation financière, variables institutionnelles et croissance économique :

Echantillon total

Modèle	Blundell et Bond (1998) (deux étapes)					
Régression	**1**	**2**	**3**	**4**	**5**	**6**
Constante	-0.758	-0.373	-0.557	-0.531	-0.487	-0.619
	(-1.24)	(-0.73)	(-1.15)	(-0.70)	(-0.65)	(-0.97)
LOGPIB$_{i,t-1}$	-0.309	-0.127	-0.378	-0.221	-0.208	-0.224
	(-2.47)b	(-1.48)	(-2.91)a	(-3.18)a	(2.64)a	(-1.57)
LOGINV	0.149	0.096	0.158	0.128	0.128	0.104
	(3.92)a	(2.17)b	(3.66)a	(3.11)a	(3.31)a	(2.28)b
LOGINF	-0.004	-0.003	-0.004	-0.0011	-0.003	-0.003
	(-2.03)b	(-1.30)	(-1.44)	(-0.67)	(-1.34)	(-1.35)
LOGOUV	0.023	0.012	0.021	-0.016	0.015	0.008
	(0.73)	(0.36)	(0.71)	(-0.59)	(0.39)	(0.22)
LOGH	0.137	0.058	0.152	0.112	0.084	0.08
	(1.55)	(0.74)	(1.67)c	(0.86)	(0.70)	(0.90)
ILF	-0.055	-0.057	-0.066	-0.042	-0.063	-0.051
	(-2.78)a	(-3.21)a	(-2.79)a	(-2.84)a	(-3.39)a	(-2.67)a
LDEPPUB	-0.111	-0.069	-0.142	-0.114	-0.114	-0.04
	(-1.83)c	(-1.13)	(-2.84)a	(-1.81)c	(-1.80)c	(-0.61)
Corruption	0.012					
	(2.13)b					
Rule		0.0033				
		(1.48)				
Ethnic			-0.015			
			(-2.15)b			
Contrat				0.010		
				(2.95)a		
Risque					0.0038	
					(1.59)	
Bureaucratie						0.010
						(3.07)a
AR(1)	-1.2214	-2.0898	-1.4449	-1.8447	-1.7204	-1.7902
pvalue	0.2219	0.0366	0.1485	0.0651	0.0854	0.0734
AR(2)	-1.619	-0.6669	-3.3095	-1.6081	-1.307	-0.9402
pvalue	0.1055	0.5048	0.0009	0.1078	0.1912	0.3471
Sargan test	12.506	15.029	9.048	13.934	12.647	14.685
Pvalue	1	1	1	1	1	1
Nbre. d'obs.	285	285	285	285	285	285

V. Conclusion

Après avoir présenté un état d'art empirique englobant les principales études qui intéressent ce sujet. Nous avons conclu, parfois, une divergence au niveau des résultats obtenus. Cette divergence est due à la multitude des indicateurs de mesure du degré de la gouvernance. C'est pour cette raison que nous avons essayé dans le cadre de ce travail d'étudier empiriquement la relation entre la gouvernance et la croissance économique par l'utilisation des indicateurs de mesures adéquats. Pour ce faire, nous avons pris un échantillon de 19 pays émergents durant la période 1990-2005. Nous avons fait appel à des techniques en données de panel dynamique.

En guise de conclusion, il importe de mettre en évidence que la gouvernance et la croissance sont positivement corrélées et que le lien entre ces deux variables est statistiquement significatif. Ceci veut dire que la bonne gouvernance est vitale pour toute stratégie de croissance.

Les voies par lesquelles la bonne gouvernance favorise la croissance sont principalement au nombre de deux : elle contribue, d'une part, à l'accélération du rythme de l'investissement qui est nécessaire pour l'amélioration de la croissance et permet, d'autre part de renforcer les secteurs productifs pour faciliter l'accumulation du capital et la répartition de la richesse.

Dans ce cadre, les dimensions de la gouvernance qui nécessitent un développement prioritaire afin de renforcer l'efficacité de système productif sont d'une part, celles relatives à la promotion d'un cadre favorable aux investissements afin d'accélérer le rythme de la croissance économique et d'autre part, celles relatives à la mise en place d'un cadre réglementaire et institutionnel en mesure d'améliorer l'efficacité des politiques publiques en matière de développement et notamment celles orientés vers le renforcement des capacités de production.

Pour la mise en place d'un cadre favorable à la croissance, les réformes devraient porter sur le renforcement de la cohérence et de l'anticipation dans les actes de l'Etat, la mise en place d'un système fiscal incitatif, la mise en place d'une législation du travail flexible, la lutte contre la corruption, la réforme du système judicaire et la modification du régime foncier.

Toutefois, ces résultats varient selon la nature de la gouvernance « goods » ou « buds » et la catégorie du pays. En fait, la gouvernance a été la source de défaillance des secteurs financiers et réels et l'émergence de discrimination socio-économique dans les pays émergents, essentiellement, d'Afrique.

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- Main Text: Font size 10 with justified two columns section
- Two Column with Equal Column with of 3.38 and Gaping of .2
- First Character must be three lines Drop capped.
- Paragraph before Spacing of 1 pt and After of 0 pt.
- Line Spacing of 1 pt
- Large Images must be in One Column
- Numbering of First Main Headings (Heading 1) must be in Roman Letters, Capital Letter, and Font Size of 10.
- Numbering of Second Main Headings (Heading 2) must be in Alphabets, Italic, and Font Size of 10.

You can use your own standard format also.
Author Guidelines:

1. General,

2. Ethical Guidelines,

3. Submission of Manuscripts,

4. Manuscript's Category,

5. Structure and Format of Manuscript,

6. After Acceptance.

1. GENERAL

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Papers: These are reports of significant research (typically less than 7000 words equivalent, including tables, figures, references), and comprise:

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(b) A brief Summary, "Abstract" (less than 150 words) containing the major results and conclusions.

(c) Up to ten keywords, that precisely identifies the paper's subject, purpose, and focus.

(d) An Introduction, giving necessary background excluding subheadings; objectives must be clearly declared.

(e) Resources and techniques with sufficient complete experimental details (wherever possible by reference) to permit repetition; sources of information must be given and numerical methods must be specified by reference, unless non-standard.

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(g) Discussion should cover the implications and consequences, not just recapitulating the results; conclusions should be summarizing.

(h) Brief Acknowledgements.

(i) References in the proper form.

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Search engines for most searches, use Boolean searching, which is somewhat different from Internet searches. The Boolean search uses "operators," words (and, or, not, and near) that enable you to expand or narrow your affords. Tips for research paper while preparing research paper are very helpful guideline of research paper.

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Acknowledgements: Please make these as concise as possible.

References

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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.

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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.

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Key points to remember:

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- Please note the criterion for grading the final paper by peer-reviewers.

Final Points:

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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.

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· Present your points in sound order

· Use present tense to report well accepted

· Use past tense to describe specific results

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- To the point depiction of the research
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- Significant conclusions or questions that track from the research(es)

Approach:

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- 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.
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Approach:

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- 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.
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- 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.

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- 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.
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- 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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Introduction	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
Methods and Procedures	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
Result	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
Discussion	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
References	Complete and correct format, well organized	Beside the point, Incomplete	Wrong format and structuring

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