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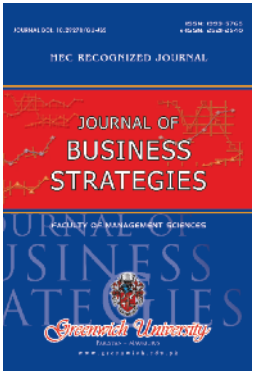

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NEXUS BETWEEN RISK MANAGEMENT AND PROJECT SUCCESS: AN EMPIRICAL EVIDENCE FROM ENGINEERING SECTOR OF PAKISTAN

Asad Ashfaq Lodhi, Dr. Rafique Ahmed Khan, and Dr. Sayma Zia

ABSTRACT

This paper aims at identifying various risk management techniques being adopted by the engineering consultancy sector of Pakistan and to examine their impact on project success. Five risk management(RM) practices including, risk identification, risk assessment, risk controlling, risk reporting and risk monitoring were chosen. Adopting the deductive approach, hypotheses were developed and a questionnaire survey was undertaken to record responses of the employees working in the engineering consultancy sector. The primary data were collected from 110 engineers and managerial level employees of the selected firms which were further analyzed through appropriate statistical tools with the help of software 'Statistical Package for Social Sciences (SPSS), version 23. As a result of the analysis, it was found that the impact of risk controlling, risk monitoring and risk reporting was significantly positive on project success. However, the impact of risk identification and risk assessment was not significant. This paper is likely to help engineering consultancy firms in understanding the impact of existing RM factors on project success and enable them to take remedial measures for improving the overall risk management system. Other organizations and academia may also benefit from the findings of this study.

Keywords: *Risk Management, Project Success, Risk identification, Risk assessment Risk controlling, Risk reporting &Risk monitoring*

INTRODUCTION

This paper focuses on various risk management techniques being practised in engineering consultancy sector of Pakistan and examines their impact on successful completion of projects. Risks are undoubtedly very

rapidly if not timely addressed. In the context of business organizations, risk management is an essential part of the managers' job. In today's fast-paced dynamic business environment, risk-taking and risk management have gained focused attention of the managers (Ahan, M., &Zwikael, O., 2011). Effective risk management is essential for the success of every project as it protects much-needed resources. Uncertain market conditions such as varying interest rate revised regulations and volatile socio-economic environment and most importantly rising turnover rate of managers are some of the salient risk factors. If they are not given due consideration at the beginning of a project, it leads to project failure (Coskun, 2012). A study by Park, Cha & Hyun, (2016)mentions that only 32% of the projects meet their objectives as far as cost, quality and schedule are concerned; the main cause for this low success rate is the absence of effective risk management framework. Although the issue of risk management has remained the focus of many researchers, there is still an extensive gap in the literature as well as the practical implementation of risk management is concerned. In the case of Pakistani firm, this gap is more prominent since risk management is not given due attention which leads to failure of projects and spoils image of the organization as well. An effective risk management system is therefore needed which allows an organization to recover its investment and profit without obstructing progress. Investors and lenders are more confident and are encouraged to spend an organization that has an effective risk management system in place(Junior & Carvalho, 2013).

Although project risk cannot be avoided, appropriate preparation to deal with risks by putting into practice risk management principles can significantly reduce losses and delays. As such, a proper structure to implement risk management practices can shield the organization from any threat that can hit during the project life cycle (Raz, Shenhar, & Dvir, 2002). Therefore, Risk management plays a crucial role in the effectiveness of an organization by recognizing, evaluating and forecasting the impact of risk; this allows minimizing the risk to get positive outcomes. Although it is evident that risk management is a significant and essential tool in project success, not enough has been done in this regard (Junior et al., 2014). The success of any project is usually estimated in terms of timely completion, low cost and meeting quality standards as per specifications (Mirzaa, M.N., *et al*. 2013). Hence minimizing wastages and re-work during a project cycle lead to timely and economically completion of a project which make the topic worth investigating.

In engineering consultancy sector, managing risk involves a wide area which requires heavy investment. Moreover, the rate of risk in this sector is comparatively higher than other sectors. Risk management in the engineering sector is implemented proactively to comprehend the possible future risks rather than being reactive. Engineering firms that are not properly dealing with risk management techniques are not getting project success because of risks that hit them during the project life cycle. When companies are not implementing appropriate RM practices, their projects get exposed to problems and are likely to get delayed and may also suffer in terms of high cost(Elkhalek, 2011). Che, X., and A. P. Liebenberg. (2017) have argued that although risk management is quite essential for successful completion of any project, it does require a heavy investment which may pose a real challenge to the project manager.

LITERATURE REVIEW

Significance of Project Success

Every project starts with some worthy idea coupled with a strong commitment to achieving intended outcomes through heavy investment and consistent efforts. In general, cost, schedule, quality, project specification and customer satisfaction are considered primary factors that may impact the overall success of the project (Mirzaa, Pourzolfaghar, & Shahnazari, 2013). Project success can be segregated based on short term and long term criteria. Short term criteria are based on delivering the project on time, within the desired cost and as per quality standards; these are estimated before the project ends. Long term criteria for project success are based on providing both noticeable and intangible benefits; these are estimated after the completion of the project (Sauter, 2009). Success can be estimated by finding out whether the project is completed as per specifications. Cost is also a successful element of the rare project success criteria which is very vital in overall project success (Mirzaa, M.N., *et al*. 2013). However, projects have often enough been delivered within time, cost, and quality still considered as failed projects (Ika, L. 2009). According to Ai, J., V. Bajtelsmit, and T. Wang. (2018), effective risk management leads to the completion of the project according to customer requirement and employee satisfaction.

Success is required in every part of life including investment areas and projects. Considering the high rate of projects that fail to meet project goals or desired outcomes, the factors that facilitate in achieving project

success are of great significance. These factors relate to positive outcomes by taking proactive measures to handle the effects of events that may cause project failure (Elkhalek, 2011). The elements that influence project success have to be recognized in the early phase of project however projects environment is dynamic therefore prompting factors to vary with their level of impact concerning time and situation. To cope up with these elements, stable and regular monitoring of these elements is required in an organization and wherever essential the project manager should empower and encourage concerned persons to raise the likelihood of achieving success criteria (Beleiu, *Crisan*, &Nistor 2015). Another important factor to ensure project success is maintaining a certain level of raw material and inventory for ensuring smooth supply of required items required for project completion. This is essential when a vendor is located at longer distance and delays are probable, reliability of timely delivery is low (Lukinskiy and Panova, 2017).

Risk Management

Risk is referred to as the possibility of something happening and the extent of occurrence of loss as a result of it, and loss may be felt directly or indirectly. Risk Management is the execution of a proactive approach to planning, lead, organize, and handle the wide variety of risks that are rushed into the dynamics of an organization. According to Ruchi Agarwal, Lev Virine (2019), a firm handling project is supposed to ensure risk management not only at the project (miro) level but at the corporate (macro) level as well. However, dynamics and complexity at either of the two levels may vary drastically. While specific operational risks are to be given priority at the micro-level project, risk must be aggregated to provide a holistic view at the macro level. As per findings of the research by Carvalho et al., (2013), management of risk comprises of the method to manage the probable risks through identification and analysis. The method leads to a decline in harmful effects and thereby creates an opportunity for the project team to add more value. Effective risk management approaches permit companies to recognize the project's strengths, weaknesses, opportunities and threats. Risk management encompasses clear consideration of risks in all decision-making methods with risk assessment fundamental to this by providing evidence-based data, this helps accomplish project goals. Risk assessment is intended to make decisions credible utilizing all available information (Fletcher, 2014). Although risk management is one of the main needs in project

management, it is identified that little has been done in this respect (Junior & Carvalho, 2013). Every project is different and includes some degree of improbability. Still, many organizations assume that all their projects will succeed, and usually fail to consider and examine likely project risks(Raz et al., 2002). To escalate the chances of proposed project success, it is necessary for the organization to have ample knowledge of potential risks, to analytically and quantitatively evaluate these risks, expect likely causes and effects, and then choose suitable methods of handling them (Kishk&Ukaga 2008). While business risks exist in large number, their consequences can be damaging; there are methods to protect against them, to avoid them and to reduce their damage when they hit. For effective RM, hiring a risk management consultant may be a viable cautious step (Davis, 2015).

Risk management plays a significant role in the accomplishment of project objectives, leading to overall project success (Khan & Ahmed, 2001). Risk management permits a balance to hit between taking risks and reducing them. Effective risk management can complement value to any organization. Specifically, companies working in the investment industry depend heavily on risk management as the base that permits them to withstand market crashes (Lamont, 2015). Following five components are considered essential for risk management framework:

- Risk identification
- Risk assessment
- Risk controlling
- Risk reporting
- Risk monitoring

Risk Identification

Risk identification approach determines risks which can avert the organization from attaining its objectives. It comprises of documenting and conveying the concern. Risk identification is the initial and most crucial step in the risk management process. The primary aim of risk identification is timely and continuous recognition of events that may occur during the project life cycle and cause undesired impacts on the team's capability to attain quality objectives (Mitre, 2007). Identification of risk is the initial phase of risk management as it creates the foundation for the next phases that are evaluation and risk control. Precise risk identification guarantees effectiveness in risk management. In case risk

management fails to identify all probable risks that challenge the success of the organization, then unidentified risks will become difficult to control. The lack of ability to identify risks that may give positive outcome is as inappropriate as unidentified risks that cause loss (Tchankova, 2002).

Risk identification is a correlative process. The team that looks after the project has to involve it in the risk identification process to create and retain the sense of ownership and responsibility for risk and its corrective actions. The risk identification procedure generally leads to qualitative risk analysis method. Sometimes only identification of risks recommends action to counter it and these should be documented for further evaluation and application in later stages of risk management (Ritter, 2013). Risk identification is also elaborated as a process which determines what might happen and when will it happen (Garrido, Cassia, Ruotolol, Miguel, Ribeiro & Naked, 2011). Arranging a risk identification session timely in a project, as part of the front end growth process will advance the project teams likelihoods of having a successful project (Schroeder, Alkemade & Lawrence, 2011).

Risk Assessment

The responsibility to assess and evaluate a wide area of risk-related information is usually the responsibility of many individuals and various functions throughout the organization. Risk assessment performs risk evaluation as part of a process and determines the level of risk and its implications. The risk assessment strategy is discussed in several national and international standards including ISO 31000 series. It states that risk assessment is a process which determines the risk, evaluates it and suggests suitable action. The initial step in risk assessment is usually to recognize the possible impacts, covering instant consequences to long term impacts. Although risks of low likelihood with a high consequence are quantitatively identical to the risks of high likelihood with the low consequence, latter risks are easier to handle and therefore our self-assurance in these risk forecast is mostly higher as we involve in these events (Gibbs &Browman, 2015).

Risk assessment is an element of decision analysis which reflects and analyzes uncertainties and risks. Outcomes of these analyses provide a recommendation to decision-makers (risk managers), who also reflect other information (Peterman, 2004). Risk assessment is the method of recognizing and ranking risks considering project objectives. The

assessment is vital as without an assessment, worthy policies and strategies cannot be designed which are the organization's critical assets. Risk assessment needs individuals either working class or management to take responsibility for the risk-management method (Gregg, 2005).

Risk Controlling

The modern approach to risk controlling is vital to handle and manage risks. The intuition behind is to transfer the allocation from risky assets to the financial market during unstable market eras and vice versa. This creates a statement of a negative correlation between the return and instability of equity markets, i.e. very unstable periods are more often related to negative returns (Fuss, Grabellus, Mager& 2012). Risk controlling also encompasses planning, mitigation, and monitoring of risk. Risk management plans must be created for each highlighted risk so that proactive action can be taken to handle it. Employing risk mitigation and risk controlling techniques, strategies are developed to minimize the chances or severity of a risk. Proper risk controlling leads to a situation where risks are either evaded or suitably resolved (Gibbs et al., 2015).

Risk avoidance is used when there is a severe possibility of loss in case a risk event occurs; the project team chooses to avoid the risk by taking alternate path or team chooses not to create a particular product or provide some specific feature that may cause high risk. In Risk protection, firm purchases insurance to overcome a financial loss that results in case of risk event occurs. Risk controlling and risk mitigation activities are often accompanied by a high cost. Project managers should thoroughly evaluate the possible risks to ensure that cost incurred in controlling risks does not exceed the benefits achieved by the measures taken to manage the risks (Williams, 2014).

Risk Reporting

In the last few years, interest in risk reporting has raised internationally. Increase in corporate crises contributes to the demand for risk reporting to provide investors with timely caution of possible negative events. Normally, risk reports notify about the consequences and opportunities of risks that may hit a firm's future economic position. National and international regulators and standards-setter organizations report on their risk. There is ever-rising need for risk reporting and organizations are now expected to report possible risks likely to develop in their projects as well as those risks surrounding them (Mellet& Mokhtar, 2013).

Risk reporting can be considered a source of information that plays a vital role in decision making. Risk management defines risk reporting in two major ways. First, the risk management system offers relevant data for external reporting. Shortfalls in identification and evaluation phase directly damage the content of risk reporting. Furthermore, dynamic corporate risk handling has to be considered because it alters the concerning distribution. As risk management is a constant process, all stages of corporate risk management are at least indirectly interconnected to risk reporting. Second, risk reporting is utilized as an approach to handle risk (Dobler, 2005). Timely reporting of the possible risks leads to enhanced risk management practices and also reflects the effectiveness of the project managers in risk handling (Marzouk, 2016). The most significant potential advantage is a decrease in the cost of capital that is, if risks are revealed through risk reporting, sponsors of capital may take out a part of the premium that is invested to cover for uncertainty concerning the organization's risk position (Linsley& Shrives, 2006). According to Alexander Bohnert, Nadine Gatzert, Robert E. Hoyt & Philipp Lechner (2018), firms with a highly developed RM tend to be larger and exhibit lower financial leverage as compared to the companies with a less developed risk management system. The study further states that risk reporting is an important segment of risk management, without which project success remains questionable.

Risk Monitoring

Risk monitoring involves integrated and on-site monitoring of source records; these are complementary actions through which certain quality and reliability in information can be achieved. Risk monitoring offers a few practices that play a vital role in meeting quality objectives (Mitchel, 2013). The critical monitoring which is considered key to the success of risk-based monitoring constantly recognizes problems right from the beginning and offers a basis for a prompt response to evolving matters. This type of monitoring is so consistent that participants of the project team apply several checks every day (Rosenberg, 2014).

All possible risks should be periodically reviewed and critically evaluated by the project team to determine whether changing the environment shall be matched with the RM measures. At every periodic evaluation, all new likely risks should be added in the existing list and the ones no more likely may be excluded. This shall help in setting priority to manage risks after every interval and keep the risks up to date. This shall

also help in a reprioritization of risk handling. Indeed, risk monitoring is a continuous, on-going process initiated by the project teams during various stages of life-cycle of a project. Project team participants and stakeholders are always cautious in observing risk indicators (Balakian, 2010).

Theoretical Framework

The theoretical framework has been developed based on identified variables as depicted in figure-1.

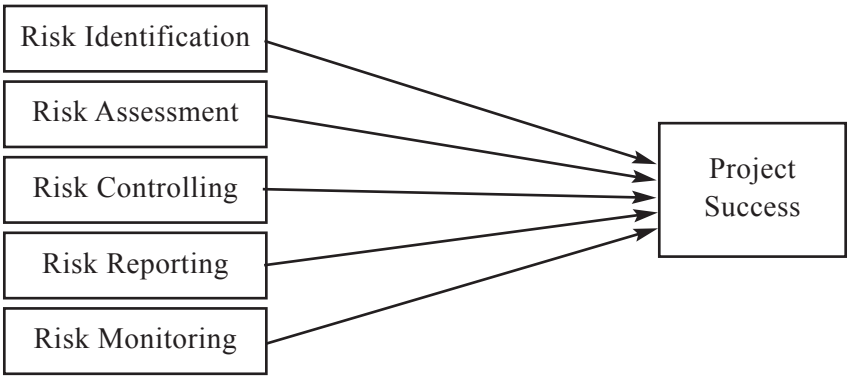

Figure-1: Theoretical Framework

Research Hypotheses

Based on research variables, the following five hypotheses were formulated for later testing through statistical tools:

H_1: Risk identification has a positive impact on project success.
H_2: Risk assessment has a positive impact on project success.
H_3: Risk control has a positive impact on project success.
H_4: Risk reporting has a positive impact on project success.
H_5: Risk monitoring has a positive impact on project success.

METHODOLOGY

The study is explanatory, based on primary quantitative data. Following a deductive approach, hypotheses were formulated based on research variables. The unit of analysis for the study refers to the engineering consultancy firms. The study population included 310 engineers of different disciplines of two engineering firms (EnarPetrotech and Descon). A sample of 110 engineers and managerial level employees of the two firms was approached through a convenience sampling technique for data collection.

Research instrument for the study was a self-developed questionnaire whose validity was checked through pilot testing. For developing a questionnaire, a step by step approach was adopted, keeping in mind the kind of information to be collected and type of questions for seeking such information. Length of the questionnaire was restricted according to the questions and protection of respondents' privacy was ensured. The questionnaire was developed (Likert scale of 1-5; 1 denoting strongly disagree and 5 denoting strongly agree) which was distributed to 20 managers for pilot testing and results were quite encouraging (Saunders, Lewis & Thornhill, 2012). Few minor changes were made in the questionnaire as a result of feedback through pilot testing. Data were treated through statistical toolRegression on SPSS V-23 software.

ANALYSIS

Respondents' Profile

Basic information about the respondents is projected in table 1 to 6.

Table 1. Gender-based statistics

		Frequency	Per cent	Valid Percent	Cumulative Percent
Valid	Female	15	13.2	13.4	13.4
	Male	94	86.1	86.6	100.0
	Total	109	99.3	100.0	
Missing		1	.9		
Total		110	100.0		

As given in Table 1, the total number of respondents who participated in the survey was 110, out of which 94 were male employees whereas only 15 were females. Hence, overall a good number of both genders took part in the survey.

Table 2. Organization based statistics

		Frequency	Per cent	Valid Percent	Cumulative Percent
Valid	Enar Petrotech	50	45.5	46.7	46.7
	Descon	57	51.8	53.3	100.0
	Total	107	97.3	100.0	
Missing		3	2.7		
Total		110	100.0		

As depicted in table 2, a total number of respondents who took part in the survey was 110 out of which 50 were from EnarPetrotech and 57 were from Descon while 3 respondents didn't mention their working organization.

Table 3. Age-based statistics

		Frequency	Per cent	Valid Percent	Cumulative Percent
Valid	**20- 30**	72	65.5	65.5	65.5
	30- 40	32	29.1	29.1	94.5
	>40	6	5.5	5.5	100.0
	Total	110	100.0	100.0	

As mentioned in table 3, among 110 respondents that participated in the survey belonging to various age groups, 72 respondents fall in the age of 20-30 years whereas 32 belonged to age group 30-40. Moreover, six respondents are having more than 40 years of age. It shows that the responses for the study were gathered form a mature age group of respondents and are supposed to have a healthy contribution.

Table 4. Education-based statistics

		Frequency	Per cent	Valid Percent	Cumulative Percent
Valid	**Undergraduate**	4	3.6	3.7	3.7
	Graduate	64	58.2	58.7	62.4
	Master	38	34.5	34.9	97.2
	PhD.	3	2.7	2.8	100.0
	Total	109	99.1	100.0	
Missing		1	.9		
Total		110	100.0		

Table 4 shows that in among 110 respondents, the maximum of the respondents were graduates and master's degree holders. This level of education in Pakistan is considered to be highly regarded and well-matured level of education. People having this level of education usually easily understand and interpret English as a language therefore the responses received from them are supposed to have more validity.

Table 5. Tenure based statistics

		Frequency	Per cent	Valid Percent	Cumulative Percent
Valid	**1-10**	88	80.0	80.7	80.7
	11-15	17	15.5	15.6	96.3
	16-20	2	1.8	1.8	98.2
	21-25	1	.9	.9	99.1
	26-30	1	.9	.9	100.0
	Total	109	99.1	100.0	
Missing		1	.9		
Total		110	100.0		

As mentioned in table 5, the majority of respondents were having one to fifteen years of work experience with the same organization and were well informed about the practices of risk management used in that organization. The question about tenure is inquired as respondents having practical work experience are in a better position to highlight the actual situation in the engineering firm.

Table 6. Number of projects based statistics

		Frequency	Per cent	Valid Percent	Cumulative Percent
Valid	**Below 3**	42	38.2	38.8	38.8
	3 -5	37	33.6	34.3	73.1
	5 -10	19	17.3	17.6	90.7
	Above 10	10	9.1	9.3	100.0
	Total	108	98.2	100.0	
Missing		2	1.8		
Total		110	100.0		

Table 6indicates average number of projects respondents are exposed to. Maximum numbers of respondents in engineering firms handle up to five number of project annually.

Test of Reliability

Reliability of scales in this research study is examined using reliability test Cronbach's Alpha. The details for the test of reliability 'Cronbach's Alpha' are mentioned in the tables below:

Table 7. Reliability of Scales

Variable	Cronbach's Alpha	No. of Items
Risk Identification	0.863	4
Risk Assessment	0.839	4
Risk Controlling	0.769	4
Risk Reporting	0.837	4
Risk Monitoring	0.859	3
Project Success	0.905	5

Reliability of constructs was checked using Cronbach's alpha. Values of Cronbach's alpha are depicted in table 7. Generally, the reliability is acceptable when the value of the alpha is 0.7 and above (Sekaran, 2003). In the current case, all the values are above the essential limit which means data is highly reliable.

Regression Analysis

Regression analysis is a process for measuring the effect of independent variables on the dependent variable.

Values of this analysis are displayed in Table 8 (model summary) and table 9 (Coefficients).

Table 8. Model Summary

Regression Analysis				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.912[a]	.832	.824	.31778

a. Predictors: (Constant), RM, RI, RR, RA, RC

The value of R Square in Table 8 is 0.832; it indicates the estimates of the proportion of variance in the project success as accounted for by the five independent variables namely, Risk Identification, Risk Assessment, Risk Controlling, Risk Monitoring and Risk Reporting. We can say that five independent variables explain 83% variation in the project success.

Table 9. Coefficients

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	.196	.165		1.186	.238
RI	.007	.060	.008	.117	.907
RA	.055	.076	.060	.732	.466
RC	.396	.092	.386	4.321	.000
RR	.239	.082	.247	2.903	.005
RM	.253	.066	.283	3.830	.000

a. Dependent Variable: PS

Looking at the beta values and their significance values in table 9, it is evident that the most important factor influencing project success is risk controlling (beta = 0.396, Sig = 0.000) followed by risk monitoring (beta = 0.253, Sig = 0.000) and risk reporting (beta = 0.239, Sig = 0.005).These three factors contribute positively and significantly towards project success in engineering firms of Pakistan. Whereas the other two factors i.e.risk identification (beta = 0.007, Sig = 0.907) and risk assessment (beta = 0.055, Sig = 0.466) are not significant since sig value is > .000.

In the light of the regression results, it is evident that hypothesis 3, 4 and 5 are accepted by the statistical analysis whereas hypothesis 1 and 2 have been rejected.

DISCUSSION

The values of the first two independent variables, i.e. risk

identification, risk assessment indicate that although the impact of these two variables is positive on project success but the same is not significant. Hence, hypothesis 1 & 2 stand rejected. However, remaining three variables i.e. Risk Controlling, Risk Reporting and Risk Monitoring, have a positive significant impact on project success; hence hypotheses 3, 4 & 5 are accepted. Findings of this paper indicate that risk identification and risk assessment are not contributing to project success despite being very salient factors. Therefore it is necessary for organizations to further identify the reasons for this anomaly. As far as remaining three factors are concerned, although their contribution towards project success is quite significant but beta values are not so encouraging and there is a need to seriously look into the reasons for low scores. Organizational culture could be a contributing factor in below-expected results. If organizational culture is such that all likely risks are reported, documented and monitored, there would be a tendency to cause less harm to project goals. Risk monitoring and risk reporting provide a healthy contribution to project success as it is a good source of proactive strategy that needs to be initiated to handle risks. The findings of this paper support similar empirical findings from previous researches of Schroeder and Kishk (2011). Thus the research findings attained are coherent with the existing literature, tested over a wide range of industrial sector and in varying contexts. Findings of the study are important for the engineering consultancy firms since these help in ascertaining the effectiveness of the risk management practices and also indicated areas where further improvements are required. The engineering firms may continuously monitor the effectiveness of existing risk management practices for ensuring that desired results in terms of time, cost and quality standards are reaped.

CONCLUSION

The main focus of this paper was to identify various risk management techniques considered essential to ensure project success, in the context of engineering sector of Pakistan and then examining their impact of project success. Five factors considered quite common to risk management include, risk identification, risk assessment, risk reporting, risk monitoring and risk controlling. Out of these, risk controlling, risk reporting and risk monitoring have been found contributing to the project success significantly whereas, risk identification, risk assessment is not contributing towards project success. As such, there is a need to find out reasons for weak risk management practices in the engineering sector. For

consistent success in all projects, continuous monitoring at all stages of the project would be required by the expert engineers to make ensure that implementation of risk management practices is done as per standard laid down procedure. The study has added value in the existing literature, especially in the context of Pakistani engineering firms.

RECOMMENDATIONS

Based on findings, some measures are recommended to the engineering sector intending to further improve the existing risk management system:

- Risk identification needs to be paid special attention to find out the reasons for its weak application in the engineering sector.
- Risk assessment should also be suitably addressed to ensure that it is properly done to ensure project success.
- During each phase of the project life cycle, employees should be encouraged to report any risk they may be facing and also to provide management sincere feedback.
- Employees should be provided with training sessions and workshop related to risk management for enhancing their skills to identify and counter risks.
- Regular meetings shall be conducted among management and employees to discuss ongoing risks and strategies to handle them.

SUGGESTIONS FOR FUTURE RESEARCH

This paper has identified only five risk management factors and examined their impact on successful completion of a project. Moreover, this study has merely focused on engineering sector of Pakistan and it has not separately focused on risk management practices during each phase of the project. As such, any future research may be undertaken to evaluate the mechanisms in greater depth and formulate necessary principles for developing and implementing risk management techniques in each phase of the project. Future researchers may also study the impact of an organizational culture of risk management success. A comparative study may also be undertaken to examine the effectiveness of risk management practices among local and foreign engineering sectors. Future scholars may conduct similar research on other industries of Pakistan.

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MEDIATION EFFECT OF INFORMATION TECHNOLOGY BETWEEN SUPPLY CHAIN MANAGEMENT CAPABILITIES AND BUSINESS PERFORMANCE

Anwar Pasha and Dr. Asim

ABSTRACT

Information Technology is the core component of business processes 21st century and Pakistani firms have utilized varied aspects of information technology, both advantageously and operationally. Therefore, this quantitative study attempts to determine the mediating relationship of information technology between supply chain management capabilities and business performance. The results indicates that there is a positive relationship between supply chain management capabilities and business performance and information technology significantly mediates the relationship between the independent variable supply chain management and dependent variable business performance.

Keywords: *Information Technology, Business Performance, Supply Chain Capabilities*

INTRODUCTION

The supply chain encompasses all the companies involved in the production process - upstream and downstream - from raw material supply to the last consumer (Slack, Chambers, & Johnston, 2009; Pires, 2016); Therefore, its management consists of a set of methods to better integrate and manage its parameters, such as transportation, inventory and costs (Christopher, 1997). As a result, companies operating in it, seek to add value to the product at lower costs and improve long-term performance, both individually and within the chain as a whole (Min &Mentzer, 2004). According to Chopra and Meindl (2011), information is paramount for the knowledge of the global scope of the chain; Information systems therefore provide the tools necessary for better decision making in supply chain management (Corrêa, Gianesi, & Caon, 2010). According to Peng, Schroeder andShah (2011), competitive performance in technological capabilities can be conceived as an advantage assessed in terms of cost, quality, and flexibility and delivery performance.

These characteristics, coupled with human resources, laboratories and state-of-the-art equipment, exchanges between agents involved in the supply chain and less bureaucratic institutional arrangements that encourage the development of technological innovations and organizational performance, define the so-called technological poles (Institute of Studies for Industrial Development, 2014).

These industrial environments have demonstrated efficiency in the transfer of knowledge from science and technology institutions to the business sector, qualifying and generating companies whose focus is to add technology and innovation in their products, processes and services. In Pakistan, the technology centers have already generated more than 30,000 jobs, distributed among research institutes, managing institutes of their own structures and private initiative (Ministry of Science, Technology and Innovation, 2014).

OBJECTIVE

The objective of the study is to determine the mediating relationship of information technology between supply chain management capabilities and business performance.

LITERATURE REVIEW

Regarding the theoretical and empirical ones, it was identified the need for a macro view on IT and an adaptation of this theme to the context of the national technological poles from the perspective of the SC; we sought to fill a gap of methodological knowledge in the relationship between the constructs addressed.

The use of information systems makes collaboration between supply chain partners easier (Chen, Papazafeiropoulou, & Wu, 2012), with integrated management that improves services and suppresses costs, providing a good supplier-company relationship. -customer (Hong &Jeong, 2006). This integration facilitates the development of strategies with partners, enabling companies, for example, to anticipate, with the help of suppliers, the dynamic needs of customers (Flynn et al., 2010). Peng, Jing, Zhang and Dubinsky (2016) argue that companies should be concerned with SCM, coordination and optimization to improve competitive performance, and for this information systems help companies in more complex operations and that They require faster resolutions and, backed by technological capabilities, help improve business processes,

with accurate information that is easily accessible to other departments and companies in the chain (Modgil& Sharma, 2017). CapT-SI integration is required for GCS integration, producing accurate information that improves business and supply chain efficiency and productivity, and hence customer satisfaction, and ultimately business performance (Budiarto, Prabowo, &Herawan, 2017).

Peng J. et al., (2016); Budiarto et al., (2017); Modgil& Sharma, (2017), investigated that the IT - in particular the integration between Chain links via information systems and R&D investments in new product and process technologies - are among the determining variables in the mediation relationship between companies' supply chain and development, particularly in terms of quality (design, product and design compliance introducing new products and design flexibility to meet specific customer needs.

HYPOTHESIS

On the basis of literature review and objective of the study, we have developed the following hypothesis.

H_1 Supply chain management does not influence business process management.

H_2 Technology and information systems don't mediate the relationship between supply chain management and business process management.

H_3 Supply chain management doesn't influences capabilities in information technology and systems.

METHOD

It's a quantitative research and the primary data we have collected through structured questionnaire from graduates of different institutes. A survey questionnaire for the study was adapted from Peng, Quan, Zhang& Dubinsky (2016). The items of the questionnaire are all closed ended. The data was collected from 347 respondents, 180 were female and 162 were male. While the data for literature review is obtained from research journals, papers and articles.

RESULTS

The demographics data included gender, age, occupation and monthly income. Out of 347 respondents, 180 were female and 162 were male. The majority of the respondents were supervisors (228) while rests are project managers (56), middle level management (48) and top management (10).

The age of the respondents were mainly lying between 30 to 49 years (241) while least in age of 50+ having frequency of 7. The highest range of the monthly income falls between Rs.50, 000 to 100,000 (159) followed by Rs.100, 001 to 150,000 (96).

Demographic Profile

		Freq	Per	Valid Per	Cum Per
Gender	**Male**	162	47.6	47.6	47.6
	Female	180	52.4	52.4	100
	Total	**342**	**100**	**100**	
Age	**Under 19**	11	3.2	3.2	3.2
	20-29	83	23.9	23.9	27.1
	30-39	125	36.6	36.6	63.7
	40-49	116	34.3	34.3	98
	50+	7	2	2	100
	Total	**342**	**100**	**100**	
Monthly Salary	**<50,000**	85	24.8	24.8	24.8
	50,000-100,000	159	46.7	46.7	71.5
	100,001-150,000	96	28	28	99.4
	150,000>	2	0.6	0.6	100
	Total	**342**	**100**	**100**	
Management Level	**Top Management**	10	2.9	2.9	2.9
	Middle Level Management	48	14.1	14.1	17
	Project Managers	56	16.4	16.4	33.4
	Supervisors	228	66.6	66.4	100
	Total	**342**	**100**	**100**	

Descriptive Statistics

Descriptive Statistics

	N	M	S.D	Skew		Kurt	
	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
BPM	342	3.7560	.67566	-.626	.131	.269	.261
SCP	342	3.4313	.79579	-.381	.131	.065	.261
IT	342	3.4157	.74463	-.182	.131	-.337	.261
Valid N (listwise)	342						

Above mentioned table shows that the maximum skewness belongs to variable of delivery quality i.e. -.172(Mean=3.355, S.D=.753) and the minimum skewness belongs to variable of BPM i.e. -.626 (Mean=3.75, S.D=.675). SCP and IT have positive kurtosis while others have negative kurtosis. As all constructs lie within the range of skewness and kurtosis, i.e. ±3.5 therefore it can be believed that the data has a normal tendency.

Reliability
Fig 4.3.

Constructs	Cronbach's Alpha	Number of Item
BP	0.721	6
SCM	0.573	3
IT	0.626	4
Overall	**0.849**	**6**

The above mentioned table is reliability of all constructs used in this study. According to Hinton, Brownlow, McMurray, and Cozens (2004), Cronbach's alpha value above 0.75 is considered as high reliability while 0.5 to 0.75 signifies moderate reliability. The overall reliability of the complete instrument used in this study is 0.849. The highest reliability is of business process management (0.721) and the lowest is of SCM (0.573).

Inferential Analysis
SCM

MODEL SUMMARY

Model	R	R Square	Adjusted R Square
1	.537 [a]	.289	.287

ANOVA

Model	Sum of Squares	Df	Mean Square	F	Sig.
Regression	65.905	1	65.905	139.983	.000[b]
Residual	162.429	345	.471		
Total	228.334	346			

a. Dependent Variable: BP
b. Predictors: (Constant), SCM,IT

Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	.960	.208		4.608	.000
SCM	.646	.055	.537	11.831	.000

a. Dependent Variable: BP

The Regression analysis results from the above model signifies that the predictor SCM has an association with business performance and explain 29% of the variance (.289, f=139.983, p<.05), which according to **Cohen (1988)** is a slightly moderate effect large effect.

IT

Fig 4.4.2. Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.520[a]	.270	.268	.69510

ANOVA[a]

Model	Sum of Squares	Df	Mean Square	F	Sig.
Regression	61.641	1	61.641	127.576	.000[b]
Residual	166.693	345	.483		
Total	228.334	346			

a. Dependent Variable: BP

b. Predictors: (Constant), IT

Coefficients[a]

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	1.450	.175		8.266	.000
IT	.567	.050	.520	11.295	.000

a. Dependent Variable: BP

The Regression analysis results from the above model signifies that the predictor IT has an association with business performance and explain 27% of the variance (.270, IT=127.576, p<.05), which according to **Cohen (1988)** is a slightly moderate effect large effect.

Mediating Effect of IT

Model = 7
Y = BP
X = SCM
M = IT

********** INDEX OF MODERATED MEDIATION **********

Mediator

Fig 4.4.5.

	Index	SE (Boot)	BootLLCI	BootULCI
IT	.0000	.0065	-.0144	.0144

The above model where run on sample size of 342 taking the Independent variable of Supply Chain (X), with the dependent variable of business performance (Y). The mediatorhere is IT (M). The result of direct effect of X on Y here indicates the sig value of 0.0001 which is less than

the 0.05 value. The index of moderated mediation value here for bootstrap of confidence interval are -0.0144 (LLCI) and 0.0144(ULCI).

SUMMARY OF HYPOTHESIS

S.No.	Hypothesis	Decision
H_1	Supply chain management does not influence business process management.	Rejected
H_2	Technology and information systems don't mediate the relationship between supply chain management and business process management.	Rejected
H_3	Supply chain management doesn't influences capabilities in information technology and systems.	Rejected

CONCLUSION

Supplier-business-customer interactions increasingly depend on fast and effective internet communication. By utilizing information systems for integration between internal sectors, companies invest in new product and process technologies to improve their competitive performance indicators. In the national context, technology cluster companies attribute to these indicator variables such as compliance with the technical specifications of the project, high quality in design and finishing, introduction of new products to the market and ability to customize product designs to meet specific customer needs. .

The hypotheses formulated demonstrate that SCM relates to both competitive performance and capabilities in technology and information systems. These strategies, executed through partnerships at supply chain, consist of actions aimed at adapting new technologies in products and processes, promotional event planning, market forecasting, inventory management, product variety and joint problem solving, providing companies with higher quality, thus increasing their competitive performance. The qualitative and quantitative steps of this study demonstrated the importance of investments in high quality and speed in production and skilled labor to act in innovation processes, corroborating the hypothesis that IT fully intermediate the business performance. It is also noteworthy that companies from Pakistanian technology centers can invest even more in technological capabilities of manufacturing, marketing and strategic planning. Nevertheless, it is worth stressing the limitations of the research, which included the sample size, data collection by accessibility and the studied period, cross-sectional. Finally, it is recommended for future research: a) to develop a computational model that uses different simulation rounds, in order to evaluate the effect of

changes in control variables; b) enlarge the sample and compare the results with those of technological centers in other countries; and c) develop ITmediation scenarios with, for example, the use of scanning or saving methods.

The utilization of IT in Pakistani business process can be a shift Pakistani market from traditional systems of production to a system that will be more responsive to the needs and demands of the customers **(Chandrashekar & Schary,1999**). The effective application of information technology can bring speed and flexibility in supply chain system of Pakistani firms. Moreover, the information about the effectiveness of IT will allow supplier to organize inventories of vendors and distributors, allow managers to manage stock system and make entire supply chain responsive to the needs of consumer market.

LIMITATIONS

The data collected has reduced generalizability to the limited number of participant and a limited number of organizations selected for the study. The research needs a higher number of data for more effective results.

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DETERMINANTS OF ELECTRICITY PRICES IN KARACHI: VAR ESTIMATION APPROACH

Madiha Saleem, and Nawaz Ahmad

ABSTRACT

New era presents the war for resources, and the balance of global interest has shifted from just land to energy. Countries are striving hard to become efficient in not only consumption but also the production of energy which is the new unit of power. Therefore, global focus is now moving towards the determination of factors that may aid the inefficient production of energy, mainly electricity rather than blind pursuit of energy sources. The visibility of this efficiency is the price at which electricity is available to consumers. Western counties like USA and Germany have performed various research studies to establish a list of factors, both economic and social, that influence overall electricity prices. Their approaches have primarily been empirical and point out towards the interest of even superpowers towards this topic. Pakistan being a developing country needs efficiency in the production of consumables to develop swiftly. The country has resources but lacks the technology to produce electricity efficiently. The largest city Karachi is overpopulated, and the demand for energy is ever rising, so are the shortages. This study employs Vector Auto-Regression (VAR) to study historical electricity prices in Karachi about electricity consumption, Gross Domestic Product and Oil Price. Results indicate that electricity prices are influenced directly by their first lagged values and negatively by GDP.

Keywords: *Electricity Prices, Electricity Consumption, VAR*

JEL Classification: *C32, Q41, Q43,*

INTRODUCTION

Karachi is the largest city of Pakistan. With the reach to warm waters and broad access to the Arabian Sea, there are numerous possibilities to trade from this important coast which is located in the emerging Asian

region. For the prosperity and definite progress, electricity is a significant utility which should be utilized efficiently for the economic growth of the country.

Without power today, there is no concept of progress since electricity is required by the majority of appliances and even locomotives now. Such dependence calls out for an extensive investigation on how the price patterns change so that the dependent industries and households may estimate and forecast possible scenarios and plan accordingly.

Prices of electricity can differ broadly from region to region and country to country or by some other boundaries named cities, provinces and states within a single country. The prices of electricity are factors dependent like the cost of power generation, transmission, distribution infrastructure, taxes, subsidies from the Government, and patterns of local weather. Many other features, such as multi-tiered industry regulation, that differentiate electricity from other commodities.

Currently, electricity has been treated as other supplies, although it has some particular features. Electricity is non-storable utility, and its demand needs to be fulfilled instantaneously. As a prediction, Demand has been found a significant variable of interest, as a change in centralized structure has been led from the liberalization of the power market. The estimation of electricity price, for both producer and consumer, has been observed as an unavoidable task (Martos, Rodriguez & Sanchez, 2011).

Energy is an expensive production input and has implications for the environment adversely. If the economy of a country has shown some growth or structure of the economy has been changing, which results in increased consumption of energy day by day. However, every society has a desire to keep that increase at its minimum level. Whereas, If consumption of energy increases without structural change or growth of the economy. It is a clear indication of the inefficiency of a country which shows that country is utilizing more energy for the same rate of production (He, Wang &Guang, 2020)

Scope of the study

The research is being performed for electricity price fluctuations and factors affecting electricity prices in Karachi. Therefore, the geographical scope of this research is limited to Karachi only.

Objective of the study

To study the impact of GDP, Heating Oil Price, and Electricity Consumption on Electricity Prices in Karachi

Research gap

The span of research (period) presents a limited trend which has a margin for more extension. Furthermore, only the factors affecting the prices of electricity in Karachi have been considered for this research. Data availability limited the scope of study too.

Statement of the problem

In the situation where gas prices and electricity consumption of Karachi are volatile, their effects on prices of electricity, i.e. the unit price of KE is required to be established which have yet not been identified by research for future reference or explanation of past price trends.

Research questions

1. Do the factors like Heating oil price, GDP and gross electricity consumption value affect electricity prices in Karachi?

2. What is the direction of the effect of identified significant explanatory variables on the dependent variable?

Hypotheses

H_1:There is no impact of GDP on electricity prices in Karachi.
H_2:There is no impact of Heating Oil price on electricity prices in Karachi.
H_3:There is no impact of Gross electricity consumption on electricity prices in Karachi.
H_4:There is no impact on the lag of Electricity Prices on Electricity Prices in Karachi.

LITERATURE REVIEW

Electricity has some salient characteristics such as spot volatility which in terms of financial assets become higher in magnitude as compare to other commodities (Karakatsani& Bunn, 2004). In the electricity market, the average daily electricity price demonstrates the electricity price to be supplied during the next full day and indicated as the main reference price. This study has been conducted for the daily average price in the Nord Pool market. It has been elucidated that disaggregated hourly prices have useful analytical and predictive insights for the average daily price (Raviv, Bouwman & Dijk, 2015). Until initial 90s electricity prices have been secured or fixed by

regulators mainly depending on generation cost, transmission cost and distribution cost, which leads a little uncertainly in electricity prices. However, competition has been introduced in generation and supply activities in the last two decades. The reform has been evolved in consequence of the interaction between supply and demand (generators and supplier to consumers) and commonly known as pool (Escribano, Pena &Villaplana, 2011).

Research in the UK has been performed using multivariate OLS regression to find out the relative consumption drivers effect for heating on gas. The marginal contributions of each factor to the consumption of energy have been discussed in the study by using standardized coefficients. The findings indicate that prevailing practice policy emphases mainly on dwelling characteristics(Fuerst, Kavarnou, Singh & Adan, 2019).

Silva and Cerqueira (2017) have explored the impact of different economic variables on prices of household electricity by using econometric panel data techniques. They have presented their research scope on the electricity industry value chain via the market opening of the generation segment. As after the first set of European directives, generation segment was expected to be the most progressive segment. Consumer electricity prices are expected to be affected by generation segments as wholesale market transfer electricity to retails. The results of the study have indicated that increased trends of market liberalization in few scenarios come with a decrease in concentration and new actors of the market. Also desired decrease in household electrical prices are the outcomes of increased trends of market liberalization. Whereas, no adverse impact on the household paid prices have been evident in the result of regulated prices. Aqeeq, Hyder, Shehzad and Tahir (2018) have presented a research study, and for five years respectively, results show economic competitiveness of electricity PV, with an IRR and payback averaging approximately 28%.

A study was performed recently in 2019 for the prediction of the price of electricity based on forecasted aggregate purchase and sales curve. The researcher had to model the purchase and sales curve hourly bases, to identify the intersection of the forecasted curves to get the forecasted equilibrium market volume and price. Functional data analysis methods have done it, namely, parametric (FAR) and nonparametric (NPFAR) functional autoregressive models and results have been compared to benchmarks (Shah &Lisi, 2019).

Carmona and Coulon (2013) have discussed structural models in their extensive research work. The structural models which have been parented meet the criteria by directly incorporating capacity, demand and prices of fuel and also the mathematical benefits conventionally associated with reduced-form approaches have not been compromised. However, they did recommend thinking beyond the price services evident historically. Kabak and Tasdemir (2020) have studied recently that the price of electricity has a dynamic structure, and many factors affect that structure directly or indirectly. Market transactions have now being carried out on forecasting based contracts. Usually, the transactions are based on the day-ahead market (DAM) and one day before balancing the power market, also an intra-day market half hour before, mid and long term for market derivatives. Researchers have purposed a short-term price forecasting model by examining historical data which have affected the price most appropriately that have been correlated by using artificial neural network method.

Jamil and Ahmad (2010) have performed in-depth research using the four main categories (residential, commercial, agricultural and manufacturing) and taken data for aggregate series from 1960 to 2008 time period. They carried out the inter-relationship in a multivariate co-integrated system between consumption of electricity, price of electricity and economic growth. Also, the existence of a long-run equilibrium relationship has been found between three variables via co-integration. However, short term deviation may exhibit for electricity consumption and output but eventually turn to long-run equilibrium.

The internal enterprise factors such as labour and remuneration costs have a direct effect on the real costs of the electricity distribution enterprise, which has been established by the estimated cost function. During market deregulation and price liberalization of electricity, the real cost of purchasing did not significantly reduce for distribution enterprise. There are possible sources of market power for electricity producers, wholesalers and the electricity distribution enterprise (Papler&Bojnec, 2016).

Lucia and Schwartz (2002)have observed the behaviour of electricity prices and the importance of regular patterns and implications for the secondary pricing purpose. This study has been conducted for Europe and analyzed the Nordic Power Exchange's spot, its futures, and the forward prices of electricity. Furthermore, the researchers concluded that systematic seasonal patterns importantly explain futures or forward curve

shapes during the whole year. The seasonal patterns of the futures and forward curve can be adequately carried out by a simple sinusoidal function, which is directly implied spot prices seasonal behaviour.

Wang, Zhang and Zhang (2012) have researched in China on reforms of tiered electricity price. They had identified the determinants of the willingness of TEP among Chinese civilians and they moreover had tried to find out the tolerable range of premium for chines people. They had taken an ordinary regression model for their analysis, and the main purpose is to identify factors of TEP acceptance to the general public. Results indicated that TEP had been opposed strongly by the middle-class group. Whereas, highlighted TEP implications are public environmental awareness, including economic factors. Although studies had not found cost as a statistically significant determinant, in urban cities of China, tolerable TEP premium rate had identified below 0.05 RMB/kW h in their piece of research.

A study has been conducted to provide a real-time relationship between total peak demand and spot market prices and its quantification. A researcher has found a low value for the real-time price elasticity. This may justify in a way that not all users or consumers observe the spot market price. For the generalizability to all users, limited scope for government intervention in supply security issues would be implied in that case (Lijesen, 2007).

Another study was performed in Europe in 2008, with particular attention to the European energy exchanges paper has been offered the most salient statistical features of electricity prices. A researcher has used sum-OU model, i.e., a model representing the price as a sum of L´evy-driven Ornstein Uhlenbeck (OU) processes, and showed a relatively new method for filtering out the different OU components. Also, the researcher has developed a statistical procedure for estimating the sum-OU model from data(Brandis& Tankov, 2008).

Hirth(2018) has studied two countries Germany and Sweden and found both countries differ significantly as fuel and CO_2 prices identified as a significant price driver in Germany whereas in Sweden, electricity demand was found as an essential driver. This difference is elucidated and justified by the single leading factor, i.e., expansion of renewable energy. The study has been performed in Australia during 2010, which suggests factor models-DSFM for the hourly electricity prices behaviour with the use of dynamic semiparametric. Researchers have been concluded that the three-

factor model has explained variation in hourly electricity prices with high proportion. They have also focused on the characteristics of the market, particularly concerning the factors of hourly electricity prices and its dynamic behaviour with time (Hardle&Truck, 2010).

Kirschen, Strbac, Cumperayot, and Mendes (2000) have discussed in their study about the elasticity demand of electricity and how it could be taken into account for the price setting in the competitive centralized market. Also, the concept of cross elasticity has been taken for checking consumer react to the volatility of electricity prices. Karakatsani and Bunn (2008) have investigated and discussed in detail about the two model characteristics to check the influence on day-ahead price forecasting. The two characteristics include fundamental of markets that affect the formation of price and specification of time-varying effects. Wolde-Rafael (2006) has been established a relationship between electricity consumption and economic growth with a time series data for 17 African countries.

It has been derived from the electricity market, which shows that electricity per hour prices significantly depend on electricity demand. Moreover, demand shows hourly, daily and seasonal fluctuations which are directly or indirectly influenced by gross domestic product (GDP) and economic activity of the country (Gareta, Romeo & Gil, 2005).

In Germany, Schwarz and Lang (2006) have tried in detail to compute the significance of fundamental variables for increasing trend of fluctuating electricity prices in the wholesale market. Factors include rising fuel cost, CO_2 emission factor fuel, CO_2allowance price, hot start-up and abrasion costs. It has been observed that electricity prices data in time series shows non-stationarity form, in the long term]behaviour, sometimes one or more periodic components exhibits a dependence on calendar effects. This behaviour of data allows us to account for both long term and periodic components in electricity prices modelling (Lisi& Nan, 2014). Public discontent or dissatisfaction caused in a result of increasing utility prices which has been getting intensified day by day. Although regulators are enforced from external pressures to alter practices and behaviours, thus, researchers have presumed regulators more than the mediators between producers and punchers (Primeaux, Jr.& Mann, 1986).

In California, Joskow and Kahn (2002) have studied that increase in demand, increased gas prices and reduction in the availability of power

imports with high emission permits prices significantly affects the higher wholesale market price. It has been observed that during summer, high wholesale electricity prices have been observed as a natural seasonal outcome considering the competitive nature of the market. Whereas, a significant gap has been found between market price and its benchmark price.

Another research has been done in Spain. The researcher has purposed and analyzed the Hidden Markov Model (IOHMM) for spot electricity prices forecasting. The predictions about the accuracy and information dynamics about the market have been proved good in model testing which in turn helped in identification and characterization of more relevant explanatory variables (González, Roque & González, 2005). In 2005, researchers conducted in-depth research to identified price differences caused by different variables such as climate change, mix fuel, cost of fuel and effects of ISO. They have used four classes for grouping of customers. They have included both nominal and real prices and three regulatory status definitions. Also, the study has not found empirical support in generalizability as customers of deregulated states have lower rates than customers of regulated states (Taber, Chapman &Mount, 2005).

Conceptual model

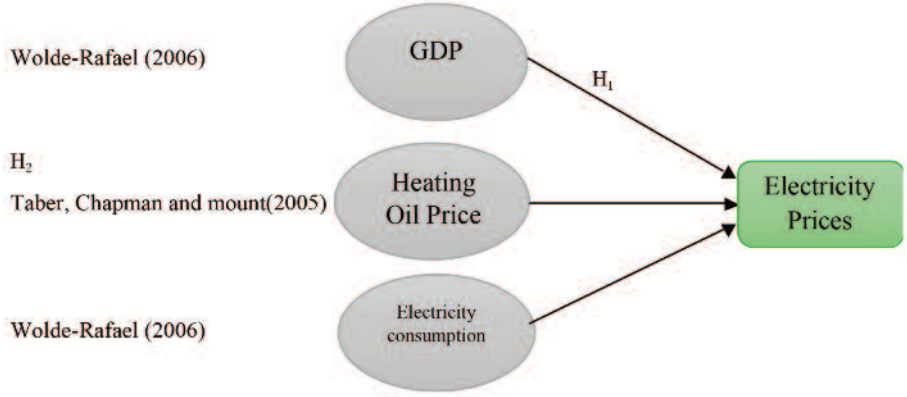

Figure 1: Conceptual Model

METHODOLOGY

Data

This research is based on secondary data collected from credible sources such as the State Bank of Pakistan's and KE official website. Nature of data is time series as yearly data has been taken from 1981 to 2020 (40 years).

Independent Variable

Real gross domestic product (GDP) is a measure of economic output adjusted for price changes such as inflation or deflation. Data has been taken in Billion-USD for GDP.

Heating Oil price (OP)is a price of fuel oil, used in industrial heating equipment for burning. International heating oil price is measured in per Ton USD.

Gross electricity consumption (EC) is a total unit of electricity consumed per year by Karachi City. Consumption of electricity is measured in kilowatt-hours.

Lag values of Electricity Prices (EP) are the unit price of electricity charged by Karachi Electric (KE). Electricity price is measured in Rs/Kw.

Dependent Variable

Electricity Price (EP) is the unit price of electricity charged by Karachi Electric (KE). Electricity price is measured in Rs/Kw.

Sample size

Since secondary data will be used in this research, the GDP, heating oil prices and electricity have been adopted. Aim of this study is to determine the effects of electricity prices on Karachi. Therefore,40years' data has been taken only for Karachi from KE and State Bank of Pakistan.

Statistical model

Data is time-series in nature, and when each series was tested, it was found to be stationary at first difference. Hence all the series are of the same order of integration, and Vector Auto Regression (VAR) is the suggested test for this case.

RESULTS AND DISCUSSION

Graphical analysis

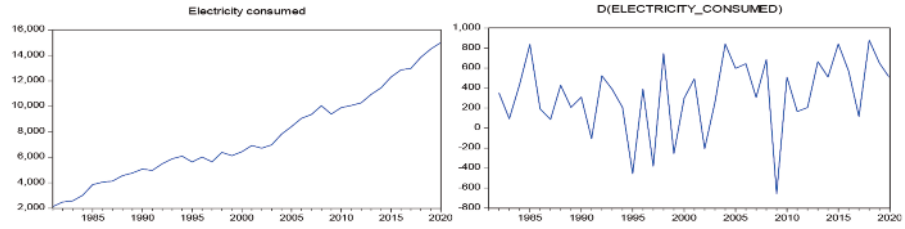

Figure 2: Trending and De-trending of Electricity Consumed

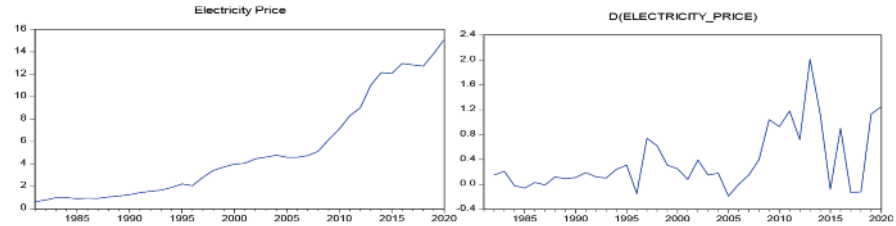

Figure 3: Trending and De-trending of Electricity Price

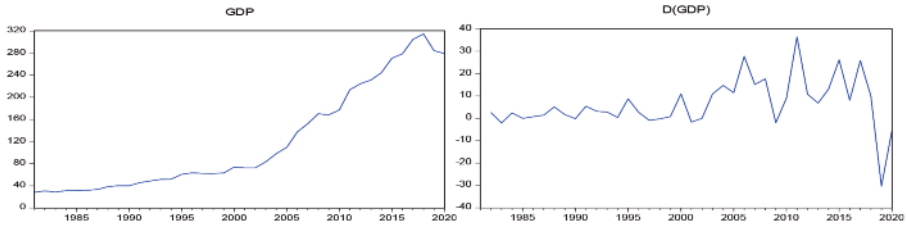

Figure 4: Trending and De-trending of GDP

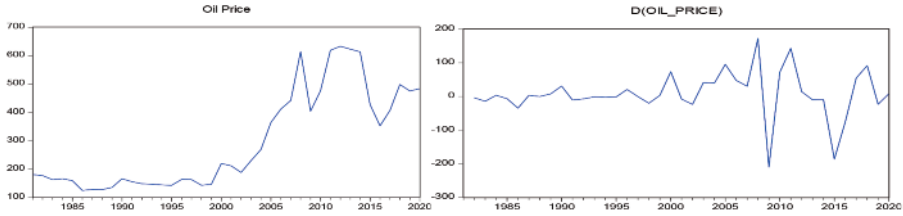

Figure 5: Trending and De-trending of Oil Price

From Figure 2 to Figure 5, trending and de-trending of variables have been presented. De-trending of data is the graphical presentation of first difference for EP, EC, OP and GDP whereas, trending of data is the graphical presentation of raw data for EP, EC, OP and GDP.

Unit Root test

The unit root test results indicate that all the variables have unit roots at the level. Therefore, the first difference was evaluated, and it was found that they are all stationary at first difference.

Table 1: Unit root test results

Variable	T-statistic	p-value	Stationary at
Electricity Consumed	-6.932943	0.0000	*I*(1)
Electricity Price	-3.424083	0.0162	*I*(1)
GDP	-4.269522	0.0017	*I*(1)
Oil Price	-6.417864	0.0000	*I*(1)

Table 1 shows the unit root test results summary for all the variables. Electricity

consumed, GDP, and Oil Prices have p-values less than 0.01 whereas Electricity Price has p-value less than 0.05 which suggest that the variables are integrated of order one, i.e. *I*(1), so the first difference will be used in further analysis.

Descriptive statistics

Table 2: Descriptive Analysis

	D(ELECTRICITY_ CONSUMED)	D(ELECTRICITY_ PRICE)	D(GDP)	D(OIL _PRICE)
Mean	330.1026	0.371026	6.430754	7.766154
Median	388.0000	0.180000	3.183216	-0.260000
Maximum	879.0000	2.010000	36.42178	172.2200
Minimum	-656.0000	-0.190000	-30.37821	-209.9000
Std. Dev.	369.1475	0.496253	11.11713	67.78128
Skewness	-0.764927	1.331969	-0.010515	-0.804281
Kurtosis	3.217082	4.367381	5.707701	6.303820
Jarque-Bera	3.879809	14.57023	11.91464	21.94188
Probability	0.143718	0.000686	0.002587	0.000017
Sum	12874.00	14.47000	250.7994	302.8800
Sum Sq. Dev.	5178256.	9.358159	4696.445	174583.5
Observations	39	39	39	39

Jarque-Bera probability value for EC is 0.143718 which is greater than 0.05 which indicates that data set is standard whereas, Jarque-Bera p-value for EP, OP and GDP is less than 0.05 which depicts that data set is not typical. EC, GDP and OP data is negatively skewed, indicating that it has a tail to the left side but tilt to the right. Although EP data is positively skewed, all four datasets are Lepto-kurtic since the Kurtosis values are greater than 3.

Econometrical Analysis

Table 3: Granger Causality Test

Null Hypothesis:	Obs	F-Statistic	Prob.
GDP does not Granger Cause OP	37	0.81858	0.4938
OP does not Granger Cause GDP		9.05149	0.0002
EP does not Granger Cause OP	37	0.53012	0.6651
OP does not Granger Cause EP		3.67878	0.0228
EC does not Granger Cause OP	37	1.44785	0.2485
OP does not Granger Cause EC		0.17886	0.9099
EP does not Granger Cause GDP	37	2.87634	0.0525
GDP does not Granger Cause EP		7.15662	0.0009
EC does not Granger Cause GDP	37	0.96422	0.4224
GDP does not Granger Cause EC		1.67849	0.1926
EC does not Granger Cause EP	37	3.45367	0.0287
EP does not Granger Cause EC		3.28579	0.0342

Table 3 shows the results of the Granger causality test, which indicates

that Oil Price, GDP, and Electricity Consumption, which are taken into consideration as determinants of Electricity Price, all Granger cause Electricity Price at 5%, 1%, and 5% respectively. Electricity Price has two-way causation with Electricity Consumption only. Other variables like Oil Price Granger cause GDP at 1%. There is no other causality between any set of variables.

To get more insights for the study variable, i.e. Electricity Price, VactorAutoregression (VAR) model is applied to consider the lag impact as well. To decide the number of lags for the model, VAR lag selection criteria are tested first to determine the number of lags for the VAR model.

Table 4: VAR Lag Order Selection Criteria

VAR Lag Order Selection Criteria
Endogenous variables: D(EP)
Exogenous variables: D(EC) D(GDP) D(OP)

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-31.80781	NA	0.405059	1.933767	2.065727	1.979825
1	-23.77336	14.28347*	0.274174	1.542964	1.718911	1.604374
2	-21.88401	3.253878	0.261188	1.493556	1.713489*	1.570319
3	-20.13512	2.914817	0.250878*	1.451951*	1.715871	1.544066*

* indicates lag order selected by the criterion
LR: sequential modified LR test statistic (each test at 5% level)
FPE: Final prediction error
AIC: Akaike information criterion
SC: Schwarz information criterion
HQ: Hannan-Quinn information criterion

Table 4 shows the VAR Lag selection criteria in which three lag have been selected based on the Akaike Information Criterion (AIC).

Table 5:Vector Auto-Regression Estimates

	D(EP)
D(EP(-1))	0.558727
	(0.17374)
	[3.21582]
D(EP(-2))	0.285021
	(0.22915)
	[1.24382]
D(EP(-3))	0.333777
	(0.19077)
	[1.74961]
D(EC)	-2.66E-05
	(0.00020)
	[-0.13115]

D(GDP)	-0.018417 (0.00868) [-2.12239]
D(OP)	0.001488 (0.00138) [1.07567]
R-squared	0.292161
Adj. R-squared	0.174188
Sum sq. resids	6.451158
S.E. equation	0.463723
F-statistic	2.476501
Log-likelihood	-20.13512
Akaike AIC	1.451951
Schwarz SC	1.715871
Mean dependent	0.392500
S.D. dependent	0.510291

D(EP) = 0.558727 D(EP(-1)) - 0.018417 D(GDP)

Table 5 shows the Vector Auto-regression Estimates.Coefficient of D(EP(-1)) and D(GDP) have been taken into account as they are significant (based on their t-statistics) to formulate the equation for D(EP). R-squared is 29.2%, whereas Adjusted R-squared is 17.4%. As both values are not close, it indicates that we have used a smaller number of observations and by increasing the observations, the Adjusted R-squared will be improved.

Hypotheses assessment summary

Table 6: Hypotheses Assessment Summary

No.	Hypotheses statement	Remarks
H_1	There is no impact of GDP on Electricity Prices in Karachi	Rejected
H_2	There is no impact of Heating Oil Price on Electricity Prices in Karachi	Retained
H_3	There is no impact of Gross Electricity Consumption on Electricity Prices in Karachi	Retained
H_4	There is no impact of the lag value of Electricity Prices on Electricity Prices	Rejected

Table 6 shows an overall summary of the hypotheses on the bases of its rejection and retention. GDP and the first lag of Electricity Prices are significant estimators of Electricity Prices whereas Oil Prices and Electricity Consumption are not found to be significant estimators of Electricity Prices.

Discussion

The results vary and yet at the same time present some agreement with

the evidence found in theory. In African countries, fuel prices were found to influence electricity prices via literature Wolde-Rafael (2006). However, empirically it was found that fuel prices were insignificant to impact electricity prices in Karachi. Also, Hirth (2018) has found that Germany and Sweden differ significantly as fuel prices recognized as a significant price driver in Germany as in Sweden. Also, electricity consumption (taken as a proxy for demand), does not impact electricity prices in Karachi whereas

However, the discussion about reforms and economic variables have found to be useful in this case as GDP has turned out to be a significant variable in impacting the electricity prices same was studied for 17 countries of Africa (Wolde-Rafael, 2006). The relationship is inversely showing that as the GDP decreases, electricity prices increase. However, there is a new finding that was not found in the studied literature. Electricity prices depend directly on their lagged value. Meaning that increased values tend to cause further enhancement in electricity prices in Karachi.

CONCLUSION, LIMITATIONS AND RECOMMENDATIONS

Conclusion

In partial agreement with the literature, it was found that the Electricity Prices in Karachi are directly proportional to their first lagged value and inversely proportional to the GDP. None of the other variables, including Oil Prices and Electricity Consumption, were found to predict the Electricity Prices. These results were found via Vector Auto-Regression method while Granger causality indicated Oil Prices and Electricity Consumption also to affect Electricity Prices.

Limitations

Observations were limited, higher no. of observation may generate better results. Difference between R-squared and Adjusted R-squared was, therefore, also high. Data only on Karachi city cannot let this research to be generalized for the whole country. Also, data from other major cities like Lahore, Islamabad, Peshawar and Quetta may present a better picture if included in the empirical study as panel data.

Recommendations

From the evidence presented in this research, the Government should place reforms according to which consumers may not face enormous

electricity price hikes based on fuel price and electricity consumption changes. Instead, the electricity price forecast should be related to economic factors like GDP and measures for its stabilization should be taken. In that way, electricity prices may be controlled realistically.

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HEALTHY ORGANIZATIONAL ENVIRONMENT ENHANCES EMPLOYEES' PRODUCTIVITY: AN EMPIRICAL EVIDENCE TO CLASSICAL CONCEPT

Dr. S. Khurram K. Alwi and Dr Mohammad Shaiq

ABSTRACT

The concept that a worker-friendly environment in any organization helps its employees to perform better, is anold classical concepts. Various researchers have tried to find out different characteristics of worker-friendly environment. This research is not to explore any new attributes but to test this old concept in today's apparently stressful environment of multinational companies in Pakistan. To make this study simple, only four mostly discussed variables are studied which are, open door policy, entertainment facilities, work life balance, workforce diversity and their impact on employee productivity is analyzed. Out of four independent variables, two relate to management strategy and two are related to the dealing with employees. With the help of a close-ended structured questionnaire the data, using various communication means, was collected from 212 mid and junior-level mangers working in the stressful environment of multinational organizations. The primary data so collected was statistically analyzed to see the strength and significance of predictors. The two variables named open-door policy and entertainment facilities emerged as strong predictors of employees' productivity. Open-door policy apparently is one of the operational strategy designed by higher management but since it directly relates to employees, so it is proved that the more the policies are worker friendly the better it is to boost and enhance workers' productivity. This analysis implies that in a stressful working environment, big organization should make the environment more workers-friendly to make them more productive.

Keywords: *Employee productivity, Open door policy, Entertainment facilities, Work life balance, workforce diversity*

INTRODUCTION

Workforce output possesses a pivotal part in the growth of a company. Hence, companies have to ensure that their workforce consistently focuses with dedication on their work.The overall output of workers is necessary to be characterized as a pillar of a company strength because this stimulates optimum growth in the long run.The dedication of employees depends on the overall awareness of culture that improves the behavior of an organization (Brooks, 2006). According to Cascio (2006), workers' productivity is their degree of accomplishment in the particular job in comparison to the expected performance of that particular workforce member and which is expected by the company.The exact elements which are a part of the company environment are debatable as far as the standpoint of various writers are concerned. Based on Armstrong's outlook as mentioned by classical researchers like Zugaj and Cingula, (1992), the overall company environment is comprised of several important elements such as company's perception in the eyes of stakeholders, the overall company environment, management philosophies and processes of all the responsibilities that are supposed to be carried out in the workplace. The combination of overall customs and traditions of a company refers to the action guidelines and certain performance benchmarks which assemble them together (Schein, 2004).

Organizational environment and culture was initially outlined by Administrative Science Quarterly (Pettigrew, 1979), as a bonafide understanding regarding morals and workplace practices which lead employees to optimum workplace performance. The organizational environment firmly lays the blueprint regarding the way work is to be conducted and the corporate survival strategies that lead to organizational growth(Dave and Jeanne, 2011).

The overall company environment comprises a bona fide structure of theoretical organizational concepts as well as their practical applications in order to operate in a proper manner throughout the company (Harris & Moran, 1981). After five years, almost the same thing was restated by Handy (1986) who said that the overall company environment refers to a combination of morals, benchmarks and philosophies. But the question is that what are the real factors related to organizational culture which helps workers in improving their productivity. This study is in the background of the classical concept that a healthy and suitable work environment helps improving workers' productivity. Initially, related literature and especially

the classical concepts are reviewed to see how healthy work environment helps workers to improve their productivity which as a result helps organizations grow further. In this paper an effort is made to ascertain thatbasic attributes of a healthy and supportive environment, helpemployees improve their performance even in the apparently stressful environment of the modern industrialized world and particularly inmultinational companies in Pakistan.

LITERATURE REVIEW

Organizations must be holding humanity, warmth, wisdom, and modernism and should have similar worthful identities. In companies these characters are applied to stimulate performance and predict the employee's behavior (Khorshidi, 2009).The performance of the employees can be enhanced by strong culture in the organization which is very supportive for the functioning and leads to concentrate on achievement and escalates the overall performance of the organization (Deal & Kennedy, 1982). Conversely, in weak and unsupportive work environment, the workersdo not share their knowledge, beliefs and norms (O'Reilly, Chatman,& Caldwell, 1991). Delicate environment can provide pessimistic outcome on workers' performance and behavior as their main focus is on expanding the earnings (Harrison& Stokes, 1993). Discussing the worthful productivity Kenney (1992) defined it as how workers are performing their task which has been given to them. Employee's productivity is the capability of employees to achieve or attain company's goals by applying assets resourcefully and effectually (Daft, 2000).

Although, occasionally performance and productivity are used as synonyms or they can be used interchangeably but Ricardo and Wade (2001) implied that employees' output and overall results generated by the employee are two distinctive elements. Employees' output is a display of results generated by the employees' stability and standard of tasks carried out while the overall results generated by the employees referred to the proportion of the quantity of tasks carried out with in the relevant time span.In Schein(1992)research, it is heavily implied that the aspect of letting workforce members actively engage in discussions with the upper management would lead to the workforce members getting higher motivations levels which would lead to the overall goals of the workforce members being materialized properly. In the process, the results of the company would be achieved in the desired manner as well. Organizational culture refers to the philosophy that is ingrained and practiced consistently

throughout a business organization. Kotter and Heskett (1992) and Gordon and Cummins (1979) outlined company environment as the pillar which acknowledges the overall work of the entire workforce in the organization and displays a 360 degree-angle bird's eye view comprehension of directions that are necessary to grow for a company. Hosftede (1980) defines the company environment as philosophy of a company, as a whole, which makes it stand out in comparison to other companies. Hence, the above notion outlines that the company environment could be a method of managing the workforce properly.

Prior authors of organizational cultureand early organizational behavior researchers Peters and Waterman (1982); Deal and Kennedy (1982) and Pascale and Athos (1981) believe that there is an unambiguous connection between organizational environment and its performance. These cultural ideals are consistent with theopted organizational strategies that lead organizations thrive in the long run. In spite of this, the links regarding overall company environment with workforce productivity have been agreed. Willmott (1993); Legge (1994) and Ogbonna (1992) are not completely sure about the links and have questioned them.

Schein (2004) outlined company environment as a high-magnitude element present inside the organization which is dynamic and is established by the actions and beliefs of the entire workforce of the organization. As mentioned by Uddin, Luva, and Hossian(2013), the earlier authors (Rossman, Corbett and Firestone, 1988; Schwartz and Davis, 1981; Cooke and Rousseau, 1988; Gordon and Di Tomaso, 1992; Schall, 1983; Schein, 1992; Rousseau, 1990) have defined the overall company environment as a collective entity which is dependent on the organizational actions. Based on the study of Slocum and Hellriegel (2009)the company environment can heavily boost productivity in a considerable manner if the vital elements required to maintain a particular corporate culture can be conceptualized in a bona fide manner.However, Teimouri, Chegini, Jenab, Khoury and LaFevor(2016)state a very important factor that in previous years monetary aspect and training and development were indeed a source of motivation for employees leading to enhanced job performance, whereas in today's time organizations have realized that another very important component has made an additional entry that is workers-friendly organizational culture. An organizations' culture has to be greatly focused upon and adapted according to an employee's expectations.Robertson, Birch and Cooper (2012), lay great

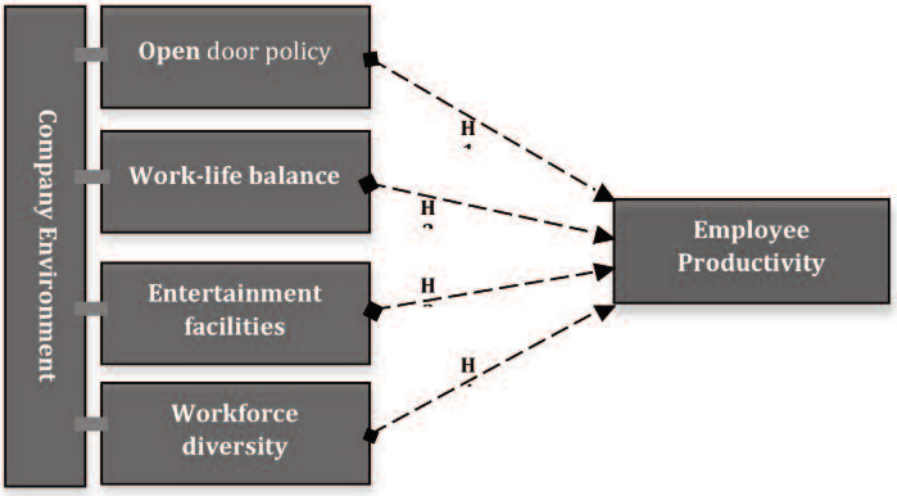
emphasis on organizations culture, and state that it has a direct link to any employee's job performance. An organization must practice an open-door policy and focus upon efficient and effective communication.

All in all, It can be extracted from this review that organizations thrive various ways to improve employees' performance and productivity but an environment which is worker friendly is the most effective organ in this regard and the most effective strategies in this regard have been those which facilitate their workers physically and mentally. Direct communication with workers, accessibility to senior managers, relaxing workers in physical and mental pressure, help booting their productivity. Now the question arises if these classical concept still hold true in today's work environment.

Research Model and Hypotheses

Based on previous studies and established management theories the variables, selected to represent a worker friendly and healthy environment in an organization, are used to assess their impact on workers' productivity and performance. In this study the variables used as predictors are - open door policy, entertainment facilities, workforce diversity and work-life balance and their impact on workers' performance is studied.

Research Model



Independent Variables*:Open door policy, Work-life balance, Entertainment Facilities and Workforce diversity*
Dependent Variable*: Employee Productivity*

To assess the relationship of independent variables on workers productivity, the following hypotheses are formulated:

H_1: Open door policy positively impacts employees'work performance.
H_2: Social and entertainment facilities positively impact employee'swork performance.
H_3: Workforce diversity positively impacts employees' job performance.
H_4: Work-life balance has a positive impact on employees' job performance

RESEARCH METHODOLOGY

As the target is to get an empirical evidence from the stressful working environment multinational companies of the current era to the classical relationship between worker friendly organizational environment and employees work performance so this study is quantitative in nature. The type of research design is causal and relational to explain the patterns of relationships between variables based on cross-sectional data collected from MNCs working in Pakistan. Population of the study is the mid and junior level managers working for multinational organizations. The sample size is 220 individuals comprised of both male and female between the age group of 30-45 who fall in the category of middle and junior level management. A randomized sampleof 500 respondents, based on convenience, was selected from all over Pakistan and the psychometric data was collected through a structured questionnaire on a 5-point Likert scale.These researchers used all possible communication modes to approach respondents and to collectedresponses. Ultimately. In all 220 analyzable responses were received to do the required analysis for this study.

Data Reliability

As it is shown in Table-1, the value of Cronbach's Alpha coefficient for all five variables ranges between 0.70 and 0.91 which proves reliability of data for further analysis.

Table 1. Cronbach's Alpha Values

Variables	Items	Cronbach's Alpha
Work-Life Balance	4	0.722
Work-Force Diversity	4	0.660
Open-Door Policy	4	0.706
Entertainment Facilities	4	0.909
Employee Productivity	4	0.897

Data Analysis and Results

As mentioned above the data was collected from 220 respondents. Some meaningful statistics regarding gender, age group, education level, experience, position and geographical coverage of the sample is shown in Table -2

Table 2. Sample Statistics

Gender	Male	23%
	Female	77%
Age	30 – 35	21%
	35 - 40	33%
	40 - 45	46%
Education	Bachelor and under	17%
	Master's degree	69%
	Postmaster Diploma	14%
Experience	< 5 years	15%
	5 to 10 years	21%
	More than 10 years	65%
Position	Mid-level Manager	68%
	Junior Manager	32%
Location	Punjab	29%
	Sindh	51 %
	KPK	11 %
	Baluchistan	09%

Table 3. Correlation

Correlations						
		Work Life Balance	Work Force Diversity	Open Door Policy	Entertainment Facilities	Employee Productivity
Work Life Balance	Pearson Correlation		.617**	.593**	.358**	.373**
Work Force Diversity	Pearson Correlation	.617**		.635**	.427**	.419**
Open Door Policy	Pearson Correlation	.593**	.635**		.675**	.654**
Enter/ Facilities	Pearson Correlation	.358**	.427**	.675**		.865**
Emp/ Productivity	Pearson Correlation	.373**	.419**	.654**	.865**	

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

Table – 2 shows Pearson correlation coefficient values of all variables. It is evident from this table that all predictors have significant correlation with dependent variables. All values of Pearson correlation coefficients are significant and lie within moderate to strong correlation.

Table 4. Multiple Linear RegressionModel Summary

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.870[a]	.758	.753	.538

a. Predictors: (Constant), Entertainment Facilities, Work Life Balance, Workforce Diversity, Open Door Policy

Table - 4 indicates a good fit between observed and predicted values of workers performance. Model summary shows that more than 75 % variance can be predicted from independent variables. This is the overall measure of the strength of association. Here we can deduce that Work Life Balance, Work Force Diversity, Open Door Policy, Entertainment Facilities explain more than 75% change in the dependent variablewhich is Employee Productivity.

Table 5. Analysis of Variances (Anova)

ANOVA[b]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	194.326	4	48.582	168.092	.000[a]
	Residual	62.139	215	.289		
	Total	256.465	219			

a. Predictors: (Constant), Entertainment Facilities, Work Life Balance, Work Force Diversity, Open Door Policy
b. Dependent Variable: Employee Productivity

After the analysis of the values, it is safe to say that the model possesses a predictive value, this is proven as the significance is .000, hence we can accept the hypothesis whereas the goodness of fit can be measured by the F value (Benchmark should be 4 or above). The model deems fit, because the value is above 4.0 at 168.092.

Analysis of Coefficients

The table above shows the coefficient output of the linear regression. This table shows the strength and direction as well as the significance of the independent variables. Work Life Balance does not have a significant effect on Employee Productivity, as its t value is .632 which is below the benchmark of 2 for the t-statistic. Furthermore, it is not statistically significant. Work Force Diversity does not have a significant effect on Employee Productivity as its t value is -0.80 below, furthermore, it is not statistically significant as the p value is above the alpha value.

Table 5. Coefficients

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.058	.198		.291	.771
	Work Life Balance	.041	.065	.029	.632	.528
	Work Force Diversity	-.005	.067	-.004	-.080	.936
	Open Door Policy	.162	.079	.114	2.033	.043
	Entertainment Facilities	.754	.044	.779	17.086	.000

a. Dependent Variable: Employee Productivity

Open DoorPolicy has a significant effect on Employees' productivity as its t-statistics is statistically significant. Entertainment Facilities have a significant effect on Employee Productivity with a t-value 17.086. The degree or magnitude of the impact that each relevant independent variable has on employee job performance, which is the dependent variable has been clearly highlighted in the table of the analysis of coefficients.

DISCUSSION OF FINDINGS

In our research, as mentioned in the table of analysis of coefficients, out of four independent variables, only two variables which are open-door policy and entertainment facilities showed significant impact on employees'work productivity. Entertainment facility has a great degree of significance in terms of the overall workplace environment. The rationale behind this statement is that the presence of considerable entertainment facilities leads to high level of physical and metal relaxation which resultantly leads to optimum employee job performance and this is realistically idealistic and main end goal of organizations. As far as the open-door policy is concerned, this aspect also showed a great degree of importance from the standpoint of overall workplace happening as well. The rationale behind this statement is that employees would psychologically feel more motivated to work in proper manner for the organization, which would naturally result in much better employee job performances. It is also obvious that workers feel confident that some seniors' doorsare open for him or her to share his or her concerns and problems.

Workforce diversity did not show distinct impact on job performance. The rationale behind it might be that employees generally are not concerned about workplace diversity as much as they are concerned about their own progress.Work-life balancealso, surprisingly did not show a significant impact on workers' performance, although this factor has always been in the limelight from the standpoint of workplace environment. Seems like mangers in Multi National Corporation (MNC) environment are more concerned about their own career growth and promotions and sometimes in this race they lose balance in work and life.

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IMPACT OF WORKING CAPITAL (LIQUIDITY NEXUS RATIO) ON PROFITABILITY EVIDENCE FROM MANUFACTURING SECTOR OF PAKISTAN (COMPARATIVE ANALYSIS)

Naveed Khan, Dr. Hamid Ullah and Dr. Shahid Jan Kakakheli

ABSTRACT

The purpose of this study is to empirically investigate the impact of WCM on Profitability for a sample of 30, Cement and Sugar industries that are listed on the Pakistan Stock Exchange (PSX). This research will expand the horizon of knowledge and comparative analysis of the manufacturing sector (Cement and Sugar). Data is secondary in nature while the time of the study is 2014-2018. STATA software is used to measure the effect. In this research, NPM is taken as dependent variables and WCM independent which is measured by liquidity ratio while Size of Firm is taken as a control variable. The key finding of analysis shows that CR has a positive and significant effect on profitability in both sectors. However, CCC has a negative and significant but positive and insignificant effect on profitability in both sectors. ITR has a positive and insignificant effect on Profitability, Size has a positive and significant effect on profitability in both sectors. The final discussion comprehends that increase in CCC leads to decrease in Profitability, while the decrease in CCC leads to increase in Profitability. The quicker the firm converts its assets into liquidity the better the firm will assume profitability. It concluded that profitability can be enhanced if the industry manager manages its working capital more efficiently. At last test equality of matched pairs was applied to measure the trend effect which shows that both industries have the different operation, techniques and infrastructure, which has a significant difference between firm variables and ITR has an insignificant effect. Which show that both industries have the same mean of Inventories Turnover.

***Keywords**: Net Profit Margin, Current Ratio, Inventories Turnover Ratio, Cash Conversion Cycle, Size of Firm.*

INTRODUCTION

WCM is an extremely vital element for any corporate financing since it in a straight line influence the liquidity and performance of the firm. Usually, it states with CA and CL which is very imperative for a company especially in a case, when they are trying to survive continuously in the market, because of its sound effects of company financial performance and associated risk.

Either in day to day operation or lifetime financing. Certainly, WCM straightforwardly clenches the liquidity and financial performance of a company (Rahman & Nasr, 2007).

Moreover, WCM is the vital rudiments that play a key role in the liquidity and financial performance of the firms. WCM takes a huge segment of possessions and appreciated instant of an administrator, occasionally it has long been taken as a critical constituent in the comparative financing decision or making procedure of any firm (Gomes, 2013).

Consistently increase in firm daily operation especially (in term of cost operation) leads a prior interest in-progress state of affairs; management of WC has happened to an extra imperative for company endurance.

However, employing summary sheet data, liquidity and solvency ratios, liquidity can be calculated at any summit of instance, and Static method extensively used these points of the scale. However, for calculation of CCC, we usually take data from the income statement and summary sheet for managing the enduring changes in liquidity with the point in time (Manuel L. Jose, 1996).

The most prior element and ingredients of WCM are as follow, which is consistently used in accounting and financial books for such measurement. CA comprise, Cash, Account receivable (AR), stock in trade and other CA while CL are short term loans, Accounts payable, and other CL

The most consistent part of finance in today world, which signifies the easily accessible, and its conversion of liquid assets into a readable form and its ultimate effect on the financial performance of firms in WCM. In today competitive world financial performance and easily adequate conversion of assets into readable form are vital elements which demonstrate the ability of firms to pay its current debts, and its assign the capability of the company to pay their short-term obligation. The most

prior responsibility of an administrator is to keep an optimum level of CA to its total assets turnover and too short-term payment obligation. Sometimes holding too many inventories and not even capable of short-term debts may affect the financial performance negatively.

A bunch of problems the company administrator faces in day to day operation even in term of liquidity and financial performance. The company representative is entitled to several activities to maintain an optimum level of profitability and liquidity, because if the manager did not adequate use of liquidity the company may face the problem of solvency and bankruptcy. Moreover, if the representative does not even think about the sound financial performance of firm, he will not survive his company in the market. Accord from the above discussion there must be a tradeoff between these two comparable elements which we called WCM and sound financial performance. Producing larger inventory when demanded to decrease the stock out risk. A consign element in which the customer has access to the product before making a purchasing decision of something is credit facility.(Maltiz & Ravid, 1993, Deloof & Jegers, 1996).

A consistent time lag depends on the length of investment even short or long, ultimate the longer time lag better effect the length of investment in comprising of short time lag in WC (Deloof, 2003).

As discussed, longer length of CCC conversion might increase the financial performance of the company since it envelops to the ordering of peak sales. Corporate/financial performance also decreases with CCC effects. And effective tradeoff of granting credit to customer requires constant maintenance of look after for various components of WC: CR, stock in trade and payment of short-term obligation.

Purpose of the Study

According to the above discussion the latent term of financial management arises the intention of causality and ultimately portrays a sense of the existence of relationship or impact linking WCM and firm financial management. With the consequent presence, the rationale of this revision is to investigate the important aspect of financial management Known as WCM. This area is almost touched in the research arena and but a variety of contribution has made to research. This study is focused on WCM and its impact on financial profitability from a selected sample of Pakistani firms and analyzing the relationship between WCM and

Profitability and sound effects of different components of WC on probability in Sugar and cement sector of Pakistan. Since Pakistan has a developing economy.A convoluted revision has been done on poles apart sectors in developing sectors on the association among WCM and company performance. Variety of studies has been found on this particular topic i.e. impact of WCM on the performance of a firm utilizing its current ratio, CCC, also some work in textile and cement sector of PSE (KSE-listed) has conducted, but the comparative analysis is still lacking between these research arenas. Furthermore, this study will extend the horizon of comparative analysis of the most prominent sector of Pakistan which has a great contribution in Pakistan economy.

Research Gap

This context tries to contribute to the literature on the associated connecting of WCM and profitability in at least two ways. Alpha, it focuses on comparative analysis of Pakistani Sugar and Cement companies where least literature has been found. Priory, this study will validate some of the findings of previous studies which is statistically tested, and the association between WCM and the firm performance of the sample and selected firms(nationally and internationally). Thus, this revision will add some substances to the existing research knowledge which is developed by the previous researcher.

Research Question

An exceeding affirmed principle; succeeding exact research questions are framed:

- What are the factors/determinants of working capital management that affect firm profitability?
- How efficiently a firm converts its operational ratio's (working capital) into ready form?

Research Objective

- To examine the impact of WC on the profitability of selected sectors (comparative analysis).
- To investigate the relationship between WCM and profitability of cement and sugar sector.
- To examine the cause of liquidity ratio (WCM) on the profitability of selected Sugar and cement companies on through NPM.

Plan of the Study

This context explains the onion layer of this study which is organized as follows. Segment two presents a review of related literature, section three followed by research methods and variables of the study. Segment four portray and discuss the statistics and interpretation analysis. And the last section will conclude the paper in term of finding (existing phenomena) and future direction.

Review of Existing Literature

Many researchers have studied working capital from different views and in a different environment. Accord from the previous study the following section urges with the association between WCM and firm financial performance and its existence effects which is articulated by the previous researcher.

The manner of WCM has a substantial sway on the financial performance of the firms. Conqueringly it premeditated that most companies have a WC which is accomplished by a large sum of invested cash (Deloof, M., 2003).

However, Eljelly (2004) Conduct a study on manufacturing and agriculture sector, his study was carried out by 29 joint-stock companies that are listed and operated in Saudi Arabia; he accomplished significant level, but the unconstructive relationship between profitability and CCC in a company which has larger CCC. Ultimately, he also remarked that those firms which have a shorter length of CCC bear an insignificant and negative relationship with firm profitability. Furthermore, he culminates that there exists a constructive and significant association between size and the company who have larger and shorter cash conversion cycle.

Although Raheman and Nasr, (2007). Conduct a study on 94 firms that are listed at KSE, he takes a sample from 1999-2004. His finding suggests that net NOP, bear an unconstructive but momentous association with ACP, Average Payment Period (APP) and Inventory Turnover in days (IT), Debt ratio, and Size are positively related with firm profitability.

Although Nazir, (2007) argued with semantic and remarked that a company representative must maximize shareholder wealth and use WC efficiently and effectively.

Although Kulkanya Napompech (2012), Carried the revision on the effects of WCM on firm financial performance and evidenced his result from Thailand stock exchange by taking the sample from 2007-2009, he concluded that GOP are unconstructively related with RCP, and ICP, he further suggested that, company financial position can be increase by reducing the trend of RCP, CCC and ICP.

Moreover, Taghizadah et al. (2012), Conduct a study on Iranian business context. After statistical analysis, he originates that Firm Growth (FG) and Size has a constructive impact on firm financial performance. Moreover, leverage and concretive insistent investment policies state unconstructive impact on firm value and performance indicator.

Although Al-Mwalla, (2012). Conduct a study on this meticulous trend; he founds that Economic Growth (EG), Size and sales growth has helpful relation with firm financial performance (measure on Tobin's Q). He further concluded that company core embedded value and firm financial performance has a positive impact on Concretive Investment policy (CIP). While the unconstructive association was encountered between Aggressive Financing Policy (AFP) and firm financial performance and value.

Consequently, Shah and Khan (2012), inspect the effect of WCM and firm financial performance, they remarked their result from the 46 selected sample of Pakistani listed firms from 2003-2009. They concluded thatnumber of day's account receivable, number of day's inventory, number of day's account payable and CCC depressingly affected the dependent variable which is taken ROA.

However, Iqbal et al. (2014), demeanour a study on WCM and firm financial performance, they concluded that ACP, ITID, ACP, and CCC has an unconstructive association with the net profit margin. And they argued their evidence from selected firms of Pakistan stock exchange.

Moreover, Iqbal and Zhuquan (2015), investigate the phenomena linking WCM and financial performance of a firm. By providing facts from Pakistani scheduled firm. He concluded that ACP, ITID, ACP and CCC has a negative relation with the financial performance of firms; however, Size and sale to growth (Control variable) fraction has a constructive relative connection with firm financial performance.

Consequently, Nida Shah (2016), investigates the study on the topic of WCM and firm financial performance indicators by providing the facts from 2004-2013, 65 non-financial firms that are scheduled at Pakistan stock exchange (KSE). Furthermore, she argued that, exist a significant unconstructive association between CCC and its components with firm financial performance. Moreover, business cycles affect the association between WCM and firm financial performance.

Moreover Usman et al. (2017), demeanour a revision on WCM on firm financial indicators by providing evidence from the sugar sector of Pakistan. They concluded financial performance (ROA, ROE) of the sugar companies is significantly influenced by WCM.

Concurringly Shah and Khan (2018), conduct a study on financial performance indicators and WCM ratio Nexus. They evidenced their result from personal and consumer care product companies that are listed at Pakistan stock exchange. Their statistical section quarrel that ROA, is unconstructively correlated with, ACP and positively correlated with ITID, Average APP, CR and SG. All the relationships are significant except ITID and SG ones.

Research Hypothesis

Based on the literature gap the following hypothesis have been designed.

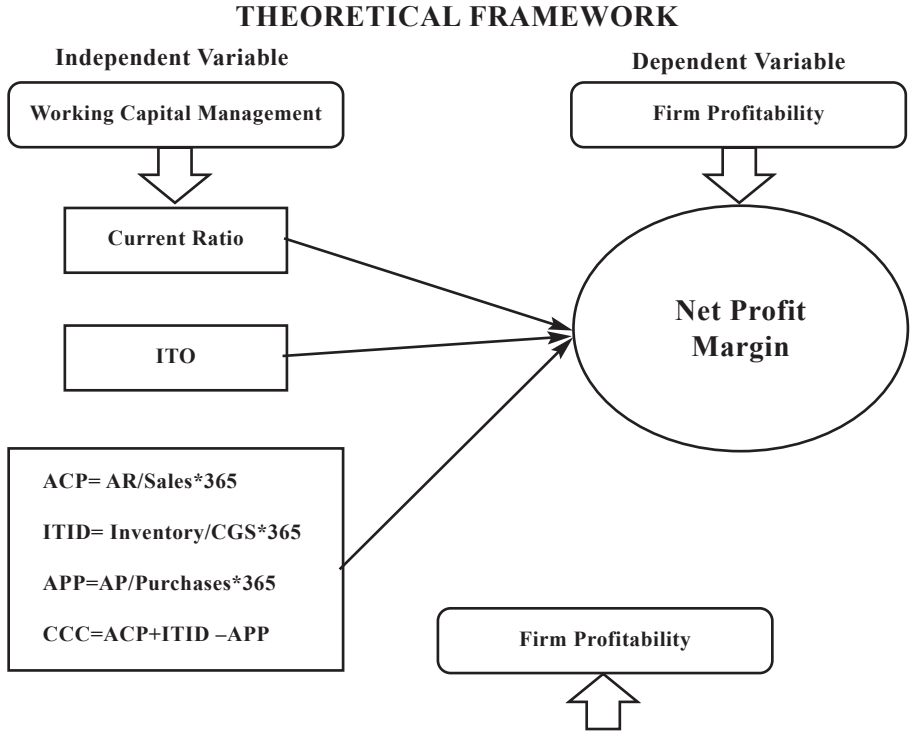
H_1. The current ratio has expected constructive and significant effect on firm profitability

H_2. Inventories turnover ratio has an effect on firm Profitability.

H_3. Cash Conversion Cycle has an effect on firm Profitability.

H_4. Firm Size has constructively effect on firm Profitability.

The figure 1.2 shows the theoretical framework of the study.



(Fig 1.2)

Control Variabl

RESEARCH METHODOLOGY

Nature of Research

The estimated and second-hand data for variable measurement were collected from investor information reports which are published by each company and available on Pakistan stock exchange (KSE), data is secondary in nature, while the time of the period is taken from 2014-2018. Data and companies were selected on data availability, whomever companies with missing data were excluded from the selected time frame. The nature of this study is based on quantitative analysis, while variables are computed on previous literature approaches. The final sample of this study involves 30 sectors for comparative analysis of sugar and cement (15 from Cement and 15 from Sugar sector). However, these results are only restricted to limited sample.

Sampling Technique

According to Pakistan stock exchange reports, there are 29 sugar and allied companies which are listed at PSX, which is considered as targeted population, based on that 15 companies randomly selected for quantitative analysis. Moreover, there are 21 in the number of cement companies sector which are listed at PSX, based from targeted population 15 firm were randomly selected. Data sample is 2014-2018 because it is the latest annual analysis data.

Variables

Net Profit Margin is used as an exploratory variable while CR, CCC, ITR, used as explanatory variables. Moreover, Size of Firm is taken as a control variable.

Variable of the study

Variable	Abbreviation	Measurements
Dependent Variable		
Net Profit Margin	**NPM**	Net Income/Net Sales
Independent Variable		
Current Ratio	**CR**	Current assets/Current Liability
Inventory Turnover Ratio	**ITR**	CGS/Average Inventory
Cash Conversion Cycle	**CCC**	ACP+ITID –APP
Control Variable		
Size of Firm	**Size**	Log of total assets Scott and Martin (1975)

Estimation model

Regression is used to predict the values of the quantitative outcome of the exploratory variable using several other predictive variables. Multiple regressions analysis shows the communal upshot of independent variables on the dependent variable.

$NPM_{it}=\alpha_o+\beta1CR_{it}+\beta2ITR_{it}+\beta3CCC_{it}+\beta4Size_{it}+€i_{it}$

Where:

α_o = Intercept
β1to β4=Co-efficients of independent and control variables.
NPM_{it}= Net Profit Margin of the i_{th} firm for the t_{th} moment in time.
CR_{it}= Current Ratio of the i_{th} firmforthe t_{th} moment in time.
ITR_{it}= Inventory turnover of the i_{th} firm for the t_{th} moment in time.
CCC_{it}= Cash Conversion Cycle of the firm i_{th} for the t_{th} moment in time.
$Size_{it}$=Size of Firm i_{th} for the t_{th} moment in time.
$€I_{it}$= Error term of the firm i_{th} for the t_{th} period.

Result and Discussion

Results of Sugar Industry

Statistics Summary

Variable	Obs	Mean	Std.Dev.	Min	Max
Net Profit	75	-.049	.273	-1.95	.173
CR	75	1.188	1.249	.053	7.934
Inventories	75	16.584	20.577	3.87	54.967
CCC	75	22.207	28.879	10.08	130.256
Size	75	6.508	.444	5.353	7.714

The above model shows the descriptive statistics of the study which consists on mean, standard deviation, the maximum and minimum value of the Sugar sector, the mean value of NPM is -.049 which shows the negative trend in Profit. While the maximum value is .173 and the minimum value is -1.95, however, the standard deviation is.273 which shows the fluctuation of data, meanwhile, the mean value of CR is 1.188 which shows the average payment of current liability which is cover by current assets, on the other hand, the maximum value is 7.934 which shows maximum period while the minimum value is 0.53

On the other hand, the mean value of ITO is 10.58, it shows average inventory turnover, the maximum value is 54.96 while the minimum value

is 3.87. Meanwhile, CCC has an average value of 22.207 which shows the conversion cycle of inventories, account receivable, account payable into readable cash form, while its maximum and the minimum value is 130.256 and 10.08. While the average mean value of Size is 6.508 which show the actual Size growth of sugar industry, moreover it has an utmost worth of 7.714 and smallest amount worth is 5.353.

Correlations Table

Variables	(1)	(2)	(3)	(4)	(5)
(1) Net profit	1.000				
(2) CR	0.256	1.000			
(3) Inventories	0.008	-0.022	1.000		
(4) CCC	-0.430	-0.198	-0.111	1.000	
(5) Size	0.414	-0.130	-0.012	-0.375	1.000

The correlation analysis shows that the Current ratio has a positive effect on Net Profit Margin. While inventories turnover ratio bears a positive static relationship with Net Profit Margin, on the other hand, CCC has a negative relationship with NPM which means that increase in CCC will lead to increase in Net Profit Margin. Meanwhile, Size has a positive effect on Net Profit Margin which means that increase in Firm size will lead to a catalytic change in Net Profit Margin.

Linear regression

Net Profit	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
CR	0.055	0.023	2.44	0.017	0.010	0.101	**
Inventories	0.000	0.001	-0.10	0.924	-0.003	0.003	
CCC	-0.002	0.001	-2.23	0.029	-0.004	0.000	**
Size	0.218	0.067	3.23	0.002	0.083	0.353	***
Constant	-1.480	0.459	-3.23	0.002	-2.395	-0.565	***
Mean dependent var		-0.049	SD dependent var			0.273	
R-squared		0.318	Number of obs			75.000	
F-test		8.166	Prob > F			0.000	
Akaike crit. (AIC)		-1.449	Bayesian crit. (BIC)			10.138	
Durbin-Watson stat	1.81732						

The above model shows the associations that exist and flanked between dependent and independent variables. The current ratio has a coefficient of 0.055 and individual t-value is significant which means that CR has positive and significant impact on Net Profit Margin. Inventories turnover ratio has a coefficient of 0.000 and individual t-value is insignificant which shows that ITO has week positive and insignificant impact on Net Profit Margin. Meanwhile, the coefficient of CCC is -0.002 which shows

week negative impact on Net Profit Margin and individual t-value is statistically significant. Which portray a message that rise in CCC will bring catalytic changes in firm Profitability. However Size has a positive coefficient, but individual t-value shows that there exists a significant impact between Size and NPM.

Moreover, R-squared of this study is 31.8% which means that NPM is that much explained by listed independent variables in the Sugar sector.

F- Test has a value of $8.16>4_{tab}$, and have Prob>F is 0.000 which means that the overall model is statistically significant.

Variance inflation factor

	VIF	1/VIF
CCC	1.278	.782
Size	1.232	.812
CR	1.1	.909
Inventories	1.019	.981
Mean VIF	1.157	.

To check the correlation between independent variables the VIF test was applied. VIF and tolerance value shows that all explanatory variables are not interrelated with each other.

Results of the Cement Industry

Statistics Summary

Variable	Obs	Mean	Std.Dev.	Min	Max
Net profit	75	.156	.122	-.292	.304
CR	75	1.79	1.241	.195	5.421
Inventories	75	18.406	12.63	3.689	86.234
CCC	75	43.877	18.388	5.244	98.946
Size	75	6.998	.453	6.029	7.941

The above model shows the descriptive statistics of the study which consists on mean, standard deviation, the maximum and minimum value of the cement industry, the mean value of NPM is .156 which shows the average earning in term of net profit in radical form. While the utmost worth is .304 and the smallest amount worth is -.292, however, the standard deviation is .122 which shows the fluctuation of the data, meanwhile, the mean value of CR is 1.79 which shows the average payment of current liability which is cover by current assets, on the other hand, the maximum value is 5.421 which shows maximum period while the minimum value is .195.

On the other hand, the mean value of ITO is 18.40, it shows average inventory turnover, the utmost worth is 86.233 while the smallest amount worth is 3.689. Meanwhile, CCC has an average value of 43.877 which shows the conversion cycle of inventories, account receivable, account payable into readable cash form, while its maximum and the minimum value is 98.946 and 5.244. While the average mean value of size is 6.998 which shows the actual industry growth, moreover it has an utmost worth of 7.941 and smallest amount worth is 6.029

Correlations Table

Variables	(1)	(2)	(3)	(4)	(5)
(1) Net profit	1.000				
(2) CR	0.372	1.000			
(3) Inventories	0.112	-0.137	1.000		
(4) CCC	0.028	0.207	-0.537	1.000	
(5) Size	0.627	0.223	0.097	-0.031	1.000

The correlation analysis shows that the Current ratio has a positive effect on Net Profit Margin. While inventories turnover ratio bears a positive static relationship with Net Profit Margin, on the other hand, CCC has a static positive relationship with Net Profit Margin which funds that raise in CCC will lead to a decline in assets turnover. Meanwhile, Size has a positive effect on Net Profit Margin which means that increase in industry growth will lead to a catalytic change in Net profit.

Linear regression

Net Profit	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
CR	0.025	0.009	2.72	0.008	0.007	0.043	***
Inventories	0.001	0.001	1.19	0.237	-0.001	0.003	
CCC	0.000	0.001	0.57	0.570	-0.001	0.002	
Size	0.151	0.024	6.17	0.000	0.102	0.200	***
Constant	-0.986	0.172	-5.72	0.000	-1.329	-0.642	***
Mean dependent var		0.156	SD dependent var			0.122	
R-squared		0.461	Number of obs			75.000	
F-test		14.949	Prob > F			0.000	
Akaike crit. (AIC)		-139.951	Bayesian crit. (BIC)			-128.364	
Durbin-Watson stat	1.879699						

*** $p<0.01$, ** $p<0.05$, * $p<0.1$

The above model shows the association that exists and flanked between exploratory and explanatory variables. The current ratio has a value of 0.025 and individual tabulated value is 2.72 which is significant which means that CR has a positive and significant impact on Net Profit Margin. Inventories turnover ratio has a value of 0.001 and individual tabulated value is insignificant which shows that ITO has a positive and insignificant impact on NPM. Meanwhile, the coefficient of CCC is 0.00 which shows week positive impact on Net Profit Margin and individual t-value is statistically insignificant. Which portray a message that rise in CCC will bring a catalytic decline in firm profitability. HoweverSize has a positive coefficient, but individual t-value shows that there exists a significant relationship between Size and NPM.

Moreover, R-squared of this study is 46.1% which means that NPM is that much explained by listed independent variables in the cement sector. F- Test has a value of $14.94>4_{tab}$, and have Prob>F is 0.000 which means that the overall model is statistically significant.

Variance inflation factor

	VIF	1/VIF
CCC	1.441	.694
Inventories	1.422	.703
CR	1.109	.902
Size	1.071	.934
Mean VIF	1.261	.

To check the correlation between independent variables the VIF test was applied. VIF and tolerance value shows that all explanatory variables are not interrelated with each other.

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity

Ho: Constant variance
Variables: fitted values of Net Profit
chi2 (1) = 0.42
Prob > chi2 = 0.5161

For similarity of checking the error moment behaviour, Breusch-Pagan test was applied; the test has a value of 0.5161 which is greater> 0.05. Therefore we accept the null hypothesis which is (HO: constant variance).

Hypotheses Acceptance

The entire hypotheses from H1-H4 have some connection with previous studies final statistical outcomes. Therefore I accepted the hypotheses.

Two-tailed Mean comparison of Cement and Sugar Industry

To check the trend analysis of both sector, observation 1 explain the statistics summary of cement sector while observation 2 shows the summary of the sugar sector.

For trend analysis I developed two hypotheses which are:

H_0: DIFFERENCE = 0

H_1: DIFFERENCE ≠ 1

Table 1-1.4

Two-sample t-test with equal variances

	obs1	obs2	Mean1	Mean2	dif	St_Err	t_value	p_value
Net profit	75	75	-.049	.156	-.205	.035	-5.95	0.01

Two-sample t-test with equal variances

	obs1	obs2	Mean1	Mean2	dif	St_Err	t_value	p_value
CR	75	75	1.188	1.79	-.603	.203	-2.95	.004

Two-sample t-test with equal variances

	obs1	obs2	Mean1	Mean2	dif	St_Err	t_value	p_value
Inventories	75	75	16.784	18.407	-1.623	5.723	-.3	.777

Two-sample t-test with equal variances

	obs1	obs2	Mean1	Mean2	dif	St_Err	t_value	p_value
CCC	75	75	32.606	49.544	-16.937	8.221	-2.05	0411

Two-sample t-test with equal variances

	obs1	obs2	Mean1	Mean2	dif	St_Err	t_value	p_value
Size	75	75	6.508	6.998	-.49	.073	-6.7	0.01

Table 1-1.4

Which show the Net Profit Margin, CR, ITR, CCC, and Size in both sectors. The summary statistics consist of mean, difference, and t-value. Accord from the preceding hypothesis there is a difference in all statistical summaries, which assume that both sectors have different operational strategies regarding, manufacturing, accounting, financing and WCM and

its effect on selected financial performance. Common t-value and P-value of all variables expresses the statistically significant relationship. But ITR has insignificant t- value. Which show that both industries have the same mean of Inventories Turnover.

Variable	Hypothesis H0.	Hypothesis H1	Acceptance/Rejection
Net Profit Margin	Difference = 0	Difference ≠1	H1. Accepted
Current Asset	Difference = 0	Difference ≠1	H1. Accepted
ITR	Difference = 0	Difference ≠1	H0. Accepted
CCC	Difference = 0	Difference ≠1	H1. Accepted
Size	Difference = 0	Difference ≠1	H1. Accepted

CONCLUSION

The prime intense of this revision is to check the impact of WCM on company financial performance by providing a comparative analysis of variables from the two most prominent sectors of Pakistan. This study takes data from the published report and companies annual financial analysis reports for the measurement of variables from 2014-2018. Accord from the different statistics and tools which is applied for such measurement and comparison the final result reveals that CR ratio has a positive and momentous effect on NPM in both sectors which means that the better the firm converts its working capital to liquidity the companies will assume better profit. Moreover, inventories turnover ratio has a positive and insignificant relation in the sugar sector, while in the cement sector it has a positive but insignificant impact on NPM. CCC has a negative but significant effect on NPM in the sugar sector, while it has a positive but insignificant effect on Net Profit Margin in cement sector, which means that increase in CCC leads to decrease in firm profitability while a decline in CCC leads to increase in firm profitability ratio. However, if we look at Size it has an optimistic and important relation with Net Profit Margin in both sectors. Which mean that increase firm size is the determinant which has a linear effect on Profitability.On the concluding remarks of this final study, the finding comprehends that profitability of sugar and cement industry can be enhanced if both sector's representative manages their daily operation activity and ratio efficiently and effectively. The outcome has associated connection which investigated by some previous researcher.

Such as Shah and Khan (2018), Nida Shah (2016), Iqbal and Zhuquan

(2015), Iqbal et al. (2014), Shah and Khan (2012), Kulkanya Napompech (2012), Eljelly (2004)

FUTURE DIRECTION

This study is only investigated the comparisons analysis of Sugar and Cement sector while this other study can also be done on other manufacturing sector increasing the sample size, further research can also be done by taking another variable for measuring firm profitability by Gross Profit Margin, Return on Assets, or measure the working capital by Quick ratio, Sales to Working Capital, Cash Ratio and taking Sales Growth as a control variable.

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DYNAMIC CAUSAL ASSOCIATION BETWEEN TOURISM AND MACROECONOMIC VARIABLES: EMPIRICAL EVIDENCE FROM PAKISTAN

Saghir Pervaiz Ghauri, Anum Hayat, and Marium Mazhar

ABSTRACT

This research paper made an effort to define the association between Tourism and macroeconomic variables (Economic growth, Exchange rate, current account deficit and inflation). The objective is to discover if the association is unidirectional or bidirectional. For this purpose annual data has been used since 1995 to 2018. Furthermore, Cointegration has been calculated using Johansen's cointegration assessment on time series data to find if a long-run affiliation exists among the variables. Before the co-integration test, it is desirable to find the static of the series for which Augmented Dickey-Fuller technique used at first difference. Because of the existence of cointegration, there is a possibility of short-run disequilibrium, so Vector Error Correction Model (VECM) is utilized to examine the disturbances of divergence or convergence finally Granger causality/Block exogeneity test is useful to find the causal relationship among variables, it also specifies unidirectional relationship or bidirectional relationship. As a result, it is found that there is a significance co-integration equation which shows the existence of long-term affiliation among series. Moreover, there is also an indication of short-run affiliation among variables. Finally, by using Granger causality test we identified one-way causal relationship, from tourism to current account balance, from economic growth to tourism and from exchange rate to CPI and current account balance. Furthermore, there is a two-way causality existence found between current account balance and inflation (CPI).

Keywords: Economic Growth, Exchange Rate, Current Account Deficit, Inflation and Tourism.

INTRODUCTION

In the present economic scenario, the Tourism sector can not only be regarded as one of the most important ones but one of the very fast-growing sector, which is an extreme necessity in the progress of the economic conditions of any nation in the current scenario. This sector is especially focused by the developing countries due to its potential to improve the economic conditions. For many nations, it is the single largest employment sector. Because this sector is mostly labour intensive it is a very ideal development sector for developing countries. Although the importance of this sector cannot be denied its importance has only been accepted since the start 0f 2000.

United Nations World Tourism Organization (2019) report demonstrates that the arrival of international tourist reaches 1.4 billion in 2018. The target was expected to reach by 2020, but a two year ahead achievement of the forecast depicts the rapid pace at which the sector is growing worldwide due to high demand. (Khalil, n.d.) said that progress in tourism can increase in the earnings of the household. Not only would it affect the individual levels but also the government revenue both with direct earnings and indirect business enhancements which is due to the multiplier effect. Because of the chain reaction that leads to progress in other sectors as well, it is important to make sure that the sector achieves momentum in a sustainable direction.

Majority of the studies conducted on tourism focuses on any one of the four major dimensions of tourism(Dwyer & Forsyth, 1993), of which the most basic one to be addressed is of economic growth because of enlarged tourism which highlights Tourism Led Economic Growth hypothesis. So the importance to find out the strength of link among the variables international tourism and economic growth and also to find out if the existence of this link is only one way or bidirectional is evident. Studies have shown that tourism inculcates competition among the firms causing them to increase their quality standards and therefore efficiency. This rise efficiency is due to competition between domestic and foreign firms which also results in achieving economies of scale which further plays a role in economic development (Jalil, Mahmood, & Idrees, 2013). This paper not only focuses on the effects of tourism on economic growth but further focuses on its effects on current account deficit, exchange rate and inflation.

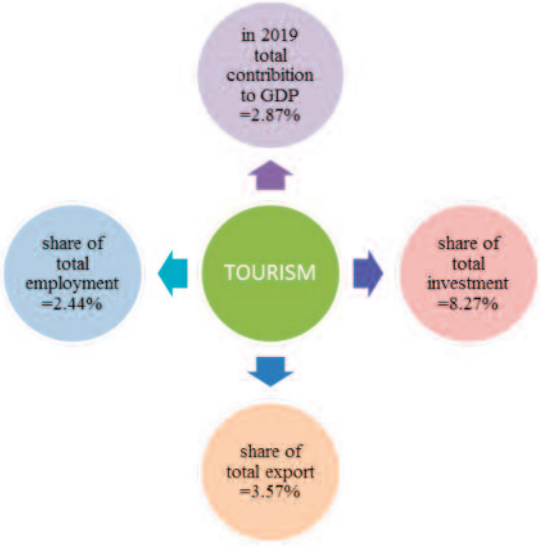
In many nations, the tourism sector has played as a fundamental industry in curbing the current account deficit for example in Turkey (Ongan, n.d.) and Portugal (Proença & Soukiazis, 2005). What needs to be taken care of is that the sector should have a sustained share as Current account balance is a prominent measure to investigate the health of an economy it is crucial to maintain a balanced current account because large

current account deficits would eventually lead to financial problems.

Moreover, any volatility in the national currency rate affects tourist spending on the destination. Depending on the strength of the internal currency and the strength of the currency the tourists intend to visit the sector is affected. This situation has been witnessed by even stronger states like the U.S (Ongan, Işik, & Özdemir, 2017) and Greece (Thompson Alexi & Thompson Henry, 2010). These changes in the exchange rate are partly effected by inflation, Therefore it is necessary to figure out the association between inflation and tourism. Inflation deteriorates the tourist's purchasing power which in turns affects the sector. If the domestic country is weaker the number of tourists from that certain nation might not wish to travel to a destination with stronger currency while if the destination intended has a stronger currency this reduces the no. of inbound tourists. (Fullard, 2014).

In the case of Pakistan, It has an intense potential for this sector. Each of the five provinces of Pakistan is unique in their manner with great opportunities and sites that can be of great attraction to international tourists. Recently the number of tourists arriving in Pakistan are increasing each year, One reason might be the fact that the current government is focusing on this sector very diligently to make it one of the prominent contributors towards the growth of the economy. Pakistan has intense scenic beauty and strong prospects for ecotourism as well as adventure tourism which can also further enhance our sports industry.

IMPACT OF TOURISM IN PAKISTAN ECONOMY



Source: World travel and tourism council (WTTC)

LITERATURE REVIEW

(Mohammed, Mostéfa, & Mohammed, 2015) studied causality between economic growth and tourism spending in 49 nations. Cointegration technique has been used, while Granger causality is also applied. The results show co-integration further two-way causality is also evident among tourism spending and economic growth. This implies that if resources are allocated properly it would enhance the industry and tourism growth will lead to economic growth.

(Mishra & Rout, 2011) they inspect the link among the expansion of the variable of the industry of tourism spending and economic growth in the economy of India. This paper verifies the possibility of a uni-directional causal relationship in the long-term from the tourism sector towards the growth and expansion of the economy. This paper has applied Johansen's method for co-integration, for causality granger method and error correction model has been used.

(Malik, 2010) examine the causal and co-integration relationship among current account deficit in tourism and growth in the economy of Pakistan by using Johansen co-integration techniques and Error Correction Model (ECM). The findings show that tourism increase which decreases the deficit in the current account which further leads to GDP growth and therefore an indication of long-run affiliation is highlighted. The paper also discovers the causal link between tourism and GDP, GDP and CAD, tourist and CAD by using Grangers Causality test. This study finds evidence of the one-way causal link between tourist to GDP, CAD to GDP and tourist to CAD.

(Stauvermann, Kumar, Jawad, Shahzad, & Kumar, 2018) in their research examined short and long-run association of GDP, exchange rate and tourism receipts (a case study of Srilanka) and they find out the evidence for both. The link exists among tourism receipt, exchange rate and GDP. They also found one-way causal relationship among exchange rate to output and receipts of tourism to output and capital and from production to capital (output and capital in each worker terms).

(Tang, 2011) in their study inspected the association among arrival of tourist, unemployment, crime rate and inflation by application of multivariate Johansen co-integration test is used to find out the long-term association and the granger causality approach by the VECM is applied to discover the causal association among mentioned variables (a case study

of Malaysia). As a result, they found that variables are cointegrated and in long-term crime, inflation and tourist arrivals all by nature represent bilateral causality although unemployment is unidirectional from unemployment to crime. However, in short-run, they found one-way causality from inflation towards tourist arrival while inflation does lead to crime. Fascinatingly tourist arrivals, unemployment and corruption are in a two-sided causal relationship in nature.

(Tang & Lumpur, 2012) examines three variables real tourism receipts, real income and a real exchange rate, the paper shows that a dynamic relationship is present between the variables. No evidence of Granger causality has been found in the short run but evidence of causality among real income and real tourism receipts both ways is highlighted in the long-term. Additionally, unidirectional causality has been found in both the long and short run in the direction of real exchange rates leading to real tourism and at last to real income.

(Schubert, Brida, & Risso, 2011) studies the influence of a small economy that is pushed forward by tourism. As the rate of international tourism demand expands this is reciprocated by the growth in the economy. The model used shows that transitional dynamics cautiously accelerating growth in the economy and accelerating terms of trade. The aim is to find out the possibility of a long-term link amid variables of economic growth. Cointegration analysis has been performed for calculating earnings from the real exchange rate and international tourism. The case of Antigua and Barbuda has been considered since 1970 – 2008.

(Kennedyja, 2010) inspects the case of Croatia in tourism-led growth hypothesis applying data quarterly from 2001 to 2008. In this study Toda-Yamamoto method for long run causality test has been used which shows positive one-way causality, from GDP towards international tourism revenues. It also reveals positive one-way causality leading from Real GDP towards the Real effective exchange rate. Therefore the outcome is supportive of Tourism growth Hypothesis.

(Brida, Cortes-jimenez, & Pulina, 2017) described the international trade is considered to be an unconventional kind of exports as it requires an origin of receipts and consumption. Exports help in the progress as it accelerates the level of investment in a country. This is caused by various reasons like a relief in the foreign exchange reserves which eventually

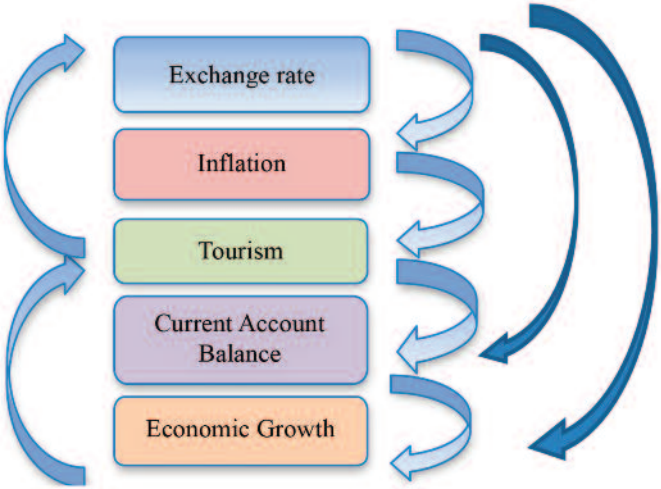
causes capital and intermediate goods to be imported (McKinnon, 1964), The import also causes voluntary domestic savings and investment opportunities resulting from government savings, external capital and banking system to enhance (Ghirmay, Grabowski, & Sharma, 2001).

(Milne, Ateljevic, & Milne, 2010) This paper inspects the complex link across the tourism industry and economic development. A brief overview has been given as to how this link is important to understand the theoretical framework to enhance international as well as local development process through further improvement in the tourism structure.

(Kim & Lee, 2016) takes the scenario of inbound tourism to Japan from South Korea. The study suggests that usually tourism is used as a strong indicator to reveal tourism demand. The purpose was to indicate genuine indicators of the price for the model of demand. Six different models were considered. Significance was found in the exchange rate, Relative price and per capita income in the model applied with the exchange rate and relative price excluding the transport cost.

(Şak2 & Karymshakov, n.d.)studies relationship across economic growth and tourism (1995-2008) in Europe, America and Asia discovered evidence of the two-way link between GDP and tourism revenue in Europe and one-way causality from GDP towards tourism in America, Caribbean and Latin America furthermore there is an indication of one way causality from tourism directing towards GDP in South Asia, East Asia and Oceania but no causal relationship in Middle East Asia and Sub Saharan Africa, North Africa and Central Asia.

THEORETICAL FRAMEWORK



DATA

The objective of the research is to observe the dynamics of causality between tourism/travel and macroeconomic variables in Pakistan by putting time-series annual data from 1995 to 2018. This study included macroeconomic variables — Real Exchange Rate (EXCH), Real Gross Domestic Product (GDP), Current Account Balance (CAB), Inflation (CPI index) and for Tourism, it included proxy tourism receipts (TR).

HYPOTHESIS

H_1: There is a long-term association between tourism and macroeconomic variable.
H_2: There is causality amongst tourism and macroeconomic variables

Table-I:

Variables	Measurement	Source	Expected sign
Tourism receipts	US dollar$	The World Bank, World development index	Dependent variable
Real GDP	US dollar $	Economic Survey of Pakistan	+ev
Current account balance (deficit)	US dollar $	Handbook of statistics, SBP	-ev
Inflation (CPI index)	In %	Handbook of statistics, SBP	-ev or +ev
Real exchange rate	US dollar	The World Bank, World development index	- ev

Table I shows variables included in the study their measurement, sources and expected relationship with dependent variable tourism receipt.

METHODOLOGY

This study is investigating that the development of tourism depends on economic growth through the improvement of macroeconomic variables — CAB, CPI and EXCH.

All variables are altered into logarithm to solve the issue of heteroscedasticity. Then, firstly, stationary of all series have been tested through the ADF unit root test. Secondly, Johansen's co-integration test has been implemented to find if there is a long-term association with VECM to find direction and speed of short-term to long-term affiliation and finally granger causality test to find out the pair-wise causal connection amongst variables.

RESULT AND DISCUSSION

Augmented Dickey-Fuller Unit Root Test:

Checking for the stationarity of series is of crucial importance before determining the integration of the series. This is necessary to avoid the issue of spurious variables, where two variables seem to associate with each other either because of the presence of a third variable or entirely due to coincidence. For this determination Augmented Dickey-Fuller test is applied. The outcomes are depicted in Table II

Here Null hypothesis: H0= series is non-stationary /series has a unit root.

Table-II

Series	Order of Integration I(0)	p-value of ADF Test	H0= series has a unit root
LCPI	Level	0.8912	ACCEPT H0
LEXCH	Level	0.4703	ACCEPT H0
LGDP	Level	0.9914	ACCEPT H0
LTR	Level	0.6484	ACCEPT H0
CAB	Level	0.6108	ACCEPT H0
Since p-value of ADF test of all the series is greater than 0.05 hence they all are non-stationary at a level.			
Series	Order of Integration I(1)	p-value of ADF Test	H0= series has a unit root
LCPI	1ST Difference	0.0220	REJECT H0
LEXCH	1ST Difference	0.0022	REJECT H0
LGDP	1ST Difference	0.0036	REJECT H0
LTR	1ST Difference	0.0055	REJECT H0
CAB	1ST Difference	0.0091	REJECT H0
Since p-value of ADF test of all the series is less than 0.05 hence they all are stationary at 1st difference.			

According to result at 1st difference I (1) all the series are stationary hence we reject the null hypothesis of the existence of unit root for all series at 5% level of significance.

Johansen's Co-integration Test:

To examine the unit root test is the precursor of co-integration modelling, which is the first step. Theories of economics and finance postulates that there is a long-term association among non-stationary time series variables. Cointegration equilibrium method applied to inspect the long-term association among variables if they are taken on the first difference I (I),

The second step is the co-integration test; co-integration is a situation in which the regression of all non-stationary series may not lead to a false/spurious regression. If series are co-integrated that means there equilibrium/ long-term association among them.

As multiple variables exist in this study Johansen's co-integration test has been used. The variables that have been studied have the following form of the equation:

$$lTOUR_t = \beta_0 + \beta_1 lCAD_t + \beta_2 lEX_t + \beta_3 lINF_t + \beta_4 lGDP_t + ut$$

The initial step of applying Johansen's co-integration is to check Lag Length Criteria.

H0= no co-integration exist.

Table III. Johansen's Co-integration Test results:

Hypothesized Number of co-integration equations	Eigen values	Trace statistics	0.05(5%) critical value (p-value)	Max-Eigen statistics	0.05(5%) critical value (p-value)
None	0.846852	93.20222*	69.81889 (0.0002)	39.40340*	33.87687 (0.0099)
At most 1	0.726814	53.79883*	47.85613 (0.0551)	27.24965	27.58434
At most 2	0.456956	26.54917	29.79707 (0.1131)	12.82188	21.13162 (0.4688)
At most 3	0.339031	13.72729	15.49471 (0.0907)	8.695002	14.26460 (0.3124)
At most 4	0.213083	5.032291*	3.841466 (0.0249)	5.032291*	3.841466 (0.0249)

Trace test and indicates 2 cointegrating eqn(s) at the 0.05 level
Max-eigenvalue test indicates 1 cointegration at the 0.05 level
** denotes rejection of the hypothesis at the 0.05 level*
***MacKinnon-Haug-Michelis (1999) p-values*

Table-III illustrate the outcome of Johansen's cointegration test in which the Trace test indicates the 3 co-integrating equation at the significance level of 5% and Max-Eigen test specifies 1 co-integrating equation significance at 5% which robust the findings of trace test. Hence there is the presence of long-term nexus among variables.

Vector Error Correction Model:

Johansen's cointegration test outcomes depicted the presence of long-run or equilibrium affiliation among variables that means there must be volatility in short-run. Thus we have to verify in this study whether short-run disequilibrium diverges or converges in long-run and at what speed it will adjust. For this purpose, we have to use the vector error correction model. Engle, Granger, & Mar 2007 developed Error correction mechanism which integrates short-run performance with the long-run performance of variables.

For the application of VECM we need to find Lag length criteria (SIC) or lag exclusion test and according to this the number of lag is 1 further results of VECM are shown in table-IV

Table-IV:

Variables	Error correction Coefficients	Standard error	t-stats
D(LTR)	-0.249066	(0.14950)	[-1.66600]
D(LGDP)	-0.001623	(0.01974)	[-0.08222]
D(LCPI)	0.089730	(0.02788)	[3.21864]
D(LEXCH)	0.140485	(0.08734)	[1.60840]
D(CAB)	-1.70E+10	(3.9E+09)	[-4.35071]

The ECM table-III result depicts that the coefficient of error terms for the estimated DLTR, DLGDP, DLCPI, DLEXCH and DCAB from which DLTR, DLGDP AND DCAB are negative while DLEXCH and DLCPI are positive. As the theory suggests that if the variable was above the equilibrium level, it is negative therefore in the following era the error term will diminish to its equilibrium level while if the variable is below the equilibrium level it is positive therefore in the following era the trajectory of the error term will move upwards towards the equilibrium. The pace at which alteration takes place is the coefficient's value.

Granger Causality /Block Exogeneity Test:

Table V:

DEPENDENT VARIABLE	DLTR	DLGDP	DLCPI	DLEXCH	DCAB EXCLUDED
DLTR	-	1.69E-06 (0.9990)	3.645333* (0.0562)	0.602266 (0.4377)	1.155585 (0.2824)
DGDP	3.264288* (0.0708)	-	0.001392 (0.9702)	1.149744 (0.2836)	0.518768 (0.4714)
DLCPI	1.312871 (0.2519)	0.495227 (0.4816)	-	1.249171 (0.2637)	17.92912* (0.0000)
DLEXCH	0.126475 (0.7221)	1.909722 (0.1670)	7.984472* (0.0047)	-	5.450864* (0.0196)
DCAB	2.128674 (0.1446)	0.001056 (0.9741)	3.033202* (0.0816)	1.265916 (0.2605)	-

**Values show the significance of Chi-sq value at 0.10 level.*

Granger causality test specifies the presence of a one-way causal association between tourism and real GDP from DLGDP to DLTR and between exchange rate, inflation and current account balance from DLEXCH to DLCPI, DCAB and Two-way causality between DCAB to DLCPI. Furthermore, this study found a one-way causal association between tourism and inflation from DLTR to DLCPI.

One / Two-way causality between the macroeconomic variables:

DLGDP	⟶	DLTR
DLTR	⟶	DCAB
DLEXCH	⟶	DLCPI and DCAB
DLCPI	⟷	DCAB

CONCLUSION:

This study investigates the causality between Tourism and other variables including Economic growth, Inflation, Current account deficit and Exchange rate. To attain the goal first Dickey fuller test was used because of non-stationary variables and found that entire variables of the study are static at I (1). After taking the variables at the first difference I (1), Johansen's co-integration and Granger causality test was used to explore the possibility of both long-run and short-run relationship. Findings illustrate that long-term equilibrium exists. It is further concluded that one-way causality present between Tourism and Current account balance. An increase in Tourism receipts would help in curbing and reducing the current account deficit.

Moreover, it was also seen that there is evidence of a one-way causal association between exchange rate and other macroeconomic variables including CPI and CAB. Therefore a change in the exchange rate would affect Inflation levels and Current account balances in Pakistan. Furthermore, there is the existence of one-way causality from real economic growth to tourism which means the rise in real economic growth eventually causes an increase in tourism in Pakistan. Moreover, two-way causality between inflation and current account balance is also found. Further variables have no causal relationship or significant impact on each other.

POLICY IMPLICATION

Considering the influence of Exchange rate and tourism receipts on current account deficit strong and applicable steps and policies should be made to solve this problem. The government of Pakistan is currently investing both its energy and funds to boost this industry but further steps should be taken as there are still many constraints and hurdles for the inbound tourism to grow. Some of the major constraints where the government should focus on are:

1. Pakistan lacks the infrastructure to invite a large number of tourists, which includes trained and skilled manpower, proper tourist accommodation facilities and attractions etc.

2. Proper wastage disposal as the increasing number of tourists are causing insufficient resources for waste management which must be taken care of on an urgent basis.
3. Besides infrastructure efficient transportation is also required to boost the number of tourists.
4. Safety measures should be taken as the topmost priority, as in the past this particular issue led to a huge loss in the tourism industry.
5. Pakistan needs to focus on attractive marketing strategies to not only attract more tourists but also highlight a positive image of Pakistan.

EMPIRICAL FINDINGS OF THE STUDY:

Series	ADF Unit root test (Level of integration for Stationarity)	Johansen's Cointegration Existence	Speed of adjustment towards long-run equilibrium in %	VEC Granger Causality
	Level	*1st diff*		
Tourism receipt	No	Yes		
Real GDP	No	Yes		
Current account balance (CAB)	No	Yes		
Inflation (CPI)	No	Yes		
Real Exchange rate (EXCH)	No	Yes		
Tourism receipts, CAB, GDP CPI and EXCH		Yes		
Tourism receipts			-24.9%	
Real GDP			-0.01%	
CAB			-170%	
CPI			0.89%	
EXCH			1.40%	
TR cause GDP, CPI, CAB, EXCH				TR cause CAB
GDP cause TR, CPI, CAB, EXCH				GDP cause TR
CPI cause GDP, TR, CPI, CAB, EXCH				CPI cause CAB
CAB cause TR, CPI, GDP, EXCH				CAB cause CPI
EXCH cause TR, CPI, CAB, GDP				EXCH cause CPI and CAB
At the significance level of 0.05 Significance lag level at 1				

Source: Author's calculations

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ECONOMIC GROWTH, FOREIGN DIRECT INVESTMENT AND TRADE ACCESSIBILITY: EMPIRICAL EVIDENCE FROM SAARC ECONOMIES (1996-2017)

Maryam Nasir and Raza Ali Khan

ABSTRACT

Foreign direct investment (FDI) accounts for the largest share of external capital flows into Asia. From a host country perspective, the FDI is considered to be more attractive and less volatile as compared to other forms of international capital flows i.e. Portfolio investment and remittances. The main motive of this study is to illuminate the importance of inward FDIs for SAARC economies and to determine the proportion of these economies that have been assessed and managed to attract FDI over the last two decades. This study seeks to investigate the impact of FDI on Economic growth via trade accessibility through empirical evidence from SAARC economies such as Afghanistan, Bangladesh, Bhutan, India, Nepal, Maldives, Pakistan and Sri Lanka by using Panel data technique. GDP per capita growth will be used as a variable to assess Economic growth in Foreign Direct Investment inflows data will be obtained from the website of World Bank, World Development Indicators for the selected countries. The data will be a cross-sectional time series from 1996-2017. FDI is considered as one of the conventional determinants of Economic growth. Economies that are pursuing for a better tomorrow must focus on attracting Foreign Direct Investments, although FDI depends on several factors in a country such as market size, level of openness, natural resources, labour cost and productivity, economic growth rate, macroeconomic stability, inflation, technology level and so on. Besides these factors trade accessibility in the recipient economy is also determinants of FDI. This research study argues that openness in trade is one of the

important preconditions for FDI inflows to have a positive impact on economic growth. The results indicate that these absorptive capacity factors do not exert their impact on FDI inflows in SAARC economies.

***Keywords**: Economic Growth, Foreign Direct Investment, Trade Accessibility*

INTRODUCTION

Today's world out looked like a global village, more integrated and interdependent in terms of world economy driven by international trade and foreign investment. Globalization aims to provide a platform that is one huge global marketplace by merging of historically distinct and separate national markets with the help of declining cross border trade barriers and ease of doing investment that is a free flow of goods and services and capital between nations.

Globalization not only helps out in providing one platform for business but also helps out in reducing overall cost structures by taking advantage of national differences in the form of absolute advantage and/or comparative advantage through cost and quality of factor of production include land, labour, capital & technology.

The global institutions such as GATT (general agreement on tariff and trade) and its subsidiary the WTO (world trade organization) played a pivotal role in accelerating globalization of minimizing tariff rates, reducing barriers to cross border investments, helps out in bilateral and multilateral investment treaties, providing protection for patent, trademarks and copyrights & limiting the use of antidumping laws.

Adam Smith, David Ricardo, Eli Hecksher & Bertil Ohlin well-reputed economist firmly supports the contribution of international trade in economic growth by penning the concept of absolute and comparative advantage and renowned Hecksher & Ohlin theory, however, these concepts are contrary to the doctrine of Thoams Man, that was emerged in the mid-sixteenth century.

The economic philosophy of Thomas Mun is termed as Mercantilism, advocates that economies should encourage exports only and discourage imports at the same time. The mercantilist doctrine prescribes government intervention by limiting imports by imposing tariffs and quotas while subsidizing exports to achieve a surplus in the balance of trade, the gain

by one country results in a loss by another country was the underpinned plot of Mercantilism. Adam Smith and David Ricardo overrule the zero-sum game and ratified trade as a positive-sum game or as a situation in which all countries can get a benefit.

The regional trade blocs EU (European Union), NAFTA (North American free trade agreement) between Canada, Mexico and the United States and CAFTA-DR (The Dominica Republic and Central American free trade agreement) between the United States, Central American countries of Costa Rica, El Salvador, Guatemala, Honduras and Nicaragua and the Dominican Republic provide clear evidence for the link between trade and economic growth that leads to increase in income level and hence improve the standard of living. Opponents of free trade argue that free trade associated with an increase in pollution and labour exploitation, however, supporters of free trade argue that the tougher enforcement of environmental protection regulations and the implementations of labour laws tie with free trade agreements leads to the sustainable development of the economies.

In addition to the concept that was emerging in the late nineteenth century by Paul Krugman, the new trade theory advocates that countries attain economies of scale as well as a first-mover advantage through international trade. Besides international trade, foreign investment possesses crucial importance concerning economic growth and hence economic development. Foreign direct investment inflows act as a catalyst for non-speedy developing and/or under developing economies. From host country perspective economies get aid from foreign direct investment inflows in the form of transfer of resources and technology and employment opportunities. Moreover, foreign direct investment inflows have favourable and/or adverse effect on competition, the balance of payment and national sovereignty and autonomy. Low tariff rates and transportation cost leads to international trade while high transportation cost and tariff, tight control over the foreign operation lead to foreign investment. Many economists found either complementary or substitute relationship between trade and foreign investment, therefore the scheme of present study revolves around the interdependence of foreign direct investment (FDI) inflows on trade accessibility, and their overall impact on economic growth. The result of this study would assess to what extent trade openness contributes to the absorption of FDI inflows in SAARC economies.

According to the world investment report 2016, only about 7% FDI was attracted by India and Pakistan aggregately, 6% and 1%, respectively, however, in 2017, 11% FDI was attracted by India and Pakistan remain stagnant with the 1% (UNCTAD, 2016-2017).

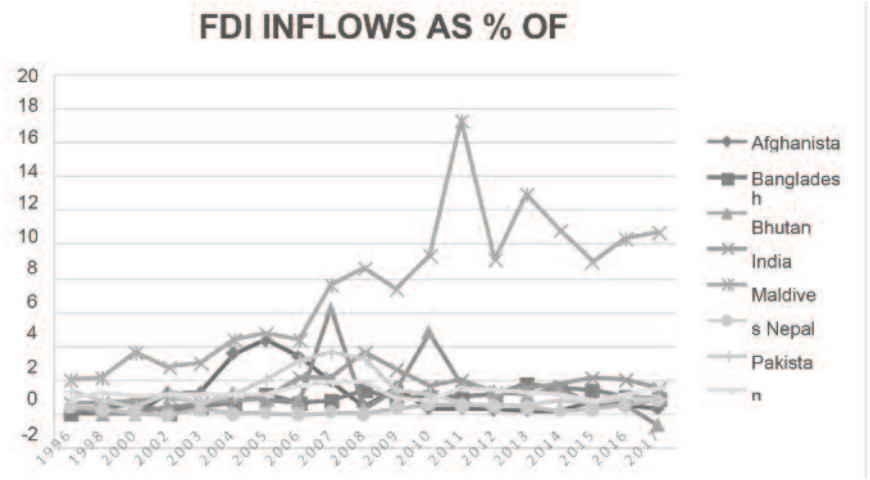

Figure 1: FDI inflows as a percentage of GDP

Source: World Development Indicators (https://data.worldbank.org), accessed September 24, 2018

SAFTA (South Asian free trade area) an agreement reached at the 12th SAARC summit in 2004 for bilateral trade and reduce customs duties ratified by Pakistan and India in 2009 and by Afghanistan in 2011. The trend line shows in figure 2 that Sri Lanka, Pakistan, Nepal, Maldives has higher trade accessibility as compared to India, Bhutan, Bangladesh and Afghanistan after 2005.

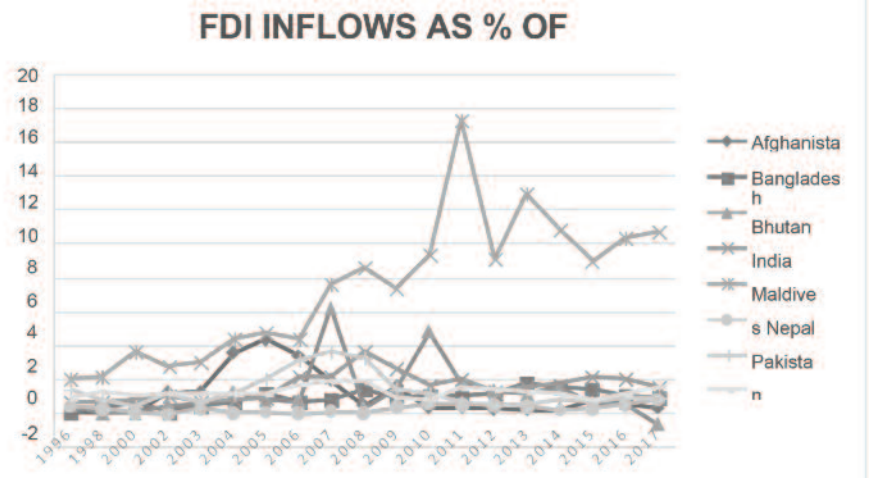

Figure 2: Trade Openness as percentage of GDP

Source: World development Indicators (https://data.worldbank.org) accessed September 24, 2018

RESEARCH OBJECTIVES

This study primarily aims to investigate the impact of FDI on Economic growth via Trade accessibility and to highlight the importance and role of openness of trade towards the absorption of FDI inflows.

To investigate the complementary relationship between FDI inflows and trade accessibility, multiplicative interaction model used and thus generate a conditional hypothesis, a hypothesis in which relationship between two or more variables depends on the value of one or more other variable known as a conditional hypothesis. The null hypothesis is as follows:

H_0 = An increase in FDI is associated with an increase in economic growth when condition trade accessibility is met but not when trade accessibility is absent

LITERATURE REVIEW

The liaison between the FDI and trade is familiar. It is postulated by various researchers that FDI and trade openness can lead to economic growth. (Grossman & Helpman, 1993) emphasized on global interdependence and comparative advantage as an endogenous variable for long term economic growth. (Krueger, 1997) studied the transformation of high-inflation, inner-oriented, aid-dependent and highly indebted economies of East Asia to major exporting economies through openness in trade and export promoting policies. Similarly (Balasubramanyam, Salisu, & Sapsford, 1996) found the strong impact of inward FDI on economic growth in the presence of export promoting policies.

Moreover, many researchers hypothesized substitute and complement relation between FDI and trade. (Mundell, 1957) under the assumption of the identical production function for two countries within the framework of Heckscher-Ohlin- Samuelson model of trade found FDI and trade substitute for each other, while researchers like (Purvis, 1972; Schmitz & Helmberger, 1970) under the assumption of varied production function between two countries found Foreign investment work complementary to international trade. (Kojima, 1975) put a step forward to find the relation between FDI and trade in the light of previous research work found FDI work as complement and substitute to trade as trade creating and trade destroying factor respectively.

Several researchers test the spillover effect of FDI on trade empirically. (Haddad & Harrison, 1993) explored the spillover effect of FDI on improving the quality of human capital, increase competition and boost export performance and opportunities in the host economy through technological diffusion. (Bhalla, 1995) and (Fry, 1993) drew special attention in their study towards the FDI role in elevating trade and emphasized on improving FDI policies to get benefits from spilt over effect especially in case of developing economies.

(Gnangnon & Roberts, 2015) worked on the panel of eighty-six countries, including developing and least developed economies found a more significant impact of FDI on export performance in the least developing economies. (Makki & Somwaru, 2004) claimed that trade openness lubricates FDI spillover effects. They further claimed that FDI has a significant impact on human capital development, improvement in the quality of institutions and trigger domestic investment. (Zhang, 2005) observed the effect of horizontal and vertical foreign investment in export productivity in China found an indirect effect of horizontal foreign direct investment towards export while the direct effect of vertical foreign direct investment. (Saadi, 2014) examined the impact of FDI inflows on export productivity found FD elevate overall productivity level of the developing and emerging countries' exports.

(Tekin, 2012) examined two-way relationship between FDI, export and GDP at least developing economies by using Granger causality test from the period 1970 to 2009 found growth led to export in countries rich in natural resources while export-led growth in manufacturing and services exporters. Moreover, then explore that FDI is market seeking in economies rich in renewable resources and trade creating in manufacturing economies.

(Sharma & Kaur, 2013) explored the causal relationship between FDI and trade in India and China by using Granger causality test for time series data from 1976 to 2011, observed unidirectional causality from FDI to trade in China while bidirectional causality between FDI and trade in India.

(Hsiao & Hsiao, 2006) to study the causal association between FDI, GDP and exports by using Granger causality test for four Southeast Asian economies, known as Asian tigers, Hong Kong, Singapore, South Korea

and Taiwan along with China, Thailand, Philippines and

Malaysia explored bidirectional causality between export and GDP for the selected economies and unidirectional from FDI to GDP but directly and indirectly caused effects through exports. (Min, 2003) analyzed FDI spillover effect towards the shift from primary to the manufacturing sector to boost export in the perspective of Malaysia over the period from 1988 to 1995.

The study of (Fukao, Ishido, & Ito, 2003) explored that FDI plays a key role to get access to international markets and tie domestic enterprises with global manufacturing chains, predominantly efficiency-seeking and export-oriented FDI contribute in enhancing trade performance in East Asia during the 1970s to 1980s.

RESEARCH METHODOLOGY

Empirical model Equation

The model is derived from standard neoclassical simple production function,

$$Y=f(K, H) \quad (1)$$

Where Y is GDP per capita, K is the stock of physical capital, and H is the human capital; by differentiating the function we get the following equation termed as a base equation:

$$y= \gamma_1 k + \gamma_2 h \quad (2)$$

FDI affects growth directly by increasing the stock of physical capital and indirectly by inducing human capital development and promoting technological upgrading (De Mello, 1999) therefore FDI denoted as F is introduced as an additional variable in the production function we get

$$Y=f(K, H, F) \quad (3)$$

Differentiating (3) we get

$$y= \gamma_1 k + \gamma_2 h + \gamma_3 f \quad (4)$$

To empirically examine the impact of FDI on Economic Growth via Trade accessibility, this study hypothesizes a model as follows:

$$\mathbf{EG}= \gamma_0 + \gamma_1 \mathbf{M} + \gamma_2 \mathbf{FDI} + \gamma_3 \mathbf{TA} + \gamma_4 \mathbf{FTA} + \gamma_5 \mathbf{C} + \epsilon \quad (5)$$

The dependent variable is the growth rate of real GDP per capita, (**EG).** The vector **M** include generally accepted variable to economic growth. There are 2 variables in vector **M;** namely gross capital formation (formerly gross domestic investment) it is denoted as **(GKF)** and computed as the ratio to GDP. Tertiary school enrollment as a percentage of the gross enrollment ratio (the ratio of total enrollment) used as a proxy for human capital, represented as **(HC).** The variable (**FDI)** represents foreign direct investment inflows as a percentage of GDP. The variable (**TA)** depicts constitutive term the variable of interest that is Trade accessibility. (**FTA**) represents an interaction term of FDI and Trade accessibility. The vector **C** includes three conditional variables, namely Inflation (**INF**) used as a proxy for measuring macroeconomic stability, Government expenditures denoted as **(GE)** is measured as GDP ratio and institutional quality (**IQ**) measured as by simply computing average of six components of Worldwide Governance indicators produced by Daniel Kaufmann and Aart Kray, these six dimensions of governance include Control of Corruption, Government Effectiveness, Political Stability and Absence of Violence/Terrorism, Regulatory Quality, Rule of Law and Voice and Accountability. Each of these variables is measured in percentile rank. A higher value indicating better performance.

Table A exhibits a correlation matrix to investigate the dependence between the selected variables, the Correlation coefficient value ranges from -1 to +1 indicate a strong correlation between the variables. Values close to zero indicate a weak correlation between the variables. The correlation matrix indicates that EG is positively correlated with FDI (0.48), Gross capital formation (0.29), human capital (0.13), institutional quality (0.23), government expenditure (0.13) and trade accessibility (0.21). However, inflation is negatively correlated or inversely correlated with EG (-0.30).

Table A: Correlation Matrix

	EG	GKF	HC	FDI	TA	INF	GE	IQ
EG	1.00							
GKF	0.29	1.00						
HC	0.13	0.28	1.00					
FDI	0.48	0.25	0.13	1.00				
TA	0.21	0.75	-0.06	0.21	1.00			
INF	-0.30	0.13	0.12	0.18	0.03	1.00		
GE	0.13	0.58	-0.13	0.27	0.79	0.03	1.00	
IQ	0.23	0.65	0.38	0.37	0.52	0.04	0.49	1.00

Table B: Regression Model

		VARIABLE		PROXY
EG	DEPENDENT	ECONOMIC GROWTH	(EG)	GROWTH RATE OF REAL GDP PER CAPITA
M	INDEPENDENT	HUMAN CAPITAL	(HC)	GROSS ENROLLMENT RATIO (TERT)
	INDEPENDENT	GROSS CAPITAL	(GKF)	GDI TO GDP RATIO FORMATION
FDI	INDEPENDENT	FOREIGN DIRECT INVESTMENT	(FDI)	INWARD FDI FLOWS TO GDP RATIO
TA	INDEPENDENT	TRADE ACCESSIBILITY	(TA)	TRADE AS % OF GDP
FTA	INDEPENDENT	FDI AND TRADE	(FTA)	MULTIPLICATION
C	INDEPENDENT	INFLATION	(INF)	CONSUMER PRICES ANNUAL %
	INDEPENDENT	GOVERNMENT EXPENDITURE	(GE)	GE AS GDP RATIO
	INDEPENDENT	INSTITUTIONAL QUALITY	(IQ)	GOVERNANCE INDICATOR AVERAGE

FINDINGS

In table 1, specification IA explores the empirical results of the base equation & specification IB explores the empirical results of the base equation along with foreign direct investment and trade accessibility, interaction term by using fixed effects (FE) and random effect (RE) least-squares technique.

For specification IA, the required model for fixed effect technique is as follows:

$$EG_{it} = \gamma_{0i} + \gamma_1 GKF_{it} + \gamma_2 HC_{it} + \gamma_3 FDI_{it} + \gamma_4 TA_{it} + \mu_{it} \quad (6)$$

For specification IA, the required result of the fixed effect technique is as follows:

$$EG_{it} = 3.56_{0i} + 0.06\ GKF_{it} + 0.01\ HC_{it} + 1.12\ FDI_{it} - 0.05\ TA_{it} + \mu_{it} \quad (7)$$

For specification IA, the required model for random effect technique is as follows:

$$EG_{it} = \gamma_0 + \gamma_1 GKF_{it} + \gamma_2 HC_{it} + \gamma_3 FDI_{it} + \gamma_4 TA_{it} + \omega_{it} \quad (8)$$

For specification IA, the required result of the random effect technique is as follows:

$$EG_{it} = 1.66_0 + 0.08\ GKF_{it} - 0.00\ HC_{it} + 1.04\ FDI_{it} - 0.02\ TA_{it} + \omega_{it} \quad (9)$$

For specification IB, the required model for fixed effect technique is as follows:

$$EG_{it} = \gamma_{0i} + \gamma_1 GKF_{it} + \gamma_2 HC_{it} + \gamma_3 FDI_{it} + \gamma_4 TA_{it} + \gamma_5 FTA_{it} + \mu_{it} \quad (10)$$

For specification IB, the required result of the fixed effect technique is as follows:

$$EG_{it} = 3.28_{0i} + 0.06\, GKF_{it} + 0.01 HC_{it} + 1.46\, FDI_{it} - 0.05\, TA_{it} - 0.00\, FTA_{it} + \mu_{it} \quad (11)$$

For specification IB, the required model for random effect technique is as follows:

$$EG_{it} = \gamma_0 + \gamma_1 GKF_{it} + \gamma_2 HC_{it} + \gamma_3 FDI_{it} + \gamma_4 TA_{it} + \gamma_5 FTA_{it} + \omega_{it} \quad (12)$$

For specification IB, the required result of the random effect technique is as follows:

$$EG_{it} = 1.35_0 + 0.09\, GKF_{it} + 0.00\, HC_{it} + 1.00\, FDI_{it} - 0.02\, TA_{it} + 0.00\, FTA_{it} + \omega_{it} \quad (13)$$

Table 1: Base equation along with Trade openness Interaction term

	IA		IB	
	FE	**RE**	**FE**	**RE**
C	3.56**	1.66	3.28*	1.35
	(1.79)	(1.11)	(1.90)	(1.16)
GKF	0.06	0.08**	0.06	0.09***
	(0.06)	(0.03)	(0.05)	(0.03)
HC	0.01	-0.00	0.01	0.00
	(0.09)	(0.06)	(0.07)	(0.05)
FDI	1.12***	1.04***	1.46	1.00
	(0.35)	(0.29)	(0.81)	(0.70)
TA	-0.05**	-0.02	-0.05**	-0.02
	(0.02)	(0.01)	(0.02)	(0.02)
FTA			-0.00	0.00
			(0.01)	(0.00)
R^2	0.29	0.19	0.29	0.23
d	1.00	0.94	1.01	0.92
F-stats	3.29***	5.17***	2.98***	5.02***
OBS	89	89	89	89
H Test-P	0.51		0.20	

-Standard Errors are reported in parentheses
-The significance level indicated by (*). One (*) indicates significance at the 10% level, (**) indicates significance at the 5% level, while (***) indicates significance at the 1% level.

In specification IA, the base equation includes Gross capital formation (GKF), human capital (HC), foreign direct investment (FDI) and trade accessibility (TA) where (GKF) and (FDI) are positively significant at the 5% and the 1% significance level respectively. The coefficient 1.04

implying that an increase in FDI inflows as a percentage of GDP leads to an increase in GDP per capita growth 1.04%. Many researchers have found a positive link between trade accessibility and human capital (Miller & Upadhyay, 2000) but in case of SAARC economies, the variable human capital (HC) in the presence of trade accessibility is insignificant while the variable of interest trade accessibility (TA) is insignificant too. The result depicts that human capital and trade accessibility has no impact on GDP per capita, in other words, human capital and trade accessibility not enhancing the living standards of people of SAARC region. This is due to lack of adequate knowledge workers and proves trade deficit in SAARC economies. It also shows that the ratio of import is greater than the ratio of export. The negative sign is usually associated with a lower level of technology transfer, lower level of transparency and disclosure of the risk associated with business, low market regulation and low production of goods and services by domestic firms.

Many researchers found a positive impact of trade accessibility on domestic growth, income growth and regional per capita (Buch & Toubal, 2009) but in case of SAARC economies, the inclusion of interaction term of foreign direct investment and trade accessibility (FTA) in specification IB turns (FDI) insignificant although (GKF) remains significant at the 1% significance level.

In Table 2, specification IIA explores the empirical results of the base equation with the inclusion of one conditional variable that is inflation & specification IIB explores the empirical results of conditional variable inflation along with foreign direct investment and trade accessibility interaction term by using fixed effects (FE) and random effect (RE) least-squares technique.

For specification IIA, the required model for fixed effect technique is as follows:

$$EG_{it} = \gamma_{0i} + \gamma_1 GKF_{it} + \gamma_2 HC_{it} + \gamma_3 FDI_{it} + \gamma_4 TA_{it} + \gamma_5 INF_{it} + \mu_{it} \quad (14)$$

For specification IIA, the required result of the fixed effect technique is as follows:

$$EG_{it} = 1.45_{0i} + 0.08\, GKF_{it} + 0.00\, HC_{it} + 1.49\, FDI_{it} + 0.01\, TA_{it} - 0.35\, INF_{it} + \mu_{it} \quad (15)$$

For specification IIA, the required model for random effect technique is as follows:

$$EG_{it} = \gamma_0 + \gamma_1 GKF_{it} + \gamma_2 HC_{it} + \gamma_3 FDI_{it} + \gamma_4 TA_{it} + \gamma_5 INF_{it} + \omega_{it} \quad (16)$$

For specification IIA, the required result of the random effect technique is as follows:

$$EG_{it} = 3.24_0 + 0.07\ GKF_{it} + 0.01\ HC_{it} + 1.43\ FDI_{it} - 0.00\ TA_{it} - 0.37\ INF_{it} + \omega_{it} \quad (17)$$

For specification IIB, the required model for fixed effect technique is as follows:

$$EG_{it} = \gamma_{0i} + \gamma_1\ GKF_{it} + \gamma_2\ HC_{it} + \gamma_3\ FDI_{it} + \gamma_4\ TA_{it} + \gamma_5\ FTA_{it} + \gamma_6\ INF_{it} + \mu_{it} \quad (18)$$

For specification IIB, the required result of the fixed effect technique is as follows:

$$EG_{it} = 1.64_{0i} + 0.08\ GKF_{it} + 0.00\ HC_{it} + 1.02\ FDI_{it} + 0.01\ TA_{it} + 0.00\ FTA_{it} - 0.33\ INF_{it} + \mu_{it} \quad (19)$$

For specification IIB, the required model for random effect technique is as follows:

$$EG_{it} = \gamma_0 + \gamma_1\ GKF_{it} + \gamma_2\ HC_{it} + \gamma_3\ FDI_{it} + \gamma_4\ TA_{it} + \gamma_5\ FTA_{it} + \gamma_6\ INF_{it} + \omega_{it} \quad (20)$$

For specification IIB, the required result of the random effect technique is as follows:

$$EG_{it} = 3.57_0 + 0.06\ GKF_{it} + 0.02\ HC_{it} + 1.07\ FDI_{it} - 0.01\ TA_{it} + 0.00\ FTA_{it} - 0.36\ INF_{it} + \omega_{it} \quad (21)$$

Table 2: Inflation as Conditional variable

	IIA		IIB	
	FE	**RE**	**FE**	**RE**
C	1.45	3.24***	1.64	3.57***
	(1.73)	(0.86)	(1.76)	(1.03)
GKF	0.08*	0.07*	0.08*	0.06*
	(0.05)	(0.03)	(0.05)	(0.03)
HC	0.00	0.01	0.00	0.02
	(0.06)	(0.04)	(0.06)	(0.04)
FDI	1.49***	1.43***	1.02	1.07*
	(0.28)	(0.24)	(0.74)	(0.64)
TA	0.01	-0.00	0.01	-0.01
	(0.03)	(0.01)	(0.03)	(0.02)
INF	-0.35***	-0.37***	-0.33***	-0.36***
	(0.08)	(0.07)	(0.08)	(0.07)
FTA			0.00	0.00
			(0.00)	(0.00)
R^2	0.49	0.44	0.49	0.45
d	1.19	1.09	1.17	1.07
F-stats	6.56***	13.1***	6.01***	10.9***
OBS	87	87	87	87
H Test-P	0.27		0.38	

-Standard Errors are reported in parentheses
-The significance level indicated by (*). One (*) indicates significance at the 10% level, (**) indicates significance at the 5% level, while (***) indicates significance at the 1% level.

Many researchers found negative nature between trade accessibility and inflation such as (Sachsida, Carneiro, & Loureiro, 2003) and (Kim, Lin, & Suen, 2010) found a negative relation between trade accessibility and low-income level, high inflated economies although in case of SAARC economies the inclusion of inflation (INF) as a conditional variable in base equation as shown in specification IIA, possess no impact on trade accessibility (TA) and it remains insignificant while gross capital formation (GKF) and foreign direct investment (FDI) remain significant at the 10% and 1% significance level respectively during the study period. The conditional variable inflation is negatively significant at the 1% significance level. The following results depict that the presence of inflation in SAARC economies possesses a negative impact on

economic growth. The coefficient 0.37 implying that an increase in inflation leads to a decrease in GDP per capita growth 0.37%.

In Table 3, specification IIIA explores the empirical results of the base equation with the inclusion of another conditional variable that is government expenditure & specification IIIB explores the empirical results of conditional variable government expenditure along with foreign direct investment and trade accessibility interaction term by using fixed effect (FE) and random effect (RE) least-squares technique.

For specification IIIA, the required model for fixed effect technique is as follows:

$$EG_{it} = \gamma_{0i} + \gamma_1 GKF_{it} + \gamma_2 HC_{it} + \gamma_3 FDI_{it} + \gamma_4 TA_{it} + \gamma_5 GE_{it} + \mu_{it} \quad (22)$$

For specification IIIA, the required result of the fixed effect technique is as follows:

$$EG_{it} = 5.92_{0i} + 0.07\, GKF_{it} + 0.02\, HC_{it} + 1.09\, FDI_{it} - 0.06\, TA_{it} - 0.23\, GE_{it} + \mu_{it} \quad (23)$$

For specification IIIA, the required model for random effect technique is as follows:

$$EG_{it} = \gamma_0 + \gamma_1 GKF_{it} + \gamma_2 HC_{it} + \gamma_3 FDI_{it} + \gamma_4 TA_{it} + \gamma_5 GE_{it} + \omega_{it} \quad (24)$$

For specification IIIA, the required result of the random effect technique is as follows:

$$EG_{it} = 1.49_0 + 0.09\, GKF_{it} - 0.02\, HC_{it} + 1.05\, FDI_{it} - 0.02 TA_{it} - 0.04\, GE_{it} + \omega_{it} \quad (25)$$

For specification IIIB, the required model for fixed effect technique is as follows:

$$EG_{it} = \gamma_{0i} + \gamma_1 GKF_{it} + \gamma_2 HC_{it} + \gamma_3 FDI_{it} + \gamma_4 TA_{it} + \gamma_5 FTA_{it} + \gamma_6 GE_{it} + \mu_{it} \quad (26)$$

For specification IIIB, the required result of the fixed effect technique is as follows:

$EG_{it} = 5.58_{0i} + 0.07\ GKF_{it} - 0.02\ HC_{it} + 1.40\ FDI_{it} - 0.05\ TA_{it} - 0.00\ FTA_{it} - 0.22\ GE_{it} + \mu_{it}$ (27)

For specification IIIB, the required model for random effect technique is as follows:

$EG_{it} = \gamma_0 + \gamma_1\ GKF_{it} + \gamma_2\ HC_{it} + \gamma_3\ FDI_{it} + \gamma_4\ TA_{it} + \gamma_5\ FTA_{it} + \gamma_6\ GE_{it} + \omega_{it}$ (28)

For specification IIIB, the required result of the random effect technique is as follows:

$EG_{it} = 1.48_0 + 0.09\ GKF_{it} - 0.00\ \beta_2\ HC_{it} + 1.06\ FDI_{it} - 0.02\ TA_{it} - 0.00\ FTA_{it} - 0.04\ GE_{it} + \omega_{it}$ (29)

Table 3. Government expenditure as Conditional variable

	IIIA		IIIB	
	FE	**RE**	**FE**	**RE**
C	5.92	1.49	5.58	1.48
	(3.93)	(1.02)	(4.03)	(1.21)
GKF	0.07	0.09***	0.07	0.09***
	(0.05)	(0.03)	(0.06)	(0.03)
HC	0.02	-0.00	0.02	-0.00
	(0.07)	(0.05)	(0.07)	(0.05)
FDI	1.09***	1.05***	1.40*	1.06
	(0.33)	(0.28)	(0.81)	(0.71)
TA	-0.06**	-0.02	-0.05**	-0.02
	(0.02)	(0.01)	(0.02)	(0.02)
GE	-0.23	-0.04	-0.22	-0.04
	(0.35)	(0.10)	(0.35)	(0.10)
FTA			-0.00	-0.00
			(0.01)	(0.00)
R^2	0.30	0.23	0.30	0.23
d	0.99	0.92	1.00	0.92
F-stats	3.01***	5.07***	2.75***	4.18***
OBS	89	89	89	89
H Test-P	0.22		0.27	

-Standard Errors are reported in parentheses
-The significance level indicated by (*). One (*) indicates significance at the 10% level, (**) indicates significance at the 5% level, while (***) indicates significance at the 1% level.

In specification IIIA the inclusion of government expenditure (GE) as conditional variable possess insignificant property depicts there is no impact either positive or negative or relationship between government expenditure (GE) and GDP per capita, the reason behind is the unnecessary size of government that is there is a negative relationship between country

size and government size, the augmentation of government personnel and government spending, less in favour of public amelioration, although gross capital formation (GKF) and foreign direct investment (FDI) remain significant at the 1% significance level in presence of government expenditure (GE) variable in case of SAARC economies. Many researchers have found a negative relationship between government size and trade accessibility, large governments are less needy to open market due to their sizeable domestic market (Alesina & Wacziarg, 1998) but in case of SAARC economies the government expenditure not hinder foreign investment nor the domestic investment as well.

In Table 4, specification IVA explores the empirical results of the base equation with the inclusion of another conditional variable that is institutional quality & specification IIIB explores the empirical results of conditional variable institutional quality along with foreign direct investment and trade accessibility interaction term by using fixed effect (FE) and random effect (RE) least-squares technique.

For specification IVA, the required model for fixed effect technique is as follows:

$$EG_{it} = \gamma_{0i} + \gamma_1 GKF_{it} + \gamma_2 HC_{it} + \gamma_3 FDI_{it} + \gamma_4 TA_{it} + \gamma_5 IQ_{it} + \mu_{it} \quad (30)$$

For specification IVA, the required result of the fixed effect technique is as follows:

$$EG_{it} = 7.72_{0i} + 0.05\ GKF_{it} - 0.04\ HC_{it} + 1.11\ FDI_{it} - 0.05\ TA_{it} - 0.09\ IQ_{it} + \mu_{it} \quad (31)$$

For specification IVA, the required model for random effect technique is as follows:

$$EG_{it} = \gamma_0 + \gamma_1 GKF_{it} + \gamma_2 HC_{it} + \gamma_3 FDI_{it} + \gamma_4 TA_{it} + \gamma_5 IQ_{it} + \omega_{it} \quad (32)$$

For specification IVA, the required result of the random effect technique is as follows:

$$EG_{it} = 1.45_0 + 0.09\ GKF_{it} - 0.00\ HC_{it} + 1.05\ FDI_{it} - 0.02\ TA_{it} - 0.00\ IQ_{it} + \omega_{it} \quad (33)$$

For specification IVB, the required model for fixed effect technique is as follows:

$$EG_{it} = \gamma_{0i} + \gamma_1 GKF_{it} + \gamma_2 HC_{it} + \gamma_3 FDI_{it} + \gamma_4 TA_{it} + \gamma_5 FTA_{it} + \gamma_6 IQ_{it} + \mu_{it} \quad (34)$$

For specification IVB, the required result of the fixed effect technique is as follows:

$$EG_{it} = 7.6_{0i} + 0.05\ GKF_{it} - 0.0\ HC_{it} + 1.50\ FDI_{it} - 0.0\ TA_{it} - 0.00\ FTA_{it} - 0.10\ IQ_{it} + \mu_{it} \quad (35)$$

For specification IVB, the required model for random effect technique is as follows:

$$EG_{it} = \gamma_0 + \gamma_1 GKF_{it} + \gamma_2 HC_{it} + \gamma_3 FDI_{it} + \gamma_4 TA_{it} + \gamma_5 FTA_{it} + \gamma_6 IQ_{it} + \omega_{it} \quad (36)$$

For specification IVB, the required result of the random effect technique is as follows:

$$EG_{it} = 1.52_0 + 0.09\ GKF_{it} + 0.00\ HC_{it} + 0.95\ FDI_{it} - 0.02\ TA_{it} + 0.00\ FTA_{it} - 0.00\ IQ_{it} + \omega_{it} \quad (37)$$

Table 4: Governance as Conditional variable

	IVA		IVB	
	FE	**RE**	**FE**	**RE**
C	7.72** (4.09)	1.45 (1.08)	7.63** (4.12)	1.52 (1.22)
GKF	0.05 (0.06)	0.09** (0.05)	0.05 (0.06)	0.09** (0.05)
HC	-0.04 (0.09)	-0.00 (0.06)	-0.05 (0.09)	0.00 (0.06)
FDI	1.11*** (0.35)	1.05*** (0.30)	1.50** (0.88)	0.95 (0.78)
TA	-0.05** (0.02)	-0.02 (0.01)	-0.05* (0.02)	-0.02 (0.02)
IQ	-0.09 (0.10)	-0.00 (0.03)	-0.10 (0.10)	-0.00 (0.03)
FTA			-0.00 (0.01)	0.00 (0.01)
R^2	0.34	0.23	0.34	0.24
d	1.04	0.92	1.05	0.91
F-stats	2.92***	4.26***	2.66***	3.58***
OBS	74	74	74	74
H Test-P	0.15		0.15	

-Standard Errors are reported in parentheses
-The significance level indicated by (*). One (*) indicates significance at the 10% level, (**) indicates significance at the 5% level, while (***) indicates significance at the 1% level.

The inclusion of institutional quality (IQ) as a conditional variable in the base equation turns trade accessibility (TA) insignificant, although gross capital formation (GKF) and foreign direct investment (FDI) is significant at the 5% and 1% significance level respectively. However many researchers found a significant positive impact of institutional quality on trade accessibility (Dollar & Kraay, 2003) found improved institutional quality embraced trade accessibility, moreover (Méon & Sekkat, 2008) found both positive and negative impact of institutional quality on trade accessibility based on different sectors and goods. The variable institutional quality possesses an insignificant nature itself. The following result

depicts that there is no impact of institutional quality on economic growth.

CONCLUSION

The finding of trade accessibility and foreign direct investment (FTA) interaction term implies that trade accessibility not necessarily promotes FDI spillover effect in case of SAARC economies. However, it is important to study the substitute and complement the relationship between FDI and trade openness, especially in case of SAARC economies that either both variables that are FDI and trade openness acted as a substitute or complement to each other. Particularly SAARC region absorbed comparatively less FDI inflow as compare to remaining Asia, in case of trade deficit SAARC should focus on declining trade barriers, bilateral trade treaties and must shift towards from import oriented economies to export-oriented economies.

Furthermore, this study used the ratio of the sum of export and import as a proxy for measuring trade openness the researcher can also check the robustness of result by using the value of export as a percentage of GDP only instead of a sum of export and import as a proxy for trade openness.

Table 5: Combined results

	IA	IB	IIA	IIB	IIIA	IIIB	IVA	IVB
	RE	RE	RE	RE	RE	RE	RE	RE
C	1.66 (1.11)	1.35 (1.16)	3.24*** (0.86)	3.57*** (1.03)	1.49 (1.02)	1.48 (1.21)	1.45 (1.08)	1.52 (1.22)
GKF	0.08** (0.03)	0.09*** (0.03)	0.07* (0.03)	0.06* (0.03)	0.09*** (0.03)	0.09** (0.03)	0.09** (0.05)	0.09** (0.05)
HC	-0.00 (0.07)	0.00 (0.05)	0.01 (0.04)	0.02 (0.04)	-0.00 (0.05)	-0.00 (0.05)	-0.00 (0.06)	0.00 (0.06)
FDI	1.04*** (0.31)	1.00 (0.70)	1.43*** (0.24)	1.07* (0.64)	1.05*** (0.28)	1.06 (0.71)	1.05*** (0.30)	0.95 (0.78)
TA	-0.02 (0.01)	-0.02 (0.02)	-0.00 (0.01)	-0.01 (0.02)	-0.02 (0.01)	-0.02 (0.02)	-0.02 (0.01)	-0.02 (0.02)
INF			-0.37*** (0.07)	-0.36*** (0.07)				
GE					-0.04 (0.10)	-0.04 (0.10)		
IQ							-0.00 (0.03)	-0.00 (0.03)
FTA		0.00 (0.00)		0.00 (0.00)		-0.00 (0.00)		0.00 (0.01)
R^2	0.19	0.23	0.44	0.45	0.23	0.23	0.23	0.24
d	0.94	0.92	1.09	1.07	0.92	0.92	0.92	0.91
F-stats	5.17***	5.02***	13.1***	10.9***	5.07***	4.18***	4.26***	3.58***
OBS	89	89	87	87	89	89	74	74
H Test- P	0.51	0.20	0.27	0.38	0.22	0.27	0.15	0.15

Table C: Comparison of Expected and Estimated Outcome

DEPENDENT VARIABLE: ECONOMIC GROWTH			
VARIABLE	EXPECTED RESULT	OUTCOME	REMARKS
GROSS CAPITAL FORMATION	POSITIVELY SIGNIFICANT	POSITIVELY SIGNIFICANT	GROSS DOMESTIC INVESTMENT ACCELERATE ECONOMIC GROWTH
HUMAN CAPITAL	POSITIVELY SIGNIFICANT	INSIGNIFICANT	LOW LEVEL OF EFFICIENCY/ IMPROPER UTILIZATION OF HUMAN RESOURCE
FOREIGN DIRECT INVESTMENT	POSITIVELY SIGNIFICANT	POSITIVELY SIGNIFICANT	FDI BOOST GDP PER CAPITA
TRADE ACCESSIBILITY	POSITIVELY SIGNIFICANT	NEGATIVELY SIGNIFICANT	TRADE DEFICIT/ HEAVILY RELY ON IMPORT
INFLATION	NEGATIVELY SIGNIFICANT	NEGATIVELY SIGNIFICANT	HIGH INFLATION CAUSE DECREASE IN GDP PER CAPITA
GOVERNMENT EXPENDITURE	NEGATIVELY SIGNIFICANT	INSIGNIFICANT	UNEFFECTIVE UTILIZATION OF PUBLIC FUND
INSTITUTIONAL QUALITY	POSITIVELY SIGNIFICANT	INSIGNIFICANT	ABSENCE OF ADEQUATE GOVERNANCE
INTERACTION TERM (FTA)	POSITIVELY SIGNIFICANT	INSIGNIFICANT	LOW LEVEL OF OPENNESS IN TRADE

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