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JBR

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Editorial Board

Editor's Note

Thanks to the efforts of research scholars, faculty members and management of the Jinnah Business Research Center (JBRC) and Mohammad Ali Jinnah University (M.A.J.U) Islamabad that enabled us to bring the first issue of Jinnah Business Review (JBR) on the surface. It is a bi-annual research journal, and would be made available in both soft and hard forms.

Since the prime aim of JBR is to promote research, the selection of articles in this first volume seems to concentrate on the practical nature of the research topics selected and methodologies adopted. The article by Hussain and Ahmed, entitled "Capturing imperative inevitability of spiritual values in Pakistani organizations", demonstrates how one-sample Z-test can be used to validate various hypotheses set for measuring the effects of spiritual values on organizational behavior. Iqbal, Rana and Khan's article examines the impact of dividend announcement on stock returns of non-financial sector companies listed on Karachi Stock Exchange, covering period from 2007 to 2008. This study uses event analysis methodology, and finds out that dividend announcement has no significant impact on sample companies' abnormal stock returns. Miss Sana's study, entitled "Education level, public policy and private sector HR practices determine female job participation rate", uses a randomly selected sample of 100 female employees of telecommunication sector of Rawalpindi-Islamabad area and tries to analyze whether government policies and private sector human resource practices exist to promote favorable environment for female job participation. The study uses econometric modeling to arrive at the conclusions. Ali Khan also uses econometric modeling to capture the quality of services sector and its various outcomes.

Malik and Chishti study short run and long run relationship between foreign direct investments (FDIs) and its major determinants; they analyze time series, using unit roots analysis, Co-integration and ECM modeling. Saeed and Hussain evaluate the relationship between real exchange rate and trade balance of Pakistan for the period 1985-2010; this study, in addition, uses Johansen Juselius test to inquire into the long term connection between exchange rate and trade balance. Mubarik and Aurangzeb's study investigates whether augmenting service sector GDP can increase exports and imports or augmenting exports and imports accelerate service sector GDP; this study represents very good examples of the uses of Granger causality test and ARDL analysis.

Shah, Hashmi and Chishti's study represents a comparison between the Baron and Kenny's (1986) classical approach and Kenny's (2012) contemporary approach of mediation analysis; the authors argue for adoption of the latter approach because of its superiority of yielding relatively better and more logical results.

It is hoped that research scholars would find this Journal a good source of learning, especially in areas like conceptual modeling and quantitative/analytic techniques; management of JBR would always welcome suggestions for improvements.

Professor Dr. Anwar F. Chishti
Editor-in-Chief (JBR)

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Capturing imperative inevitability of spiritual values in Pakistani organizations

Munir Hussain and Shakil Ahmed

Abstract

This study is an attempt to understand and analyze the attitudes and behaviors of Pakistani employees and workers towards adoption of spiritual values for enhancing their productivity and in order to become an effective employee for the organization. The spiritual values are hypothesized in terms of individual betterment, collective betterment and organizational betterment to determine the organizational behavior. The Z-test has been employed which validates most of our developed hypothesis and shows that most of Pakistani employees believe that spiritual values can affect positively their individual, collective and organizational betterment.

JEL Classification: Z10, Z12, Z13, Z18
Keywords: Spiritual values, organizational behavior, individual, collective and organizational betterment.

I. INTRODUCTION

We are living in the age of everyday transformational situations in the business environment. After revolutionary advancement of business industry, there are many dilemmas of changing demographic work conditions such as instability resulted by globalization, mergers and acquisitions, downsizing, cut-backs, increasing work-load, 'do more for less', environmental pollution, energy crisis, increasing incidents of depression, scandals of unethical corporate behavior, de-humanizing effects of technology-driven information economy, workplace violence and office rage, etc. These are some major factors causing organizations to adopt some spiritual values which are directly concerned with individual's meaning of work, loyalty, motivation, connectedness of organizational culture and organizational citizenship.

Spiritual values within organizations are not new phenomena. There are many countries where the practices of these values are adopted for the sake of enhancing organizational culture. Katz (2007) mentions that trends are evident in the United States particularly and other Western countries generally which reflect the tendency of people turning towards spirituality. A research study reveals that 33 to 50 percent Americans believe that they have experienced a significant spiritual life affection, 23 percent regularly do spiritual practices such as yoga, meditation, prayer or other stress reducing exercises, 20 percent described that all aspects of their lives are influenced by spirituality, 12 percent experienced a great deal with God, Allah, Jesus, Mary, Elijah or Buddha, 40 percent people proclaimed themselves religious but not a member of any religious institution (Forman, 2004). It was the discussion of general spiritual attitude of Western people, while many authors have mentioned the importance of spiritual norms on workplace. Aburdene (2005) has listed many mega trends towards intrinsic values inspired by spirituality; some of these include:

a) After economic turbulence and crises, people look for journey inwards; 78 percent people are looking forward spiritual practices, such as, meditation and yoga.
b) The capitalism is going down that means top companies and CEOs are rearranging themselves to fulfill all stakeholders' needs (including customers and employees working for them)
c) Leadership is not just at senior level but leadership values and morality are carefully considered from middle level within the organization.
d) Spirituality in business is showing a rising drift.
e) Now people have very much conscious about companies to respect the values of humanity such as environment.
f) Many businesses are showing social responsibility investment boom after much criticism, reflecting that labor forces are being much more monitored than 10 years ago.

Because of increasing importance of spirituality on workplace, it is being a part of curriculum of many universities, institutions and management/administration schools. Harvard Business School has included courses where workplace spirituality is being studied (Wong, 2003). Conlin (1999) mentions that the American University of New Haven, Minnesota's University of St. Thomas and University of Denver have established research centers on the subject of 'spirituality and the workplace'. Similarly Cranfield School of Management in the United Kingdom offers an elective of a spirituality and organizational transformation (Howard, 2002). Weston (2002) adds that the Department of Management of the Canterbury University in New Zealand has started offering a subject on spirituality in workplace since 2002. According to the research by Garcia-Zamor (2003), more than 30 MBA programs are offered on the importance of spirituality in the workplace

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in USA.

A. Meaning of Spirituality

Hense (2006) mentions that there are too many definitions of spirituality, based on geographic, ethnic and demographic grounds. Harmer and Fallon (2007) report tremendous differences in way spirituality is defined. Myers, Sweeney and Witmer (2000) believe that spirituality is an awareness of a being or force that transcends the material aspects of life. Vella-Brodrick (1995) mentions that spiritual life causes self development, encompasses aspects of self awareness, existentialisms, religiosity and life purpose, morality and ethics, peace with oneself and self actualization.

The role of spirituality within an organization strives employees for connectedness to the workplace and authenticity on oneself which are considerably important both for an employee and the organizational culture. This would be a great deal to create personal meaning, warmth engagement, effectiveness and productivity of individuals that directly and positively impact on organizational culture. Mitroff and Denton (1999); Dierendonck et al. (2005); Milliman et al. (2003); Harmer and Fallon (2007); and Neal and Biberman (2004) describe that the purpose of spiritual organization is to support the spiritual development of employees, customers and other stakeholders and for the organization to be an agent of change for positive good in the world.

Ashmose and Duchon (2000) believe that an organization can be regarded as being spiritual when it recognizes that employees have an inner life that nourishes, and is nourished by meaningful work that takes place in the context of community. Coetzee and Roythorne-Jacobs (2007) believe it a search for spiritual wholeness with the context of the workplace. It involves seeking to discover one's true self, higher life purpose and meaning through one's work activities and roles.

B. Criticism

Robbins, Judge and Sanghi (2007) add that criticism on spirituality is of three types. First type of criticism is about the scientific foundation or authenticity of spiritual culture within an organization. Second criticism is about secularization of organization, according to which spirituality is a religious term that can damage the secular interpretation of an organization. To answer this criticism, Robbins, Judge and Sanghi (2007) opine that this criticism is valid if spirituality is applied as a religious practice; however it is less stinging when the goal is limited to helping employees find meaning in their work lives. Third criticism is about the relation or compatibility between spirituality and profit margins of an organization. Robbins, Judge and Sanghi (2007) state that that the organizations which used spiritual norms have more productivity and higher profits than the organizations which did not.

Bierly, Kessler and Christensen (2000) believe that spirituality enhances organizational learning. On the other hand, Cavanaugh et al. (2000) argue that it unities and builds communities. Khanna and Srinivas (2000) believe that spirituality helps for connecting to others in an organization and to work itself. Maxwell (2003) describes spirituality as a source of healing and harmonizing expression of compassion, wisdom and connectedness that transcendent all egocentric, sociocentric and anthropocentric forms.

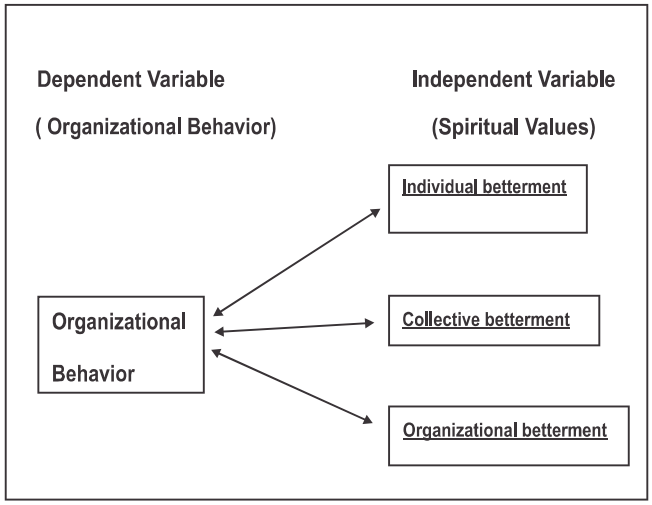
The aforementioned references encouraged the present researchers to investigate and study the attitudes and behaviors of employees towards adoption of spiritual values for enhancing their performance and productivity, especially in the context of working environment prevailing in Pakistan.

II. METHODOLOGY

A. Conceptual framework

To operationalize the idea of studying spirituality in Pakistani organizations, we hypothesize that spiritual values, including individual betterment, collective betterment and organizational betterment determine the organizational spiritual behavior. Figure 1 represents the idea in a formal form.

Figure I
Conceptual framework



For this piece of research, we further formulate the research idea and present it in a formal operational definition form in details, as follows.

For statistical testing, hypotheses are formulated, as follows.

a) H_1: *Spirituality is something that provides under-*

standing of one's self-awareness.

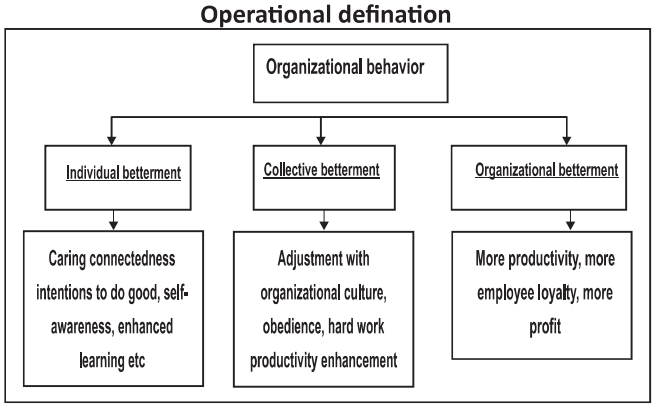
b) *H_2: Spiritual values positively affect one's ethics/ good moral.*

c) *H_3: Spiritual values positively affect one's mental and physical health.*

d) *H_4: Spiritual values enable a person to make good relations to his/her colleagues.*

e) *H_5: Spiritual values improve the productivity of an organization.*

Figure II
Operational defination



III. METHOD

A. Statistical tool used

The responses of the organizational employees were collected and analyzed, using the Z test, namely:

$$Z = (\bar{x} - \mu)/(\sigma/\sqrt{n}) \qquad (1)$$

Where $\bar{x}$ represents the sample mean of the respective variable; μ represents the population mean, and has been taken as 3; and $\sigma/\sqrt{n}$ is standard error. The calculated Z values have been evaluated at critical values, ranging within 1.96± range, at significance level $\alpha = 0.05$.

B. Sample and sampling

According to the need of our research, we used stratified random sampling for acquiring desired feedback from respondents belonging to different industries, including print media (editors, and other workers), banking (managers and other workers), education (primary/ secondary school and university teachers), and factory employees (managers and other workers).

In total, 135 respondents provided their answers. Personally administered questionnaires were used to measure the response, except for nine respondents from whom questionnaires were managed to be filled via telephone. A five point likert scale was used to collect responses. A number of respondents were not proficient in English, so we used Urdu translation of the questionnaire.

The questions covered the following aspects: (i) meaning of spiritual values; (ii) application of spiritual values on individual level (for individual betterment), and (iii) application of spiritual values on collective (group and organizational betterment) levels.

IV. DATA ANALYSIS AND FINDINGS

The respondents' responses, collected through the above stated Likert-type scale, were subjected to one-sample test; the empirical results obtained, are provided in summarized form tables III (a & b); while the results are further discussed in detail (hypothesis-wise) in subsequent tables.

TABLE I (a)
One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
H_1	135	3.93	.908	.078
H_2	135	4.08	.978	.084
H_3	135	3.96	.973	.084
H_4	135	4.13	.893	.077
H_4	135	3.86	.940	.081

TABLE I (b)
One-Sample Test

	Test Value = 3					
					95% Confidence Interval of the Difference	
	t	df	Sig. (2 tailed)	Mean Difference	Lower	Upper
H_1	11.947	134	.000	.933	.78	1.09
H_2	12.852	134	.000	.1.081	.92	1.25
H_3	11.501	134	.000	.963	.80	1.13
H_4	14.650	134	.000	1.126	.97	1.28
H_5	10.624	134	.000	.859	.70	1.02

A. Interpretation of empirical results

Hypothesis 1

Our first hypothesis covers the attributes/dimensions of understanding of one's intrinsic values that describes as to what idea Pakistani workers have regarding their spirituality. This aspect covers the meaning of spirituality within the minds of employees that provides basis for their understanding about the impact of spirituality on their individual, collective and organizational betterment.
More specifically:

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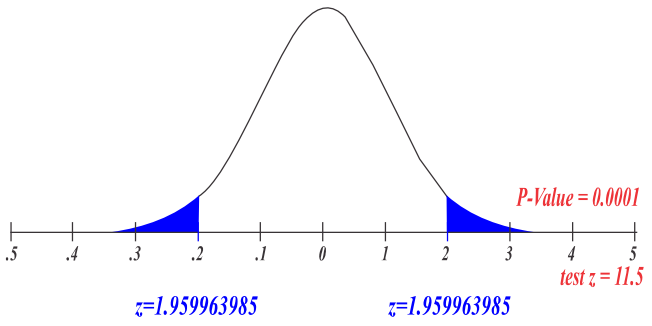
H_{O1}: *Spiritual values are NOT something providing understanding of one's self-awareness.*

H_{A1}: *Spiritual values are something providing understanding of one's self-awareness.*

Detailed empirical results are provided, as follows.

TABLE II

Hypothesis H_1	
Null Hypothesis =	3
Level of Significance	0.05
Population Standard Deviation	0.9384
Sample Size	135
Sample Mean	3.93
Intermediate Calculations	
Standard Error of the Mean	0.080764613
Z-test Statistic	11.51494409
Two-Tailed Test	
Lower Critical Value	-1.959963985
Upper Critical Value	1.959963985
p-Value	0
Reject the null hypothesis	



Two tail test figure demonstrates that Z test value = 11.51 falls outside the critical area. This requires that the null hypothesis (H_{O1}) be rejected, in favour of alternate hypothesis (H_{A1}). The confidence interval difference (lower level: 0.78 and upper level: 1.09) shows adequate confidence level of respondents that is an evidence that respondents were much convinced that their spiritual values can provide them high self-awareness on their professional aspirations. It also proves that Pakistani workers believe that spiritual values can endow with positive meaningfulness to their organizational culture.

Hypothesis 2

It has already been discussed in literature review that there have been three expected interpretations of spirituality. Some scholars interpret it in the light of mysticism, some for enhancing their religious affiliation and some for enrichment of their ethics or having good morale. Second hypothesis was set to acknowledge the attitudes of Pakistani workers toward ethical betterment or impact of spiritual values on their good morale. More specifically:

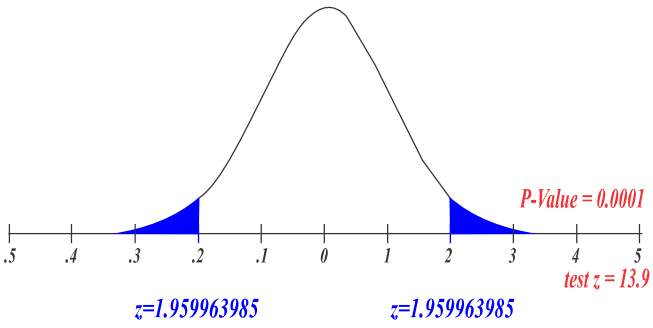
H_{O2}: *Spiritual values DO NOT positively affect one's ethics /good moral.*

H_{A2}: *Spiritual values positively affect one's ethics/good Moral.*

Detailed empirical results are provided, as follows.

TABLE III

Hypothesis H_2	
Data	
Null Hypothesis =	3
Level of Significance	0.05
Population Standard Deviation	0.9384
Sample Size	135
Sample Mean	4.08
Intermediate Calculations	
Standard Error of the Mean	0.080764613
Z Test Statistic	13.37219314
Two-Tailed Test	
Lower Critical Value	-1.959963985
Upper Critical Value	1.959963985
p-Value	0
Reject the null hypothesis	



The test statistic Z estimates at 13.372, and therefore falls outside of the critical values Z = 1.96±, that suggests rejection of null hypothesis in favor of alternative. This test shows that

Pakistani employees believe that spiritual values can positively affect their ethics and enhance the overall morale.

Hypothesis 3

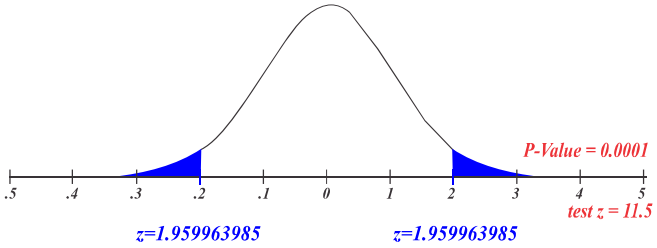
This hypothesis was set to ask for the understanding of workers towards impact of spiritual values on mental and physical health. The main purpose behind this hypothesis was to look at the possibilities and acceptance level of workers if there were some spiritual exercises applied within their organizations. There are many international organizations in developed countries where some spiritual exercises are practiced, such as yoga, meditation, Reiki, kinesiology and collective enchanting of some particular words. The main question within the hypothesis was to ask whether the understanding of Pakistani workers exists towards mental and physical health through spiritual practices; more specifically:

- H_{O3}: *Spiritual values DO NOT positively affect one's mental and physical health.*
- H_{A3}: *Spiritual values can positively affect one's mental and physical health*

Detailed empirical results are provided, as follows.

TABLE IV

Hypothesis H_3	
Data	
Null Hypothesis =	3
Level of Significance	0.05
Population Standard Deviation	0.9384
Sample Size	135
Sample Mean	3.96
Intermediate Calculations	
Standard Error of the Mean	0.080764613
Z Test Statistic	11.8863939
Two-Tailed Test	
Lower Critical Value	-1.959963985
Upper Critical Value	1.959963985
p-Value	0
Reject the null hypothesis	



The estimated Z-test value = 11.88 strongly rejects the null hypothesis, in favor of alternate hypothesis; this suggests that Pakistani working class strongly believes mental and physical health can be strengthened through enhancement of spiritual culture within the organizations.

Hypothesis 4

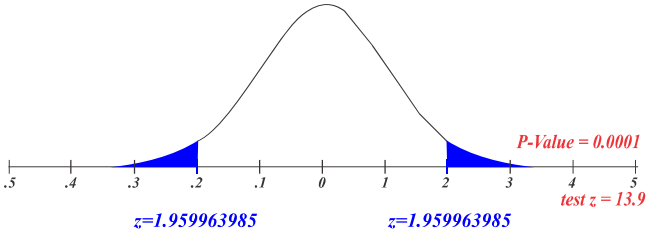
The fourth hypothesis was set to test the enrichment of relationship among workers of organizations through spiritual values. The organization is a cluster of people where organizational relationships are very important; so the question was asked with reference to the relation between spiritual values and its positive impact on employees' relationships. More specifically:

- H_{O4}: *Spiritual values DO NOT enable a person to make good relations to his/her colleagues*
- H_{A4}: *Spiritual values enable a person to make good relations to his/her colleagues*

Detailed empirical results are provided, as follows.

TABLE V

Hypothesis H_4	
Data	
Null Hypothesis =	3
Level of Significance	0.05
Population Standard Deviation	0.9384
Sample Size	135
Sample Mean	4.13
Intermediate Calculations	
Standard Error of the Mean	0.080764613
Z Test Statistic	13.99127615
Two-Tailed Test	
Lower Critical Value	-1.959963985
Upper Critical Value	1.959963985
p-Value	0
Reject the null hypothesis	



The calculated Z-values = 13.99 favors to reject null hypoth-

esis in favor of alternate hypothesis, suggesting that Pakistani employees believe that their professional relationships can be strengthened with the help of spiritual values.

Hypothesis 5

The fifth hypothesis was set to test whether employees believe that there is positive relationship between spiritual values and productivity of an organization. Essentially the management is always conscious about having full loyalty and commitment of employees on workplace so that it can acquire full productivity, profits and revenues in the business. This hypothesis explores the answer of these types of problem more clearly within Pakistani work environment.

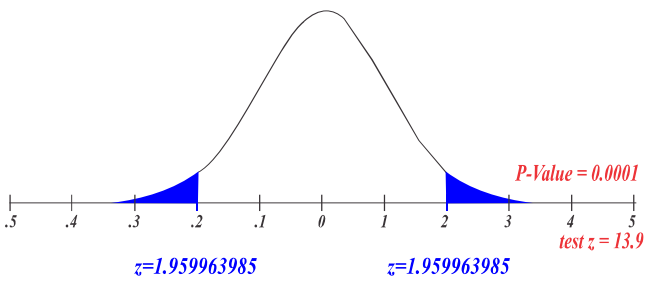
H_{O5}: *Spiritual values CAN NOT improve the productivity of an organization.*

H_{A5}: *Spiritual values can improve the productivity of an organization.*

Detailed empirical results are provided, as follows.

TABLE IV

Hypothesis H_5	
Data	
Null Hypothesis =	3
Level of Significance	0.05
Population Standard Deviation	0.9384
Sample Size	135
Sample Mean	3.86
Intermediate Calculations	
Standard Error of the Mean	0.080764613
Z Test Statistic	13.99127615
Two-Tailed Test	
Lower Critical Value	-1.959963985
Upper Critical Value	1.959963985
p-Value	0
Reject the null hypothesis	



The calculated Z-value = 10.6 falls outside the critical values of Z = 1.96±, and thus suggests rejecting null and accepting alternate hypothesis. This further means that Pakistani employees believe that spiritual values can positively affect their ethics and enhance their overall morale, resulting in improvement in the productivity of an organization.

V. CONCLUSION AND RECOMMENDATIONS

This study has tried to test five hypotheses, using a holistic conceptual framework for evaluating the effect of spiritual values on three major aspects of organizational behavior, namely: (i) individual betterment; (ii) collective betterment; and (iii) organizational betterment.

The results help to draw five major conclusions. First, the majority of the Pakistani employees believe that their spiritual values provide high level of self-awareness on their professional aspirations. It can improve their connectedness with work, intentions to do good, self awareness, learning competency and caring attitude in individual levels. Second, they understand that spiritual values positively affect their ethics and enhance the overall morale. It affects their adjustment with organizational culture, obedience, hard work and productivity on collective levels. Third, they believe that mental and physical health can be strengthened through enhancement of spiritual culture within the organizations. Fourth, they understand that their professional relationships can be strengthened with the help of spiritual values. And fifth, Pakistani employees believe that spiritual values positively affect their ethics and enhance their overall morale, resulting in improvement in the productivity of their organization. Hence, the organizational productivity, employee loyalty and profit margins might be increased through the positive outcomes of spiritual values.

It reflects that understanding ourselves and others is very important for an organizational culture. It is therefore recommended that organizations adopt the stated spiritual values within their circumstances. It seems important to recognize the individual and organizational level of awareness or the degree in which spiritual practices can be applied. The best way for doing so is to improve management intelligence system (MIS) for measuring up the level of coaching/training that is required. An important question is about those spiritual practices (for example; meditation, yoga, reflexology, breathing exercises etc.) that can be adopted for all members of organizations. It is recommended to adopt any such practice with the consultation of representatives of employees so that there is little probability of clash of idea regarding the implementation of practices. These practices should be adopted according to socio-cultural needs of employees. It is recommended to combine appropriate connectedness between ethical dilemmas and

work spiritual values. It is recommended to sketch some important questionnaires for acquiring feedback from employees. These questionnaires can be distinguished for management/supervisors and general employees.

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BIOGRAPHIES

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Capturing impact of dividend announcement on stock returns: an event analysis study of KSE

Amir Iqbal, Rana Muhammad Shahzad and Muhammad Yasir Khan

Abstract

This study examines the impact of dividend announcement on stock returns of 30 non-financial sector companies listed on Karachi Stock Exchange. Daily stock returns have been used, covering period from 2007 to 2008. The study has used event analysis study methodology; a fifteen days event window has been created to examine the effects of dividend announcement on KSE stock returns. The study finds that dividend announcement has no significant impact on sample companies' abnormal stock returns.

JEL Classification: G12, G13, G15, G17
Keywords: Dividend announcement effect, CAR, mean Returns, event analysis study, KSE

I. INTRODUCTION

It is generally accepted that value maximization of shareholders' investment is the main focus of any corporate entity. Investors choose competent managers with a hope that they would ensure a better utilization of the invested assets. On the other hand, managers entrust themselves to achieve this goal through different profitable investment and financing decisions. Apart from these decisions, managers always need to make an assessment on how to pay back the investor's share of the earnings from company's earnings without damaging company's smooth profit. Cash dividend is a way to pay investors from external sources. However, it decreases company's ability to invest in new projects. For that reason, the dilemma remains whether dividend payment actually increase the shareholders' value or not. Ever since the work of Miller and Modigliani (1961), the effect of dividend announcement on stock price or shareholders' value has become a strong area of study in finance. In later periods, many theories from well-known researchers have come forward to describe a clear picture of the relationship between dividend announcement and share price. Many studies have found that a change in the dividend payment have a direct effect on the share price of the company. On the other hand, many researchers have put forward the idea that dividend change does not really affect the company's share price. Dividend decision by any company is an important issue to be determined by the financial management. The important point is to determine how much earnings are to be distributed to shareholders and how much amount is to be retained in the firm. What is the dividend payout ratio and what should be the retention ratio are important questions to be considered. Dividend payout ratio is the percentage of earnings paid by way of dividend, while retention ratio is the percentage of earnings retained by the firm, not distributed as dividend. Many researchers have carried out studies on dividend announcement and come up with different findings. Some researchers conclude that dividend announcement has significant impact on stock returns and some express that the dividend announcement has no impact on stock returns.

The main objective of this study is to check the effect of dividend announcements on stock returns of non-financial sector of Pakistan. To measure this impact, the samples have been taken from one of the biggest security markets of the Pakistan – Karachi Stock Exchange (KSE). Previous studies have mostly covered the effects of dividend announcement on stock returns during normal economic periods. This study intends to cover the effect of dividend announcement during recession period; so prime aim of this study is to figure out whether the effect is same in the recession period. For this reason, a period which has been labeled as an 'economically depressed period' around the world has been selected for this study. Thus data from KSE for the period 2007 - 2008 have been used in this study. It is believed that this study would be able to provide valuable insights to the existing knowledge base regarding the impact of dividend announcement on stock returns during recession period.

II. LITERATURE REVIEW

Miller and Modigliani (1961) irrelevance theory provides the foundational base to building on the modern corporate finance theory. Miller and Modigliani argued that dividend policy is irrelevant for the cost of capital and the value of the firms in a world without taxes and transaction cost. They showed that when investors created any income pattern by selling and buying shares, the expected return required them to hold firm's shares; hence, the way the firm packages its dividend payments and issues new shares become invariant. Since the firm's assets, investment opportunities, expected future net cash flows and cost of capital are not affected by the choices of dividend policy, its market value is unaffected by any change in the firm's payout pattern. Thus, dividend policy is irrelevant and firm can choose any payout pattern without affecting their value. Miller and Modigliani theory implies that dividend payout will vary as a by-product of the firm's investment and financing decisions. This will not ex-

hibit an organized pattern over time. Miller and Modigliani (1961) argue that the firm's value is determined only by its basic earning power and its business risk.

The event study methodology was first introduced by Fama and Fisher (1969), while Ball and Brown (1968) introduced the event study methodology that is essentially the same as that which is in use today. The study by Fama and Fisher (1969) can be categorized as an efficient market study, while Ball and Brown's (1968) study is an informational usefulness study. Fama and Fisher (1969) examined the impact of stock splits on security prices. They found that abnormal returns dissipated rapidly, following the news of stock splits. Ball and Brown (1968) examined the value of company's earnings announcements.

The theoretical principles underlying the dividend policy and its impact on firms can be described either in terms of dividend irrelevance or dividend relevance theory. Black and Scholes (1974) conclude that corporations that increase its dividend can expect that their dividend policy would have no definite effect on its stock price. The price may change momentarily in response to a change in the dividend, because the market may believe that the change indicates something about the probable future course of earnings. If it becomes clear that the change was not made because of any change in estimated future earnings; this temporary effects will disappear. Thus a corporation may want to choose its dividend policies under the assumption that changes in dividend policy will have no permanent effect on its stock price.

Asquith and Mullins (1983) found that dividends increased shareholders' wealth. They selected a sample of 168 NYSE and ASE listed firms which initiated dividend to common shareholders from 1963 to 1980. Of the 168 initial firms, 114 increased their dividend within 3 years, 7 decreased their dividend and the remaining 47 kept their dividend at the initial level.

Hamid and Chowdhury (2005) used a sample of 137 DSE listed companies, which declared dividends during October 2001 and September 2002, and employed analytic measures, namely daily market-adjusted abnormal return (MAAR) and daily cumulative abnormal return (CAR). Researchers concluded that investors were not benefited from dividend announcement.

Thirumalvala and Sunitha (2006) concluded that dividend announcements showed positive and statistically significant results for abnormal returns around the announcement date. For dividend announcements the markets immediately signaled an upward swing in the share price movement. But this positive signaling existed only for a day after the announcements, after which the extent of positivity of shares started decreasing. They selected stock repurchase and dividend announcement as independent variables while stock return as dependent variables. The sample consisted of stock repurchase announcements obtained from the online database of Bombay Stock Exchange between January 2002 and December 2004. There were 55 dividend announcements reported, of which 21 were taken in the final sample. They used CAR for the market adjusted cumulative abnormal return, 5-day pre-CAR, 5 day post-CAR and t-statistics for the data analyzing by using 11 days window.

Azhagaiah and Priya (2008) concluded that higher dividend increased the market value of the share and vice versa. As far as the dividend paying companies were concerned, there was a significant impact of dividend policy on shareholders' wealth in organic chemical companies, compared to the inorganic chemical companies, wherein shareholders' wealth was not influenced by the dividend payouts. The sample of 28 companies in Chemical Industry (organic-19 and inorganic-9) had been chosen from 114 listed companies in BSE (Bombay Stock Exchange) using Multi-Stage Random Sampling Technique.

Chen et al. (2009) concluded that the share prices react significantly and positively to both cash dividend increases and cash dividend decreases. The announcement effect of cash dividend changes and investors' feelings toward cash dividend changes may shift with time. They selected all the listed firms having cash dividend announcement, on the Shanghai Stock Exchange and the Shenzhen Stock Exchange that had cash dividend announcement over the period 2000 to 2004. The market model was applied to estimate the abnormal returns of sample firm for different windows. They used CAR, cross-sectional method which was introduced by Boehmer, Musumeci and Poulsen (1991), and t-value for testing the data. For each security, a maximum of 141 daily return observations for the period around its respective event was used, starting at day-120 and ending at day +20 relative to the event. The first 100 days in this period (-120 through -21) were designated as the "estimation window", and the following 41 day (-20 through +20) were designated as the "event window".

Different researchers have found different findings regarding effects of dividend announcement on stock returns taken as a whole stock exchange index returns or as an individual company' stock return. Bathia (2010) conclude that dividend per share has a positive significant impact on the determinants of share prices. It might be interpreted from the results that there was impact of dividend announcements on the stock returns on the sector of companies as a whole as few of the sample companies of a sector which got changes in stock returns during dividend announcement phase might be out of chance factor. The core reason for the same could be that

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the companies announced a constant dividend every year on the face value of the share. So, the dividend values were in general already known to the shareholders. Thus, stock returns because of this did not get a radical changeover at the stock exchanges. He selected 28 companies randomly from the NSE India on the basis of their order of trading volumes. He used CAR, constant mean return model, t-test, and Z-test for hypothesis testing. The dividends declared by the sample companies in the financial year 2008-09 were taken as the main event to the study. He used 61 days window including the event date.

Mehndiratta and Gupta (2010) reported that investors did not gain significant value in the period preceding as well as on the dividend announcement day, yet they could gain value in the post announcement period. For the purpose of research, 15 most actively traded companies during the year 2009 from National stock exchange were selected on random basis. They used two stage approaches to test the stock price responses to dividend announcement. The first stage consists of estimation of parameter like beta based on the ex-post returns on stocks and market index, and expected returns on each of the stocks based on the market model. In the second stage these estimated parameters were used to calculate abnormal returns around the event day. They used market model, AAR, CAAR and t-statistics by using 61 days event window.

Ali and Chowdhury (2010) examined that there was no strong facts that stock price reacts significantly on the announcement of dividend. They explained that this might be due to insider trading. So the information used to be adjusted with the stock prices before announcement and as a result the announcement of dividends didn't carry any new information to the market. They selected 25 local commercial banks which had announced dividend between January 2008 and September 2008. They selected event window of 44 days starting from 30 days before the dividend announcement date and ending 14 days after the announcement and used CARR model for data analyzed.

Akbar and Baig (2010) concluded that the reaction of stock prices to cash dividend announcements was statistically insignificant. But the average abnormal and cumulative abnormal returns for stock dividend announcement are statistically significant which suggest a positive reaction. Stock dividends were not taxed and were resorted to by firms when cash needs were high and future operations require expanded equity capital base. Further capital gains in the equity market were not taxed in Pakistan. Hence stock dividends were alleged favorably by investors in KSE. This finding suggested that KSE was not strong form efficient. The results for the simultaneous cash and stock dividend announcements were alike those for the stock dividend announcements and rejects the semi-strong form of market efficiency for KSE. They used sample companies from the KSE-100 index and had paid-out cash dividend or bonus stock or both at least once in the period from July 1, 2004 to June 29, 2007. A total of 79 companies out of KSE 100 index is selected on the having 193 dividend announcements during the sample period. The dividend announcements included 129 cash, 24 stock and 40 simultaneous cash and stock dividend announcements using 41 days event window and AR, AABR, and CAABR model were used for data analysis. Dividend policy has got the significant impact on share price or stock returns. As dividend increased share price increased and vice versa.

Nazir et al. (2010) concluded that dividend policy measures (dividend yield and payout ratio) had a significant impact on the share price volatility. The effect of the dividend yield to stock price volatility increased during the whole period (2003-2008) whereas payout ratio had only a significant impact at lower level of significance. In overall period, the size and leverage had negative and non-significant impact on stock price volatility. They selected sample of 73 firms from KSE and evaluated for the period of six years from 2003 to 2008. Their investigation was based upon a fix effect and random effect regression analysis between the dividend policy and stock price volatility along with control variables of size, leverage, growth and earning.

III. METHODOLOGY

This study uses daily stock return data to compute excess stock returns and to examine dividend announcements for each firm. The daily excess return and average excess returns had found by using Cumulative Excess Returns (CER) model.

Given the depth of information available about the stock prices from Karachi Stock Exchange (KSE), the null hypothesis was set for testing that dividend announcement had no significant impact on the stock price movement of the non-financial sector companies listed in KSE. During the study period, 436 companies were listed on KSE. Out of 436, there were 60 companies that paid dividend regularly over the period 2007 to 2008. A sample of 30 companies from the non financial sector had been selected on the basis of following criteria:

a) All companies that had paid dividend regularly for the period 2007-2008.
b) All companies that had paid up capital more than 200 million.

The dividend announcement date and daily closing prices were used for the study. Daily closing prices were collected over the period July 2007 to June 2008. The dividend announcement dates ware collected from balance sheets of the joint stock companies, issued by the State Bank of Pakistan.

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An event study approach was used to examine the impact of dividend announcement on stock returns. Event window referred to the total time period revolving around the event which was taken as the main time frame to study the impact of the respective event. The present study had taken an event window of 15 days in total including the event date, i.e., the date on which dividends were announced for the respective sample stocks of the companies. So, the total event window was broken into two parts. First part composed of stock prices before the dividend was announced and the second part composed of stock prices after the dividend was announced. The event date, i.e., the date when dividend was announced was termed as t=0, middle of the event window. First part of the event window was composed of 7 days stock prices (-7) and the second part of the event window was composed of 7 days stock prices (+7). Thus, the total event window was (-7) – t – (+7) where -7 represented pre announcement phase, t represented the event date and +7 represented the post announcement phase.

The daily stock prices of all the 30 sample companies were taken from the KSE website (www.brecorder.com) for further processing. The returns were further calculated in detail with normal, average, abnormal and cumulative abnormal returns. Event study methodology was used to find the impact of dividend announcement on companies' stock return. AR, CAR and constant mean CAR approaches were used. Companies' share price was used as a proxy for return. Return for the company was calculated by using the formula, given as follows.

$$R_{it} = (P_t - P_{t-1})/P_{t-1}$$

Where R_{it} = Current Day Normal Return, P_t = Current Day Stock Price, P_{t-1} = Previous Day Stock Price. The abnormal returns for all the stocks have been calculated using the constant mean return model. After obtaining the mean returns for all the sample stocks, the abnormal returns had been calculated, using the following formula:

$$AR_{it} = R_{it} - E(R_{it-1})$$

Where AR_{it} = Current Day Abnormal Return, R_{it} = Current Day Normal Return, $E(R_{it})$ = Expected Return (mean return). The abnormal returns calculated were further converted into cumulative abnormal returns for application of statistical techniques with the help of constant mean return model. The cumulative abnormal returns were calculated for both before and after the event date.
The mean CAR is calculated as:

$$\text{MeanCAR} = \frac{\sum_1^n \text{CAR}_i}{n}$$

Where, mean CAR = Mean of Cumulative Abnormal Returns, CAR_i = Cumulative Abnormal Returns, and n = number of days. The standard deviations for all the stocks were calculated for pre and post announcement events to find out the magnitudinal change in the stock returns. It was calculated, as follows:

$$\sqrt{CAR/n}$$

Where CAR = Cumulative Abnormal Returns, n = number of days.

A. Statistical techniques used

In consonance to the objectives of the study, and for testing the hypothesis, t-test was used. T-test was applied to test the impact of dividend announcement on abnormal stock returns of the sample companies for both in pre announcement and post announcement of dividend. The total event window of 15 days consisted 7 days prior to the announcement and 7 days after the announcement of dividends, excluding the event date. The t-values were calculated with the formula given below:

$$t = \frac{\overline{CAR}}{\left(\frac{ó_{\overline{CAR}}}{\sqrt{N}}\right)}$$

The t-values were further compared with the table values at 1%, 2% and 5% level of significance to test the significance of the results.

IV. EMPIRICAL RESULTS

The results of the study were arrived at using mainly three major tools, namely Mean CAR, Standard Deviation, and t-values. Mean CAR for the two periods (before and after dividend announcement) were compared with the other sample companies to find out that which of the companies had maximum mean abnormal returns. Standard Deviations were similarly compared to place the company with maximum variation in abnormal stock returns. The significance of the stocks of the different sample companies was further tested with the help of t-values.

Appendix table I shows the sector-wise Mean CAR values and standard deviation values for the sample companies before and after declaration of dividends. The results can be interpreted by dividing the 30 companies in textile sector, oil & gas sector companies, chemical sector, engineering sector, automobile, food, sugar, power, refinery and mscellaneous sector.

The Maximum CAR was observed for Gatron Industries into the both pre announcement and post announcement event

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window. This might be the fact that the Gatron Industry offered better returns as compare to the other sector sample companies. The Mean CAR value of all three Textile sector companies were also observed positive values for before the announcement of dividends. The Mean CAR values of all other textile companies except Shappire Textile were found negative for after the dividend announcement. This indicates that the shareholders of these companies were not satisfied with the abnormal returns after the declaration of dividends. The maximum standard deviation was observed in case of Gatron industry for the pre announcement period. For the post announcement period, the maximum standard deviation value was observed in case of Shappire textile mills. The high value of standard deviation in case of Shappire textile might be due to its not having good reputation into the market during the period 2007-2008. This might also be happened due to the world recession in 2007. The maximum mean CAR was observed for Mari Gas Company for both pre and post announcement periods. It might be due to announcement of net profit of Rs 683.885 million for the year ending December 2007, an increase of 1.13% compared with the year ending December 2006. The Mean CAR value of all other sector companies were observed negative values for before the announcement of dividends. The Mean CAR of all other Oil & Gas companies except Shell Pakistan, Sui Northern gas, & Sui Southern gas after the dividend announcement were observed negative. This indicates that the shareholders of these companies were not satisfied with the abnormal returns after the declaration of dividends. The maximum standard deviation was observed in case of Pakistan State Oil for the pre announcement period. For the post announcement period, the maximum standard deviation value was observed in case of Mari Gas. The high value of standard deviation in case of Mari Gas might be due to its not having good reputation into the market during the period 2006-2007. This might also be happened due to the world recession in 2007. The Maximum CAR was observed for Dawood Hercules in the both pre and post announcement event window. This might be the fact that the Dawood Hercules offered better returns as compared to the other sector sample companies. The Mean CAR values of five out of eight companies were also observed positive values for before the announcement of dividends. The Mean CAR of most of the other chemical sector companies except Otsuka Pakistan after the dividend announcement was observed negative but Otsuka Pakistan got the highest value of 0.123 as compared to all other sector companies. This indicates that the shareholders of these companies were not satisfied with the abnormal returns after the declaration of dividends. The maximum standard deviation was observed in case of Dawood Hercules for the pre announcement period. For the post announcement period the maximum standard deviation value was observed in case of Sitera Chemicals. The high value of standard deviation in case of Sitara Chemical and Dawood Hercules may be due to its not having good reputation into the market. The maximum mean CAR was observed for International Industries for both pre announcement and post announcement period. It might be due to announcement of net profit of Rs 612.98 million for the semi year ending June 2007, an increase of 1.15% compared with the year ending December 2006. The maximum standard deviation was observed in case of KSB pumps for the pre & post announcement period. The high value of standard deviation in case of KSB pumps is due to not having a good reputation into the market during the period 2006-2007. The Maximum CAR was observed for Indus Motors in the both pre and post announcement event window. This might be the fact that the Indus motors limited offered better returns as compare to the other sector sample companies. The Mean CAR of all other automobile companies before the dividend announcement was observed negative. The Mean CAR of most of the other automobile companies was observed positive after the dividend announcement. The maximum mean CAR was observed for National Refinery for both pre and post announcement period. It might be due to announcement of net profit of Rs 4202.654 million for June 2007, an increase of 1.23% compared with the year ending December 2006. The Mean CAR value of Nestle Pakistan, Shahtaj Sugar Mills and Hub Power were also observed positive values for after the announcement of dividends. The maximum standard deviation was observed in case of Shahtaj Sugar Mills for both pre and post announcement period. The high value of standard deviation in case of Shahtaj Sugar Mills might be due to its not having good reputation in the market during the sample period 2006-2008.

After analyzing all 30 sample companies on sectoral basis, it was found that Gatron Industries had got the highest value for both before and after the dividend announcement date. This showed that Gatron Industries offered better returns than that of all other companies relating to different sectors. The maximum standard deviation was observed in case of Gatron Industries for pre announcement period while for the post announcement period maximum standard deviation was observed in case of Shappire textile. This showed that the shareholders of Shappire textile were less satisfied as compared to all other companies of different sectors.

Appendix table II shows the sector-wise t-statistic values calculated for the sample companies before and after declaration of dividends. The results can be interpreted by dividing the 30 companies in textile sector, oil & gas sector companies, chemical sector, engineering sector, automobile, food, sugar, power, refinery and miscellaneous sector.

The t-values in case of Gatron industries & Shappire textile were observed significant for the both pre and post announcement periods of dividend. It was because of the CAR value of Gatron Indusrries and Shappire Textile were the high-

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est in the pre and post announcement periods as compared to other companies. The t-values in case of Rupali Polyester were found significant only for pre announcement period. Other than that, all other companies of the sector showed insignificant t-values. The t-values in case of Mari Gas were found significant in pre announcement period. For post announcement period, Mari Gas, Shell Pakistan and Sui Southern Gas were found significant. The t-values in case of Abbot Laboratories, Dawood Hercules, Engro chemical and ICI Pakistan were found significant in pre announcement period. For post announcement period, the Abbot Laborities, Otsuka Pakistan and Sitara Chemicals were found significant. Results indicate that 3 out of 8 companies observed significant t-values. The t-values in case of International Industries were observed significant for pre and post announcement. Other than that, no significant t-values were observed for rest of the companies. No company of automobile sector showed the significant t-values in pre announcement period. And for post announcement period, Agriautos, Baluschistan Wheels and Indus Motors showed significant t-values in post announcement period. This showed that dividend had got significant impact in post announcement because 3 out of 4 companies showed significant values.

The t-values in case of National Refinery were observed significant in pre and post announcement period. For post announcement period, Shahtaj Sugar Mills showed significant t-values. This showed that dividend did not get the significant impact on these companies' abnormal returns.

Finally for all 30 sample companies, it was found that only 11 companies out of 30 had got the significant impact on abnormal returns in pre announcement periods and 15 companies out of 30 had got the significant impact on abnormal returns in post announcement period. So from the above results, it was found that the dividend announcement did not get any significant impact on nonfinancial sector companies' stock returns.

V. CONCLUSION

This study used a sample of 30 non-financial sector companies listed at Karachi Stock Exchange, and tried to evaluate the effect of dividend announcement on stock returns, using the event study methodology. The results showed that some companies had significant impact of dividend announcement while majority did not. So from the given results, null hypothesis had been accepted, meaning that there had been no strong indication found that the stock prices reacted significantly to the companies' dividend announcement.

This might be due to the insider trading in the market because the information used to be adjusted with the stock prices before announcement and therefore the announcement of dividends did not bring any new information into the market. Another factor for the insignificance might be the concept of speculation because in Pakistan majority of the investors preferred to invest their money for short term due to which they got short-term gain by buying and selling shares that caused dividend information useless.

APPENDIX I
Mean CAR and standard deviation (SD) values (before and after declaration of dividends)

Sample Companies	Mean CAR (Before)	Mean CAR (After)	S.D. (Before)	S.D. (After)
Gatron Industries	0.196	0.368	0.098	0.067
Masood Textiles	0.012	-0.001	0.019	0.021
Rupali polyesters	0.063	-0.014	0.026	0.003
Shappire Textiles	0.016	0.184	0.019	0.088^
Mari Gas	0.043	0.100	0.015	0.066
Pakistan Oilfield	-0.010	-0.040	0.011	0.013
Pakistan State Oil	-0.047	-0.067	0.024	0.006
Shell Pakistan	-0.003	0.133	0.006	0.053
Sui Northern Gas	-0.015	0.064	0.007	0.028
Sui Southern Gas	-0.016	0.054	0.006	0.034
Abbott Laboratories	0.023	0.018	0.030	0.015
BOC Pakistan	-0.012	-0.100	0.015	0.019
Dawood Hercules	0.034	0.074	0.045	0.019
Engro Chemical	0.006	-0.073	0.006	0.037
Fauji Fertilizer	-0.058	-0.090	0.021	0.013
ICI Pakistan	0.025	-0.061	0.011	0.030
Otsuka Pakistan	-0.005	0.123	0.011	0.031
Sitera Chemical	0.012	0.046	0.016	0.055
International Industries	0.016	0.083	0.010	0.040
KSB Pumps	-0.055	-0.187	0.033	0.033
Agritous	-0.001	0.070	0.012	0.012
Al -Ghazi Tractors	-0.008	-0.027	0.011	0.027
Baluchistan Wheels	-0.048	0.046	0.016	0.032
Indus Motors	0.001	0.044	0.003	0.009
Lever Brothers	-0.001	-0.029	0.009	0.019

Nestle Pakistan	0.000	0.001	0.003	0.008
Shahtaj Sugar Mills	-0.051	0.020	0.043	0.027
The Hub Power	-0.017	0.001	0.013	0.009
Tri- Pack	-0.009	-0.118	0.019	0.039
National Refinery	0.019	0.109	0.014	0.022

APPENDIX II
t-statistic values
(before and after declaration of dividends)

Sample Companies	t-values (Before)	t-values (After)
Gatron Industries	5.287*	14.569*
Masood Textiles	1.695	-0.158
Rupali polyesters	6.440*	-11.073
Shappire Textiles	2.338*	5.561*
Mari Gas	7.549*	4.010*
Pakistan Oilfield	-2.423	-7.839
Pakistan State Oil	-5.185	-27.282
Shell Pakistan	-1.279	6.701*
Sui Northern Gas	-5.516	5.953*
Sui Southern Gas	-7.116	4.188*
Abbott Laboratories	1.996*	3.161*
BOC Pakistan	-2.116	-14.115
Dawood Hercules	5.292*	-5.066
Engro Chemical	2.716*	-5.283
Fauji Fertilizer	-7.415	-17.948
ICI Pakistan	5.940*	-5.305
Otsuka Pakistan	-1.113	10.428*
Sitera Chemical	2.069*	2.220*
International Industries	4.375*	5.479*
KSB Pumps	-4.393	-15.204
Agritous	-0.288	15.760*
Al -Ghazi Tractors	-2.066	-2.722
Baluchistan Wheels	-8.122	3.746*
Indus Motors	1.352	12.740*
Lever Brothers	-0.420	-3.920
Nestle Pakistan	0.233	0.496
Shahtaj Sugar Mills	-3.134	2.010*
The Hub Power	-3.452	0.377
Tri- Pack	-1.252	-8.121
National Refinery	3.672*	13.015*

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Education level, public policy and private sector HR practices determine female job participation rate: a case of Pakistan's telecom sector

Muniba Sana

Abstract

This study uses a randomly selected sample of 100 female employees of telecommunication sector of Rawalpindi-Islamabad area and tries to analyze whether government policies and private sector human resource practices exist to promote favorable environment for female job participation. The study's results indicate that female employment-participation rate estimates at 32.28 percent, suggesting that a little less than one-third of females get employment in research area under study. The respondents' perception on government policy and private sector organizational HR practices regarding female job participation are found positive; however, females still feel the necessity of making their jobs more secured and their work worthwhile. Econometrically estimated relationship suggests that female educational levels determine the female job participation at the first place, and government policy helps determine the private sector organizational HR practices and policies, which further affect and encourage the female job participation. The results suggest that, for a more effective private sector female participation, the government policies need to be further strengthened and made substantiated. For future research, this study provides a base-model which may be replicated to evaluate public and private sector roles in determining female job participation of other economic sectors of Pakistan's economy.

JEL classification: J21, J82, C31
Keywords: Female job participation, public/private sector, econometric model, Pakistan

I. INTRODUCTION

The labor force participation plays important role in determining socio-economic growth and development of an economy, in general, while share of females in total work force of an economy contributes special part, in particular, in both developed and developing economies. According to the U.S. Department of Labor (2012), about 60% of all women in U.S. are in labor force, compared with nearly 75% of all men. U.S. women now account for 47% of total labor force in 2008, compared to 40% in 1975. According to ILO (2009), increased access to labor markets for women has great potential as a contribution to economic development, but only if the work in which women are engaged, is decent and productive. ILO's (2009) report highlights that women are too often trapped in insecure employment situations with low productivity and low earnings, especially in developing countries. "In wage and salaried employment across all sectors, women face persistent earnings gaps which cannot always be justified by differences in skills, experience, or tenure……. Women are often in a disadvantaged position in comparison to men in labor markets around the world". Social customs, culture, and institutions, including the legal framework, play a large part in the participation of women and younger people in the labor market. In certain cultures, where religion plays an important role, females do not engage in paid work and hence are not part of the labor force (Encyclopedia.com, 2008).

Referring to the situation in Pakistan, ILO's (2009) report mentions that, though in 2007, more than nine million Pakistani women were employed (almost four million more than in 2000 or an increase of more than 80 per cent), the employment-to-population ratio for women remained 19.9 per cent, which is four times lower than for men (79.1 per cent), and is much lower than the ratio in South Asia as a whole (33.5 per cent). Despite a significant widening of employment opportunities, gender equality in terms of labor market access has not yet been achieved in Pakistan. In general, women have lower wages than men; this can be explained in part by the large gap in educational attainment of women and men. In 2007, just 26.8 per cent of economically active women had more than 1 year of formal education, compared to 61.5 per cent of men. Relatively more women gained access to education, but equality in education is still far from being a reality in Pakistan (ILO, 2009).

Hafeez and Ahmad (2002) specifically searched in to the factors which determine the labor force participation decision of Pakistani educated married women, and identified various socio-economic and demographic factors. Their study finds that the females' education level is strong and positive determinant of female job participation; however, monthly household income, number of workers in the household other than husband and wife and financial assets are significantly and inversely related to it. Among demographic factors, age and household structure and size affect the female labor force participation. Naqvi and Shahnaz (2003) investigated in to

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the two important aspects of Pakistani women's decisions regarding their participation in economic activities and how they make these decisions. Their results indicate women are often low paid, have low skilled jobs, and are less educated. Looking at the decision-making process related to labor force participation, researchers find that women, who are older, better educated, happen to be female head of the household, or coming from smaller better off urban families, are more empowered to take decisions on their own about whether to get a job or not. In contrast, younger, poorly educated women who are from larger families, enter the labor market not out of their own choice. Decisions whether they go out and get a job are made by other members of the households at times even without their consultation.

Ejaz (2007) analyzed the data relating to the 'Pakistan Social and Living Standards Measurement Survey of 2004-05; his results suggest that age, educational attainment and marital status have significant and positive effects on female labor force participation. When women belong to the nuclear family and have access to vehicles, they are more likely to participate in economic activities, whereas a large number of children and the availability of home appliances reduce the probability of female participation in labor force. The results imply that reducing the child care burden on females and facilitating educational attainment would lead to a higher labor force participation rate for females in Pakistan. Researcher has specially observed that 70% of female labor force is illiterate, while only 7% of the remaining 30% are graduates.

Fatima and Sultana (2009) tried to trace out the U-shape relationship between female labor force participation rate and economic development of Pakistan. Results confirm that high rate of economic development is encouraging the female participation in the labor force by increasing the work opportunities for females. The females are taking full advantage of these increased opportunities by increasing their level of education attainment.

A. Problem statement

The ILO (2009) as well as other private researchers' studies referred above have brought a number of important aspects of female job participation on surface, but almost all these studies have been found quit, particularly on the roles of the public and private sectors, in the determination of female job participation. With the understanding that government policies and private sector human resource (HR) practices can contribute prime role in determining and influencing the female job participation, this researcher intends to address this issue. More specifically, this research would pursue the following research question.

Do government policies and private sector organizations' HR practices positively affect female job participation in Pakistan?

As discussed in the preceding section, pursuing such a research question would be one of the initial steps in bridging gap in the existing literature on public and private sector role in female job participation in Pakistani context, where females constitute around half of the country's total population, and can play a very significant role in country's economic development.

B. Research objectives

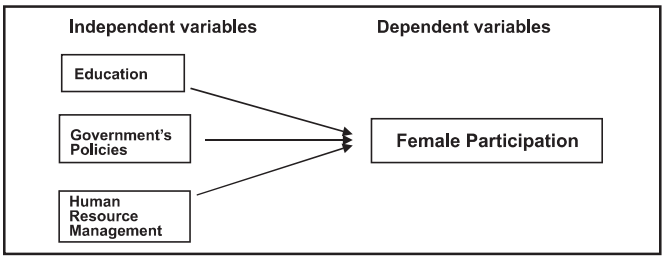
The intended research is expected to help achieved, particularly the following specific research objectives.

a) To analyze whether public sector policies on female job participation exist in Pakistan, and favorably affect female participation, as well.
b) To check whether private sector organizational HR policies and practices favor female job participation.
c) To develop and test a theoretical and methodological framework, at least of an initial nature, to provide a base for carrying out larger studies, aiming at bridging the existing gap in literature, on the public and private sectors roles in female job participation.

The research question narrated above and the specific research objectives enlisted here would help shape a research study which would not only provide material to bridge gap of research on public and private sectors role and contribution in female job participation, but would also encourage further research in this area.

II. THEORETICAL FRAMEWORK

Figure I



In accordance with what we have discussed earlier, the underlying rationale of this research is to determine whether the important factors like education, government policies and public and private sector HR practices and policies have been affecting female's participation in Pakistan labor force,

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and if yes, then how these and other factors have been effectively contributing, and their contributions can be made more efficient. So, we start with the basic model, wherein we check whether and how education, government policies and private sector HR practices determine female participation.

III. METHODOLOGICAL FRAMEWORK

The above shown relationship can best be estimated econometrically, through the model specified, as follows.

$$FPR = \beta_0 + \beta_1 ED + \beta_2 GP + B_3 HRP + \varepsilon \quad (1)$$

Here the abbreviation FPR denotes female participation rate, ED respondents' educational levels, GP government policies and HRP private sector's organizational human resource practices (HRP).

For this particular study, because of the time and other constraints, this research has been restricted to the telecom sector firms located in Rawalpindi-Islamabad area. Female participants, 100 in number, have been surveyed, using a self-administered questionnaire, provided in appendix – I.

IV. RESEARCH FINDINGS

A. Demographics: descriptive statistics

Information on the general demographics of the respondents of this study, covering their age, education levels and length of service experience, is provided in appendix II. The result reveals that there are 100 respondents included in the study, whose average age has been estimated at 28.67 years, with standard deviation (SD) of 3.67; the respondents' age ranged between 22 and 35 years. The respondents, on average, have 17.74 years of schooling, with SD = 1.83 years; the respondents have education between a minimum-maximum range of 16 and 22 years. The respondent's service experience is averaged at 4.9 years, with SD = 2.05 years; the service experience ranges between 1 and 8 years. It appears that the respondents' statistics on age and education levels are more consistent relative to variations in their experiences.

B. Estimation of female job participation

In response to three questions, stated under 'Female Participation' in questionnaire (Appendix – I), the respondents provided information regarding the number of their employed close-family members, relatives and neighbors, along with the total female strength; this is how data on the female job participation rate have been collected for this study. The data collected in this way have been provided in appendix III.

The average female employment-participation rate (FPR) arrives at 0.3228 with standard deviation of 0.1048, suggesting that a little less than one-third of female of the sampled population is employed. These estimates of FPR are significantly higher than that shown by ILO (2009) for Pakistan (19.90%) for year 2007. Three possible reasons can be forwarded to explain this study's higher estimates of FPR. First, there is a sizeable time-difference of the two studies; our estimates are of 2012 compared to ILO's 2007. Second, our estimates relate to Rawalpindi-Islamabad area (relatively more advanced area), while ILO (2009) talks about the average figure valid for whole of Pakistan. However, our estimates are closer to the ILO's estimates for the South Asia as a whole (33.5 per cent).

C. Main reasons for working

Respondents were provided four reasons for working on a job; these reasons were:

a) Empowerment
b) Independence
c) Economic needs
d) Not-to-feel-bored

Respondent were free to pick one or more reasons. Accordingly, they picked more than one reasons, ranging between a minimum-maximum range of 1 – 4. However, average number of reasons remained at 1.58, with SD = 0.6541, suggesting that majority opted for one to two reasons (Appendix IV).

In order to explore which of the reasons-for-doing-job got more scores, the same appendix provides data on number of respondents answered 'yes'. Hence, 'economic-need' is the major reason (with the highest score of 64) for female participation in jobs, followed by empowerment (score = 44) and independence (score = 37); the reason feel-not-bored got the lowest response (score = 13).

D. Is the job career of your choice?

In response to this question, 72 percent respondents said 'yes', and 28 percent were found not satisfied with their present jobs (Appendix V).

E. Opportunities to find a job

Two questions (Question 5 a & b) were meant to explore whether respondents faced difficulties in finding jobs; 65 percent respondents said 'Yes' to the first question asking 'Difficulties in finding jobs', and 73 percent said 'Yes' to the second question asking 'Finding not enough job opportunities' (Appendix VI A & B)).

The responses on the above referred two questions are used as two items to generate a variable named as 'Difficulty in

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Finding a Job', abbreviated as DIFJ (for future reference). Taking mean value of these two items, variable DIFJ is generated; its descriptive statistic is provided in the appendix VI (C).

The newly generated variable (DIFJ) ranges between 0 – 1, and averages at 0.69, with SD = 0.3392. The variable's mean value = 0.69 indicates that the majority, that is, more than 50 percent respondents have said 'Yes' to the 'getting of job difficulty' question. Whether this mean value is statistically significant, using one-sample t-test; we carry out the referred test (Appendix VID & E). Using test value = 0.5, the one-sample t-test's results indicate that the mean difference value = 0.19 is statistically significant at t = 5.602 ($p < 0.01$).

F. Government policies

To capture the respondents' perception regarding government policy on female job participation, two questions (Question 7 a & b) have been included; these two questions aim at to know 'whether government is supportive' (GP1) and 'whether government has certain encouraging laws' (GP2). The descriptive statistics of the respondents' responses on these two government policy-items are provided in appendix VII. The mean values of responses on both the questions range between 2 and 5, and average at 3.60 and 3.56, indicating that majority of respondents adopted positions in-between the 'Neutral' and 'Agreed' ones. The responses on the above referred two questions are used as two items to generate a 'government policy' variable (GP); the reliability test (Cronbach's alpha) and descriptive statistic of the newly generated variable GP are provided in appendix VII. The reliability test yields Alpha = 0.716, which is in the acceptable range, while variable GP averages at 3.57, indicating respondents' position in-between the 'Neutral-Agreed' range.

In order to further analyze whether the mean value of variable GP (= 3.57) is statistically significant, one-sample t-test has been conducted, using test value = 3; the results are provided in appendix VII. The results of one-sample t-test regarding mean difference of government policy (GP) variable indicate that the mean difference = 0.57 is statistically significant at t = 8.407 ($p > 0.01$).

Our efforts to generate a government policy variable on the basis of two questions ('whether government is supportive' and 'whether government has certain encouraging laws') have successfully resulted in yielding a variable GP, which has not only cleared a reliability test (with Cronbach's alpha score of 0.716) but has also stood significant on the basis of one-sample t-test. As already indicated that we would not find any comparable results across literature, but with the generation of this variable and its statistical testing has helped us to achieve the first part of our research objective 1, that requires "Analyzing whether public sector policies on female job participation exist in Pakistan....."

G. Organizational HR practices

In order to capture the respondents' perceptions whether or not the organizational HR practices (HRP) favour female job participation, 10 questions (Question 8 a – j) were included; the descriptive statistics of the respondents' responses are presented in the appendix VIII. With the exception of two questions (Question Q4 & Q8), the respondents' responses on all other (eight) questions have appeared on positive (Neutral-to-Agreed) side), and the mean-differences of all such responses are statistically significant at $p < 0.05$), suggesting that the responses are more away-from 'Neutral' (= 3) than near-to 'Agreed' situation. As far as the responses to questions Q4 and Q8 are concerned, their mean values happen to be on negative (Disagreed-to-Neutral) side, and their mean-differences are statistically significant at $p < 0.10$, instead of $p < 0.05$. Another point which warrants attention is that the standard deviations (SD) of the responses on these two questions are relatively higher than other eight questions, suggesting that the respondents have expressed more varied views on these two questions. These two questions, respectively, ask:

Q4: "How secure do you think your Job is?"
Q8: "Is your work valued in the organization?"

The above evaluation thus suggests that, whereas the majority of respondents are in agreement with the positive side of a number of organizational HR practices, they still feel the need that their jobs are made more secured, and their work be valued, as well.

To evaluate the organizational HR practices as a whole, the responses on all ten questions are aggregated in to a single variable, abbreviated as HRP, and the results of its reliability Cronbach's Alpha test, descriptive statistic and one-sample t test are provided in appendix VIII.

The newly generated variable HRP averages at 3.382, with standard deviation = 0.443 and Cronbach's Alpha reliability score = 0.694. The one-sample t test reveals that the mean-difference of this variable (= 0.382) is statistically significant at $p < 0.01$, suggesting that the respondents perceive the organizational HR practices, as a whole, positive towards the female job participation.

Similar to the earlier case of government policies (GP) variable, in this case of private sector's organizational HR practices (HRP), we have tried ten questions to generate HRP variable which has also cleared reliability test (Cronbach's alpha score = 0.694) as well as one-sample t-test for significance

at $p < 0.01$). This statistical testing for significance helps us to achieve, at least partially, this research's second objective, that enquires about the existence of private sector organizational HR policies and practices. The regression analysis, being carried out in next section, would further reinforce that private sector organizational HR policies and practices favor female job participation.

H. Regression Analysis: Female job participation and its antecedents

The original model (1) required regressing female participation rate (FPR) over the respondents' educational levels (ED), government policies (GP) and organizational human resource practices (HRP); and econometrically:

$$FPR = \beta_0 + \beta_1 ED + \beta_2 GP + B_3 HRP + \varepsilon \quad (2)$$

However, the nature of the data described above, especially the data on the respondents' educational levels indicate that almost all respondents are highly educated; the frequency distribution of such data (appendix IX) further confirms that the employees belong to three distinct levels of education, suggesting that at least 16 years education is the prerequisite for having jobs in the organizations under study. Data pertains to different telecom organizations, such as Telenor, Ufone, Nokia-siemens, etc., situated in Islamabad-Rawalpindi area. The discussion in preceding section suggests that, in this particular case, female participation (FPR) first depends upon education (ED), and then on other factors, like government policy (GP) and organizational HR practices (HRP). The aforementioned econometric model (2) would thus change, as follows.

$$FPR\ (ED) = \beta_0 + \beta_1 HRP(GP) + \varepsilon \quad (3)$$

Whereas model (2) postulates that FPR directly depends upon ED, GP and HRP, model (3) prescribes that FPR is first determined by respondents' educational level (ED), and then by the organizational HR practices (HRP), which are in turn determined by government policies (GP).

Model 3 has now adopted the type of formulation that is referred to as Structural Equation Modeling (SEM) in management-related or Simultaneous Equations Modeling in economics-related econometrics. The model would therefore have to be estimated in two steps. In the first step, the two major components of the equation, FPR (ED) and HRP(GP) would be estimated, following the techniques:

$$FPR\ (ED) = \alpha_0 + \alpha_1 ED + e \quad (4a)$$
$$HRP\ (GP) = \gamma_0 + \gamma_1 GP + \mu \quad (4b)$$

In the second step, the predicted values of FPRED (estimated on the basis of equations 4a) would be regressed on predicted values HRPGP (estimated on the basis of equations 4b), using the equation:

$$FPRED = \beta_0 + \beta_1 HRPGP + \varepsilon \quad (4c)$$

Estimating model 4 (a – c) yielded the results that are reported in appendix X.

I. Evaluation of results

In the regression of female participation rate (FPR) over the respondents' education levels (ED), run through Model 4 (a), has not yielded very significance results in terms of R2 and F-statistic, as well as, in terms of t-ratio and p-value; however, ED has found moderately ($p = 0.119$) positively determining FPR, and we have to accept these results as part of the whole/bigger model (4).

Model 4 (b), which regressed organizational HR practices and polices (HRP) over government policies (GP), has provided relatively reasonable results in terms of almost all needed diagnostic statistics, and most importantly, the explanatory variable, government policies (GP) has found statistically significantly determining ($p < 0.01$) organizational HR practices and policies (HRP).

Model 4 (c), wherein the predicted values of FPR (found in Model 4 (a) have been regressed over predicted values of HRP (found in Model 4b) as the final part of model 4, has provided good results. $F = 9.057$ indicates that model as a whole is statistically significant at $p < 0.01$. T statistic = 3.010 shows that explanatory variable, predicted values of organizational HR practices (HRP), statistically significantly determines dependent variable, predicted values of female participation rate (FPR), at $p < 0.1$.

DW statistics of this model 4c is equal to 1.844; this statistic indicates two facts: first, whether or not the estimated model is suffering from autocorrelation problem specifically in case of time series data, and second, whether or not the model is misspecified. Since we have used cross-sectional data, we should not worry about autocorrelation; however, model is not even suffering from spatial-autocorrelation problem as its computed DW = 1.844 falls in no-autocorrelation zone, measuring between du = 1.622 and 4 – du = 2.378 (n = 99, k' = 1 & p = 0.01).

DW = 1.844 also indicate that the estimated model 4c is not underestimated or misspecified; for misspecification, DW should lie near to zero where DW can possibly range between 0 – 4.

In addition, we also carry out a relatively more sophisticated

model diagnostic test, generally referred to as Lagrange Multiplier (LM) test (Engle, 1982; Gujarati, 2007, pp. 534-535). Since we have to test our following estimated model (4c) for under-fitting or misspecified.

$$FPRED = \beta_0 + \beta_1 HRPGP + \mu \quad (5a)$$

The LM rest requires that we estimate the model (5a), save its residuals (μ) and carry out an auxiliary regression like the following one.

$$\mu = \beta_0 + \beta_1 HRPGP + \beta_2 HRP2GP + \beta_3 HRP_{3GP} + e \quad (5b)$$

Then the test statistic (nR^2) is computed, which asymptotically (in large sample cases) follows χ^2 distribution, meaning that, if the value of nR^2 does not exceed critical value of χ^2, the original estimated model is not under-fitted, and if exceeds, the model is misspecified. Running model 5b yields the results that were reported in appendix XI. First, the newly run auxiliary regression analysis is highly insignificant in terms of almost all types of diagnostic statistics. Second, the LM test statistic estimates at:

$$nR^2 = 100(0.009) = 0.9 \quad (5c)$$

which does not exceed $\chi^2 = 5.9914$ at p = 0.05 and DF = 2; hence or original estimated model 4c is not misspecified.

J. Interpretation of results

Reproducing estimated model 4 (a-c):

$$FPR\ (ED) = \alpha_0 + \alpha_1 ED + e = 0.164 + 0.009ED$$
$$(0.110)\ \ (0.119)$$

$R^2 = 0.025$ $R^2_{adjusted} = 0.015$ $F = 2.468$ (p = 0.119)
DW = 1.362 (6a)

$$HRP\ (GP) = \gamma_0 + \gamma_1 GP + \mu = 2.348 + 0.290GP$$
$$(0.000)\ \ (0.000)$$

$R2 = 0.196$ $R^2_{adjusted} = 0.188$ $F = 23.944$ (p = 0.000)
DW = 1.724 (6b)

$$FPR_{ED,\ HRP(GP)} = \beta_0 + \beta_1 HRPGP + \varepsilon = 0.241 + .024HRP_{GP}$$
$$(0.000)\ \ (0.003)$$

$R^2 = 0.085$ $R^2_{adjusted} = 0.075$ $F = 9.057$ (p = 0.003)
DW = 1.844 (6c)

(Figures in parentheses are p-values)

The estimated model 6 (a - c) is a Structural Equations Model (SEM) consisted of three equations. In the first two equations, educational level of female determines the female job participation, in the first equation, and government policy determines the organizational HR practices and policies, in the second equation.

The third equation depends upon the estimations of the first two equations; the predicted values of organizational HR practices and policies are found to be further affecting the predicted values of female participation rates.

V. CONCLUSIONS AND RECOMMENDATIONS

The findings of this research help us make certain conclusions, namely:

First, on the basis of the survey involving respondents of this study, it can be inferred that the female employment-participation rate (FPR) is 0.3228, suggesting that a little less than one-third of female are employed. 'Economic-need' is the major reason for female participation in jobs, followed by empowerment and independence. Majority of respondents, 65% faced 'difficulty in finding jobs' while 73% found 'not enough job opportunities' according to their skills.

Second, the respondents' perception regarding government policy on female job participation is positive; their average responses on 'whether government is supportive' and 'whether government has certain encouraging laws' have been 3.60 and 3.56, indicating that majority of respondents adopted positions in-between the 'Neutral' and 'Agreed' categories.

Third, the respondents mostly appear positive regarding organizational HR practices and policies. However, they still feel the need that their jobs be made more secured, and their work be valued, as well.

Fourth, the econometrically estimated models suggest that the female educational levels determine the female job participation, and government policy determines the organizational HR practices and policies, and the so determined organizational HR practices and policies then in turn determine the female participation. This model provides a basis for carrying out larger studies, aiming at bridging the existing gap in literature, on the public and private sectors roles in female job participation.

Though the respondents' perceptions regarding organizational HR practices and policies seem positive, they still feel the need of making their jobs secured, and their participation valuable. Public and private sector policy makers should take note of this situation, and take appropriate needed actions. Government policies have been found positively affecting and determining private sector organizational HR practices and policies. For a more effective private sector female participa-

tion, the government policies need to be further strengthened and substantiated. The model developed and tested in this research provides a good basis for carrying out further research, aiming at bridging the existing gap in literature on female job participation on the role of the public and private sectors organizations in Pakistan; there is a need as well as great scope of replication of this model across private sector organizations.

APPENDIX I

APPENDIX I (QUESTIONNAIRE) IS PROVIDED AT THE END

APPENDIX II
DESCRIPTIVE STATISTICS

	N	Min	Max	Mean	S. D.
Age in years	100	22.00	35.00	28.6800	3.66771
Education in years	100	16.00	22.00	17.7400	1.83468
Experience in years	100	1.00	8.00	4.0900	2.05035

APPENDIX III
DATA ON FEMALE PARTICIPATION RATE

Particulars	N	Min	Max	Mean	S.D.
Female employed in family	100	1.00	3.00	1.4200	.60603
Total female family members	100	1.00	9.00	3.5000	1.64838
Female-relatives employed	100	.00	7.00	2.5100	1.45987
Total female relatives	100	3.00	20.00	8.1000	3.21769
Female-neighbours employed	100	.00	7.00	2.6500	1.67196
Total female neighbours	100	2.00	19.00	8.8100	3.59768
Total females employed (TFE)	100	2.00	15.00	6.5800	2.80757
Total females surveyed (TFS)	100	9.00	37.00	20.4100	5.89315
Female participation rate estimated (TFE/TFS)	100	0.13	0.64	.3228	.10478

APPENDIX IV
A. NUMBER OF REASONS DOING JOBS

	N	Min	Max	Mean	S.D.
Number of reasons doing jobs	100	1.00	4.00	1.58	.65412

B. RESPONDENTS-ANSWERED 'YES'

Empowerment	Independence	Economic needs	Feel-not-bored
44	37	64	13

APPENDIX V
JOB OF YOUR CHOICE

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	28	28.0	28.0	28.0
	Yes	72	72.0	72.0	100.0
	Total	100	100.0	100.0	

APPENDIX VI
A. DIFFICULTIES IN FINDING A JOB

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	35	35.0	35.0	35.0
	Yes	65	65.0	65.0	100.0
	Total	100	100.0	100.0	

B. NOT ENOUGH JOB OPPORTUNITIES

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	27	27.0	27.0	27.0
	Yes	73	73.0	73.0	100.0
	Total	100	100.0	100.0	

C. JOB DIFFICULTIES-VARIABE

	N	Min	Max	Mean	S. D.
Job_difficulties_variable (DIFJ)	100	.00	1.00	.6900	.33919

D. ONE SAMPLE STATISTICS

	N	Mean	Std. Deviation	Std. Error Mean
Job_difficulties_Variable (DIFJ)	100	.6900	.33919	.03392

E. ONE SAMPLE TEST

Job_ difficulties Variable (DIFJ)	Test Value = 0.5					
	t	df	Sig.	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
	5.602	99	.000	.19000	.1227	.2573

APPENDIX VII

G0VERNMENT POLICY: DESCRIPTIVE STATISTICS

	N	Min	Max	Mean	Std. Deviation
Government policy Q1	100	2.00	5.00	3.6000	.73855
Government policy Q2	100	2.00	5.00	3.5400	.79671

RELIABILITY TEST

GP	Cronbach's alpha		Min	Max	Mean	Std. Deviation
	Alpha	Items				
	0.716	2	2.00	5.00	3.5700	.67801

ONE-SAMPLE T-TEST

	N	Mean	S D	Std. Error
Government policy	100	3.5700	.67801	.06780

ONE-SAMPLE T TEST

Government policy	Test Value = 3					
	T	Df	Sig.	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
	8.407	99	.000	.57000	.4355	.7045

APPENDIX VIII

HR PRACTICES: DESCRIPTIVE STATISTICS

	N	Min	Max	Mean	Std. Deviation
HR practices Q1	100	2.00	5.00	3.5500	.79614
HR practices Q2	100	2.00	5.00	3.6900	.91778
HR practices Q3	100	2.00	5.00	3.2100	.87957
HR practices Q4	100	1.00	5.00	2.8200	1.04813
HR practices Q5	100	1.00	5.00	3.6900	.86100
HR practices Q6	100	1.00	5.00	3.5900	.75338
HR practices Q7	100	2.00	5.00	3.4200	.71322
HR practices Q8	100	1.00	5.00	2.8200	1.02868
HR practices Q9	100	2.00	5.00	3.4400	.68638
HR practices Q10	100	1.00	5.00	3.5900	.81767

ONE-SAMPLE T-TEST

	Test Value = 3					
	t	Df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
HR practices Q1	6.908	99	.000	.55000	.3920	.7080
HR practices Q2	7.518	99	.000	.69000	.5079	.8721
HR practices Q3	2.388	99	.019	.21000	.0355	.3845
HR practices Q4	-1.717	99	.089	-.18000	-.3880	.0280
HR practices Q5	8.014	99	.000	.69000	.5192	.8608
HR practices Q6	7.831	99	.000	.59000	.4405	.7395
HR practices Q7	5.889	99	.000	.42000	.2785	.5615
HR practices Q8	-1.750	99	.083	-.18000	-.3841	.0241
HR practices Q9	6.410	99	.000	.44000	.3038	.5762
HR practices Q10	7.216	99	.000	.59000	.4278	.7522

HRP VARIABLE: ONE-SAMPLE T-TEST

	N	Min	Max	Mean	Std. Deviation
HR practices (HRP)	0.694	2.30	4.20	3.3820	.44299

ONE-SAMPLE T-TEST

	Test Value = 3					
	T	df	Sig.	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
HR practices (HRP)	8.623	99	.000	.38200	.2941	.4699

APPENDIX IX
EDUCATION IN YEARS

	Educational Level	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	16.00	37	37.0	37.0	37.0
Valid	18.00	51	51.0	51.0	88.0
	22.00	12	12.0	12.0	100.0

APPENDIX X
MODEL 4(A): FPR (ED) = $A_0 + A_1ED + E$

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.157a	.025	.015	.10401	1.362

ANNOVA

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	.027	1	.027	2.468	.119a
	Residual	1.060	98	.011		
	Total	1.087	99			

COEFFICIENTS

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	.164	.102					
	Education in years	.009	.006	.157	1.571	.119	1.000	1.000

MODEL 4(B): HRP (GP) = $\Gamma_0 + \Gamma_1GP + M$

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.443a	.196	.188	.39914	1.724

ANNOVA

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	3.815	1	3.815	23.94	.000
	Residual	15.613	98	.159		
	Total	19.428	99			

COEFFICIENTS

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	2.348	.215		10.92	.00		
	Education in years	.290	.059	.443	4.893	.00	1.000	1.000

MODEL4(C): FPRED = $B_0 + B_1HRPGP + E$

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.291a	.085	.075	.01579179	1.844

ANNOVA

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	.002	1	.002	9.057	.003a
	Residual	.024	98	.000		
	Total	.027	99			

COEFFICIENTS

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	.241	.027		8.781	.00		
	Education in years	.024	.008	.291	3.010	.003	1.000	1.000

APPENDIX XI
MODEL 5: LM TEST

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.093a	.009	-.012	.01580413	1.839

ANNOVA

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	.000	2	.000	.424	.656a
	Residual	.024	97	.000		
	Total	.024	99			

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COEFFICIENTS

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.215	.235			
	HRP	-.098	.107	-1.22	-.918	.361
	HRP3	.003	.003	1.226	.920	.360

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BIOGRAPHIES

Muniba Sana has worked with Transworld Associates as a Marketing Executive. She has obtained a Master's degree in Management from the University of Leicester, UK. She did her Bachelor's degree in Business Administration from Bahria University, Islamabad. Her areas of interest are labor studies and empowerment of women.

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APPENDIX 1
Questionnaire

(Determining Female Participation Rate Using Structural Equation Modelling Technique: A Case of Pakistan's Telecom Sector)

1. Age (in years) _____

2. Education (Years of schooling) _____

3. What is the main reason for you doing job?
A. Empowerment _____
B. Independence _____
C. Economic need to earn _____
D. Feel bored at home _____

4. Is this the career of your choice/is your job in accordance with your qualification?
Yes. _____ No._____

If No, why did you chose to do this job, please specify)

---

5. How long have you been working for?
A. 1-3 years
B. 3-5 years
C. 5-7 years
D. Above 7 years

6. (a) There are many difficulties in finding a job.
A. Yes.
B. No.
If yes, please specify some of the difficulties you had to face)

(b) There are not enough job opportunities to choose from
A. Yes.
B. No.

Government policies

7. (a) Do you agree that Government is fully supporting female participation in job employment?
(Select 1 for Strongly-disagreed, 2 for Disagreed, 3 for Neutral (Not disagreed nor Agreed), 4 for Agreed and 5 for Strongly agreed (Follow the same pattern in the following questions)

1	2	3	4	5

(b) Do you agree that Government has certain laws to ensure/encourage female participation in job employment?

1	2	3	4	5

Organizational HR practices (HRP)

8. HRP1: Do you think your organization is following the labor laws imposed by the Government?

1	2	3	4	5

HRP2: Are you satisfied with the organization's policy of recruitment and selection?

1	2	3	4	5

HRP3: Does your company provide enough opportunities for career development and growth?

1	2	3	4	5

HRP4: How secure do you think your Job is?

1	2	3	4	5

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HRP5: Are you satisfied with the company's policy of dealing with harassment?

1	2	3	4	5

HRP6: Are you satisfied with the company's policy of dealing with discrimination issues?

1	2	3	4	5

HRP7: Does your company encourage your participation in decision making?

1	2	3	4	5

HRP8: Is your work valued in the organization, or do you feel your role in the organization is "cog in the wheel"?

1	2	3	4	5

HRP9: Do you feel the other female co-worker's participation is encouraged in your company?

1	2	3	4	5

HRP10: Do you feel that the HR policies and practices of your organization are NOT gender biased?

1	2	3	4	5

Female participation

9. (a) How many FEMALE members of your family are employed?

Employed _____ Nos. out of total female family members _____

(b) How many your FEMALE relatives are employed?

Employed _____ No. out of total female relatives _____

(c) How many your close female-neighbors are employed?

Employed _____ No. out of total female neighbor _____

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Measuring quality of service and its outcomes: an econometric model

Ali Khan

Abstract

The Hierarchical Service Quality Model (HSQM), developed by Brady and Cronin (2001) to capture the quality of services sector, was used as base to extend it to evaluate Pakistan's banking sector services' quality and its outcomes in the form of banking sector customers' satisfaction, trust and loyalty. Sample included 240 bank-customers of six different randomly selected banks located in Islamabad-Rawalpindi area. A 5-item Likert scale questionnaire was used which yielded data on customers' responses with good reliability tests measuring Cronbach's alphas ranged from acceptable (0.70s) to good (0.80s) and very good (0.90s) levels. Econometrically modeled HSQM's replication coupled with its extensions aiming at to measure various outcomes like customers' satisfaction, trust and loyalty behaved well and yielded statistically significant results. Based on the results, the HSQM extended econometric model is recommended to measure services quality in other sectors.

JEL Classification: F13, F14, F18, F31
Keywords: Services quality, HSQM's extension, customers' satisfaction, trust, loyalty, econometric modeling, Pakistan.

I. INTRODUCTION

The work on capturing quality of services sectors – the largest sector of an economy – got momentum during the last two decades of previous century, and a number of different approaches were forwarded by academicians and researchers in this regard (Garvin, 1984 & 1987; Parasuraman, Berry & Zeithaml, 1985, 1988 & 1991; Babakus & Boller, 1992; Rust & Oliver, 1994; Buttle, 1996; Dabholkar et al., 1996; Stevenson, 1999; Sower, 1999; Evans & Lindsay, 1999; Brady & Cronin,2001). Most of the approaches, especially in their early stages, were qualitative in nature. With the passage of time and efforts made, quantitative techniques for measuring services quality got momentum. The two very sophisticated tools of measuring services quality, which got global recognition, have been popularized under the names of SERVQUAL (Parasuraman et al., 1988) and Hierarchical Service Quality Model (Brady and Cronin, 2001).

Brady and Cronin's (2001) Hierarchical Service Quality Model (abbreviated as HSQM) measures services quality through three of its main dimensions, namely Interaction quality, Physical environment quality and Outcome quality; each of which, respectively, further consists of three sub-dimensions, namely Attitude, Behavior & Expertise; Ambient conditions, Design & Social factors; and Waiting time, Tangibles & Valence. The HSQM tool provides base for measuring services quality quantitatively, using econometrics techniques. This researcher has attempted to extend Brady and Cronin's (2001) HSQM measure to link it with and measure services quality outcomes, namely customers' satisfaction, customers' trust and customers' loyalty, using a quantitative econometrically specified model.

II. METHODOLOGICAL FRAMEWORK

A. Measuring services quality

Brady and Cronin (2001) presented a relatively improved contemporary model for measuring services quality (as opposed to product quality) and named it "Hierarchical Service Quality Model" (HSQM). This model "is perhaps the most fruitful approach to service quality assessment to date" (Pollack, 2009). The model incorporates ones "understanding of what defines service quality perceptions, how service quality perceptions are formed and how important it is where the service experience takes place (Caro and Roemer, 2006).

Brady and Cronin's (2001) HSQM measures services quality through three of its main dimensions (Interaction quality, Physical environment quality and Outcome quality), each of which further consists of three sub-dimensions, namely:

Major dimension of Interaction quality and its sub-dimensions of:

a. Attitude
b. Behavior
c. Expertise

Major dimension of Physical environment quality and its sub-dimensions of:

a. Ambient conditions
b. Design
c. Social factors

Major dimension of Outcome quality and its sub-dimension of:

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a. Waiting time
b. Tangibles
c. Valence

The first part of Figure I represents how nine sub-dimensions of services quality are developed in to three main dimensions, namely Interaction quality, Physical environment quality and Outcome quality, which further add up to yield total perceived services quality. Section I of the questionnaire, given in Appendix IV, represents the related items (questions) and constructs (sub-dimensions and main dimensions) developed to capture perceived services quality, using HSQM. To test the applicability of HSQM, the following hypotheses were tested through the estimation of related econometric models developed and placed along with each hypothesis below.

H_1: Pakistani banking sector Interaction quality (IQ) is a function of employees Attitude (AT), Behavior (BE) and Expertise EX); where IQ would econometrically estimate as:

$$IQ = f(AT, BE, EX) \quad (1)$$

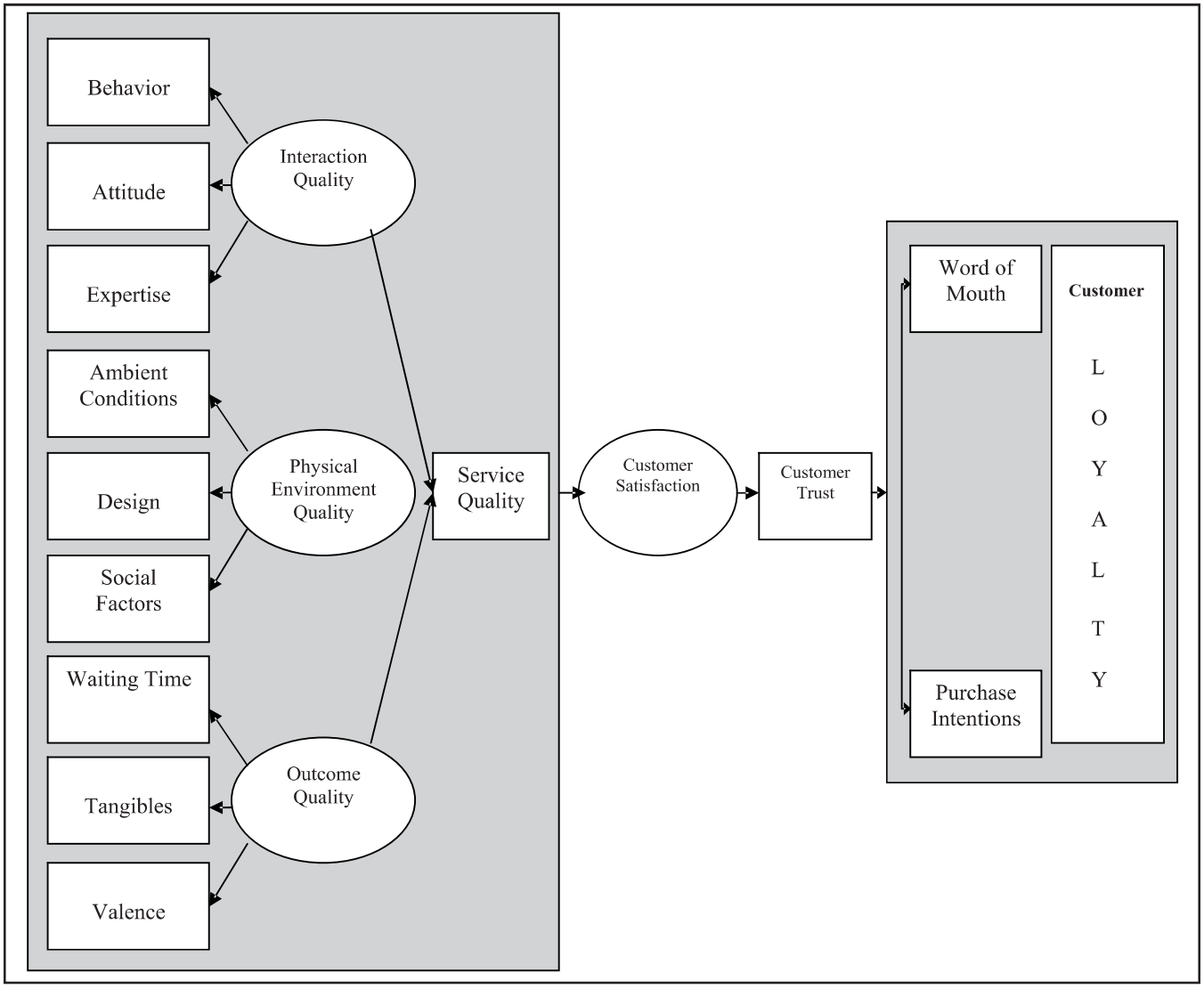
H_2: Pakistani banking sector Physical environment quality (PE) is a function of Ambient conditions (AC), Design (DE) and Social factors (SF); where PE would econometrically estimate as:

$$PE = f(AC, DE, SF) \quad (2)$$

H_3: Pakistani banking sector Output quality (OQ) is a function of Waiting time (WT), Tangibles (TA) and Valence (VA); where OQ would econometrically estimate as:

$$OQ = f(WT, TA, VA) \quad (3)$$

Figure I : Research model
Measuring Quality of Services and Its Outcomes: An Econometric Model



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H_4: Pakistani banking sector Service quality (SQ) is a function of the predicted values of Interaction quality (IQP), Physical environment quality (PEP) and Output quality (OQP); where SQ would econometrically estimate as:

SQ = f(IQP, PEP, OQP) (4)

B. Extending HSQM to measure services quality outcomes

The latter half of Figure I portrays how the perceived services quality measured through HSQM would extend to measure services quality outcomes, namely customers' satisfaction, customers' trust and customers' loyalty's two facets, Customers' Word-of-Mouth and Customers' Purchase intent. Section II of the questionnaire (Appendix IV) represents the related items (questions) and constructs to capture customers' satisfaction, customers' trust, customers' word-of-mouth and Customers' purchase intent.

The following hypotheses would be tested through the estimation of the related econometric models developed and placed below.

H_5: Pakistani banking sector Customers' Satisfaction (CSP) is a function of the predicted value of Service quality (SQP); where CSP would econometrically estimate as:

CSP = f(SQP) (5)

H_6: Pakistani banking sector Customers' Trust (CTP) is a function of the predicted value of customers' satisfaction (CSP); where CTP would econometrically estimate as:

CTP = f(CSP) (6)

H_7: Pakistani banking sector Customers' Word-of-Mouth (WMP) is a function of the predicted value of customers' trust (CTP); where WMP would econometrically estimate as:

WMP = f(CTP) (7)

H_8: Pakistani banking sector Customers' Purchase Intent (PIP) is a function of the predicted value of customers' trust (CTP); where PIP would econometrically estimate as:

PIP = f(CTP) (8)

C. Sampling

Pakistan banking sector customers, belonging to (i) five public sector banks, (ii) four specialized banks, (iii) seventeen private banks, (iv) eight micro-finance banks, (v) five Islamic banks, and (vi) six foreign banks, constitute the population for the study under hand. The above referred six major types of banks constitute the sampling frame. This helped to use the Stratified random sampling technique, wherein the above stated six types of banks provided the first strata in the first stage of sampling, which was followed by the second stage, wherein one bank from each of the six major bank-types was randomly selected. Please refer to Appendix I to have a look at the list of banks where the study was conducted.

In the third stage, 50 questionnaires were provided to main branches of each of the six banks located in Islamabad/Rawalpindi area, for filling from their respective customers. In total, 300 questionnaires were distributed, but 264 were returned and 240 were found valid and complete for use in the study.

III. RESULTS AND DISCUSSION

A. Reliability test

The data on customers' responses, collected through questionnaire, were tested for reliability; the results were turned out to be satisfactory. Please refer to appendix III for results.

B. Measuring services quality: econometric analysis

The empirical results of econometric models, meant for measuring services quality (equation 1 through 4) and its outcomes (equations 5 through 8), are provided in Appendix

table III. A discussion on the evaluation and interpretation of results is presented in the following paragraphs.

Econometric model 1 measures Interaction quality (IQ). Its estimation has been found statistically significant on the basis of F statistics (F = 246.144; p = 0.000). The three explanatory variables included (AT, BE and EX) appear to be collectively responsible for 75.80 percent variance (R^2 = 0.758) in the dependent variable. However, as far as individual explanatory variables are concerned, BE and EX have been turned out to be highly statistically significant (p < 0.01) while AT has not, suggesting that BE and EX are contributing towards Interaction quality (IQ) and AT does not. H_1 is therefore partially accepted.

Econometric model 2, which measures Physical environment quality (PE), suggests that the estimated model as a whole is statistically significant (F = 138.000; p = 0.000), and the three explanatory variables included (AM, DE and SF) are collectively responsible for 63.70 percent variance in the dependent variable (PE). As far as individual explanatory variables are concerned, all three explanatory variables, AM, DE and SF have turned out to be statistically significant (p < 0.05), suggesting that AM, DE and SF are contributing towards determining of Physical environment quality (PE). H_2 is therefore

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accepted.

Econometric model 3 measures Outcome quality. The results suggest that model as a whole is statistically significant (F = 119.506; p = 0.000), and the three explanatory variables included (WT, TA and VA) are collectively responsible for 60.30 percent variance in the dependent variable (OQ). However, as far as individual explanatory variables are concerned, TA and VA have turned out to be highly statistically significant (p < 0.01) and WT has not, suggesting that TA and VA are contributing towards Output quality (OQ) significantly while WT is contributing but relatively insignificantly. H_3 is therefore partially accepted.

Econometric model 4 incorporates the effects of all the above three estimated services quality sub-dimensions to measure Service quality (SQ) as per HSQM measure, suggested by Brady and Cronin (2001). The results suggest that model as a whole is statistically significant (F = 138.203; p = 0.000), and the predicted values of the three explanatory variables included (IQP, PEP and OQP) are collectively responsible for 63.70 percent variance in the dependent variable (SQ). As far as individual explanatory variables are concerned, all three explanatory variables, IQP, PEP and OQP, have turned out to be statistically significant (p < 0.05), suggesting that all the three sub-dimensions of Service quality positively contribute towards determining of Service quality (SQ). H_4 is therefore fully accepted.

Econometric model 5 measures Customers' satisfaction (CSP) as the first outcome of predicted value (already estimated) of Services quality (SQP). The empirical results suggest that model as a whole is statistically significant (F = 1456.586; p = 0.000), and the 86 percent variance of the dependent variable (CSP) has been explained (R^2 = 0.860). The explanatory variable SQP has turned out to be highly statistically significant (p < 0.01), suggesting that the predicted value of Service quality positively contribute towards determining of customers' satisfaction. Hypothesis H_5 is therefore accepted.

Econometric model 6 measures whether the predicted value of Customers' satisfaction (CSP) further determines Customers' trust (CTP). The results suggest that model as a whole is statistically significant (F = 1158.853; p = 0.000), and the 83 percent variation in the dependent variable (CTP) has been explained (R^2 = 0.830). The explanatory variable CSP has turned out to be highly statistically significant (p < 0.01), suggesting that the predicted value of customers' satisfaction positively contributes towards determining of customers' trust.

Econometric models 7 and 8 measure whether the predicted value of Customers' trust (CTP) further determines customers' loyalty in terms of its two dimensions, namely Customers' word-of-mouth (WMP) and purchase intent (PIP). The estimated empirical results of model 7 suggest that model as a whole is statistically significant (F = 741.930; p = 0.000), and the 75.70 percent variation in the dependent variable (WMP) has been explained (R^2 = 0.757). The explanatory variable CTP has turned out to be highly statistically significant (p < 0.01), suggesting that the predicted value of customers' trust positively contributes towards determining of customers' loyalty in the form of customers' word-of-mouth. The estimated results of model 8 suggest that model as a whole is statistically significant (F = 552.791; p = 0.000), and the 69.90 percent variation in the dependent variable (PIP) has been explained (R^2 = 0.699). The explanatory variable CTP has turned out to be highly statistically significant (p < 0.01), suggesting that the predicted value of customers' trust positively contributes towards determining of customers' loyalty in the form of customers' purchase intent. The hypothesis H_8 is therefore accepted.

IV. CONCLUSION

First, all the four econometric models used for testing of the first four hypotheses related to the application of Brady and Cronin's (2001) HSQM have been turned out statistically significant on the basis of F statistics; this helps to conclude that HSQM measure can be replicated in Pakistani situation, particularly for measuring services quality in the banking sector. The hypothesis H_4, which hypothesizes that Service quality (SQ) is a function of the predicted values of its three sub-dimensions previously discussed, has been fully accepted, suggesting that that all the three sub-dimensions of Service quality positively contribute towards determining of quality in Pakistani banking services.

Second, the four econometric models, used to test the possible extension of HSQM to measure the outcomes of services quality in the form of customers' satisfaction, trust, and customers' loyalty's two facets, namely word-of-mouth and purchase intent, have also been turned out to be statistically significant. The related hypotheses H_5 to H_8 have been accepted, suggesting that the perceived service quality as measured through HSQM determines directly customers' satisfaction, which in turn determines customers' trust, which further determines customers' loyalty's two facets, word-of-mouth and purchase intent.

APPENDIX I
Names of banks selected for study

S.No.	Types of banks	Names of banks selected
1	Public sector banks	National Bank of Pakistan
2	Commercial banks	Askari Bank Limited
3	Specialized banks	Zarai Taraqiati Bank Limited

4	Islamic banks	Meezan Bank Limited
5	Micro-finance banks	Khushhali Bank Limited
6	Foreign banks	Barclays Bank PLC

APPENDIX II
Results of reliability test

Construct	Cronbach's Alpha
Interaction Quality (IQ)	0.835
Attitude (AT)	0.776
Behavior (BE)	0.803
Expertise (EX)	0.857
Physical Environment Quality (PE)	0.788
Ambient Conditions (AC)	0.823
Design (DE)	0.874
Social Factors (SF)	0.814
Outcome Quality (OQ)	0.865
Waiting Time (WT)	0.807
Tangibles (TA)	0.880
Valence (VA)	0.888
Service Quality (SQ)	0.839
Customer Satisfaction (CS)	0.924
Customer Trust (CT)	0.907
Customers' loyalty	
Word of Mouth (WM)	0.877
Purchase Intention (PI)	0.849

APPENDIX III
Empirical Results of Econometric Models (1 – 9)

	Empirical Results
1	**Interaction quality (IQ) model** IQ = f(AT, BE, EX) IQ = - 0.115 + 0.037AT + 0.427BE + 0.551EX (-0.714) (0.504) (6.510) (11.20) (0.476) (0.615) (0.000) (0.000) F = 246.144 (0.000) R^2 = 0.758 $R^2_{adjusted}$ = 0.755 (Figures in the first and second parenthesis, respectively, are t-ratio and p-value)
2	**Physical environment quality (PE) model** PE = f(AC, DE, SF) PE = 1.148 + 0.403AM + 0.172DE + 0.163SF (6.793) (5.615) (2.459) (2.084) (0.000 (0.000) (0.015) (0.038) F = 138.000 (0.000) R^2 = 0.637 $R^2_{adjusted}$ = 0.632
3	**Outcome quality model** OQ = f(WT, TA, VA) OQ = 1.203 + 0.120WT + 0.367TA + 0.256VA (6.719) (1.479) (5.080) (3.086) (0.000) (0.141) (0.000) (0.002) F = 119.506 (0.000) R^2 = 0.603 $R^2_{adjusted}$ = 0.598
4	Service quality model SQ = f(IQP, PEP, OQP) SQ = -0.101 + 0.248IQP + 0.217PEP + 0.534OQP (-0.466) (2.914) (2.293) (4.321) (0.6410) (0.004) (0.023) (0.000) F = 138.203 (0.000) R^2 = 0.637 $R^2_{adjusted}$ = 0.633
5	**Customers' satisfaction model** CS = f(SQP) CS = -0.809 + 1.212SQP (-6.217) (38.165) (0.000) (0.000) F = 1456.586 (p = 0.000) R^2 = 0.860 $R^2_{adjusted}$ = 0.859
6	**Customers' trust model** CT = f(SQP) CT = -0.836 + 1.233SQP (-5.630) (34.042) (0.000) (0.000) F = 1158.853 (p = 0.000) R^2 = 0.830 $R^2_{adjusted}$ = 0.829
7	**Word-of-Mouth model** WMP = 0.020 + 0.984CTP (0.130) (27.238) (0.897) (0.0000) F = 741.930 (p = 0.000) R^2 = 0.757 $R^2_{adjusted}$ = 0.756
8	**Purchase intent model** PIP = 0.444 + 0.900CTP (2.738) (23.511) (0.007) (0.0000) F = 552.791 (p = 0.000) R^2 = 0.699 $R^2_{adjusted}$ = 0.698

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APPENDIX 1 **Questionnaire**						
Section I						
Strongly disagree = 1 Disagree = 2 Not disagree / neither agreed = 3 Agreed = 4 Strongly agreed = 5						
		1	2	3	4	5
1) Interaction quality						
1	Overall, the quality of my interactions with this Bank's employees is excellent					
2	Quality of interaction with my Bank's employees is high					
a) Attitude:						
1	The attitudes of employees demonstrate their willingness to help me					
2	The attitudes of employees show me that they understand my needs					
b) Behavior:						
1	The response of employees to my needs is quick					
2	The behavior of the employees indicates that they understand and value my needs					
c) Expertise:						
1	The employees are able to answer my questions to my satisfaction					
2	The employees have necessary knowledge to answer my queries					
2) Physical environment quality						
1	Physical environment of my bank is the best in the industry					
2	I would rate physical environment of my bank as high					
a) Ambient conditions:						
1	Their ambiance is exactly what I'm looking for					
2	They are aware that their atmosphere of the branch is important to me					
b) Design:						
1	Their layout always impress me					
2	They understand that the design of their branch is important to me					
c) Social factors:						
1	Other customers do not affect the bank's ability to provide me with good service					
2	They understand that other customers affect my perception of their services					
3	Other customers consistently leave me with a good impression of their services					
3) Outcome quality						
1	I feel good about what they provide to their customers					
2	My experience with my bank is always excellent					
a) Waiting time:						
1	Waiting time is always predictable					
2	They always make efforts to keep my waiting time to a minimum					
a) Tangibles:						
1	I am consistently pleased with their services					
2	I like them because they provide the services that I want					
c) Valence:						
1	Bank knows the kind of services its customers are seeking					

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2	After leaving the branch, I usually feel that I had a good experience					
3	I believe that they try their best to give me a good experience					
Service quality						
1	Overall I would say that they provide excellent services					
2	Quality of services provided by my bank is high					
Section II						
Customer Satisfaction						
1	I am satisfied with my bank for their pricing					
2	I am satisfied with my bank for their service quality					
3	I am satisfied with my bank for their customer services					
4	I am satisfied with my bank for their complaints handling					
5	Over all, I am satisfied with my bank					
Customer Trust						
1	My bank can be trusted at all times					
2	My bank is honest and truthful					
3	This bank is worthwhile to develop a long term relationship					
4	My bank is always believable					
Customer Loyalty						
a) Word of Mouth:						
1	I have introduced many customers to my bank					
2	I will recommend my bank to my acquaintances, colleagues, family members and friends					
3	I always say positive things about my bank					
b) Purchase Intentions:						
4	I will also use new services from the same bank					
5	I will not switch to any other bank					

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Trade openness and corporate tax rates determine FDI in Pakistan: a Cointegration-ECM analysis

Masood Shoukat Malik and Anwar F. Chishti

Abstract

A number of tries helped estimate a regression model, specifying short run and long run relationship between foreign direct investments (FDIs) and its two major determinants, namely trade openness and corporate tax rates in Pakistan. The estimated model, and both its Co-integration and ECM components, brings on surface certain important implications, for all major stakeholders. The public sector policy makers need to take note of the fact that foreign direct investment has been found being significantly affected positively by trade openness and negatively by corporate tax rates. So, efforts to enhance trade openness need to be encouraged. Similarly, the Federal Board of Revenue officials responsible for taxation policies in the country, should be aware of the fact that rates of corporate tax negatively and significantly affect FDIs in Pakistan; hence they should take this fact in to account while framing taxation policies and determining rates of taxes. The researchers interested in the topic for future research are urged to carry out research on optimizing relationship of tax rates and FDIs, for determining and quantifying the exact levels of relationship between the two variables.

JEL Classification:C13, C22, C32, C52
Keywords: FDI, Cointegration, ECM, Trade openness, Corporate tax rates, Pakistan.

I. INTRODUCTION

Foreign direct investment (FDI) is defined as the investment directly made into the production in a country by an investor or a company located in another country; such an investment is made either by buying a company in the target country or by expanding operations of an existing business in that country. Foreign direct investment is made for a number of reasons, including to take advantage of cheaper wages in the country, special investment privileges such as tax exemptions offered by the country as an incentive to gain tariff-free access to the markets of the country or the region. Foreign direct investment is in contrast to portfolio investment which is a passive investment in the securities of another country such as stocks and bonds (Wikipedia.org, 2012).

Foreign direct investment is influenced and affected by a number of factors. Nasreen, Baskaran and Muchie (2010) have pointed out that, "after adopting the liberalized policy measures in 1990s, there has been a significant increase in the FDI inflow", and both foreign investors and policy makers have identified "low cost labor as the major determinant of FDI inflow in Bangladesh". Beside the necessary logistic support, more simplified bureaucratic procedure, and prioritized investment can contribute to the increased FDI inflows. Stefanović (2008), after referring the OLI model, mentions that returns on foreign investment as a basic motive for FDI can be explained by three groups of factors: the ownership advantage of the firm (O), location factors (L) and internalization of transaction costs (I). Liu (2010) has shown that the source countries, with higher export ratio, depreciated exchange rate, lower borrowing cost, lower GDP per capita, higher relative labor cost, strong intellectual property rights (IPR) protection and higher volatility in their exchange rates, tend to invest more abroad. The author made this conclusion on the basis of a study on FDI inflows to China from 18 major source countries during 1989-2006. There has been some research on FDI and its determinants in Pakistan (Akhtar, 2000; Anjum and Nishat, 2005). This researcher intends to refresh this research, using recent and up-to-date data.

II. METHODOLOGY

A. Data

Data on FDI and its possible determinants (Appendix table I), pertaining to period 1981 – 2010 and converted in to natural logs, were found less varied in terms of standard deviation (SD) and coefficient of variation (COV) relative to the data in levels; hence data of the former form was used.

B. Methods

In accordance with the theory, as well as, on the basis of empirical studies referred earlier in Introductory section, it is concluded that foreign direct investment (FDI) is expected to depend on several factors, including the size of market of host country, costs of the projects, openness of the host country's trade, and so on. In the first attempt, a broader econometric model was used that included variables like GDP, GNP and country's total population (to represent proxies for the size of the market), corporate tax rate, labor wage rates and wholesale price index (to represent the levels of costs), and trade openness, literacy rates and urban population (as proxies to represent the country's openness to foreign investment, along with exchange rate, incidence of terrorist attacks and dummy for political regime/political system prevailed in the

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country.

All variables initially included in the model were then tested for unit root; those found as I(1), were then gone through the Cointegration and ECM analyses, for determining a long and short run relationship between FDI and its major determinants.

III. ANALYSIS AND FINDINGS

A. Data description

A simple comparison of the data, specifically on the basis of standard deviations (SD), reveals that data in level formulation are more variable relative to the data in natural-log formulation. For a more accurate comparison, coefficients of variation (CV) of various variables are estimated, using the formula:

$$c_v = \frac{\sigma}{\mu} \qquad (1)$$

Where the coefficient of variation (CV or Cv) is defined as the ratio of the standard deviation to the mean. Please refer to Appendix table 1 for Coefficients of variation (level versus natural-log data) which reveal that, after conversion of data in to natural-log formulation, its variations have been smoothened a lot. It further implies that the use of natural-log data would yield relatively better results; so from here onwards, the researcher is going to use natural-log data for further analysis.

B. Unit roots analysis

Since the data being used for this analysis pertains to time-series, and time series data usually have unit roots, meaning series data are non-stationary or are integrated of order 1 or I(1). In such a situation, the use of OLS yields spurious results, and regression is referred to as nonsense regression (Gujarati, 2007; p.825). The use of OLS relies on the stochastic process being stationary; when the stochastic process is nonstationary, the use of OLS can produce invalid estimates. Granger and Newbold (1974) called such estimates 'spurious regression' results, having high R^2 values and high t-ratios, yielding results with no sensible meaning. It is therefore recommended that time-series data should first be tested for unit roots, and then decision about the use of OLS or some other methods should be made. Accordingly, all variables, including both dependent and independent ones, have been tested for unit roots. Please refer to Appendix table II for the results of Augmented Dicky-Fuller (ADF) test.

The Augmented Dicky-Fuller (ADF) test statistic = -0.9936 (at p = 0.742) for variable FDI turns out to insignificant and less negative than the test's critical values at all three significant levels (1%, 5% and 10%); the null hypothesis of a unit root in case of variable FDI is therefore accepted (Panel A of Appendix table II).

Additionally, when the ADF test is again carried out at the First difference (Panel B of Appendix table II), it becomes significant at $p < 0.01$, and turns out to be more negative (-5.69857) than the critical values at all three significant levels (1%, 5% and 10%); this reconfirms that, after the first-differencing, the unit root of the series at the levels has transformed from nonstationary, I(1), to stationary, I(0).

In the same way, the ADF tests for unit roots have been carried out at level and at the 1st differences for all other variables; please refer to Appendix table III for results. The ADF test statistics, for the variables at levels, have turned out to be statistically insignificant at p-values > 10, suggesting the presence of unit roots in the concerned series of all independent variables. When these variables were re-tested for unit roots at the 1st differences, all variables but one (LWPI) have transformed from nonstationary or I(1) to stationary I(0); LWPI seems to have the 2nd root.

C. Cointegration analysis

With the exception of variable LWPI (which seems to have the 2nd root), all other variables, dependent (LFDI) and independent, have turned out to have unit roots, and are nonstationary or are of the same order of integration, that is, I(1); so these variables can now be subjected to Cointegration test for finding out whether there is a long-run relationship between them. This test is carried out in two steps (Gujarati, 2007: 841-843; Maddala, 2001:.258-260); the steps are:
Step 1: Run regression of the following type:

$$Y = \beta_0 + \beta_1 X + u_t \qquad (2)$$

And save residuals ut, for the use in step 2, as shown below.
Step 2: Regress the 'differenced residuals' on its lagged to test for stationarity, like:

$$\Delta u_t = \alpha_1 u_{t-1} + e_t \qquad (3)$$

Where $\Delta u_t = u_t - u_{t-1}$

If equation (2) is tested for unit root (like in section III (B) above), and it turns out to be stationary, that is, I(0), it would mean regression like equation (2) is cointegrated, and would not yield spurious results if OLS is used. Such a relationship (2 & 3) would prove that Y and X have long-run relationship.

D. The model:

Before carrying out the test for cointegration or long-run re-

lationship, the study has to decide on the exact specification of the model. In accordance with the theoretical framework, foreign direct investment (FDI) is expected to depend on several factors, including the size of market available for the products and services for which FDI is intended to be invested, costs expected to be incurred, openness of the country's trade, and so on.

Proxies included for the size of the market are: GDP (LGDP), GNP (LGNP) and country's total population (LPOP). These all three variables have been tested for normality. Please refer to Appendix table IV that provides results of normality tests of all the variables. It is revealed that series of all these three variables are normally distributed (p-vales of both normality tests, Kolmogorov-Smirnov and Shapiro-Wilk, are > 0.10). Hence, our regression process would determine which one of these three variables would better contribute. Proxies included to represent the levels of costs are corporate tax rate (LCTR), labor wage rates (LWR) and wholesale price index (WPI). The variable LWPI seems to have the second root; hence this variable cannot be included in the cointegration analysis. It has been found that LCTR has the lower CV value than that of LWR. Annexure table IV reflects that data of the series on LWR are normally distributed, while that of CTR do not. On the basis of both COV and normality tests, we cannot decide which one of the two variables (LCTR and LWR) would better perform; the decision is left on the regression process itself.

The variables like trade openness (LTO), literacy rates (LLR) and urban-population (LUP) have been included as proxies to represent the country's openness to foreign investment. Trade openness (LTO), though has a little higher CV value, it is the only variable whose data are normally distributed (Appendix table IV). In light of the above discussion, LGDP, LGNP or LPOP, LCTR or LWR and LTO seem suitable candidates, in addition to exchange rate (LER), incidence of terrorist attacks (LTA), dummy for political regime/political system (PSD) and GDP lagged one period (LGDPL), which need to be tested as determinants of the FDI in Pakistan. The econometric model is thus specified, as follows.

$$FDI = f(LGDP \text{ or } LGNP \text{ or } LPOP, LCTR \text{ or } LWR, LTO, LER, LTA, PSD, LGDPL) \quad (4a)$$

We gave a number of tries to model 4(a), and had to reduce/eliminate certain highly insignificant variables; the model has left out with the following variables:

$$FDI = f(LTO, LCTR) \quad (4b)$$

E. Cointegration step 1: empirical results:

The empirical results of the estimated Model (4b) are provided in Appendix table V. The model gives a good fit to the data; F-statistic = 317.982 shows model as a whole is highly significant at $p < 0.01$, while $R^2 = 0.959$ reflects that 95.90% variation in dependent variable (FDI) has been explained by variations in the two explanatory variables included. DW = 1.420 falls in no-autocorrelation zone ($du = 1.339 < DW < 4 - du = 2.661$ for $n = 30$, $K' = 2$ & $p = 0.01$). The collinearity statistics provided in the terms of VIF suggest that some moderate type of multicollinearity exists between the two explanatory variables.

As far as explanatory variables are concerned, variable LTO is statistically significant at $p < 0.01$ and LCTR at $p < 0.05$, and both explanatory variables carry expected signs as per the relevant theory.

F. Testing for model misspecification: Ramsey's RESET test

We started with seven explanatory variables (Model 4a), and ended up with only two significant explanatory variables (Model 4b); it seems appropriate to check whether the estimated model is correctly specified. Ramsey's 'Regression Specification Error Test' (RESET) is a good measure to check misspecification of an estimated model (Gujarati, 2007: 532 – 534); this test requires:

$$FDI = f(LTO, LCTR, FDI^2, FDI^3) \quad (5)$$

After running regression like (5), the F statistic is computed using the values of R^2 of the old model (4b) and new model (5), in the following manner.

$$F = \{(R^2_{new} - R^2_{old})/\text{number of new regressors}\} / \{(1 - R^2_{new})/(n-k)\} \quad (6)$$

Please refer to Appendix table VI for results. The empirical results portray very meager contributions of both newly added regressors, FDI^2 and FDI^3; the former was excluded by the model itself while the latter added little change in R^2 (from R2old = 0.959 to R2new = 0.960); putting these values in (6):

$$F = \{(0.960 - 0.959)/1\} / \{(1 - 0.960)/(30-4)\} \quad (7a)$$

$$= 0.6502 \quad (7b)$$

$F_{calculated} = 0.6502 < F_{tabulated;\ 0.05,\ DF\ (1,26)} = 4.26$; hence the estimated model (4b; Appendix table V) is not misspecified as per Ramsey's RESET test.

G. Cointegration step 2: empirical results

Before providing an interpretation of the results of cointegration step 1, it is necessary that the second step of cointegration analysis, already explained in the form of equation 3,

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is carried out. Accordingly, we estimated the second part of the model. Please refer to Appendix table VII for results. The τ-computed = - 5.71, which is much more negative than ADF critical values at 1% (-2.66) and 5% (-1.95) provided in Gujarati (2007, Table D.7, p.995), suggests that the first-differenced residuals regressed over residuals lagged one period are stationary, and this fulfills the condition of the cointegration of Model (4b), discussed in terms of Model (2 & 3). Additionally, the results regarding cointegration on the basis of Johansen-Juselius cointegration are also confirmed; the later test reinforces that there is at most one (and the same) cointegration relationship among the variables.

H. Dynamic/short-run: error correction model (ECM)

The results of Model 4(b) portray the long-run relationship of dependent variable FDI with its determinants. Error Correction Model (ECM), popularized by Engle and Granger, states that if a dependent variable and their determinants are cointegrated like they did in our above case (Subsection III-G), then their short-run dynamic relationship can also be measured through Error Correction Model (ECM), postulated, as follows.

$$\Delta Y_t = \alpha_0 + \alpha_1 \Delta X_t + \alpha_2 u_{t-1} + e_t \quad (8)$$

The ECM measure postulated in (8) states that α2 is always zero, and residuals (u_{t-1}) can be both negative and positive; so product term '$\alpha_2 u_{t-1}$' can make changes in dependent variable in both ways, positive and negative, provided α_2 turns out to be statistically significant. Please refer to Appendix table VIII for the estimated results of model (8). The coefficient α_2 of the lagged residual u_{t-1} of Model 8 (coefficient of RESID_LAG = - 0.795 in our case) has turned out to be negative and statistically significant at $p < 0.01$, suggesting that model exhibits both short-run and long-run effects; α_1 reflects the short-run effect of change in explanatory variable (coefficient of DLTO = 2.91 & coefficient of DLCTR = -4.41) on dependent variable, and α_2 is error correction or adjustment coefficient, showing how much adjustment takes place to the equilibrium during each period or how much of the equilibrium error is corrected.

I. Summarizing the results

The cointegartion analysis and ECM modeling, carried out in the preceding sections, yielded the following results.

Cointegrated model:

$$LFDI = f(LTO, LCTR,) \quad (9a)$$

$$= 0.044 + 1.845LTO - 4.365LCTR \quad (9b)$$
$$(0.0) \qquad (0.042)$$

ECM model:

$$\Delta Yt = \alpha_0 + \alpha_1 \Delta X_t + \alpha_2 u_{t-1} + e_t \quad (10a)$$

$$\Delta FDI = - 0.156 + 2.91\Delta LTO - 4.41\Delta LCTR$$
$$(0.016) \qquad (0.275)$$
$$- 0.795u_{t-1}$$
$$(0.001) \quad (10b)$$

(Figures in parentheses are p-values)

Whereas the cointegration analysis yielded a static/equilibrium model (model 9), showing the effects of changes in explanatory variables (LTO & LCTR) on dependent variable (LFDI), occurring instantaneously; the ECM modeling yielded a dynamic model (model 10) wherein the changes in explanatory variables seem to bring disequilibrium in dependent variable in the short-run, however the long-run adjustment coefficient of residuals (through changes in residuals) makes corrections and bring equilibrium back within a short duration (1 / 0.795 = 1.26 period, say years) as the adjustment coefficient happens to have substantial value (0.795).

Trade openness (TO) and corporate tax rates (CTR) have appeared to be the major determinants of foreign direct investment (FDI) in Pakistan, and the both variables seem to be capable of causing elastic changes in FDI (2.914 and -4.411), the former in positive and the latter in negative direction.

A number of tries helped estimate a regression model, specifying relationship between foreign direct investments (FDI) and its two major determinants, namely trade openness (TO) and corporate tax rates (CTR) in Pakistan; the model adopts the form: lnFDI = 0.044 + 1.845lnTO – 4.365lnCTR. The model gives a good fit to the (log) data for 1981 – 2010 in terms of F-statistic = 317.982 ($p < 0.01$) and $R^2 = 0.959$. As far as explanatory variables are concerned, variable lnTO is statistically significant at $p < 0.01$ and lnCTR at $p < 0.05$, and both explanatory variables carry expected signs as per the relevant theory. Ramsey's RESET test yielded $F_{calculated} = 0.6502$, which is less than $F_{tabulated;\ 0.05;\ DF = (1,\ 26)} = 4.26$, suggesting that the original estimated model is not under-fitted or misspecified. Since the three time-series (FDI, TO & CTR), used in estimation of the aforementioned model, were I(1), they were checked for the second condition of Cointegration, that required testing of the first-differenced residuals for I(0); the model fulfilled this condition of the cointegration. The estimated model thus portrays the long-run relationship of dependent variable FDI with its two major determinants. The model was further checked for the short-run dynamic relationship, using Error Correction Mechanism (ECM), which resulted in: $\Delta FDI = - 0.156 + 2.91\Delta TO - 4.41\Delta CTR - 0.795u_{t-1}$. The coefficient of the lagged residual (u_{t-1}), having value = -0.795, has turned out to be negative and statistically significant at $p < 0.01$, suggesting that this model exhibits both short-run and long-run effects. The coefficient of lagged residual (u_{t-1}), being the long-run adjustment coefficient makes corrections and brings

equilibrium back within a short duration (1 / 0.795 = 1.26 period, say years); this adjustment coefficient happens to have a substantial value (0.795).

IV. CONCLUSION AND RECOMMENDATIONS

The aforementioned estimated model (both its Cointegration and ECM components) helps us to draw three major conclusions, namely:

First, whereas the cointegration analysis yields a static/ equilibrium model, showing effects of changes in explanatory variables (LTO & LCTR) on dependent variable (LFDI), occurring instantaneously; ECM measure yields a dynamic model, wherein the changes in explanatory variables seem to bring disequilibrium in dependent variable in the short-run, however the long-run adjustment coefficient of residuals (through changes in residuals) makes corrections and brings equilibrium back within a short duration (1 / 0.795 = 1.26 periods, say years) as the adjustment coefficient happens to have substantial value (0.795).

Second, trade openness (TO) and corporation tax rates (CTR) appear to be the major determinants of foreign direct investment (FDI) in Pakistan, and the both variables seem to be capable of causing elastic changes in FDI (2.914 and -4.411), the former in positive and the latter in the negative direction.

Third, both of the above referred conclusions have certain important implications, for all major stakeholders including foreign investors, government of Pakistan and the local investors interested in bringing foreign investments in Pakistani domestic market. The public sector policy makers should take note of the fact that foreign direct investment (FDI) has been found being significantly affected positively by trade openness and negatively by corporate tax rates. The estimated model, both its Cointegration and ECM components, have certain important implications, for all major stakeholders. The public sector policy makers should take note of the fact that foreign direct investment (FDI) has been found being significantly affected positively by trade openness and negatively by corporate tax rates. So efforts to enhance trade openness should be encouraged. Similarly, the Federal Board of Revenue (FBR), which is responsible for taxation policies in the country, should take note of the fact that rates of corporate tax negatively and significantly affect FDIs; hence they should take this fact in to account while framing taxation policies and determining rates of taxes. The researchers interested in the topic for future research are urged to carry out research on optimizing relationship of tax rates and FDIs, for determining and quantifying the exact levels of relationship between the two variables.

APPENDIX I

Coefficients of variation (level versus natural-log data)

Names of Variables	Coefficient of Variation (CV)	
	Level data	Natural-log-data
FDI	1.663377	0.201319
GDP	1.217415	0.100722
GNP	1.103857	0.081245
Trade openness (LTO)	1.144034	0.092416
Exchange rate (LER)	0.570055	0.183907
Corporate tax rate (CTR)	0.098173	0.028275
Wage rate (LWR)	0.703163	0.086862
LWPI	0.720169	0.189934
Literacy rate (LLR)	0.260326	0.072490
Urban population (LUP)	0.297730	0.081862
Terrorist attacks (LTA)	1.415366	0.426614
Political system (LPS)	1.245000	1.245000
Population (LPOP)	0.204732	0.043078

APPENDIX II

PANEL A: ADF TEST OF FDI AT LEVEL

Null Hypothesis: LN_FDI has a unit root			
Exogenous: Constant			
Lag Length: 0 (Automatic - based on SIC, maxlag=7)			
		t-statistic	Prob.*
Augmented Dickey-Fuller test statistic		-0.9936	0.742
Test critical values:	1% level	-3.6793	
	5% level	-2.9677	
	10% level	-2.6229	

PANEL B: ADF TEST OF FDI (AT 1ST DIFFERENCE)

Null Hypothesis: D(LN_FDI) has a unit root			
Exogenous: Constant			
Lag Length: 0 (Automatic - based on SIC, maxlag=7)			
		t-statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.6985	0.0001
Test critical values:	1% level	-3.6891	
	5% level	-2.9718	
	10% level	-2.6251	

APPENDIX III

Unit root analysis of independent variables

Variables	At Level		At 1st Difference	
	ADF test statistic	p-value	ADF test statistic	p-value
LGDP	0.421949	0.9802	-8.01136	0.0000
LGNP	0.539623	0.9852	-4.89068	0.0005
LTO	0.501967	0.9838	-2.91789	0.0586
LER	-1.35114	0.5918	-3.97167	0.0061
LCTR	-0.57087	0.8623	-4.03142	0.0044
LWR	0.497844	0.9837	-5.04167	0.0003
LWPI	-0.59377	0.8572	-1.73435	0.4034
LLR	-1.17181	0.6727	-3.59597	0.0125
LUP	-0.59377	0.8572	-5.89072	0.0000
LTA	-2.37628	0.1568	-6.23567	0.0000

APPENDIX IV

Tests of Normality						
	Kolmogorov-Smirnov			Shapiro-Wilk		
	Statistic	Df	Sig.	Statistic	df	Sig.
LGDP	.103	30	.200*	.946	30	.136
LGNP	.083	30	.200*	.957	30	.253
LPOP	.081	30	.200*	.960	30	.315
LCTR	.239	30	.000	.797	30	.000
LWR	.120	30	.200*	.950	30	.167
LTO	.088	30	.200*	.954	30	.217
LLR	.115	30	.200*	.919	30	.025
LU P	.113	30	.200*	.938	30	.082

APPENDIX V

Model Summary					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.979a	.959	.956	.40000	1.420

ANOVA

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	101.753	2	50.876	317.98	.000a
	Residual	4.320	27	.160		
	Total	106.072	29			

COEFFICIENTS

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	.044	5.107		.009	.993
TO (Ln)	1.845	.163	1.182	11.35	.000
CTR (Ln)	- 4.365	2.050	-.222	-2.13	.042

APPENDIX VI

Model Summary					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.980a	.960	.955	.40491	1.423

COEFFICIENTS

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	.044	5.107		.009	.993
TO (Ln)	-.698	5.321	-.698	5.321	-.698
CTR (Ln)	2.076	.424	2.076	0.424	2.076
FDI	-4.914	2.274	-4.914	2.274	-4.914

APPENDIX VII

Model Summary					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.728	.530	.513	.35298	.728

ANOVA

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	4.067	1	4.067	32.638	.000a
	Residual	3.613	29	.125		
	Total	7.680b	30			

COEFFICIENTS

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
Residual lagged	-1.05	.185	-.728	-5.71	.000

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APPENDIX VIII

Model Summary					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.670	.449	.383	.39711	1.694

ANOVA

Model	Sum of Squares	Df	Mean Square	F	Sig.	
1	Regression	3.219	3	1.073	6.803	.002a
	Residual	3.942	25	.158		
	Total	7.161	28			

COEFFICIENTS

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	-.156	.183		-.85	.402
DLTO	2.91	1.12	.410	2.58	.016
DLCTR	-4.41	3.955	-.175	-1.11	.275
RESID_LAG	-.795	.216	-.558	-3.68	.001

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BIOGRAPHIES

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Real exchange rate and trade balance of Pakistan: an empirical analysis

Muhammad Bilal Saeed and Ijaz Hussain

Abstract

This study evaluates the relationship between real exchange rate and trade balance prevailed in Pakistan during the 1985-2010 period. Engel Granger residual based and Johansen Juselius tests have been used to inquire into the long term connection between exchange rate and trade balance. Error correction model is then employed to study the short term connection. It has been discovered that there exists a connection between real exchange rate and trade balance in long as well as short run. The evidences set forth lead to a decisive conclusion that Marshall Lerner Condition and J curve effect both hold in case of Pakistan.

JEL Classification: F13, F14, F18, F31
Keywords: Real Exchange rates, trade balance, currency depreciation, Pakistan.

I. INTRODUCTION

Exchange rate policy is considered as one of the powerful tools as it directly affects trade and indirectly business, investment and other sectors of economy, and policy decisions (Liew, Lim & Hussain, 2000). Exchange rate policy is sometimes used to target balance of trade and to push it in some specific direction. Elasticity model of balance of trade has shown the existence of a theoretical relationship between exchange rate and trade balance (Kruger, 1983). However there is still ambiguity whether depreciation or appreciation in exchange rate affects balance of trade or not and up to what extent (Quio, 2005). Empirical evidences are somewhat mixed; these are unable to provide valuable inputs to policy makers in order to use the exchange rate as an effective tool to direct balance of trade (Koray and McMillin, 1998). A large number of developing countries follow an active strategy of devaluing their currencies to cope with a severe problem of balance of payment deficit (Aftab & Khan, 2008). Depreciation or devaluation of currency impacts trade balance in two ways. First, by making domestic goods cheaper as compared to foreign goods, this shifts spending from foreign to domestic goods and ultimately improves trade balance. Secondly, devaluation reduces real value of cash balances and changes relative price of traded and non traded goods, thus improving trade balance (Ling, Mun & Mei, 2007).

Economic literature states that depreciation and devaluation of currency will improve trade balance if sum up value of imports and exports demand elasticities is greater than one. This condition is known as "Marshal Lerner Condition" and has become an underlying assumption for those who support devaluation as a means to stabilize foreign exchange market and to improve trade balance (Rincon, 1998).

Even if Marshall Lerner Condition is satisfied, there are some cases where trade balances are not improved and are continued to deteriorate (Bahmani-Oskooee & Cheema, 2009). These exceptions lead to a concept, a relatively short run phenomenon that exists when a depreciation or devaluation takes place. This phenomenon is known as "J curve". According to this concept, depreciation of currency will worsen trade balance first and then improve it later on (Magee, 1973). Marshal Lerner Condition and J curve are two concepts that explain the relationship between exchange rates for a nation's currency and its balance of trade.

This is a conventional wisdom that if currency of a country, let's say Pak Rupee, depreciates relative to other currencies, then this should lead to an improvement in Pakistan's balance of trade. One reason is that, imported goods will become expensive, so consumers will buy less imported goods. On other hand, other countries will buy more goods from Pakistan due to lower real price. Hence fewer imports and more exports will lead to improvement in country's balance of trade. This wisdom is acceptable in long run only, as the current account deteriorates sharply right after real depreciation of currency.

Literature or theory supports the argument that there is an improvement in balance of trade if Marshal Lerner Condition holds but this argument still lacks empirical support because its impact may vary depending upon the economies. J curve or a short run observed phenomenon on the other hand has also some theoretical justification but still is not supported by a lot of empirical evidences (Petrovic & Gligoric, 2010). On the basis of observed facts, there is an active need to look for empirical evidences in order to support or reject the two important phenomena, that is, Marshal Lerner Condition and J curve. Exchange rate and trade balance relationship is especially important from the view point of Pakistan because in case of Pakistan, trade balance determines major part of balance of payments. This gives an opportunity to check the relationship between exchange rate and trade balance so that valuable inputs could be provided to policy makers regarding the effectiveness of exchange rate policy to balance the

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country's foreign trade. This study empirically investigates the existence of Marshall Lerner Condition and J curve case of Pakistan. In other words, this study tries to look for empirical evidences for connection between exchange rate and trade balance and to know whether such connection is strong enough to be able to base a policy on it.

II. LITERATURE REVIEW

A large number of studies have tried to investigate the relationship between the trade balance and exchange rate. Junz and Rhomberg (1973) started work in this area and investigated the impact of exchange rate changes on trade balance. They were followed by Magee (1973). All three researchers were first to discover that there exist some lags, that is, whenever change would come in exchange rates, producers and consumers both will take time to fully adjust to new prices and this change would give rise to J curve. This concept follows a simple path that just after currency depreciation or devaluation trade balance will first deteriorate and then adjust fully to the new exchange rate. Artus and McGuirk (1981) tried to estimate demand elasticities of exports and imports of the developing countries and found out that there are no clear evidences for the existence of Marshall Lerner Condition. Kruger (1983) presented his elasticity model to theoretically address the relationship between exchange rate and trade balance. Rose and Yellen (1989) then tried to investigate the existence of J curve and Marshall Lerner Condition both for developing and developed countries and set forth their evidence for rejection of J curve hypothesis. These studies were based on ideas that were presented by Bickerdike (1920), Robinson (1947) and Metzler (1948). They put forward the elasticity approach to balance of payments. This approach addresses the improvement of trade balance when exchange rates depreciate. Marshall (1923) and Lerner (1944) further studied and explained the concept that their exist a positive effect of depreciation or devaluation on trade balance if the absolute value of demand elasticities for exports and imports exceeds one. The Bickerdike, Robinson and Metzler's approach along with Marshall Lerner Condition have now become the supporting assumption for those who look at exchange rate as an effective policy tool to direct the trade balance of a country in some particular direction.

A large number of economists are in favor of the view that a nominal devaluation improves trade balance. Rose (1991) found out that Marshall Lerner condition does not hold for five major countries who are the members of Organization for Economic Co-operation and Development (OECD) i.e. United States, United Kingdom, Japan, Canada and Germany. Backas, Kehoe and Kydland (1994) reported that movement of trade balance could observe different paths due to positive or negative correlation of trade balance with the cause of this fluctuation that is real exchange rate. Shirvani and Wilbrattee (1997) investigated the relationship between real exchange rate and trade balance of United States with group of seven industrialized nations (G7) countries i.e. United Kingdom, Japan, Germany, Canada, France and Italy. Rincon (1998) studied that behavior of trade balance of Columbia both in long as well as in short run. The results are not enough either to support or reject the existence of Marshall Lerner Condition. Another study regarding testing the short-and-long run exchange rate effects on trade balance in Colombia by Rincon (1999) examined that whether exchange rate impact balance of trade in the short run only or it also has a significant impact in the long run.

Three researchers Lim, Liew and Hussain (2000) tried to find the answer to a very simple question that if exchange rate fluctuates or simply change does the trade balance always change in response to this change or fluctuation. The evidence is collected from five members of the Association of Southeast Asian Nations (ASEAN countries) i.e. Indonesia, Malaysia, Philippines, Singapore and Thailand and showed that impact of exchange rate on trade balance is exaggerated and also that it is real exchange rate not nominal exchange rate that affects trade balance. During the twentieth century the discussion of relationship between trade balnce and exchange rate also got a lot of interest from different researchers as Bahmani-Oskooee (2001) looked into the matter and found out that real exchange rate does not change on its own it is actually the nominal exchange rate that is changed first and this change causes a shift or fluctuation in real exchange rate. Akbostanci and Fan (2002) investigated the existence of J curve for Turkey. A very important question i.e. whenever exchange rate policy is used by monetary authority what are the outcomes that follow it was addressed by Islam (2003). He argued that in order to restrain and to reduce current account gap there must be a strong connection between real exchange rate and trade balance so that a policy could be based on it. Mustafa and Nishat (2004) worked on exchange rate volatility and export growth in Pakistan and found that the two phenomenons are related in the long run perspective only. Yarmukhamedov (2007) evaluated the relationship of exchange rate fluctuations with exports and imports in Sweden and reported the absence of no significant evidence for the existence of relationship.

An empirical study conducted to explain the Real Exchange Rate and Trade Balance Relationship in Malaysia by Yuen and Mun (2007) examined the Marshall Lerner Condition and J curve effects in Malaysia using co integration techniques, Eagle Granger tests, Vector Error Correction Model and impulse response analysis. Their empirical results provided significant evidence for the existence of the Marshall Lerner Condition where as no J curve effect was observed in the Malaysian case. The short-run and long-run effects of real depreciation of Pakistani Rupee on bilateral trade balance between Paki-

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stan and each of her twelve trading partners is investigated by Aftab and Khan (2008) in their working paper. While talking of the developing countries Aziz (2008) tried to find out the long term and short term relationship between real exchange rate and trade balance. With the application of Engel Granger and Johansen technique followed by ECM the study set forths a general argument that real effective exchange rate has a significant positive relationship with trade balance in the long as well as short run for Bangladesh. Zaiby (2008) talks about devaluation and its possible impact on the economy along with the proper management of side effects of devaluation of currency, so that the benefits of using this strategy can be best achieved in case of Pakistan.

A large number of researchers have looked into the impacts of currency depreciation on balance of trade of a country. The discussion that is available is a mixture of both theoretical and empirical knowledge set forth from time to time. Bahmani-Oskooee and Cheema (2009) investigated the existence of short and long run effects of currency depreciation on trade balance of Pakistan. Using the cointegration approach the relationship between Pakistan and her thirteen trading partners have been analyzed and it is stated that the analysis is unable to provide any concrete conclusion and the relationship is somewhat confusing and need some more sophisticated model to look deep into the relationship that exist between the exchange rate and trade balance in long as well as short run. A study conducted to understand the Exchange Rate and Trade Balance: J curve effect by Pavale and petrovic and Mirjana Gligoric (2010) found that the exchange rate depreciation and trade balance are deeply related in case of Serbia. Both the Johansen's and ARDL approaches have been employed and the results validate the fact that like other countries the improvement in trade balance in long run give rise to a short run phenomenon known as the J curve.

III. THEORETICAL FRAMEWORK

The economic theory suggests that exchange rate will affect trade balance, however the extent and nature of this effect is not clear. The reason is that this relationship is also affected by the state of economy in which it persists. Exchange rate sometimes is seen as an instrument or tool that could be used to derive trade balance in some particular direction (Mark, 2006). Depreciation in currency will increase the volume of exported goods by making them cheap for foreign buyers. Due to this reason, the foreign buyers pay less in terms of their currencies or they import more exported goods from the country. On the other hand, this depreciation or fall in price will also affect imports. The imports will become expensive for local residents and they will switch to domestic substitutes, thus reducing the volume of imports. Whenever the relationship is discussed, it is assumed that trade balance will adjust fully to any change in the exchange rate but it is not the case. Trade balance actually takes time to adjust fully to new changed environment and during that time, economists argue that, there exists a short time phenomenon of adjustment. This short run phenomenon is quiet interesting as it states that trade balance will first deteriorate before it adjusts itself in response to changes in the real exchange rate. Koray and McMillian (1998) argued that, there exists a short run phenomenon known as J curve that is followed when a change in exchange rate comes. They argue that whenever there is a change in exchange rate the trade balance will improve in the long run but worsen in the short run first as trade is not something that could be adjusted immediately. It will take time and hence one can look into a simple short run phenomenon known as the J Curve.

Following Shirvani and Wilbrattee (1997), Baharumshah, (2001), Gomez and Alvarez-Ude (2006) and Ling (2008), we present the trade balance equations in the following paragraphs. The balance of trade or the net exports (NX) is simply the difference between exports and imports, so trade balance or net exports (NX) can be written as:

$$NX = X - M \quad (1)$$

where "X" stands for "Exports" and "M" stands for "Imports".

The volumes of imports and exports depend on the real exchange rate, which is mathematically determined, as follows.

$$ER = EN \times (p/p^*) \quad (2)$$

where ER is the real exchange rate, EN is the nominal exchange rate, "p" is the domestic-country price level and "p*" is the foreign-country price level. The real exchange rate is thus related with the ratio of the price levels of the two countries, directly related with domestic country price level and inversely related with foreign country price level. A higher real exchange rate (depreciation in other words) would mean higher domestic price level and expensive imports; so imports would decline. On other hand, higher prices would be received by domestic exporters for their exports items, and consequently, they will export more relatively to the earlier situations when real exchange rates were comparatively lower.

In addition, exports (X) and imports (M) are affected by foreign (Y*) and domestic (Y) incomes, respectively. Increase in foreign income Y* positively increase the demand for domestic goods and services; hence exports will increase. When the domestic income Y increases, domestic people will buy more goods; hence demand for foreign goods (imports) in domestic market will increase.

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As explained, the exports X and imports M are affected not only by changes in real exchange rates but these are also affected by national or per capita incomes of the two countries. Incorporating these effects in equation 1 would mean:

$$NX = X(Y^*, ER) - M(Y, ER) \quad (3a)$$
$$NX = f(Y, Y^*, ER) \quad (3b)$$

IV. RESEARCH METHODOLOGY

The general form trade balance (TB) model, postulated in equation (3b), can be estimated as a log-linear econometric model, in the following form.

$$\ln TB = \beta_0 + \beta_1 \ln ER + \beta_2 \ln Y + \beta_3 \ln Y^* + \mu_t \quad (4)$$

where "μ" is assumed to be white noise process. Here, natural logarithm (ln) is taken for each data series. The natural log is taken for two major reasons. First, the data are of economic time series and these series normally exhibit a strong trend, that is, a consistent upward or downward movement in values. When this is caused by some underlying growth process, a plot of the series will reveal an exponential curve. In such cases, the exponential component dominates other features of the series. Taking natural logarithm of such a series effectively linearizes the exponential trend. Second, logs are used to linearize a model, which is non linear in the parameters. Here, the logs are taken of all the variables involved rendering them linear in parameters and hence the model can easily be estimated using ordinary least squares (OLS) regression. "TB" stands for trade balance. The "ER" represents real exchange rate as already discussed, "Y*" expresses gross domestic product of foreign country and "Y" represents the domestic country income (gross domestic product of Pakistan).

The data for period 1985 to 2010 have been used. All previous studies that tried to predict the connection between exchange rate and trade balance for Pakistan used data for period prior to 1982. Since Pakistan started to follow the floating exchange rate system in 1982 and it took about two to three years for the exchange rate to adjust fully to floating exchange rate, the timeframe of 1985 onwards seemed appropriate for this study.

Since data pertaining to time series were to be used, all four variables were first tested for order of integration. For this purpose, data were graphically plotted, and were also tested for unit roots, using the three well known tests, namely Augmented Dickey Fuller (ADF), Phillip Perron (PP) and Kwiatkowski Phillips Schmidt Shin (KPSS) tests. Three methods, including Engel Granger residual based test, Error Correction Model and Johansen Juselius test were used for cointegration.

For Engel Granger residual based test, the disequilibrium errors were calculated, using relationship:

$$\mu_t = \ln TB - \beta_0 - \beta_1 \ln ER - \beta_2 \ln Y - \beta_3 \ln Y^* \quad (5)$$

The μ_t thus calculated were then tested, and the order of integration of these residuals was found. For the four variables to be co integrated, the residuals should turn out to be stationary. Johansen Juselius approach was then applied to further verify the long term connection between the variables. Error Correction Model (ECM) was used to check the long and short term relationship between Pakistan trade balance (TB) and its three determinant-variables (ER, Y and Y*). Pair wise Granger casuality test was also conducted.

V. RESULTS AND DISCUSSION

Appendix table I provides the results of ADF, PP and KPSS tests for unit roots; the first panel of the appendix provides results for unit roots test at level and the second panel at the first difference. The null hypothesis for ADF and PP tests are that the series have unit roots (non-stationary) where as the null hypothesis for KPSS test is that the series is stationary. Tests results, in light of the critical values, provided at the end of table, show that all the four variables have unit root at level and become stationary after the first differences. On the basis of the results, it is concluded that lnTB, lnER, lnY and lnY* are integrated of order one, that is I(1).

After finding that all economic time series are stationary the study proceeds to Engel Granger residual based approach. The long term equilibrium relation is estimated as follows:

$$\ln TB = -45.73917 - 0.021207 \ln ER - 2.420353 \ln Y + 3.448435 \ln Y^* + \mu_t \quad (6)$$

The residuals are then obtained of this estimated equation. Here μt is the series of estimated residuals of the long term relationship. If the residuals are found to be stationary, then the variables are cointegrated. Appendix II reports the results of ADF test for residuals based on Engel Granger two step procedure. Figure 1 reinforces the results in form of graphical representation of the residuals.

It is found that the residual series is stationary at level and integrated of order zero, that is, I(0); so the null hypothesis that the variables are not cointegrated is rejected and it is concluded that there is cointegration among the variables, that is that lnTB, lnER, lnY and lnY* are cointegrated, suggesting that long run equilibrium relationship exists between the variables.

Since the model is multivariate, hence Johansen Juselius approach is also used to better understand and explain the long

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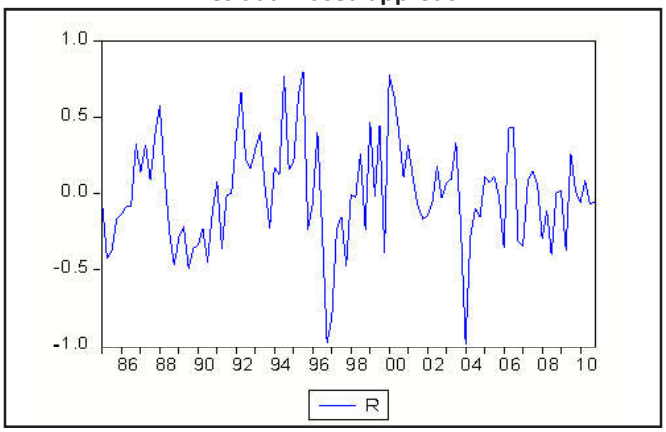
run relationship between the variables (Appendix III). The lag length is selected on the basis of AIC and SBC criterion. It is selected by running VAR model with different lag lengths and the lag that gives minimum values of these AIC and SBC is selected. The lag length is found equal to one in this model; appendix III reports the results of two types of test statistics involved in Johansen Cointegration approach. One is trace statistics and other is Max Eigen statistics. Both test statistics are checked. In case of trace test statistics, the null hypothesis is number of cointegrating equations. The first is none, meaning that there is no cointegrating equation or there is no cointegration among the four variables. The p value for null hypothesis is three percent which is less than five percent. The guide line is when the p value is less than five percent, null hypothesis is rejected but when the p value is more than five percent, null hypothesis cannot be rejected, rather it is accepted. The first null hypothesis of no cointegration can be rejected. The second null hypothesis is that there is at most one cointegrating equation. The p value is 0.3863 so null hypothesis cannot be rejected meaning that there is at most one cointegrating equation which means that there is cointegration among the four variables or these four variables have long run association ship or in the long run, they move together. The second test is max Eigen statistics. Here again, the null hypothesis is that there is no cointegrating among the variables. The p value is 0.0299 which is less than five percent, so null hypothesis can be rejected. Second null hypothesis is that there is at most one cointegrating equation. It can be tested again by looking at the p value and the p value is 0.2991 which is more than five percent, so we cannot reject null rather, and accept null meaning that there is at the most one cointegrating equation among the variables, suggesting that variables have long run association ship or all the four variables move together in the llong run. Both the trace and Max Eigen tests indicate one cointegrating equation at five percent level meaning that there iis cointegration among the four variables.

Figure I
Unit root test results of residuals based on Engel Granger Residual Based approach



After knowing that the four variables are cointegrated, the error correction model (ECM) is run; the results ECM are provided, as follows:

$$\Delta lnTB = -0.041254 + 0.765636\Delta lnER + 0.950020\Delta lnY + 0.565892\Delta lnY^* - 0.581672\mu_{t-1} \quad (7)$$

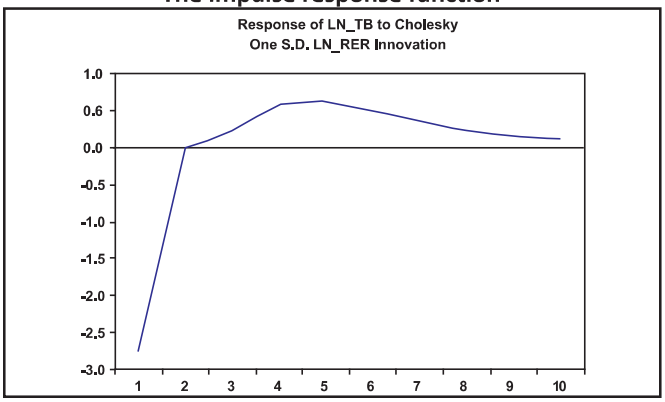
Model (7) indicates that the coefficients carrying with explanatory variables ER, Y and Y* (0.7656, 0.9500 and 0.5658) do not show long run relationship, they are short run coefficients. The coefficient of error correction term is -0.581672 that indicates that the error correction term actually corrects the disequilibrium of the system. The speed at which the error term is correcting disequilibrium is 58.16% per quarter, as the data is quarterly. The sign is negative and is also significant $p < 0.05$. It is further checked that whether this error correction model has a serial correlation or not. The Breusch Godfrey Serial Correlation LM test is used; appendix IV provides the results of Breusch-Godfrey Serial Correlation LM Test. The p-value is more than 5%, meaning that the null hypothesis of no autocorrelation is accepted and alternate hypothesis of existing of autocorreltion is rejected. Residuals are further checked for Jarque Bera normality test (Appendix V); the p value of Jarque Bera is more than 5%, meaning that null hypothesis for normality of residuals cannot be rejected

The results of Granger Pair wise causality test, reported in appendix VI, show that real exchange rate, domestic income and foreign income cause trade balance of Pakistan. All the three variables show a unidirectional granger causality at five percent significance levels.

In the end, the impulse response function is employed to have a look at short term response of trade balance to change sign of real exchange rate; purpose is to check whether the classical J curve effect could be observed or not in case of Pakistan.

Figure II reflects that the trade balance deteriorates immedi-

Figure II
The impulse response function



ately right after the depreciation in exchange rate and then improves over the period of time; hence it can easily be said that J curve is observed in case of Pakistan.

VI. CONCLUSION

Our both the Engel Granger and Johansen Juselius approaches provide ample support to the assumption under study and affirm that there exists a long term as well as short term connection between the real exchange rate and trade balance in case of Pakistan. The Granger Causality Test also shows the casual relationship between real exchange rate and trade balance of Pakistan. It is found that real depreciation in exchange rate has a significant relationship with trade balance. A valuable input could be provided to policy makers of Pakistan that the trade balance could be shifted to a progressive path by using an active strategy of controlled depreciation of currency by keeping in hand the aggregate price levels. The monetary authority could look deep into the matter and find a stabilization policy so that the exchange rate fluctuation could be used to shift balance of trade to surplus mode and put the trade driven economy of Pakistan on the track of prosperity.

APPENDIX I
UNIT ROOTS-TESTS (AT LEVEL)

	ADF statistics	
Variables	Intercept & no trend	Intercept & trend
	Tests for I(0)	
LnTB	-2.185509 (0.2129)	-1.5583 (0.8023)
LnER	0.749764 (0.9927)	-1.067469 (0.9286)
LnY	0.686745 (0.9913)	-2.148247 (0.5125)
lnY*	-1.594738 (0.4815)	-1.251983 (0.8935)
	PP statistics	
Variables	Intercept & no trend	Intercept & trend
	Tests for I(0)	
LnTB	-2.238437 (0.1942)	-2.238437 (0.1942)
LnER	1.295903 (0.9985)	1.295903 (0.9985)
LnY	0.834457 (0.9942)	0.834457 (0.9942)
lnY*	-1.264066 (0.6439)	-1.264066 (0.6439)
	KPSS statistics	
Variables	Intercept & no trend	Intercept & trend
	Tests for I(0)	
LnTB	1.582378	1.582378
LnER	2.087410	2.087410
LnY	2.171306	2.171306
lnY*	2.161048	2.161048

AT FIRST DIFFERENCE

	ADF statistics	
Variables	Intercept & no trend	Intercept & trend
	Tests for I(1)	
ΔlnTB	-4.3644** (0.0006)	-4.5416** (0.0022)
ΔlnER	-3.5605** (0.0083)	-3.6856* (0.0280)
ΔlnY	-4.2616** (0.0009)	-4.2416** (0.0057)
ΔlnY*	-4.1540** (0.0013)	-4.3501** (0.0041)
	PP statistics	
Variables	Intercept & no trend	Intercept & trend
	Tests for I(1)	
ΔlnTB	-16.008** (0.0000)	-16.406** (0.0000)
ΔlnER	-9.6163** (0.0000)	-9.7298** (0.0000)
ΔlnY	-5.2877** (0.0000)	-5.2838** (0.0002)
ΔlnY*	-8.6280** (0.0000)	-8.6967** (0.0000)
	KPSS statistics	
Variables	Intercept & no trend	Intercept & trend
	Tests for I(1)	
ΔlnTB	0.142325	0.038116
ΔlnER	0.269445	0.144317
ΔlnY	0.111804	0.055279
ΔlnY*	0.240479	0.086627

Note: * & ** show 5% and 1% level of significance, respectively. The critical values for ADF are -3.43 (without trend), -3.96 (with trend) at 1%, -2.86 (without trend), -3.41 (with trend) at 5% and -2.57 (without trend), -3.13 (with trend) at 10% level of significance. These values are from Mackinnon (1991) one sided p-values. The critical values for KPSS are 0.739 (without trend), 0.216 (with trend) at 1%, 0.463 (without trend), 0.146 (with trend) at 5% and 0.347 (without trend), 0.119 (with trend) at 10% level of significance.

APPENDIX II
ADF TEST FOR RESIDUALS BASED ON ENGEL GRANGER TWO STEP PROCEDURE

Variable	ADF test statistic	Prob.
μ_t	-3.895285	0.0002

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APPENDIX III
JOHANSEN JUSELIUS TEST OF COINTEGRATION

Cointegration Rank Test (Trace)				
Hypothesized No. of CE(s)	Eigen value	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.2495	49.8373	47.8561	0.0322
At most 1	0.1355	20.5492	29.7970	0.3863
At most 2	0.0540	5.69291	15.4947	0.7315
At most 3	0.0002	0.02397	3.84146	0.8769
Cointegration Rank Test (Maximum Eigen value)				
Hypothesized No. of CE(s)	Eigen value	Max Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.24959	29.2881	27.5843	0.0299
At most 1	0.13554	14.8563	21.1316	0.2991
At most 2	0.05406	5.66894	14.2646	0.6560
At most 3	0.00023	0.02397	3.84146	0.8769

APPENDIX IV
BREUSCH GODFREY SERIAL CORRELATION LM TEST

F-statistic	1.093912	Prob. F(2,96)	0.339041
Obs*R-squared	2.295049	Prob. Chi-quare(2)	0.317422

APPENDIX V
JERQU-BERA RESIDUAL NORMALITY TEST

Test statistic	0.961887	Prob.	0.618200
Test statistic	0.961887	Prob.	0.618200

APPENDIX VI
GRANGER PAIR WISE CAUSALITY TEST

	ΔlnTB	ΔlnER	ΔlnY	ΔlnY*
ΔlnTB	-	5.97786**	5.26394**	8.90063**
ΔlnER	1.18936	-	2.76540*	0.57652
ΔlnY	0.02160	0.76740	-	0.68121
ΔlnY*	0.10164	5.06608**	1.19612	-

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Relationship between service sector GDP and import & export trade: a case of Pakistan

Mohammad Shujaat Mubarik and Aurangzeb

Abstract

The main objective of this study has been to investigate whether augmenting service sector GDP can increase exports and imports or augmenting exports and imports accelerate service sector GDP. The study uses two approaches, namely Granger causality test in VAR analysis and Pesaran et al. (2001) ARDL approach for long run relationship analysis. Initially, the study develops three equations, and finds out that there exists long run relationship when exports and imports are used as dependent variables, but when service sector GDP is used as dependent variable, the null hypothesis of no co-integration is not rejected

Consequently, the model is left with two error correction equations, namely: (i) when exports are used as dependent variable, and (ii) when imports are used as dependent variable. The ECT of both equations are having appropriate signs and are found significant at 1% level. In Granger Causality test, between service sector GDP and exports, there exists a unidirectional relationship, where service sector GDP only causes exports, whereas in long run neither imports nor exports causes service sector GDP as there is no co-integration in this case. Hypothesis for co-integration has been accepted even at 10% level. In imports and exports cases, a unidirectional relationship exists where exports causes imports only; these results are aligned with the results of Konya et al. (2009) and Afzal and Murat (2010) which explain co-integration between import and export.

JEL Classification:F13, F14, F18, F31
Keywords: Service sector GDP, imports-export trade, Co-integration, Granger cause, ARDL.

I. INTRODUCTION

One of the prominent aspects of the Pakistani economy is the growing contribution of services sector in its GDP. In past few years, contribution of service sector towards GDP has robustly increased from 49% in year 1999 to 55% in year 2011. Economy of Pakistan is also facing problem of unfavorable balance of payments since its inception. Pakistan has tried a lot of strategies to make its foreign trade account favorable; she has been one of the countries which have adopted import substitution strategies, by producing the imported goods domestically. But implementation of such strategy has resulted in producing a non-competitive industrial structure.

Edward (1993) expounds that after the unsuccessful attempt of import substitution policy and owing to increased trend of globalization, the countries made a paradigm shift in 1960s and changed their focus to adopt an outward-oriented export based growth. Countries kept their prime target to augment their foreign exchange by accelerating exports. This strategy was also adopted to minimize the paying difficulties of a country. Keynes also had same thought that the export augmentation could expand production volumes through foreign trade multiplier.

Services sector is the fastest growing sector in Pakistan as well as in world economy. In the financial crisis of 2008, Pakistani services sector was the one which showed a good growth despite of heavy hands of global economy; the Pakistani service sector grew 7.1% during the year.

Pakistan's service sector comprises of storage and transport, wholesale and retail trade, finance and insurance, defense and public administration. Now in export led growth country needs to identify the sector which can influence the export. For this reason, a lot of studies have been conducted to explore the relationship between various sectors of GDP and export and import trade, in order to devise the right policy for making the balance of payment favorable. In this study, we will be testing the long run relationship between service sector GDP and import and export trade, using the well known econometric technique, the Autoregressive Distributed Lag (ARDL) modeling.

II. LITERATURE REVIEW

Developing countries like Pakistan usually face unfavorable structures of international trade and balance of payment. Many efforts are dedicated to devise the economic policies in a way that they can cause the better GDP growth with favorable balance of payment structure. In the same context a lot of studies have been conducted to find out the relationship between international trade and growth in GDP.

Murat (2010), highlighting the significance of international trade for developing countries, states that because the developing countries can materialize the economic growth with the help of export-led growth, so it should be their mainstay strategy for fostering growth. The issue has been the subject of research due to its prime importance. A lot of empirical research on this subject reveals a relationship between growth

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and foreign trade. It depicts a mix of the results, thus leaving no solid conclusion. Hussain and Afzal (2010) investigated the relationship between economic growth, exports and imports in Pakistan from 1990Q1 to 2008Q1 to see the success of export-led growth strategy. Their results showed that economic growth and exports are not co-integrated, suggesting the absence of long-run relationship. They also highlighted the absence of causality in Granger's sense between economic growth and exports as well as between imports and economic growth. However, they found imports and exports Granger-cause each other.

Li, Jiyang and In (2009) conducted a research on China's foreign trade. They took the data for the period 1990 to 2007. Applying Granger Causality test, they showed that there was causality between foreign trade and economic growth. Unit Root test revealed that the time series were integrated of order 1, I(1). Co-integration test confirmed a long run and sustained relationship between foreign trade and economic growth. Each 1% of increase in foreign trade made bigger the economy as much as 0.65 percent. Error Correction Model (ECM) results highlighted that a short term variation in economy will affect on economic growth in the same direction.

Chaudhary et al. (2007) carried out research to find the relationship between imports, exports and GDP. Their results highlight a long-run relationship among the three variables. Empirical results also show a feedback effect between import and output growth in the short-run for Bangladesh. This research also has found an interdependent effect between exports and output growth for Bangladesh. Singh (2007) has conducted a study to find the relationship between industrial and agricultural sector GDP and imports and exports. They concluded that exports and imports jointly and individually caused GDP, supporting the export-led growth hypothesis.

Wörz (2005) investigated the correlations between structure of trade and commercial competency and the increase in the income per capita. He took the data of 45 OECD and Latin American countries for the period of 1981 to 1997. His prime findings unveil that in long term, changes in exports build a positive impact on the growth, while the effect of import was vague. The findings refute that imports and exports have effects on the growth in long term. It had also been observed that exports and imports had important differences in economic development. Yosoff (2005) conducted a study in Malaysia. By taking the data from 1974:1 to 2004:4, he tried to explain the impact of bilateral import and bilateral export on the economic growth. He applied Granger causality test for the analysis. While comparing bilateral import with export, he concluded that bilateral imports had relatively higher effect on economic growth as compared to bilateral export. It was further confirmed that both foreign trade variables had a causality relationship with economic growth.

Ahmed et al. (2000) have investigated the export driven GDP and GDP growth led export hypotheses; they have found that neither the export-driven GDP growth, nor the GDP growth-led export promotion hypotheses were supported in all the cases investigated.

Berg (1997) investigated the relationship between foreign trade and economic growth for period from 1960 to 1976 in Mexico. He found a strong positive relationship between foreign trade and economic growth. Jung and Marshal (1985), conducted research on developed countries by applying Granger Causality technique. They used the data between 1950 and 1980. Their study indicates that in developed countries, there is a causal relationship between the increase in export and economic growth. The study also found a strong relationship between international trade and economic growth.

In GDP growth, the contribution of each of the major GDP sectors is one major issue. Presently the service sector comprises of major portion of Pakistan GDP. Policy makers are seeking whether the promoting of service sector GDP can make the balance of payment favorable, and/or focusing on international trade can augment the services sector GDP.

III. RESEARCH METHODOLOGY

Since the prime focus of this study is to find out the long run relationship between imports, exports and service sector GDP, we have primarily used Granger Causality test using Pesaran et al. (2001) ARDL approach. First, for establishing the order of integration of variables, we have used the Augmented Ducky Fuller test (ADF), Philips Perron test (PP), and Kwiatkowski-Philips-Schmidt-Shin (KPSS) test to find out the unit roots in the series. In second step, investigation of the existence of long run relationship has been done under Pesaran et al. (2001) ARDL approach. This approach is preferred because of some benefits detailed as follows:

a) Simultaneous estimation of long and short run parameters of the model under study.
b) The approach is applicable irrespective of whether the underlying repressors are purely I(0), I(1), or mutually integrated.
c) Problem of endogeneity does not arise.

The Pesaran et al. (2001) ARDL process involves exploring the presence of a long run relationship in the shape of the unrestricted error correction model for each of the variables included, as follows:

$$\Delta LM = \lambda_0 M + \sum \lambda_i M \Delta LM_{t-1} + \sum \lambda_i M \Delta LX_{t-1} + \sum \lambda_i M \Delta LGDPS_{t-1} + \beta_1 MLM_{t-1} + \beta_2 MLX_{t-1} + \beta_3 MLGDPS_{t-1} + v_{1t} \quad (1)$$

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$$\Delta LX = \lambda_0 X + \sum \lambda_i X \Delta LX_{t-1} + \sum \lambda_i X \Delta LM_{t-1} + \sum \lambda_i X \Delta LGDPS_{t-1} + \beta_1 X LX_{t-1} + \beta_2 X LM_{t-1} + \beta_3 X GDPS_{t-1} + v_{2t} \quad (2)$$

$$\Delta LGDPS = \lambda_0 G + \sum \lambda_i G \Delta LGDPS_{t-1} + \sum \lambda_i G \Delta LX_{t-1} + \sum \lambda_i G \Delta LM_{t-1} + \beta_1 G GDPS_{t-1} + \beta_2 G LX_{t-1} + \beta_3 G LM_{t-1} + v_{3t} \quad (3)$$

Where LM, LX & LGDPS represent natural logarithm of imports, exports and service sector GDP, respectively. Relationship in long run is evaluated, using Wald test, F-statistics and Chi Square.

a) Null hypothesis for Equation 1 is:
$\beta_1 M = \beta_2 M = \beta_3 M = 0 \rightarrow$ No Co integration

b) Null hypothesis for Equation 2 is:
$\beta_1 X = \beta_2 X = \beta_3 X = 0 \rightarrow$ No Co integration

c) Null hypothesis for Equation 3 is:
$\beta_1 G = \beta_2 G = \beta_3 G = 0 \rightarrow$ No Co integration

The Pesaran et al. (2001) have developed two sets of critical values. One set assumes that all variables are I(0) and the other set assumes, they are all I(1). Acceptance or rejections of hypotheses are decided by comparing the calculated values with Pesaran values. When the co-integration has been found between any of the variables, error term is developed by normalizing the coefficients and an Error Correction model is developed, as follows. Since in our case, co-integration has been found in two equations, so we have developed only two error correction models.

$$\Delta LM = \lambda_0 M + \psi ECTM_{t-1} + \sum \lambda_i M \Delta LM_{t-1} + \sum \lambda_i M \Delta LX_{t-1} + \sum \lambda_i M \Delta LGDPS_{t-1} + v_{1t} \quad (4)$$

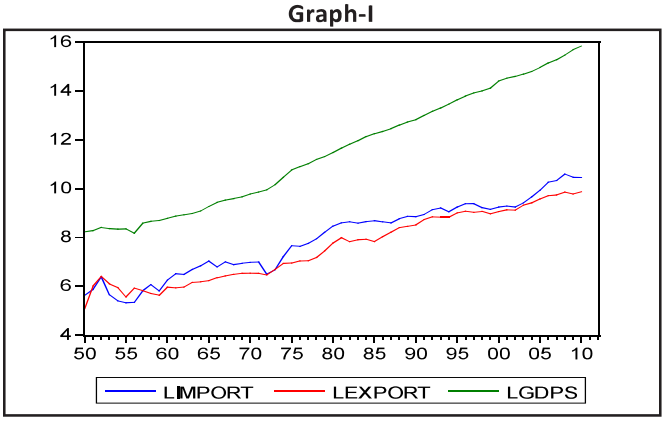
$$\Delta LX = \lambda_0 X + \psi ECTX_{t-1} + \sum \lambda_i X \Delta LX_{t-1} + \sum \lambda_i X \Delta LM_{t-1} + \sum \lambda_i X \Delta LGDPS_{t-1} + v_{2t} \quad (5)$$

Where ECTM and ECTX, respectively, represent the error correction terms of equation 1 and 2.

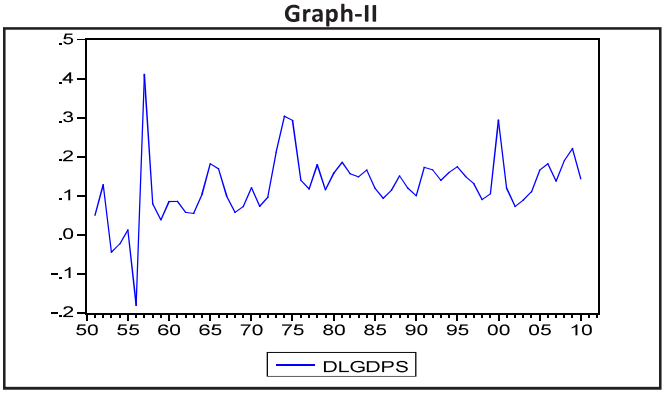
IV. DATA

Annual data for sixty one years from 1950 to 2010 have been used. The data for Pakistani exports, imports and service sector GDP have been taken at constant prices, in Pakistani Rupees. The sources of data have been the State Bank of Pakistan's statistical handbooks. All data series have been converted in to natural logarithms before proceeding for analysis. The transformed data series are symbolized as LGDPS (natural log of service GDP), LEXP (natural log of total exports), and LIMP (natural log of total imports), respectively, and are exhibited in graphs as follows:

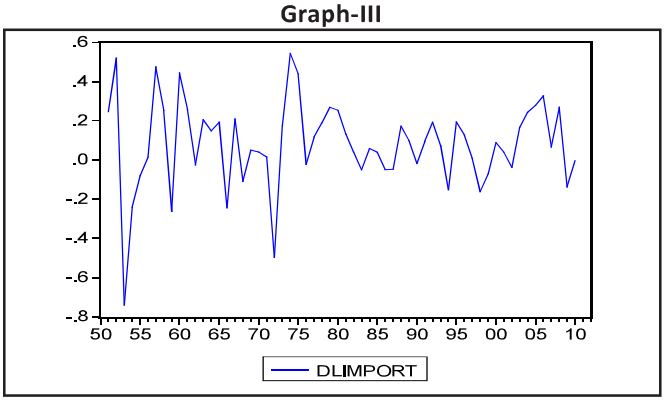
Graph-I



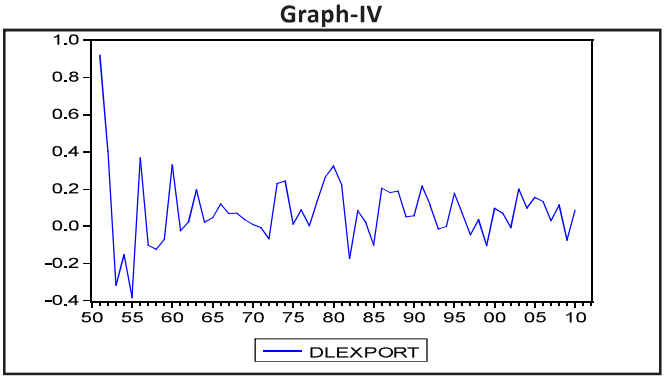
Graph-II



Graph-III



Graph-IV



A. Data properties

Before going for further analysis, it is important to check data

for its stationarity. For checking stationarity, ADF, KPSS, PP and DP tests are used. For results, readers may refer to Appendix I.. The results of all the tests are showing that all the variables are integrated of order I(1) at 1% level, as is evident from the results of ADF, PP and KPSS tests.

V. EMPIRICAL RESULTS

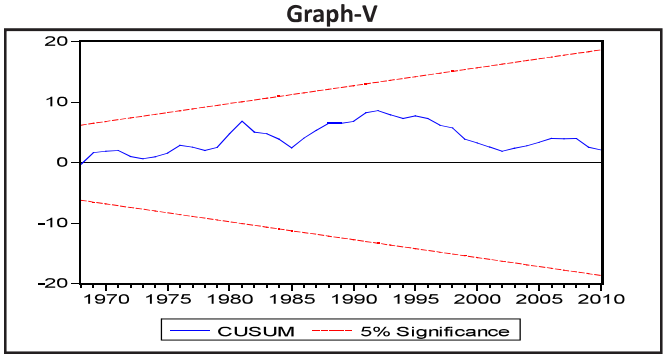
For long run relationship, we have estimated three equations, taking natural logs of imports (LIMPORT), exports (LEXPORT) and service GDP (LGDPS), as dependent variables. The results confirm the long run relationships in two equations when log of export and import are used as dependent variables. For LIMPORT and LEXPORT using as dependent variables, null hypothesis have been rejected at 1% in both cases (Appendix II). When GDPS is used as dependent variable, the null hypothesis has not been rejected at 10%, finding no co-integration. Hence we are left with two error correction models, namely: (i) when LIMPORT is used as dependent variable, and (ii) when LEXPORT is used as dependent variable.

For results of Error Correction terms and Granger causality test, refer to Appendix III. Error Correction Term (ECT), when ΔLEXPORT is dependent variable, has appropriate sign i.e. negative and significant. It is significant at 1% level. ECT is showing that approximately in three periods the ΔLEXPORT can come in equilibrium. However these results are lag sensitive, we have selected five lags by seeing the AIC criteria. ECT of model having ΔLIMPORT as dependent variable is significant at 1% level. It is also depicting the existence of long run relationship when ΔLEXPORT is dependent variable.

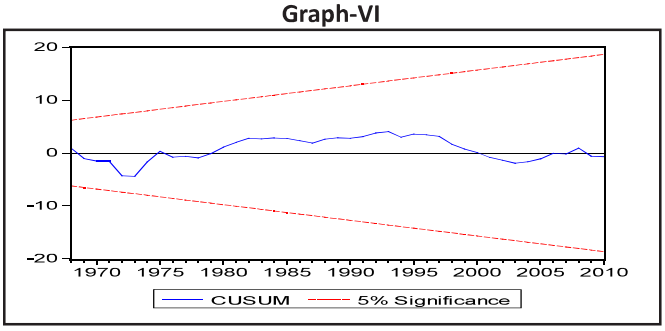
From results of Granger causality test, it is evident that ΔLGDPS is causing export in long run and there is a unidirectional relationship between ΔLGDPS and ΔLEXPORT. ΔLIMPORT is not causing ΔLEXPORT; however, ΔLEXPORT is causing ΔLIMPORT and again there is a unidirectional relationship between ΔLEXPORT and ΔLIMPORT. Whereas in long run, neither ΔLIMPORT nor ΔLEXPORT is causing ΔLGDPS as there is no co-integration in this case.

A. Stability Test

Graph-V



Graph-VI



For checking the stability of parameters we have conducted the CUSUM test. The above graphs are showing that parameters of both models are stable as the variation is within the bands.

VI. CONCLUSION AND RECOMMENDATIONS

Our main objective for this research has been to investigate whether augmenting service sector GDP can increase exports or augmenting exports can accelerate service sector GDP, for the study period from 1950-51 to 2010-11. Additionally, we were trying to scientifically testify the myth that service sector GDP had been a source of boosting imports. We used two approaches, namely Granger causality test in VAR analysis and Pesaran et al. (2001) ARDL approach for long run relationship analysis. Initially three equations were developed to find out co integration. The results depicted that there exist long run relationship when LEXPORT and LIMPORT were used as dependent variables. The both null hypotheses were rejected at 5% and 1%, respectively; while when LGDPS was used as dependent variable, the null hypothesis could not be rejected, suggesting existence of no co-integration in this case.

ECT of both equations are having appropriate signs and are found significant at 1% level. In Granger Causality test, between service sector GDP and LEXPORT, there exists a unidirectional relationship, where LGDPS only causes LEXPORT. Where as in long run neither ΔLIMPORT nor ΔLEXPORT causes ΔLGDPS as there is no co-integration in this case. Hypothesis for co-integration has been accepted even at 10% level.

In ΔLIMPORT and ΔLEXPORT cases, a unidirectional relationship exists at 1% level, where ΔLEXPORT causes ΔLIMPORT only. These results are aligned with the results of Konya et al. (2009) and Afzal and Murat (2010) which explain co-integration between import and export.

APPENDIX I

	ADF Test	KPSS	PP
LGDPS	1.906221	0.97351	2.337589
D(LGDPS)	-4.425622*	0.566226*	-6.522563*

LEXPORT	-0.785661	0.966842	-0.754477
D(LEXPORT)	-8.459374*	0.09499*	-9.000284*
LIMPORT	-0.413727	0.958685	-0.338122
D(LIMPORT)	-7.132406*	0.04743*	-7.121079*

* shows the significance at 1% ** shows significance at 5

APPENDIX II

Eq.	Null Hypothesis	Explanation		
1	$\beta_1X=\beta_2X=\beta_3X=0$	LX/ LM, LGDPS		
2	$\beta_1M=\beta_2M=\beta_3M=0$	LM/LX, LGDPS		
3	$\beta_1G=\beta_2G=\beta_3G=0$	LGDPS/ LX, LM		
F. Statistics		χ^2- Statistics		Decision
Value	Prob.	Value	Prob.	
**3.879	0.0168	**11.63	0.0087	Co- integration exists
*6.978	0.0008	*20.93	0.0001	Co- integration exists
0.878	0.4611	2.63	0.451	Co- integration does not exist

APPENDIX III

Dependent Variable	ΔLIMP	ΔLEXP	ΔLGDPS	ECT
ΔLIMPORT	_	6.77 (0.0001)	1.96 (0.1324)	-0.466 (.0001)
ΔLEXPORT	.887 (.4803)	_	2.367 (.0848)	-0.5298 (.0001)

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Much has changed since Baron and Kenny's (1986) classic paper: let us learn what Kenny's (2012) contemporary mediation analysis prescribes

Ahmadullah Shah, Shujahat Haider Hashmi and Anwar F. Chishti

Abstract

The procedure set for mediation analysis in the Baron and Kenny's (1986) classical research article did not go without criticism (MacKinnon and Fairchild, 2009; Hayes, 2009; Bullock, Green, & Ha, 2010; Zhao, Lynch and Chen, 2010), and thanks to those critics, that Kenny (2012) had to bring a number of modifications and improvements through his today's contemporary mediation analytic procedure. This paper presents a comparison of what Baron and Kenny (1986) had originally proposed, and what Kenny (2012) has now suggested after incorporating critics' concerns. For this purpose, the two approaches of mediation analysis have been practically applied on an organizational justice - trust in supervisor - employees' job satisfaction case, wherein variable 'trust in supervisor' was used to mediate between various facets of organization justice and employees' job satisfaction. Whereas the classic approach required the estimation of the four paths (c, a, b & c'), through four steps and running three regression equations and testing for their statistical significance; the contemporary mediation analysis has shortened the paths from four to three (a, b & c'), requiring taking only two steps (Steps 2 and 3), and running two regression equations, declaring the first equation as unnecessary. The classic approach required that path b needs to become statistically significant and path c' insignificant in step 3 & 4 for a complete mediation; contemporary approach asks for adding c' with ab for determining total effect c, and then decomposing c in to direct effect (c'/c) and indirect or mediation effect (ab/c). Whereas classic approach aimed at solving for full or partial mediation in abstract form, the contemporary approach has the edge over the classic, in quantifying the mediation effect (ab). In case of our solved example, classic approach could only help to indicate that 'trust-in-supervisor variable is partially mediating', while in case of contemporary approach, mediation effect of this variable for INJ facet of organizational justice was not only quantified (17.36%) and tested for its non-zero effect, but zero-effect of other two facets, DJ and IJ, were also differentiated.

JEL Classification: C01, C12, C13, C18

Keywords: Mediation analysis, Baron & Kenny's (1986) classic approach, indirect effect, Kenny's (2012) contemporary approach.

A. RESEARCH THEME

I. INTRODUCTION

A. Baron and Kenny (1986) versus Kenny (2012)

Mediator (M) is an intervening or process variable, and mediation analysis is the process analysis, that helps understand the mechanism through which the factor (X-variable) affects the outcome (Y-variable). Mediation analysis aims at to find whether the mediator M partially or totally mediates X - Y relationship; and if partially, then how much? (Wikipedia, 2012; Kenny, 2012; MacKinnon, 2008).

Reuben Baron and David Kenny are considered among the major early pioneers who laid down foundations for extensive research in the area of mediation analysis. Their classic research article entitled "The Moderator-Mediator Variable Distinction in Social Psychological Research: Conceptual, Strategic, and Statistical Considerations", published in the Journal of Personality and Social Psychology (Baron and Kenny, 1986), is one of the most-read papers, with 35467 citations (Google Scholar, December 19, 2012). This paper made a sharp distinction between 'Moderator' and 'Mediator' variables (Baron and Kenny, 1986). Most importantly, this article sets the procedure which not only has been followed for mediation analysis over the last 25 years, but is still being followed in its original shape by a vast majority of academia and researchers all over the globe.

The procedure set for mediation analysis in the Baron and Kenny's (1986) classical research article has not been without criticism (MacKinnon and Fairchild, 2009; Hayes, 2009; Bullock, Green, & Ha, 2010; Zhao, Lynch and Chen, 2010), and thanks to those critics, that Kenny (2012) had to bring a number of modifications and improvements in his today's contemporary mediation analytic procedure. The purpose of this paper is to present a comparison of what Baron and Kenny (1986) had originally proposed, and what Kenny (2012) has now suggested after incorporating critics' concerns.

For this purpose, the two approaches of meditational analysis, classical and contemporary, have been practically applied on an organizational justice - trust in supervisor - employees'

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job satisfaction case, wherein variable 'trust in supervisor' is being taken to mediate (as M-variable) between the various facets of organization justice (X-variable) and employees' job satisfaction (Y-variable).

B. Organizational justice - trust in supervisor - employees' job satisfaction

The theory of organizational justice is concerned with the employee perceptions of the fairness of work-related issues; this concept has evolved over the years, from two dimensions in 1970s to three dimensions in 1980s and finally to four dimensions in the 1990s. Today, justice scholars generally agree that organizational justice is comprised of four major dimensions, namely distributive justice, procedural justice, interactional justice and informational justice. Its first facet, distributive justice, refers to the perceived fairness of decision outcomes such as pay, recognition, promotions, performance appraisal, and rewards. Employees compare the ratio of their inputs (efforts) and outcomes (rewards) to that of a referent employee. Procedural justice refers to the perceived fairness of the decision-making processes and procedures. Interactional justice refers to the respect and propriety of the relationship between employees, and their supervisors and managers, and the assessment that relationships are disrespectful or improper leads to perceptions of unfair treatment. Informational justice refers to the truthfulness and justification of information provided to employees, and the assessment that information is inadequate or untrue leads to perceptions of unfair treatment (Bies & Moag, 1986; Greenberg, 1990; Greenberg, 1993; Colquitt, 2001; Colquitt & Shaw, 2005).

The experts in the area have found various facets of organizational justice linked with key organizational outcomes, including job satisfaction, organizational citizenship behavior, commitment, favorable assessment of supervisors, and trust. Perceived unfair treatment, in contrast, has been shown to lead to counterwork behaviors such as sabotage, intention of quitting, and antisocial behavior (Ambrose, Seabright and Schminke, 2002; Greenberg, 1997; Greenberg and Lind, 2000; Henle, 2005). Organizational justice has become such an important topic in organizational research that there have been more than 500 research articles written and more than 20 books devoted to this topic up to 2005 (Colquitt, Greenberg & Scott, 2005).

The discussion in the preceding section on various facets of organizational justice and its outcomes naturally brings up a question to the forefront: whether or not these facets of organizational justice prevail in Pakistani organizations, and if they do, then whether or not the levels of their prevalence are sufficiently enough to determine employees' job satisfaction. Since, in almost all facets of organizational justice, supervisors are supposed to play positive role, trust-in-supervisor is therefore included to test its role as mediator between organizational justice and job satisfaction.

C. Research questions

While pursuing the following research questions, we will demonstrate what has been the Baron and Kenny's (1986) procedure of analyzing mediation, and what improvements Kenny (2012) has brought in the procedure.

a) Do the four facets of organizational justice prevail to the extent to determine employees' job satisfaction in Pakistani organizations?
b) Does the 'trust in supervisor' mediate between the various facets of organizational justice and job satisfaction?
c) Does the Kenny's (2012) mediation analysis yield better results relative to what Barron and Kenny's (1986) procedure provides?

D. Organization of research

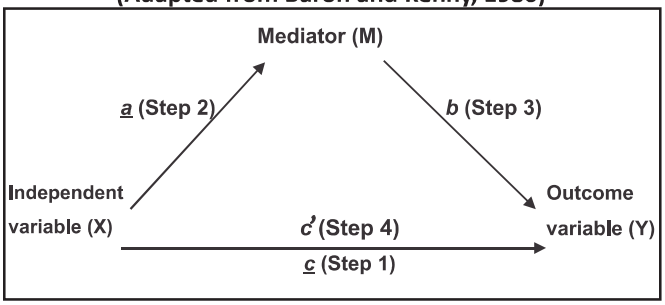
After having presented introductory material in this part, Part II and III of this paper will, respectively, demonstrate Barron and Kenny's (1986) and Kenny's (2012) applications, while Part IV will summarize the findings and conclude on the topic.

B. APPLICATION OF BARON AND KENNY'S (1986) MODEL

A. Baron and Kenny's (1986) model

As already discussed, Baron and Kenny (1986) have originally contributed the basic model for testing of the mediational effect of some variable, like the one we have introduced in our above given research question 2. To clarify the estimation procedure of mediation, the researchers introduced the following path diagram (Figure I).

Figure I
(Adapted from Baron and Kenny, 1986)



Baron and Kenny's (1986) mediation analysis requires taking four distinct and consecutive steps for establishing mediation; these steps are, as follows (Judd and Kenny, 1981; Baron

and Kenny, 1986; Kenny, 2012):

First, initially in step 1, it is required to show that some initial variable (X) is correlated with the outcome variable (Y); that means estimating and statistically testing path c for H_0: c = 0, in the above figure, suggesting that there is an effect (c) that may be mediated.

Second, step 2 should show that the initial variable (X) is correlated with the mediator (M); that means estimating and statistically testing path a for H_0: a = 0, suggesting to treat the mediator as if it were an outcome variable.

Third, step 3 should show that the mediator (M) affects the outcome variable (Y), while initial variable (X) is used as control variable; that means estimating and testing path b for H_0: b = 0; suggesting that M-variable may affect Y.

Fourth, step 4 is required to establish that M-variable completely mediates the X-Y relationship; that means estimating and testing path c' – the coefficient of X-variable while controlling for variable M; path c' should be zero for complete mediation, otherwise not.

The Baron and Kenny's (1986) four steps narrated above necessitate that:

a. The relationships between variables X, M and Y be established through regression analysis;
b. Statistical significance of the paths (c, a, b & c') be established using proper procedure, that is, evaluating via H_0: c = 0; a = 0; b = 0; c' = 0.
c. In case c ≠ 0 in step 1, a ≠ 0 in step 2, b ≠ 0 in step 3 and c' = 0 in step 4, there would be complete mediation; otherwise, in case of c' ≠ 0 in step 4, there would be partial mediation.

B. Applying Baron and Kenny's (1986) model

We now apply Baron and Kenny's (1986) analytic framework to establish whether 'trust in supervisor' (TS) mediates the relationship between four facets of organizational justice - distributional justice (DJ), procedural justice (PJ), interactional justice (IJ) and informational justice (INJ) – and employees' job satisfaction (JS). Figure II represents the case, with various paths to be evaluated as per discussion made earlier.

The above graphical representation of the variables X-Y relationship, via a moderator M, requires estimation of an econometric model specified as follows:

Step 1:

$$JS = c_0 + c_1DJ + c_2PJ + c_3IJ + c_4INJ + e_1 \quad (1)$$

Step 2:

$$TS = a_0 + a_1DJ + a_2PJ + a_3IJ + a_4INJ + e_2 \quad (2)$$

Step 3 & 4:

$$JS = c'_0 + c'_1DJ + c'_2PJ + c'_3IJ + c'_4INJ + bTS + e_3 \quad (3)$$

II. ESTIMATING THE MODEL/EMPIRICAL RESULTS

A. Data collection measures/constructs

In order to estimate the relationship specified in Figure 2 and econometric models 1 – 3, the required data were collected from 276 employees relating to both public and private sector organizations situated in Rawalpindi-Islamabad area, using the measures on JS, TS, DJ, PJ, IJ and INJ as parts of a self-administered Likert-scale questionnaire, provided in Appendix IV.

B. Data Reliability test

The respondents' responses on the respective elements of all six measures (JS, TS, DJ, PJ, IJ and INJ) were tested for reliability, and the Cronbach's alphas were estimated (appendix I). According to Uma Sekaran (2003), the closer the reliability coefficient Cronbach's alpha gets to 1.0, the better is the reliability. In general, reliability less than 0.60 is considered to be poor, that in the 0.70 range, acceptable, and that over 0.80 are good. The reliability tests of our measures/constructs happened to be in the acceptable-to-good and very-good range. After having reliability tests of all measures/constructs in good ranges, data on elements of constructs were averaged row-wise to generate data on respective variables, namely 'Job Satisfaction' (JS), 'Trust in Supervisor' (TS), 'Distributive justice' (DJ), 'Procedural justice' (PJ), 'Interactive justice' (IJ) and 'Informational justice' (INJ).

C. Regression analysis and results

According to the two research questions set earlier for this research, the researchers need to test the following respective hypotheses:

H_1: The four facets of organizational justice prevail to the levels that seem sufficiently enough to determine employees' job satisfaction in Pakistani organizations

H_2: Trust-in-supervisor plays mediating role between the four facets of organizational justice and employees' job satisfaction.

As per hypothesis H_2, if one is interested to test whether a variable is mediating or not, then, according to Baron and

Kenny's (1986) model, a 3-step regression needs to be run, as discussed earlier. Doing so yielded the following empirical results:

Step 1:

$$JS = c_0 + c_1DJ + c_2PJ + c_3IJ + c_4INJ + e_1$$
$$= 2.155 + 0.092DJ - 0.010PJ + 0.071IJ + 0.278INJ$$

(0.045)	(-0.042)	(0.0385)	(0.0658)
(2.045)	(-0.237)	(1.8420)	(4.2260)
(0.042)	(0.8140)	(0.0670)	(0.0000)

$F = 21.055$ ($p = 0.000$) $R^2 = 0.237$ $R^2_{adjusted} = 0.226$ (4)

(Figures in the 1st, 2nd and 3rd parentheses, respectively, are standard errors, t-ratios & p-values)

The estimated model 4 is found statistically significant ($F = 21.055$, $p < 0.001$). With the exception of variable procedural justice (PJ), all other three components of organizational justice statistically significantly contribute towards job satisfaction. Informational justice (INJ) has the greatest contribution ($c_4 = 0.278$, $p < 0.001$), followed by distributive justice (DJ; $c_1 = 0.092$, $p < 0.05$) and interactional justice (IJ; $c_3 = 0.071.$, $p < 0.10$).

Step 2:

$$TS = a_0 + a_1DJ + a_2PJ + a_3IJ + a_4INJ + e_2$$
$$= 1.770 + 0.037DJ - 0.042PJ + 0.063IJ + 0.322INJ$$

(0.4551)	(0.0437)	(0.0396)	(0.0673)
(0.8130)	(-0.962)	(1.5890)	(4.7850)
(0.4170)	(0.3370)	(0.1130)	(0.0000)

$F = 24.270$ (0.000) $R^2 = 0.264$ $R^2_{adjusted} = 0.253$ (5)

Model 5 is found statistically significant ($F = 24.270$, $p < 0.01$). However, with the exception of informational justice (INJ) variable, all other three components of organizational justice have turned out to be statistically insignificant. INJ variable has the greatest contribution ($a_4 = 0.332$, $p < 0.001$), followed by others with statistically negligible contributions.

Step 3 (& 4):

$$JS = c'_0 + c'_1DJ + c'_2PJ + c'_3IJ + c'_4INJ + bTS + e_3$$
$$= 1.891 + 0.086DJ - 0.016PJ + 0.062IJ + 0.230INJ + 0.150TS$$

(0.0444)	(0.0413)	(0.039)	(0.0679)	(0.0588)
(1.9370)	(-0.387)	(1.610)	(3.3870)	(2.5500)
(0.0540)	(0.6990)	(0.109)	(0.0010)	(0.0110)

$F = 18.487$ (0.000) $R^2 = 0.255$ $R^2_{adjusted} = 0.241$ (6)

Model 6 is found statistically significant ($F = 18.487$, $p < 0.01$). According to step 3, the contribution of TS variable is substantial and statistically significant ($b = 0.150$, $p = 0.011$). In accordance with step 4, with the inclusion of variable 'Trust in supervisor' (TS)), the contributions of DJ, IJ and INJ variables have decreased from $c_1 = 0.092$, $c_3 = 0.071$ and $c_4 = 0.278$ (Step 1) to $c'_1 = 0.086$, $c'_3 = 0.062$ and $c'_4 = 0.230$ (step 3), respectively; however, the latter c' have not turned out to be statistically equal to zeros – the condition for complete mediation. This fulfils the condition for 'Trust in supervisor' (TS) of being a mediator, and since the contributions of DJ and INJ variables are still statistically significant, the TS variable is therefore partially mediating. As far as hypotheses H_1 and H_2 are concerned, both hypotheses are accepted; however, the former one is fully accepted while the latter one partially.

C. APPLICATION OF KENNY'S (2012) PROCEDURE

The aforementioned analysis was carried out in accordance with Baron and Kenny's (1986) paper; however, Kenny (2012) makes a number of noticeable changes in the Baron and Kenny's (1986) earlier procedure of mediation analysis; these changes are discussed, as follows:

According to Baron and Kenny (1986), 'A variable functions as a mediator when it meets the following conditions:

a) variations in levels of the independent variable significantly account for variations in the presumed mediator (i.e., Path a);
b) variations in the mediator significantly account for variations in the dependent variable (i.e., Path b)
c) when Paths a and b are controlled, a previously significant relation between the independent and dependent variables is no longer significant, with the strongest demonstration of mediation occurring when Path c is zero.

According to Kenny (2012):

a) 'We note that Baron and Kenny (1986) steps are at best a starting point in a mediational analysis. More contemporary analyses focus on the indirect effect'.
b) 'Note that the steps are stated in terms of zero and nonzero coefficients, not in terms of statistical significance'.
c) 'Most contemporary analysts believe that the essential steps in establishing mediation are Steps 2 and 3', and not Step 1 and 4.

A. Estimation of direct, indirect and total effect

Kenny (2012), whereas asks for not emphasizing on statistical significance of the estimated coefficients (c, a, b & c'), he

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gives more importance to measuring of total effect of X on Y through Path c, and its decomposition in to direct effect of X on Y through Path c' and indirect (meditational) effect through a measure ab (product of a & b); hence:

$$\text{Total effect} = \text{Direct effect} + \text{Indirect effect} \quad (7a)$$
$$c = c' + ab \quad (7b)$$

where c, c', a and b have already been introduced in the earlier sections. However, the equality of equation 7 holds in certain conditions and does not hold in others. This equation exactly holds in: (a) multiple regression and structural equation modeling (SEM) without latent variables; (b) when same cases are used in all the analyses; and (c) when the same covariates are used in all the equations. While the two sides of the equation are only approximately equal for multilevel models, logistic analysis and structural equation modeling with latent variables included. For the latter models, "it is probably inadvisable to compute c from Step 1, but rather c should be inferred to be c' + ab, and not directly computed" (Kenny (2012). Since, in majority of the cases, the three coefficients (c', a & b) would suffice, and for that, the required steps are steps 2 and 3, and not steps 1 and 4. However, it seems necessary that the product term ab, which measures indirect or mediational effect, be checked for its statistical significance by (i) checking of significance of coefficients a and b individually, (ii) Sobel test for mediation and/or (iii) bootstrapping.

B. Applying Kenny's (2012) procedure

As discussed above, Kenny's (2012) contemporary mediation analysis requires putting values of c' and a and b coefficients in model 7, and solving it for total effect c, and then decomposing the total effect in to its direct (c') and indirect effects (ab), using the following formulas.

$$\text{Direct effect (\%)} = (c'/c) \times 100 \quad (8a)$$
$$\text{Indirect effect (\%)} = (ab/c) \times 100 \quad (8b)$$

The values of c', a and b, required for substituting in models 7 and 8 (a – b), are already available in estimated models 4 – 6; however, it should be noted that the contribution of variable PJ appears extremely insignificant (equal to zero), in all the three estimated models (4 – 6), relative to other three facets of organizational justice (DJ, IJ & INJ). Additionally, the coefficient of this variable (PJ) carries a negative sign, which makes it 'inconsistent candidate' for mediation analysis; Kenny (2012) discusses a number of such 'inconsistent mediation' cases in his webpage. Appendix II uses formulas 7 and 8 (a – b) and provides estimates of direct and indirect effects, suggesting that variable DJ, IJ and INJ apparently exert 93.94 percent, 86.77 percent and 82.64 percent direct effect, respectively, while the indirect (meditational) effect of 'trust in supervisor' relative to these variables estimates at 6.06 percent, 13.23 percent and 17.36 percent, respectively. Whether the variable 'trust in supervisor' (TS) significantly mediates towards the respective total effects of each of the three facets (DJ, IJ & INJ) of organizational justice, Kenny (2012) suggests to check the statistical significance of their respective indirect effects 'ab', using one of the following measures.

a) Testing a and b separately
b) Using Sobel test
c) Bootstraping

We carry out the first two tests here, as under.

C. Testing a and b separately

As one way to test H_0: ab = 0, is to test a = 0 and b = 0; according to Kenny (2012), a number of other researchers, including Fritz and MacKinnon (2007) and Fritz, Taylor and MacKinnon (2012) strongly urge that researchers use this test in conjunction with other tests, such as Sobel test.

Hypothesis H_0: a = 0 has already been tested in Step 2; estimated model 5 indicates that p-value of a4 and a3, which relate to variables INJ and IJ, respectively, are 0.00 and 0.113, and that of a1, which relates to variable DJ, is statistically insignificant.

Hypothesis H_0: b = 0 has already been tested in Step 3; estimated model 6 indicates that p-value of b, relating to mediation-variable TS, is 0.011.

On the basis of this approach, the indirect/mediational effect (ab) of variable INJ appears to be strongly statistically significant, followed by variable IJ, which seems to be moderately significant, while variable DJ happens to have little mediational effect.

D. Sobel test

To check H_0: $ab = 0$, Sobel test uses the following test statistic.

$$\text{Test: } Z_{ab} = ab/s_{ab} \quad (9a)$$

which follows Z-distribution, that is, ab/s_{ab} will fall within 1.96± interval for an ab = 0; otherwise, it will fall outside of the stated interval. Where sab has to be computed, using the formula:

$$s_{ab} = \sqrt{(a^2 s^2_b + b^2 s^2_a)} \quad (9b)$$

where s_a and s_b are the standard errors of a and b, respectively. Appendix III provides detailed computations done for

Sobel test, using formulas given in 9 (a & b). Statistic Zab, computed for mediational effect (ab) of TS on variables DJ and IJ, falls within the 1.96± interval, and that of variable INJ outside of the interval, suggesting that the mediational effects in respect of the former two variables are statistically insignificant, and latter variable significant.

III. SUMMARY AND CONCLUSION

The purpose of this paper, as explained in Part I, has been to demonstrate and compare the applications of Barron and Kenny's (1986) classical methodology of mediation analysis and the one Kenny (2012) has called contemporary mediation analysis. Part II and III of the paper, respectively, provide detailed applications of the two approaches, classical and contemporary, using the same case of organizational justice – employees' job satisfaction relationship via the mediational role of trust-in-supervisor. The two referred parts of the paper have explained the differences of the two approaches in detail; this part reproduces the differences in summarized form along with the explanation as to how and why the contemporary mediational analysis has certain edge over the classical one.

First, the classic approach required the estimation of the four paths (c, a, b & c'), through four steps (Steps 1, 2, 3 & 4) and three regression equations (Equations 1 to 3 or Equations 4 to 6), and their testing for statistical significance. The contemporary mediation analysis has shortened the paths from four to three (a, b & c'), requiring only two steps (Steps 2 and 3), and two regression equations, declaring the first equation as unnecessary.

Second, the classic approach required that path b needs to become statistically significant and path c' insignificant in step 3 & 4 for a complete mediation; contemporary approach asks for adding c' with ab for determining total effect c, and then decomposing c in to direct effect (c'/c) and indirect or mediational effect (ab/c).

Third, contemporary approach requires that mediation effect ab needs to be tested for non-zero, using diagnostic methods, including (i) testing a and b for non-zeros, separately, (ii) running Sobel test and (iii) performing Bootstraping.

Fourth, whereas classic approach aimed at solving for full or partial mediation in abstract form, the contemporary approach has the edge over the classic, in quantifying the mediation effect (ab). In case of our solved example, classic approach could only help to indicate that 'trust-in-supervisor variable is partially mediating', while in case of contemporary approach, mediation effect of this variable for INJ facet of organizational justice was not only quantified (17.36%) and tested for its non-zero effect, but zero-effect of other two facets, DJ and IJ, were differentiated.

APPENDIX I
RESULTS OF RELIABILITY TEST

Construct	Cronbach's alpha
Job Satisfaction (JS)	0.739
Trust in supervisor (TS)	0.692
Distributive Justice (DJ)	0.828
Procedural Justice (PJ)	0.890
Interactional Justice (IJ)	0.920
Informational Justice (INJ)	0.834

APPENDIX II
TOTAL, DIRECT AND INDIRECT EFFECTS

Coefficients	DJ	IJ	INJ
a	0.037	0.063	0.322
b	0.15	0.15	0.15
c'	0.086	0.062	0.23
ab	0.00555	0.00945	0.0483
c = (c' + ab)	0.09155	0.07145	0.2783
Direct effect *(c'/c)*	0.93938	0.86774	0.82645
%	93.94	86.77	82.64
Indirect effect (ab/c)	0.06062	0.13226	0.17355
%	6.06	13.23	17.36

APPENDIX III
COMPUTATIONS FOR SOBEL TEST

Sobel test computations	DJ	IJ	INJ
a^2	0.001369	0.003969	0.103684
b^2	0.0225	0.0225	0.0225
s_a	0.045510455	0.039647577	0.06729363
s_b	0.058823529	0.058823529	0.05882353
s^2_a	0.002071202	0.00157193	0.00452843
s^2_b	0.003460208	0.003460208	0.00346021
$a^2s^2_b$	4.73702E-06	1.37336E-05	0.00035877
$b^2s^2_a$	4.6602E-05	3.53684E-05	0.00010189
s_{ab}	0.007165128	0.007007282	0.02146294
Z_{ab}	0.774584912	1.348597125	2.25039044

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Note: The 2nd author, Mr. Shujahat Haider Hashmi, has developed macros for estimation of 'Total, direct and indirect effects' (Appendix II) and carrying out 'Sobel test' (Appendix III), and the both of these macros are being placed at this Journal's website for use by the interested researchers on mediation analysis.

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APPENDIX IV
MS Research – Questionnaire

Section 1

Your Organization: _____
Your gender: 1. Male _____ 2. Female _____
Your age (in years like 40 years) _____
Your education (actual total years of schooling) _____
Your area of specialization: _____
Your job title in this organization: _____
Working years in this organization: _____

Section 2

Trust Scale in Supervisor
(Podsakoff et al., (1990)
Strongly disagree – 1 Disagree = 2 Not disagree/neither agreed = 3 Agreed = 4 Strongly agreed = 5

	(Please do not generalize, but tell about what is actually happening in your organization only)	1	2	3	4	5
1	I feel quite confident that my supervisor will always try to treat me fairly					
2	My supervisor would never try to gain an advantage by deceiving workers					
3	have complete faith in the integrity of my supervisor					
4	feel a strong loyalty to my supervisor					
5	I would support my supervisor in almost any emergency					
6	I have a divided sense of loyalty toward my supervisor (R)					

Job satisfaction
(Agho et al. 1993; Aryee, Fields &Luk, 1999)

1	I am often bored with my job (R)					
2	I am fairly well satisfied with my present job					
3	I am satisfied with my job for the time being					
4	Most of the day, I am enthusiastic about my job					
5	I like my job better than the average worker does					
6	I find real enjoyment in my work					

Organizational Justice
(Niehoff and Moorman, 1993)
Strongly disagreed = 1 Slightly disagree = 2 Disagree = 3 Neutral (Not disagree/neither agreed) = 4 Agreed = 5
Slightly more agreed = 6 Strongly agreed = 7

		1	2	3	4	5	6	7
1	My work schedule is fair							
2	I think that my level of pay is fair							
3	I consider my workload to be quite fair							
4	Overall, the rewards I receive here are quite fair							
5	I feel that my job responsibilities are fair							
	Formal procedural justice items							
1	Job decisions are made by my supervisor in an unbiased manner							
2	My supervisor makes sure that all employee concerns are heard before job decisions are made							

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3	To make formal job decisions, supervisor collects accurate & complete information							
4	My supervisor clarifies decisions and provides additional information when requested by employees							
5	All job decisions are applied consistently across all affected employees							
6	Employees are allowed to challenge or appeal job decisions made by the supervisor							
Interactive justice items								
1	When decisions are made about my job, the supervisor treats me with kindness and consideration							
2	When decisions are made about my job, the supervisor treats me with respect & dignity							
3	When decisions are made about my job, supervisor is sensitive to my own needs							
4	When decisions are made about my job, the supervisor deals with me in truthful manner							
5	When decisions are made about my job, the supervisor shows concern for my rights as an employee							
6	Concerning decisions about my job, the supervisor discusses the implications of the decisions with me							
7	My supervisor offers adequate justification for decisions made about my job							
8	When decisions are made about my job, the supervisor offers explanations that make sense to me							
9	My supervisor explains very clearly any decision made about my job							

Informational justice items

Strongly disagree – 1 Disagree = 2 Not disagree/neither agreed = 3 Agreed = 4 Strongly agreed = 5

		1	2	3	4	5
1	Your supervisor has been open in his/her communications with you					
2	Your supervisor has explained the procedures thoroughly					
3	Your supervisor explanations regarding the procedures are reasonable					
4	Your supervisor has communicated details in a timely manner					
5	Your supervisor has seemed to tailor (his/her) communications to individuals' specific needs.					