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The Price and Volume Effect of Single-Stock Futures Trading on the Pakistani stock market

Adil Awan* and Syed M. Amir Shah**

Abstract

The advent of single-stock futures (SSFs) provides an opportunity to investigate the company-wide impact of futures trading rather than the market-wide response captured through index futures contracts. This study analyzes the price and volume effect of SSFs on the underlying spot market based on a sample of 26 Pakistani firms. The dataset used includes one-year pre- and post-event data on closing prices and trading volumes. We conduct an event study in which the abnormal returns of individual companies and average abnormal returns reveal that futures trading has very little impact on the underlying spot returns. The cumulative abnormal returns show that statistically significant positive abnormal returns are experienced after SSF trading but with negative returns in the pre-event period. We compare pre- and post-event average normalized volumes using the t-test and dummy variable regression; the trend coefficients show a general decrease in trading volume. Consequently, there is an increase in returns and decrease in trading volume post-SSF trading in the Pakistani market.

Keywords: Futures pricing, trading volume, event study.

JEL classification: G13, G12, G14.

1. Introduction

Single-stock futures (SSFs) are futures contracts that are traded on the stock exchange. They represent a commitment to buy or sell shares at a predetermined rate for particular companies listed on the stock exchange. These contracts are also known as individual equity shares and are categorized as derivatives. Their value and existence depends on the underlying stock, i.e., they rely on the price of the underlying ordinary shares.

* The author is a postgraduate student at the Faculty of Management Sciences at SZABIST, Islamabad.

** The author is an assistant professor at the Department of Commerce at Allama Iqbal Open University, Islamabad.

When an SSF contract expires, the holder of the contract purchases it from the seller at a predetermined price. The gain or loss for both parties is determined by the difference between the spot and futures price at the time of expiration. Futures contracts can be closed prior to the expiration of the contract date by taking a reverse position; the return will be determined by the difference between the initial price and existing future price.

The concept of cost-of-carry explains the link between the spot and futures markets. Strong (2005) defines the cost of carry as the net cost incurred in carrying forward an asset in time. Two main costs are incurred: the carrying charges (interest) and the carrying returns (dividends). The fair value of futures contracts depends on the cost-of-carry and spot price of the underlying ordinary shares.

Having established the link between spot and futures markets, the basic assumption behind the futures market is that price relies on the underlying spot asset. A reciprocal relationship may also exist between the two markets, which gives rise to the question, to what extent do SSFs affect the underlying spot market.

Much of the literature looks at the impact of derivatives trading on the underlying spot market (see Kumar & Mukhopadhyay, 2004, for evidence from the Indian stock market). Khan (2006) and Ahmad, Shah, and Shah (2010) investigate the Pakistani stock market in this context; their studies represent the most recent work carried out with the index as the underlying asset. Previous studies present conflicting views on stock market volatility: some results support reduced spot volatility, others support increased spot volatility, and some argue that futures trading has no effect on the spot market. The introduction of SSFs gives researchers the opportunity to reinvestigate this topic because they allow a direct valuation of the probable impact on the underlying assets. Stock index futures contracts (SIFCs) can help assessment market-wide impacts while SSFs are useful for assessing company-wide impacts.

Most studies on derivatives trading have focused on options or SIFCs; this has yielded contrasting opinions because certain arguments may apply to one derivative but not to the other. Ross (1976), Miller (1977), Detemple and Selden (1991), and Figlewski and Webb (1993) have all presented conceptual frameworks on the impact of options trading on the underlying spot market. Stock futures and options are both forms of derivative securities with different patterns of return and leverage, but we assume that these theories hold for both.

Ross (1976) argues that the introduction of derivatives may increase new investment opportunities, in turn increasing the utility of investors. This can result in a low required rate of return, thereby increasing the demand for securities. This increase in demand by investors can lead to high equilibrium prices in the underlying market, reducing volatility, and allowing markets to become more efficient or to stabilize.

There are different types of investors in the stock market depending on their objectives. Derivative securities provide opportunities for risk-takers as well as risk-averse investors. Under the diminishing short-sales restriction theory, introducing derivatives allows markets to become more efficient by creating synthetic short positions, i.e., writing a call and buying a put. This allows pessimistic investors to trade on negative information concerning a stock that was previously restricted by rules.

Miller (1977) argues that information efficiency is restricted by short-sales constraints due to which negative information cannot be incorporated into share prices. Only optimistic investors will buy and sell shares, resulting in a supply-demand imbalance and thereby leading to high equilibrium prices. Short-sales constraints enable the market to underweigh the negative view of share prices, resulting in over-valuation or an upward bias (Figlewski & Webb, 1993). These high equilibrium prices are corrected by arbitrageurs involved in short positions. Negative information is incorporated into prices such that a reduction in the asymmetric response to information yields information efficiency. As short-sales activity increases, there will be lower equilibrium prices and volatility.

The improved information environment hypothesis has several dimensions. A reduction in short-sales constraints, for instance, will lead traders to incorporate negative information into share prices and obtain higher payoffs through better information. With the transfer of informed traders from the spot market to the futures market, there is an expected decrease in trading volume. Another dimension of the theory holds that, as analysts' and media coverage increases due to the introduction of derivatives, the mix of speculators, insiders, and uninformed traders will change. The increased interest in shares will then lead to higher liquidity and more precise forecasting.

Pakistan has faced many challenges in the development of its capital markets, similar to other developing countries. The Karachi Stock Exchange (KSE) was established in 1947 and is the country's oldest and largest stock exchange. It provides products such as the cash market,

futures contracts (cash settled and deliverable), and SIFCs. The trading of SSFs at the KSE started on 1 July 2001. Cash-settled futures contracts and SIFCs were introduced in 2007 and 2008, respectively.

It is commonly held that derivatives trading can reduce volatility in the spot market, with numerous studies having discussed the effect of derivatives on stock price volatility and, recently, the impact of futures trading on the cash market. Strict regulations have been introduced to control futures trading without any empirical evidence that derivatives trading increases volatility in the spot market (Ahmad et al., 2010). Consequently, futures trading offers several benefits: efficiency in trading, price discovery, liquidity, and a price stabilization function.

This study attempts to fill the research gap on SSFs in the Pakistani stock market. Other studies on the impact of SSFs on the underlying spot market (price effect, volume effect, and volatility effect) have analyzed the case of developed countries such as the US, UK, Australia, and South Africa. Our study, therefore, is a useful addition to the literature from a Pakistani perspective and could prove beneficial to capital market regulators, academics, and general investors. If futures trading is shown to have a stabilizing effect on the spot market, regulators should introduce new derivatives products such as options and reduce strict regulations. If the findings reveal a destabilizing effect on the spot market, regulators should impose stricter regulations.

The futures market is considered more volatile than the spot market. The close link between the two can be a source of volatility (from the futures market to the spot market). Pakistan imposes strict regulations on derivatives trading but without any empirical evidence of its impact on the spot market. Consequently, the derivatives market does not yield any substantial gains.

Our aim is to determine the impact of SSF introduction in Pakistan on the price (return) of the security (price effect) and the trading volume (volume effect), and to guide stock market regulators in this context. This study is delimited to the Pakistani stock market and specifically to the sample firms included over the period 1 July 2001 to February 2008.

2. Literature Review

There are two main views concerning futures trading: the stabilizing effect (pro-derivatives) and the destabilizing effect (anti-

derivatives). The pro-derivatives argument states that markets become more efficient and investors obtain better returns after the advent of futures trading. The anti-derivatives view, which generally prevails worldwide, holds that derivatives are highly leveraged products that attract speculators who then destabilize markets to earn short-term profits.

Peat and McCorry's (1997) pioneering study on the impact of SSFs on the underlying spot market investigates ten SSF firms in Australia. Their conceptual framework draws on the complete markets theory, diminishing short-sales theory, and improved information environment hypothesis. Analyzing the price, volume, and volatility effect of SSFs, they find no significant change in returns but an increase in the volatility and volume of the underlying spot market. Lee and Tong (1998) analyze the impact of stock futures trading on the underlying spot market in Australia, based on a sample of seven stock futures firms as the control group. Their results yield significantly higher means of volumes with little variation after the introduction of stock futures. The control sample results also show that returns are not volatile post-SSF trading.

Dennis and Sim (1999) carry out an empirical study on stock price volatility in Sydney's futures exchange. Using a sample of ten individual equity shares firms, they employ an asymmetric exponential autoregressive conditional heteroskedastic (E-ARCH) model to determine time-varying volatility. Their findings show that futures trading does not lead to increased volatility in the underlying spot market, unlike spot market trading, which does. McKenzie, Brailsford, and Faff (2000) examine SSF trading and its impact on spot price volatility, using a threshold generalized ARCH model (T-GARCH) for asymmetric formulation. They find a reduction in unconditional volatility and a decline in systematic risk. The conditional volatility coefficient changes post-SSF trading (decrease in ARCH and GARCH terms). However, the results for the asymmetric response of SSF firms after futures trading are not clear or consistent.

Hung, Lee, and So (2003) investigate the effect of foreign-listed SSFs on the underlying domestic spot market, using the GARCH and Glosten-Jagannathan-Runkle (GJR) GARCH models to test conditional volatility. They find no change in the unconditional variance post-futures trading. Futures trading brings about structural changes in conditional volatility. The conditional volatility of the domestic equity market rises due to shocks associated with its foreign-listed firms. These shocks are predictable and show high variation, which reduces the conditional volatility. Generally, all the firms in the sample showed a decrease in the ARCH term (slow

incorporation of information into prices), a decrease in the GARCH term (less long-lasting impact of information), and a small autoregressive root (smaller persistence of volatility).

Faff and Hillier (2003) examine the impact of equity options on the underlying equity market in the UK. They test the three theories of options trading (complete markets, diminishing short-sales, and improved information environment) based on a sample of 86 firms. The authors find positive abnormal returns post-options trading as well as a statistically significant increase in volume and volatility. Raul (2005) investigates the impact of stock futures on the Indian stock market. The study examines price discovery and the liquidity effect of stock futures, arguing that index futures, index options, and options on shares do not generate enough liquidity in the spot market. However, stock futures increase volume in the futures market and raise market depth. The price discovery mechanism is removed by the termination of the carry-forward system.

Paulden (2005) studies the emergence of SSFs in the US market, where the relative lack of interest has led to low volumes and little activity in the One-Chicago exchange while the NASDAQ LIFFE has ceased to operate SSFs. Although the aim of introducing stock futures was to generate liquidity, this has not happened. Jones and Brooks (2005) provide an overview of the introduction and development of stock futures trading in the US. They give numerous reasons for the low popularity of stock futures among individual investors, including the lack of awareness of stock futures, different tax laws, and margin requirements.

Ang and Cheng (2005) investigate market stabilization and changes in market efficiency post-stock futures introduction in the US spot market. They test market efficiency by creating a ten-day event window in which they examine large positive or negative returns on stock futures and the matching sample. Large stock returns are shown to decrease, and this reduction is smaller than in the matching sample. The decrease in unexplained returns is positively correlated with stock futures. The authors conclude that the market becomes more efficient post-stock futures trading. Aitken and Segara (2005) look at the impact of warrants introduction in Australia, and include individual equity shares in their analysis. They find negative abnormal returns post-warrants introduction. The individual equity firms experience higher volatility and an increase in relative trading volume after the introduction of warrants.

Chau, Holmes, and Paudyal (2005) study the impact of SSFs on feedback trading and market dynamics in the underlying spot market. Based on a sample of 80 SSFs with a matching sample, they use a GJR-GARCH model to capture time-varying volatility. Their results indicate no change in unconditional volatility, the ARCH and GARCH terms, or the asymmetric response related to futures trading. Mazouz and Bowe (2006) examine the effect of SSF trading in the UK, using a sample of 21 SSF firms with a control sample. They employ a GJR-GARCH model to determine volatility and a three-factor (Fama and French) model to estimate systematic risk. The results indicate a decrease in systematic risk and a reduction in unconditional volatility. This implies faster dissemination of current information in prices post-SSF trading.

Clarke, Gannon, and Vinning (2007) look at the impact of warrants trading on the Australian equity market. Based on a sample of ten individual equity shares, they observe negative cumulative abnormal returns (CARs) around the introduction of warrants and a fall in trading volume post-introduction. Call warrants are higher in volume than others. The study concludes that there is no change in the variance or beta term after the introduction of warrants. De Beer (2008) studies the impact of stock futures trading on the South African spot market, using a sample of 38 companies. The study's results indicate no statistically significant change in price, although the trading volume shows a statistically significant increase post-stock futures trading. There is a reduction in volatility with changes in the structure of volatility. Systematic risk remains unchanged post-futures trading.

Khan (2006) studies the impact of futures trading on spot volatility in Pakistan. Applying a GARCH (1,1) model and vector error correction model, the author finds that the spot market leads the futures market in incorporating new information. While the volatility observed in the spot market is not caused by futures trading, the volatility in the futures market is a result of spot market outgrowth. Khan and Hijazi (2009) use a sample of 28 shares (for a sample and matching group) to determine the effect of open interest, spot volume, and futures volume on share price volatility in Pakistan. They find that the introduction of stock futures decreases volatility in a spot market, implying that spot volume and volatility have a positive relationship.

Ahmad et al. (2010) study the impact of futures trading on stock prices in Pakistan based on three data series: i.e., spot series, futures series, and market index. Using a GARCH model, Granger causality, and the

Johansen co-integration test, the authors find evidence of volatility clustering and persistence in returns. The market index is found to be a predictor of the spot and futures markets, but the two markets do not Granger-cause each other or the market index. Generally, all the markets are found to be highly volatile, with each market responsible for increasing volatility in the others.

Khan, Shah, and Abbas (2011) investigate the impact of SSF trading on spot market volatility. They use traditional measures to capture volatility—including the F-test, Bartlett's test, close-to-close variance estimator, and Parkinson's estimator—and a GJR-GARCH model to test for conditional volatility. Both analyses yield mixed results: the GJR-GARCH analysis shows a partial reduction in volatility for both SSF firms and the control sample. This limited decrease in volatility could be a result of other market-wide factors.

Siddiqui, Nouman, Khan, and Khan (2012) study the liquidity effects of stock futures in Pakistan, using volume, trading value, the number of trades, and value per day as proxies for liquidity. The paired difference test for two population means is used to analyze pre- and post-event liquidity, and Hotelling's T-square test is applied to test the study's hypothesis. The authors find a significant increase in volume, trading value, and the number of trades. They conclude that the liquidity of the underlying spot market increases after stock futures trading.

As we have mentioned earlier, existing studies on stock futures present mixed results with respect to prices, with most studies favoring an increase in volume and the stabilizing effect of futures trading. The bulk of the literature on stock futures focuses on the relationship between the advent of stock futures and their impact on volatility. Fewer studies have looked at the price/return and volume effect on the underlying spot market. Globally, stock futures are relatively new derivative products, which implies that there is less research on them in the context of developed and developing markets.

3. Research Methodology

This section describes our data sample and methodology.

3.1. Data and Sample

The sample for this study was selected based on the following criteria: (i) any SSF delisted during the sample period was excluded from

analysis, and (ii) a stock must have daily price data for the whole period to be selected. Previous studies have used sample periods ranging from three months to three years. To avoid any bias, we use one-year pre- and post-event data. Given that trading in individual stock futures on the KSE commenced in July 2001, the sample period for this study begins on 1 July 2001 and ends in February 2008.

We include 26 companies out of a total of 46. Data on the daily closing share prices and trading volumes was obtained from the online database of the *Business Recorder* for a period of one year before and after the listing of each stock. This yields more than 250 daily observations per stock for each sub-period (Table A1 in the Appendix).

3.2. Hypotheses

The study applies the following hypotheses:

- H0: The introduction of SSFs has no impact on the underlying stock price.
- H1A: The introduction of SSFs has either a positive or negative impact on the underlying stock price.
- H0: The introduction of SSFs has no impact on the underlying spot volume.
- H2A: The introduction of SSFs has either a positive or negative impact on the underlying spot volume.

3.3. Methodology

This section applies statistical techniques to determine the price and volume effect of SSF contracts on the Pakistani stock market. The conceptual framework draws on the complete markets theory, diminishing short-sales theory, and improved information hypotheses. Our methodology is based on De Beer (2008) and Clarke et al. (2007).

The equation below is used to calculate the returns on each stock:

$$R_{it} = \ln\left(\frac{P_t}{P_{t-1}}\right) \quad (1)$$

where R_{it} is the return of stock i in period t , P_t is the closing price of stock i on day t , and P_{t-1} is the closing price of stock i on day $t - 1$.

3.4. Price Effect

The probable effect of SSFs on the spot market is as follows:

Expected change in underlying spot market			
Characteristic	Complete markets	Diminishing short-sales restriction	Improved information environment
Price/returns	Positive	Negative	Either positively related to futures expectation

Source: Clarke, Gannon, and Vinning (2007).

3.4.1. Event Study

Event studies are conducted to determine the impact of an event on the underlying spot market and are a commonly used method in finance studies. Campbell, Lo, and MacKinlay (1997) state that the event study methodology can be used to capture the effect of an event on listed firms based on financial data. The impact of an event can result in unanticipated changes in stock prices (either positive or negative) for firms engaged in futures trading. The method uses statistical techniques to estimate the impact of an event in a specific period and draw relevant conclusions.

For the event study to be feasible and practical, individual company returns need to be independent. The event of investigation should be isolated from other events as far as possible. The assumption of constant systematic risk is maintained so that normal or expected returns can be calculated using the beta coefficient.

3.4.2. Market Model

The market model is used to estimate the beta terms and calculate both normal and abnormal returns. Abnormal returns are calculated as actual returns minus normal returns. A risk-adjusted model is used to regress the return on a particular security on the return on the market index. Ordinary least squares (OLS) are used to calculate the intercept and slope, including a risk-adjustment process to calculate abnormal returns.

For any security i , the market model is given by:

$$R_{it} = \alpha_i + \beta_i R_{mt} + \varepsilon_{it} \quad (2)$$

$$E(\varepsilon_{it}) = 0 \quad \text{var}(\varepsilon_{it}) = \sigma^2$$

where R_{it} is the return on security i in period t , α_i is the constant or intercept term, β_i is the slope coefficient, R_{mt} is the return on the market index in period t , ε_{it} is the error term, and σ^2 is the variance of the error term.

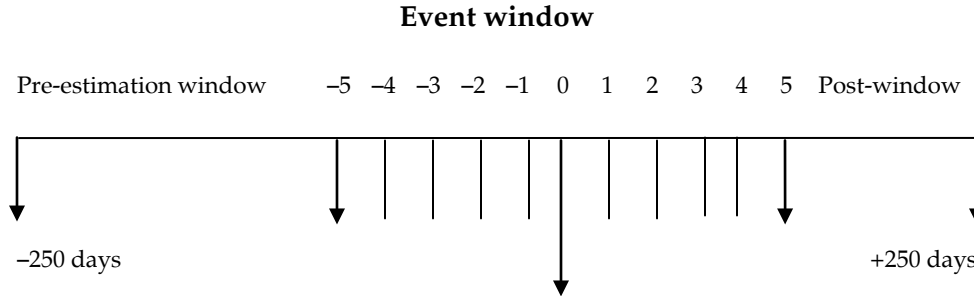
The parameters of these equations are estimated using OLS: the parameters α_i , β_i , and ε_{it} obtained from the OLS regression are then used to calculate abnormal returns (Benninga, 2008) as follows:

$$AR_{it} = r_{it} - (\alpha_i + \beta_i R_{mt}) \quad (3)$$

where r_{it} is the actual return on stock i in event-window day t and $(\alpha_i + \beta_i R_{mt})$ is the return predicted by the stock's α , β , and market return terms.

3.4.3. Measuring and Analyzing Abnormal Returns

Kothari and Warner (2006) hold that the main focus of an event study is to analyze the average abnormal return (AAR) and CAR on sample securities around the event of interest. The event day is an integral part of an event study because it is used to define pre- and post-time periods (days). Once the event day is known, the average price movement of the sample securities is investigated for particular days after the event.



The timeline of the event study is designed to remove any overlaps between the pre-estimation window, event window, and post-event window. This segregation helps estimate a normal returns model without the returns influencing the event. Thus, the event window alone is used to analyze the event. This fulfills the assumption that the impact of an event is captured by the abnormal return.

3.4.4. AAR

Abnormal returns are summed across the event days to calculate the overall effect of an event on prices. The summation of returns can be in both directions across the sample securities or over time. We have aggregated returns across the sample securities because a single-event impact was to be investigated for numerous firms in different industries. The sample security's returns are summed and averaged individually to obtain the AAR:

$$AR_t = \frac{1}{N} \sum_{i=1}^N AR_{it} \quad (4)$$

3.4.5. CAR

The CAR analyzes total returns during the event window and is an aggregate of the initial day to a specific day in the event window:

$$CAR_{t_1,t_2} = \sum_{t=t_1}^{t_2} AR_{it} \quad (5)$$

3.4.6. Day Effect

The day effect helps determine whether futures trading has had any impact on the event day, where the dummy variable is 1 for the event day and 0 for all other days:

$$R_{it} = \alpha_i + \beta_i R_{mt} + \delta D_f + \varepsilon_{it} \quad (6)$$

3.5. Volume Effect

Trading volume is generally a highly volatile factor resulting in large variances (Clarke et al., 2007) and may exhibit many outliers with a nonnormal distribution. To normalize the data, therefore, we apply an exponential smoothing process. The smoothed volume data is then analyzed.

	Expected change in the underlying spot market		
Characteristic	Complete markets	Diminishing short-sales restriction	Improved information environment
Volume	Higher	Unclear	Unclear

Source: Clarke, Gannon, and Vinning (2007).

The exponentially weighted moving average (EWMA) process entails assigning exponentially decreasing weights to old data. Single smoothing is suitable for data that moves around a constant mean randomly with no trend or seasonality, while double smoothing is used for data that has a linear trend. The smoothed series is the weighted average of past values in which exponentially decreasing weights are assigned to old data. The smaller the smoothed or damping factor, the smoother will be the calculated series (National Institute of Standards and Technology, 2006).

We apply the following exponential smoothing formula:

$$S_t = \alpha y_t + (1 - \alpha)S_t - 1 \quad (7)$$

$$D_t = \alpha S_t + (1 - \alpha)D_t - 1 \quad (8)$$

where α is the smoothing factor, S_t is the single-smoothed series, D_t is the double-smoothed series, and y_t is the raw data (see Quantitative Micro Software, 2007).

3.5.1. Difference-of-Means *t*-Test

The *t*-test is applied to determine the change in the mean of the average normalized volume before and after the event in order to detect any permanent statistically significant change in trading volume.

3.5.2. Regression Analysis

Generally, the trading volume tends to increase over time. Since trends in the trading volume cannot be detected by the *t*-test, we conduct a dummy variable regression to identify any significant changes in volume trends. The following equation is used to estimate volume:

$$V_{it} = \alpha_i + \beta_i T_{it} + \delta D_f + \varepsilon_{it} \quad (9)$$

where V_{it} is the normalized volume of security i in period t , α_i is the constant, $\beta_i T_{it}$ is the trend coefficient, and δD_f is the dummy variable (0 for pre-event data and 1 for post-event data).

4. Results and Discussion

This section presents the study's results for the price and volume effect of the sample SSFs.

4.1. Price Analysis

4.1.1. Descriptive Analysis

This section analyzes the nature of returns with respect to a normal distribution. The descriptive statistics given in Table A2 (see Appendix) indicate that the returns are not normally distributed. The pre-event data for the shares BAFL, DGKC, and LUCKY have a normal distribution; in the post-event period, only PIOC exhibits normally distributed returns. BAFL and PIOC show less excess kurtosis in the pre-event period. Normally distributed shares are likely to have rounded peaks while shares with less excess kurtosis will have shorter, thinner tails.

The kurtosis results help us identify the peakedness of the returns: in most cases, their kurtosis value is greater than 3 (excess kurtosis). Skewness measures the dispersion or asymmetry of returns: in most cases, returns are negatively skewed. Each of the returns has different kurtosis and skewness values. Of the 26 shares in the sample, the returns on ten increased between the pre- and post-event period, while the returns on the remaining 16 shares decreased. Our preliminary investigation reveals that the decrease in returns can be attributed to a stabilizing rather than destabilizing market.

The unit root of the series is tested using the augmented Dickey-Fuller (ADF) test. The test statistics are compared to the critical values in absolute form. If the ADF statistics exceed the critical value, the null hypothesis of the unit root cannot be accepted. If the test statistics do not exceed the critical value, then the null hypothesis of the unit root cannot be rejected and the series is said to be nonstationary, which can lead to spurious results. In this case, all the returns are stationary at level (Table A3 in the Appendix).

4.1.2. Event Study Analysis

The FFC and KAPCO shares show statistically significant abnormal returns on one day (Table A4 in the Appendix). AKBL, BAFL, BOP, IBF, PIOC, and POL exhibit statistically significant abnormal returns on two days. ENGRO, FABL, FFBL, MCB, NBP, PIA, and PSO show significant abnormal returns over three days. DGKC, HUB, KESC, MPLF, NML, SSGP, and TELE show significant abnormal returns over four days. The presence of statistically significant abnormal returns over one, two, three, and four

days implies that the introduction of SSFs has had very little impact on the share prices.

SNGP shows five-day significant abnormal returns while DSFL, LUCKY, and PTCL show six-day significant abnormal returns. Lucky Cement is the only company to indicate some price effect as a result of SSF trading with six days of abnormal returns starting from the pre-event period up to the event day. FFBL and Lucky Cement are the only two companies to show significant abnormal returns on the event day. Overall, analyzing the individual companies reveals that the advent of SSFs has had no impact on the underlying share prices.

In terms of AARs, only two days indicate statistically significant negative abnormal returns in the pre-event period (Table A5 in the Appendix). In terms of CARs, all the returns are statistically significant except on the second day post-event (Table A6 in the Appendix). CARs tend to become positive after the introduction of SSFs, implying that the latter exercise a positive impact (Figure A1 in the Appendix).

4.1.3. Day Effect Analysis

Only three companies exhibit statistically significant results. We can infer, therefore, that SSF trading does not affect share prices on the event day (Table A7 in the Appendix).

4.2. Volume Analysis

4.2.1. Descriptive Analysis

As mentioned earlier, trading volume tends to be highly volatile and can result in large variances, many outliers, and nonnormal distributions. The results of the Jarque-Bera test suggest that all the companies in the sample have a nonnormal distribution (Table A8 in the Appendix). The volume of ten shares increases while that of 16 shares decreases between the pre-event and post-event period. There is positive skewness in all instances and excess kurtosis in most cases except for AKBL, BOP, FFBL, MCB, and PSO post-event.

4.2.2. T-Test Analysis

The results of the t-test show that 16 shares decrease in volume post-SSF introduction, of which 13 are statistically significant (Table A9 in the

Appendix). Ten shares exhibit an increase in volume post-SSF introduction, of which eight are statistically significant (Figure A2 in the Appendix).

4.2.3. Regression Analysis

Once the trend is incorporated in the volume series, there are 21 cases in which volume decreases with only three that are statistically significant (Table A10 in the Appendix). The volumes of five shares decrease post-SSF introduction, with only one share exhibiting statistical significance (Figure A3 in the Appendix).

5. Discussion

Our analysis of individual companies shows that stock futures have little effect on price, which is further supported by the analysis of AARs. However, the event study focuses on CARs and shows that all the days are significant except one, while abnormal returns are negative in the pre-event period and positive post-event. This implies that the event has a positive impact on share prices.

Our study is in line with the complete markets theory and improved information environment hypothesis, but is in contrast to the diminishing short-sales restriction theory. The complete markets theory explains an increase in prices through the participation of investors in the shape of more investment opportunities created by futures trading. The improved information environment hypothesis states that greater coverage by the media and analysts will result in more positive expectations from the spot market and thereby in an increase in prices. However, the diminishing short-sales restriction holds that synthetic short positions in the futures market but not in the spot market lead to an imbalance in supply and demand, which results in a decrease in prices. The results of this study are similar to Faff and Hillier (2003).

We find a decrease in trading volume post-SSF trading, which is in line with Clarke et al. (2007). The study's results are in contrast to the complete markets theory, which predicts an increase in volume due to greater participation by investors (more complete markets) post-SSF introduction. The diminishing short-sales restriction theory is unclear on the volume effect because short sales occur in futures markets but not in spot markets. Our study is in line with the improved information environment hypothesis, which states that increased interest among market makers will shift the trading volume from the spot market to highly

leveraged derivatives. The substitution theorem presented by Clarke et al. (2007) categorizes derivatives as speculating instruments. Futures trading gives speculators the incentive to shift their activity from the spot market to the futures market.

6. Conclusion and Recommendations

We have found that the abnormal returns on individual shares and AARs have little effect on the underlying spot prices. Positive CARs occur post-SSF introduction, which shows that the event has had a positive impact (in line with the complete markets theory and improved information environment hypothesis). Three companies exhibit statistically significant results on the event day (introduction of stock futures), but this provides no overall evidence for the sample. The individual company analysis shows that SSFs have had very little or no impact on the underlying equity shares. The event study and CAR analysis shows that there is a positive price/return impact on underlying spot prices.

The decrease in trading volume experienced by the majority of SSF firms, including the trend coefficient for a normal increase in volume over the period, leads us to conclude that stock futures trading results in a decrease in spot market volume. This reflects the diminishing short-sales restriction theory. The decrease in trading volume can be attributed to insiders or speculators moving from the spot market to the futures market (Faff & Hillier, 2003).

Pakistan has moved toward developing its stock market by introducing stock futures on 1 July 2001 and index futures on 1 April 2008. This study supports the stabilizing effect on the spot market, implying that new derivative products should be launched and strict regulations on the derivatives market withdrawn. Further research could look at the low interest in futures trading in Pakistan and the impact of stock futures trading on share price volatility in an asymmetric model.

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Appendix

Table A1: Sample firms included in study

No.	Code	Company Name	Listing date
1	DSFL	Dewan Salman Fibers Ltd	1 July 2001
2	ENGRO	Engro Chemicals Ltd	1 July 2001
3	FFC	Fauji Fertilizer Co. Ltd	1 July 2001
4	HUBC	Hub Power Co. Ltd	1 July 2001
5	MCB	MCB Bank Ltd	1 July 2001
6	NML	Nishat Mills Ltd	1 July 2001
7	PIAA	Pakistan International Airline (A)	1 July 2001
8	PSO	Pakistan State Oil Co. Ltd	1 July 2001
9	PTCL	Pakistan Telecommunication Ltd	1 July 2001
10	SNGP	Sui Northern Gas Pipe Line Ltd	1 July 2001
11	IBFL	Ibrahim Fibers Ltd	1 January 2002
12	FFBL	Fauji Fertilizer Bin Qasim Ltd	25 November 2003
13	DGKC	D. G. Khan Cement Co. Ltd	21 June 2004
14	SSGC	Sui Southern Gas Co. Ltd	21 June 2004
15	LUCK	Lucky Cement Ltd	21 June 2004
16	MLCF	Maple Leaf Cement Factory Ltd	21 June 2004
17	NBP	National Bank of Pakistan	21 June 2004
18	POL	Pakistan Oilfields Ltd	21 June 2004
19	AKBL	Askari Commercial Bank Ltd	20 September 2004
20	BOP	Bank of Punjab	20 September 2004
21	FABL	Faysal Bank Ltd	20 September 2004
22	TELE	Telecard Ltd	20 September 2004
23	BAFL	Bank Alfalah Ltd	20 February 2006
24	KAPCO	Kot Addu Power Company	20 February 2006
25	KESC	Karachi Electric Supply Corporation	20 February 2006
26	PIOC	Pioneer Cement Ltd	20 February 2006

Source: Authors' calculations.

Table A2: Descriptive statistics, pre- and post-event period analysis of returns

Firm		Mean	Median	SD	Skewness	Kurtosis	J-B (Prob)
AKBL	PRE	0.001818	0.000802	0.024528	-0.116949	5.867304	0.000000
	POST	0.000427	0.001120	0.026661	-3.159686	33.27739	0.000000
BAFL	PRE	0.002238	0.000880	0.026263	0.143407	2.934940	0.632737
	POST	-0.00136	-0.001331	0.032239	-2.83198	26.12280	0.000000
BOP	PRE	0.002104	0.000000	0.031458	-0.544718	8.943588	0.000000
	POST	0.002191	0.001965	0.028169	-0.61571	5.958310	0.000000
DGKC	PRE	0.003818	0.001922	0.029284	0.257456	3.292773	0.156205
	POST	9.26E-05	0.000000	0.027544	-0.17558	4.929132	0.000000
DSFL	PRE	-0.00178	-0.002463	0.022010	0.227127	3.963286	0.002473
	POST	-0.00105	-0.002946	0.035648	0.112480	4.628946	0.000001
ENGRO	PRE	-0.00016	-0.001695	0.024556	-1.13434	20.53065	0.000000
	POST	0.000446	-0.000861	0.026616	0.257929	4.819107	0.000000
FABL	PRE	-0.0008	0.000000	0.025916	-0.296561	6.462142	0.000000
	POST	0.002389	0.001695	0.028794	-1.447169	12.54697	0.000000
FFBL	PRE	0.003434	0.000000	0.036627	0.544078	4.402487	0.000000
	POST	0.002917	0.000000	0.034568	6.917259	82.26043	0.000000
FFC	PRE	-0.00059	0.000000	0.018195	-1.929945	20.03056	0.000000
	POST	0.001277	0.000000	0.020880	-0.384204	6.804609	0.000000
HUB	PRE	0.000848	0.000000	0.023367	0.454959	5.014641	0.000000
	POST	0.001073	0.001992	0.031860	-0.532092	7.928861	0.000000
IBF	PRE	-0.00185	-0.002752	0.029535	-2.350226	32.54064	0.000000
	POST	0.002500	0.000000	0.025827	0.448785	6.880077	0.000000
KAPCO	PRE	0.006422	0.000000	0.103599	14.93147	233.1844	0.000000
	POST	0.000347	-0.001027	0.017317	-0.974962	10.76900	0.000000
KESC	PRE	0.002303	0.000000	0.040577	1.138963	6.968372	0.000000
	POST	-0.00261	-0.005883	0.034155	1.061914	7.464328	0.000000
LUCKY	PRE	0.003648	0.003371	0.032383	0.268578	2.996925	0.217210
	POST	0.001039	0.000000	0.027052	0.230746	3.746373	0.016995
MCB	PRE	-0.00071	0.000000	0.026393	-0.835149	7.452103	0.000000
	POST	0.000309	0.000000	0.030039	-0.400185	4.715605	0.000000
MPLF	PRE	0.004983	0.003474	0.033444	0.411606	3.141849	0.024909
	POST	-0.00183	-0.00161	0.026548	0.222215	4.513244	0.000002
NBP	PRE	0.003306	0.002236	0.024441	-1.118156	14.49332	0.000000
	POST	0.002022	0.001243	0.024330	-0.252132	6.488759	0.000000
NML	PRE	-0.00139	-0.001947	0.029031	-0.944812	14.32920	0.000000
	POST	-0.00012	0.000000	0.035714	0.297645	5.462054	0.000000

Firm		Mean	Median	SD	Skewness	Kurtosis	J-B (Prob)
PIA	PRE	-0.00176	-0.006494	0.029331	0.472140	4.351031	0.000001
	POST	0.002103	0.000000	0.047071	1.134708	8.506081	0.000000
PIOC	PRE	0.004734	0.000000	0.030906	0.203684	2.353498	0.045507
	POST	-0.00305	-0.000919	0.029962	-0.172457	3.189590	0.440549
POL	PRE	3.86E-05	0.000801	0.039931	-8.157956	106.9128	0.000000
	POST	0.001182	0.000000	0.023380	0.363010	4.658282	0.000000
PSO	PRE	-0.00069	-0.000637	0.019481	-0.308695	6.143347	0.000000
	POST	0.000254	-0.00195	0.027764	0.405520	3.878640	0.000518
PTCL	PRE	-0.00156	0.000000	0.016132	-0.195548	5.703790	0.000000
	POST	7.84E-05	0.000000	0.028433	-0.077977	6.818665	0.000000
SNGP	PRE	-0.00115	0.000000	0.026061	-0.68887	9.479483	0.000000
	POST	0.001386	0.000000	0.035100	-0.231148	6.963864	0.000000
SSGP	PRE	0.001817	0.000000	0.027874	0.383698	3.480679	0.013051
	POST	-0.00117	-0.001756	0.024361	0.237826	3.695829	0.023300
TELE	PRE	-0.00235	-0.004362	0.027158	0.451215	3.480531	0.003961
	POST	-0.00103	-0.003766	0.037165	-1.842205	22.15414	0.000000

Source: Authors' calculations.

Table A3: Stationarity of returns

Name	ADF test: t-statistic	Prob.*
AKBL	-20.699	0.0000
BAFL	-20.784	0.0000
BOP	-19.946	0.0000
DGKC	-22.159	0.0000
DSFL	-20.793	0.0000
ENGRO	-19.899	0.0000
FABL	-19.344	0.0000
FFBL	-21.654	0.0000
FFC	-22.773	0.0000
HUB	-21.965	0.0000
IBF	-22.882	0.0000
KAPCO	-23.931	0.0000
KESC	-17.394	0.0000
LUCKY	-20.009	0.0000
MCB	-21.593	0.0000
MPLF	-21.061	0.0000
NBP	-19.139	0.0000
NML	-21.837	0.0000
PIA	-24.9	0.0000
PIOC	-18.08	0.0000
POL	-20.549	0.0000
PSO	-22.162	0.0000
PTCL	-21.855	0.0000
SNGP	-23.114	0.0000
SSGP	-19.478	0.0000
TELE	-20.213	0.0000

Source: Authors' calculations.

Table A4: Abnormal returns

Firm	Significant day	Pre-	Post-	Event day
AKBL	2	2		
BAFL	2	2		
BOP	2	2		
DGKC	4	3	1	
DSFL	6	4	2	
ENGRO	3	3		
FABL	3	2	1	
FFBL	3	2		1
FFC	1	1		
HUB	4	3	1	
IBF	2	2		
KAPCO	1	1		
KESC	4	2	2	
Lucky	6	4	1	1
MCB	3	3		
MPLF	4	3	1	
NBP	3	2	1	
NML	4	4		
PIA	3	3		
PIOC	2	2		
POL	2	2		
PSO	3	3		
PTCL	6	3	3	
SNGP	5	3	2	
SSGP	4	3	1	
TELE	4	3	1	

Source: Authors' calculations.

Table A5: AARs for event study

Day	AAR	SD	z-stat	Sig.
-5	-0.01	0.02	-0.31	No
-4	-1.16	0.49	-2.36	Yes
-3	-0.34	0.16	-2.06	Yes
-2	-0.03	0.03	-1.12	No
-1	-0.02	0.02	-0.73	No
0	0.00	0.03	0.16	No
1	-0.01	0.02	-0.61	No
2	0.00	0.02	-0.01	No
3	0.00	0.02	-0.17	No
4	0.01	0.03	0.18	No
5	0.01	0.02	0.56	No

Source: Authors' calculations.

Table A6: CARs for event study

Day	CAR	SD	z-stat	Sig.	
-5	-5	-0.15	0.05	-2.71	Yes
-5	-4	-30.04	8.44	-3.56	Yes
-5	-3	-8.84	2.41	-3.67	Yes
-5	-2	-0.76	0.24	-3.14	Yes
-5	-1	-0.43	0.16	-2.75	Yes
-5	0	0.12	0.07	1.86	Yes
-5	1	-0.30	0.07	-4.20	Yes
-5	2	0.00	0.04	-0.12	No
-5	3	-0.07	0.03	-2.29	Yes
-5	4	0.15	0.06	2.61	Yes
-5	5	0.32	0.12	2.61	Yes

Note: z-stat = 2.58 implies 1% significance, z-stat = 1.96 implies 5% significance, z-stat = 1.64 implies 10% significance.

Source: Authors' calculations.

Table A7: Day effect of event

Name	Variable	Coefficient	SE	t-statistic	Prob.
AKBL	DF	0.00	0.02	-0.17	0.87
BAFL	DF	0.00	0.03	0.15	0.88
BOP	DF	0.00	0.02	0.08	0.93
DGKC	DF	0.03	0.02	1.23	0.22
DSFL	DF	-0.02	0.02	-1.00	0.32
ENGRO	DF	0.00	0.02	0.17	0.86
FABL	DF	0.00	0.02	0.13	0.90
FFBL	DF	0.08	0.02	3.21***	0.00
FFC	DF	0.01	0.01	0.38	0.71
HUB	DF	0.01	0.02	0.53	0.60
IBF	DF	-0.04	0.02	-1.79*	0.07
KAPCO	DF	0.00	0.07	0.00	1.00
KESC	DF	0.01	0.01	0.38	0.71
LUCKY	DF	0.05	0.02	2.20**	0.03
MCB	DF	0.01	0.02	0.42	0.68
MPLF	DF	0.02	0.02	0.76	0.45
NBP	DF	0.02	0.02	1.10	0.27
NML	DF	0.01	0.02	0.59	0.56
PIA	DF	-0.01	0.03	-0.44	0.66
PIOC	DF	0.00	0.03	0.16	0.87
POL	DF	0.00	0.03	-0.07	0.94
PSO	DF	0.00	0.02	-0.08	0.94
PTCL	DF	0.00	0.01	0.39	0.70
SNGP	DF	0.00	0.02	0.10	0.92
SSGP	DF	0.00	0.03	-0.11	0.91
TELE	DF	0.01	0.03	0.39	0.70

Note: DF is the dummy used for the day effect where 1 = event day and 0 otherwise.

Source: Authors' calculations.

Table A8: Pre- and post-event average normalized volumes (millions)

Firm		Mean	Median	SD	Skewness	Kurtosis	J-B (p-value)
AKBL	PRE	1799.1	613.9	2967.1	2.0	5.8	0.0
	POST	4159.2	1369.1	4614.3	0.6	1.8	0.0
BAFL	PRE	3389.6	2132.2	3710.7	1.6	4.8	0.0
	POST	4555.0	2446.6	5171.1	1.4	3.9	0.0
BOP	PRE	6896.3	3296.8	8644.6	2.2	8.0	0.0
	POST	11411.5	8225.6	10439.3	0.9	2.8	0.0
DGKC	PRE	26616.6	24812.2	14291.7	1.0	4.1	0.0
	POST	17915.9	15558.1	10553.5	1.4	4.7	0.0
DSFL	PRE	2553.5	2198.0	1518.1	1.1	3.8	0.0
	POST	2260.2	918.4	2964.5	1.9	6.0	0.0
ENGRO	PRE	3803.4	2944.6	3590.8	1.8	7.8	0.0
	POST	3225.7	2291.3	2842.7	1.9	8.4	0.0
FABL	PRE	960.9	529.2	1194.0	2.8	12.3	0.0
	POST	1189.8	616.4	1621.2	2.6	11.8	0.0
FFBL	PRE	16790.3	14279.5	10901.4	0.9	3.1	0.0
	POST	17854.1	16651.1	10554.7	0.6	2.4	0.0
FFC	PRE	2190.9	1468.8	2368.6	2.3	9.6	0.0
	POST	1928.6	1278.4	2063.9	2.8	13.1	0.0
HUB	PRE	34225.3	29449.5	24290.7	1.6	6.5	0.0
	POST	37389.2	27284.5	31032.0	1.4	5.1	0.0
IBF	PRE	793.7	142.7	1191.2	1.8	6.0	0.0
	POST	662.2	429.5	657.9	2.0	7.6	0.0
KAPCO	PRE	2039.9	1703.0	1753.3	1.1	4.4	0.0
	POST	1600.1	478.7	3530.5	3.7	17.3	0.0
KESC	PRE	3240.3	935.7	5526.2	2.5	8.5	0.0
	POST	1754.2	808.1	2462.1	2.8	11.3	0.0
LUCKY	PRE	14145.3	11982.9	10861.2	0.9	3.1	0.0
	POST	9643.6	7877.3	9009.0	1.3	4.0	0.0
MCB	PRE	2584.3	2573.0	1831.8	0.6	3.0	0.0
	POST	1922.0	1589.2	1389.3	1.2	3.9	0.0
MPLF	PRE	13747.0	11801.3	8731.1	0.8	2.7	0.0
	POST	3577.9	2436.6	3623.7	2.1	7.6	0.0
NBP	PRE	13251.8	11007.3	9332.9	1.3	4.9	0.0
	POST	19657.0	16674.4	12055.1	1.1	3.7	0.0
NML	PRE	1641.6	1118.3	1592.1	1.7	5.7	0.0
	POST	1351.7	1065.6	1100.2	1.4	4.8	0.0
PIA	PRE	116124.4	71682.7	129477.6	2.0	7.2	0.0

Firm		Mean	Median	SD	Skewness	Kurtosis	J-B (p-value)
PIOC	POST	175542.6	80555.6	233126.9	1.8	5.4	0.0
	PRE	1129.8	707.6	1203.3	1.8	5.5	0.0
POL	POST	554.7	461.4	399.9	0.9	3.2	0.0
	PRE	9934.7	7126.3	8382.9	1.8	7.0	0.0
PSO	POST	9785.3	5663.0	10403.3	1.5	4.1	0.0
	PRE	13496.7	12038.5	8965.8	0.6	3.3	0.0
PTCL	POST	7525.0	6754.9	4397.8	0.5	2.9	0.0
	PRE	25959.6	21918.0	16882.1	1.1	4.6	0.0
SNGP	POST	118432.6	23090.7	364666.6	4.0	19.1	0.0
	PRE	3486.6	1970.6	4049.9	2.7	11.5	0.0
SSGP	POST	5226.1	3536.8	5668.6	1.7	5.5	0.0
	PRE	9619.4	5301.9	13607.5	3.2	15.2	0.0
TELE	POST	6229.5	2702.1	8696.7	2.4	8.7	0.0
	PRE	2021.3	1119.2	2377.7	2.6	11.6	0.0
	POST	1213.7	625.1	1689.9	3.4	15.9	0.0

Source: Authors' calculations.

Table A9: T-test for change in means

Firm	Pre-	Post-	Change	t-test	Prob.
AKBL	1799	4159	2360	-5.999	0.000
BAFL	3390	4555	1165	-4.145	0.000
BOP	6896	11411	4515	-4.788	0.000
DGKC	26617	17916	-8701	7.139	0.000
DSFL	2554	2260	-293	1.422	0.156
ENGRO	3803	3226	-578	2.236	0.026
FABL	961	1190	229	-1.692	0.092
FFBL	16790	17854	1064	-1.049	0.295
FFC	2191	1929	-262	1.376	0.170
HUB	34225	37389	3164	-1.393	0.165
IBF	794	662	-132	1.651	0.100
KAPCO	2040	1600	-440	1.752	0.081
KESC	3240	1754	-1486	3.945	0.000
Lucky	14145	9644	-4502	4.375	0.000
MCB	2584	1922	-662	4.941	0.000
MPLF	13747	3578	-10169	17.611	0.000
NBP	13252	19657	6405	-5.728	0.000

Firm	Pre-	Post-	Change	t-test	Prob.
NML	1642	1352	-290	2.985	0.003
PIA	116124	175543	59418	-4.636	0.000
PIOC	1130	555	-575	7.098	0.000
POL	9935	9785	-149	0.172	0.864
PSO	13497	7525	-5972	8.834	0.000
PTCL	25960	119205	93245	-4.073	0.000
SNGP	3487	5226	1739	-3.725	0.000
SSGP	9619	6229	-3390	3.470	0.001
TELE	2021	1214	-808	4.378	0.000

Source: Authors' calculations.

Table A10: Regression analysis

Firm	Constant	Trend	Change	
AKBL	40.993	-0.025	-0.408	
	0.463	0.939	0.997	p-value
BAFL	-118.810	2.132	-441.388	
	0.199	0.002	0.016	p-value
BOP	150.024	1.498	-180.341	
	0.381	0.268	0.703	p-value
DGKC	1338.443	1.126	-826.365	
	0.007	0.566	0.169	p-value
DSFL	120.878	0.223	-74.878	
	0.134	0.408	0.336	p-value
ENGRO	410.963	0.474	-199.910	
	0.000	0.349	0.274	p-value
FABL	122.635	-0.317	113.460	
	0.027	0.236	0.106	p-value
FFBL	921.050	1.283	-207.619	
	0.011	0.489	0.704	p-value
FFC	223.358	0.664	-227.528	
	0.002	0.159	0.164	p-value
HUB	9.361	0.000	-0.135	
	0.000	0.630	0.290	p-value
IBF	96.252	-0.386	99.296	
	0.003	0.012	0.022	p-value

Firm	Constant	Trend	Change	
KAPCO	17.344	1.054	-302.285	
	0.870	0.008	0.029	p-value
KESC	41.418	1.693	-594.738	
	0.784	0.114	0.050	p-value
LUCKY	612.412	-0.351	-111.586	
	0.021	0.801	0.801	p-value
MCB	167.975	0.410	-157.663	
	0.001	0.196	0.114	p-value
MPLF	993.823	-0.611	-534.484	
	0.001	0.667	0.220	p-value
NBP	380.748	1.398	-52.548	
	0.136	0.313	0.908	p-value
NML	510.576	-0.750	106.178	
	0.000	0.248	0.479	p-value
PIA	4303.852	-4.918	3615.779	
	0.280	0.797	0.503	p-value
PIOC	46.990	-0.031	-14.587	
	0.077	0.813	0.701	p-value
POL	555.478	0.156	-21.093	
	0.029	0.896	0.940	p-value
PSO	1870.337	-0.388	-732.920	
	0.000	0.833	0.158	p-value
PTCL	-272.117	13.014	2377.395	
	0.916	0.473	0.253	p-value
SNGP	238.072	-0.255	195.716	
	0.124	0.738	0.260	p-value
SSGP	440.618	3.579	-1263.822	
	0.045	0.040	0.068	p-value
TELE	201.346	-0.020	-53.246	
	0.024	0.958	0.663	p-value

Source: Authors' calculations.

Figure A1: CARs for event study

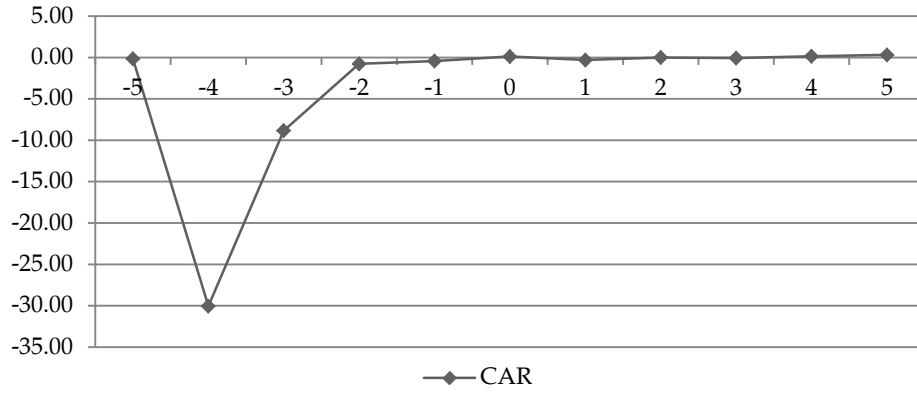


Figure A2: Volume analysis without trend

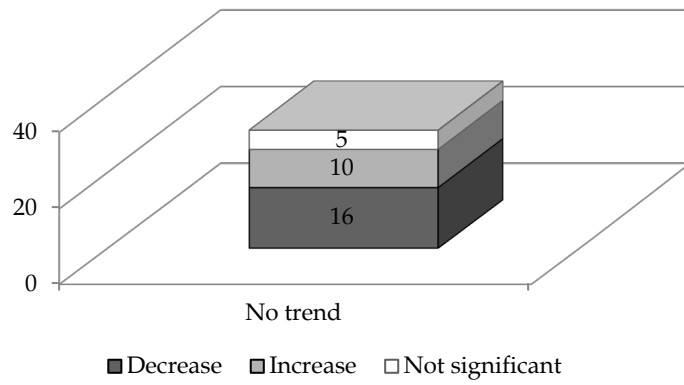
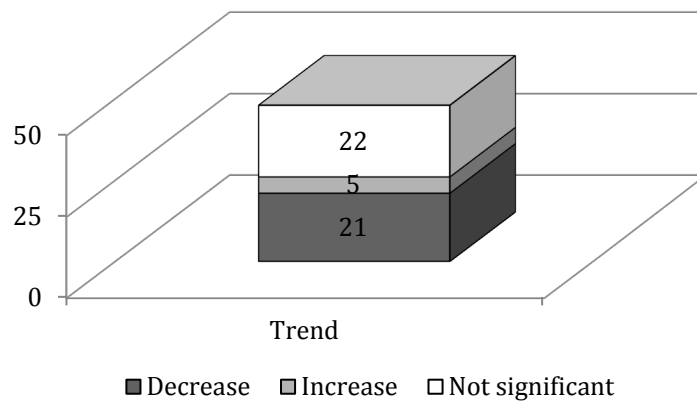


Figure A3: Volume analysis with trend



The Impact of Demographic Characteristics and Risk Tolerance on Investors' Risk Perception and Portfolio Management

Taqadus Bashir, Sadia Shaheen, Zahra Batool, Mohsin Hassan Butt, and Aaqiba Javed*

Abstract

Behavioral finance focuses on psychological factors—such as risk perception and portfolio management—that play a crucial role in investors' financial decision-making. This study investigates the effect of risk tolerance and demographic characteristics on risk perception and portfolio management, which, in turn, affect investors' decisions. Applying structural equation modeling to data collected from a sample of 120 respondents, we find a significant and positive relationship between risk perception and risk tolerance. Similarly, certain demographic characteristics, such as age and education, have a significant and positive relationship with risk perception while others, such as income and gender, have a significant but negative relationship with risk perception. Risk tolerance has a significant but negative relationship with portfolio management. Age, education, and income have a significant but negative relationship with portfolio management, while gender has a significant and positive relationship with portfolio management.

Keywords: Demographic characteristics, portfolio management, risk tolerance, risk perception.

JEL classification: G11, G12, G19.

1. Introduction

Factors that determine the risk-related attitudes of individual investors are of great concern in the field of behavioral finance, which looks at individual attributes (e.g., psychological) that play a key role in investment and financial decisions. Risk refers to the uncertainty associated with an outcome and arises when there are doubts about at least one possible outcome. Assessing the level of risk includes perceiving its state, which shows that the perception is explained by objective realism.

* Taqadus Bashir is an assistant professor at the Faculty of Management and Administration Sciences, University of Gujrat. Sadia Shaheen, Zahra Batool, Mohsin Hassan Butt, and Aaqiba Javed are postgraduate students at the institution.

Sitkin and Pablo (1992) and Sitkin and Weingart (1995) argue that an individual's risk-taking action is affected mainly by risk perception and attitude. Weber and Hsee (1998) report that individual decision-making is influenced by risk perception in the case of investment decisions in the bonds market. Vlaev, Chater, and Stewart (2009) examine investors' preferences for distinct ways of transmitting risk-related information and note that risk presented in terms of an average maximum (best) or minimum (worst) is deemed preferable. Slovic (2000) points out that risk is inherently subjective: the process of risk perception connotes an objective situation that is itself formed by experience, emotions, and knowledge.

An investor who agrees to accept uncertainty at an extreme level when making a financial decision is termed risk-tolerant. This signifies the degree of unpredictability in returns that the individual is willing to tolerate. Risk tolerance is a significant factor in investment decisions. Individuals have to realistically consider their ability and willingness to bear ups and downs in the value of their investment. Investors who take on too much risk may panic and sell at the wrong time. The ability and willingness to accept failed investment decisions while waiting for the value of the investment to increase is part of risk tolerance. Investors who are averse to taking the chance that their investments might drop in price have little or no risk tolerance.

Prabhakaran and Karthika (2011) show that investors with a higher risk tolerance are more likely to make portfolio decisions. Risk tolerance thus has a direct impact on investors' investment decisions and determines the composition of various assets in the portfolio. Individual investors' risk tolerance may change over time since it is influenced by various exogenous factors, for example, major life experiences (Cordell, 2002).

Portfolio management involves constructing and maintaining a collection of investments. Funds are invested in distinct securities that minimize the portfolio's total risk while maximizing total returns. Portfolio management combines the weaknesses, strengths, threats, and opportunities associated with a certain choice of debt, equity, national and international situations, progress, and other tradeoffs. The challenge in portfolio management is to maximize returns at a given level of risk tolerance. This involves hedging risks to obtain the maximum possible return while minimizing the risk involved. In this context, Markowitz (1952) shows that portfolio managers diversify their portfolio on the basis of the variance and mean.

2. Significance of Study

The aim of this study is to identify the effects of demographic characteristics and the level of risk tolerance on portfolio management and risk perception of different securities. The study is, therefore, significant for policymakers, financial advisors, bankers, and individual investors in the following ways. Policymakers adjust the risk and return associated with newly issued securities on the basis of risk perception and investors' risk tolerance. Financial advisors guide investors on the basis of their age, income, and risk tolerance, etc. Individual investors with a particular demographic characteristic need to understand risk perception and construct a portfolio that consists of a combination of beneficial securities.

The study aims to examine:

- The impact of demographic characteristics on investors' risk perception
- The effect of demographic characteristics on portfolio management
- The impact of risk tolerance on investors' risk perception
- The relationship between the degree of risk tolerance and portfolio management among investors and bankers.

3. Literature Review

Yordanova and Alexandrova-Boshnakova (2011) investigate the impact of gender on risk perception, propensity, and behavior, based on a sample of 382 Bulgarian entrepreneurs. Using Sitkin and Pablo's (1992) model of risk behavior and other studies on different cognitive factors, they find that gender has an indirect impact on risk perception through risk propensity and overconfidence. The gender effect on risk-taking tendency is mediated partly by age, outcome history, and risk preferences. Both male and female entrepreneurs had the same risk level but the latter had a lower risk propensity than their male counterparts.

Bashir, Ahmed et al. (2013) investigate the association between demographic variables and investment preferences in relation to stocks and gambling decisions among a sample of salaried finance teachers and bankers in Sialkot and Gujrat. The authors have analyzed risk variations among salaried individuals based on income, age, education level, and gender. Their findings show that females are more reluctant to take on risk than males. Younger as well as better-educated people are also willing to take more risk but hesitate due to resource scarcity and lack of investment

opportunities. The study concludes that a negative relationship exists between gambling and risk taking when making investment decisions in a nonconductive economic environment.

Yao, Sharpe, and Wang (2011) look at the effects of generation, period, and age on risk tolerance, based on cross-sectional data for 1989–2007. They include “baby boomers” and members of the “silent” and X-generation in their sample of 21,167 respondents. The authors propose a hypothesis on the basis of their conceptual framework. Substantial risk, high risk, and low risk are taken as dependent variables while the independent variables include generation, survey year, economic factors, demographic characteristics, and perceptions. The study finds a negative relationship between age and risk tolerance: as age increases, the capacity to recoup losses decreases.

Hoffmann, Post, and Pennings (2013) examine how the perceptions of individual investors change, based on risk taking and trading behavior during the financial crisis of 2008/09. Using a sample of 1,510 clients with brokerage records, they collected data through a monthly questionnaire administered between April 2008 and March 2009. The reliability of the variables is determined using Cronbach’s alpha. Their results indicate that investors’ perceptions fluctuate significantly during a financial crisis. Risk perception and tolerance is less volatile than return-related expectations.

Wang, Shi, and Fan (2006) gauge investors’ perceptions of risky investment in terms of psychological mechanisms in the Chinese stock market. The study aims to establish the risk perceptions associated with different types of information, cultural background, and the effect of asymmetric information. A 42-item questionnaire was distributed to 1,547 respondents from the Nan Fang Bond Company’s sale departments. The authors use structural equation modeling (SEM) to generate the level of risk perception. They find a low level of subjective risk and a high level of objective risk. In the context of the Chinese stock market, the study recommends augmenting education, knowledge, and skills; strengthening the regularity of listed companies, and correcting the stock market’s functional base.

Ramachandran, Rajeswari, and Chinnathambi (2011) study the factors affecting decision-making and risk perception among a sample of 100 investors in equity shares in India. Using primary data obtained from broker and investor profiles and the sample questionnaire results, and drawing on secondary sources, they assess investors’ status in terms of

demographic variables. The authors explain that information on these determinants contributes to making better investment decisions, but that more information on gender and religious factors was needed to explain investment decisions.

Larkin, Lucey, and Mulholland (2012) examine how age, gender, and education affect risk tolerance among investors in Ireland. Their methodology comprised socio-demographic questions that were asked to determine the behavior of individuals toward risk taking and 13 questions on financial risk tolerance in the form of a questionnaire. The authors conclude that age does not affect risk tolerance while gender does. Risk tolerance among investors has a negative relationship with home ownership and a positive relationship with household earnings and education level. Risk tolerance was found to increase with education level and decrease with homeownership.

Shafi et al. (2011) determine the relationship between investment behavior, risk perception, and risk attitude. They show how investors who are employees of an organization perceive risk relative to other investors. The study takes into account various factors, including personality traits (of investors), confidence level, period available in which to invest, and level of return. The authors find a strong association between risk perception and investors' behavior: investors who are more confident about an investment will more likely accept greater risk. Similarly, the more time available in which to invest, the more likely investors will be to invest in risky assets.

Van de Venter, Michayluk, and Davey (2012) review longitudinal studies on the shift in individual investors' risk tolerance scores over five years. The study attempts to determine which factors influence these changes and if risk tolerance changes over time. Analyzing data from the Smart Investor's Survey for the period of 2002–06, they apply a regression model to determine the outcomes. Their findings reveal that small annual changes occur in the financial risk tolerance of individual investors. A decline in household size also results in a slight decline in risk tolerance, while not using the services of a financial planner causes it to rise. Risk tolerance is not likely to alter substantially over the lifetime of an individual investor, implying that it is a stable attribute.

Bashir, Uppal et al. (2013) investigate the effect of risk tolerance with respect to stock index prices in the context of different demographic variables. Based on a sample of 106 respondents, including investors,

bankers, and household individuals, they use a regression model and descriptive statistical tools to examine how far changes in stock indices affect risk tolerance. Risk tolerance is, therefore, the dependent variable and weekly and daily changes in KSE indices (from January 2012 to March 2013) are the independent variable. Household persons with higher incomes are shown to be more risk-tolerant than those with lower incomes.

Hariharan, Chapman, and Domian (2000) investigate the impact of the risk tolerance of investors nearing retirement on portfolio management. Using data collected in the first wave of the Health and Retirement Survey in 1992 (a sample of 15,000 individuals aged 51–61), they employ a linear regression model with T-bills as the dependent variable. The study finds that risk-tolerant investors nearing retirement did not decrease their bond allocation for the purpose of buying more stock.

Prabhakaran and Karthika (2011) assess the impact of risk perception and risk tolerance on investors' investment decisions. Applying the chi-square methodology to survey data collected from a sample of 200 respondents, they find that investors who showed a higher risk tolerance were more likely to make portfolio decisions. Male investors showed a greater preference for portfolio choices yielding higher returns.

4. Hypothesis

We put forward four hypotheses:

- H1: There is a significant relationship between demographic characteristics and risk perception.
- H2: Demographic characteristics affect investors' portfolio management.
- H3: There is a significant association between risk tolerance and risk perception.
- H4: There is a significant relationship between risk tolerance and investors' portfolio choices.

5. Theoretical Framework and Methodology

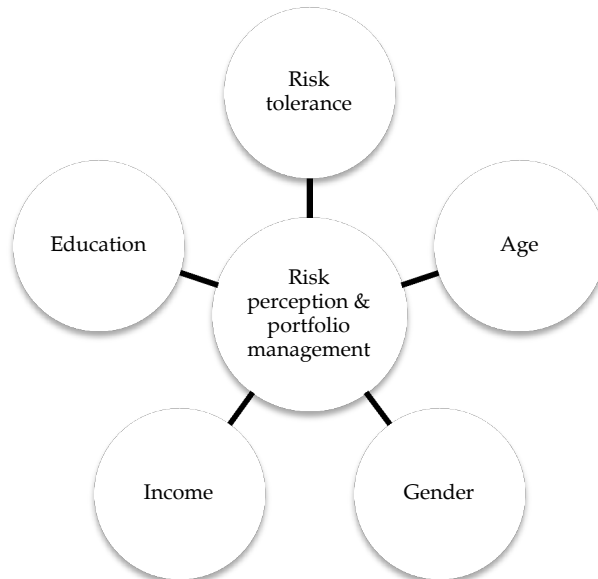
The present study is based on the theoretical framework illustrated in Figure 1.

Our objective was to investigate the impact of demographic characteristics (age, gender, education level, and income) and risk tolerance

on risk perception and portfolio management. A 26-item questionnaire was administered to a sample of 140 respondents, including investors, bankers, finance students, and teachers, in different cities in Punjab. Of these, we received 120 responses.

The questionnaire (see Appendix) comprised four sections: (i) age, gender, marital status, education level, and occupation; (ii) risk tolerance (six items), (iii) risk perception (nine items), and (iv) portfolio management (six items). The sample included 75 males and 45 females; 70 respondents were married and the remaining single. Out of 120 respondents, 70 were 40–50 years old and the remaining under 40. Thirty respondents had an MBA, 20 had an MCom degree, and the remaining were graduates.

Figure 1: Theoretical framework



The normality of the dependent variables was verified using the Kolomogrov-Smirnov test. We applied Kendall's Tau-b correlation using SPSS 16, while the software AMOS 20 was used in SEM. Cronbach's alpha test was used to determine the validity and reliability of the data. Table 1 shows that all the variables used have an alpha value greater than 0.5.

Table 1: Reliability test results

No.	Variable	Cronbach alpha
1	Risk perception	0.536
2	Risk tolerance	0.812
3	Portfolio management	0.834

Source: Authors' calculations.

6. Results and Analysis

Table 2 shows that demographic characteristics and risk tolerance have a significant relationship with risk perception and portfolio management. The correlation is significant at the level of 0.01. Risk tolerance has a strong and highly significant positive relationship (0.300**) with risk perception. Age and education have a highly significant positive relationship at the level of 0.189* and 0.200*, respectively. Income and gender have a significant but negative relationship at the level of 0.05 with risk perception (−0.008* and −0.177*, respectively).

Table 2: Kendall's Tau-b correlation

Variable	Correlation	
	Risk perception	Portfolio management
Risk tolerance	0.300**	-0.669**
Age	0.189*	-0.215**
Gender	-0.008*	0.280**
Education	0.200*	-0.254**
Income	-0.177*	-0.150

Note: * = significant at 0.05 level, ** = significant at 0.01 level.

Source: Authors' calculations.

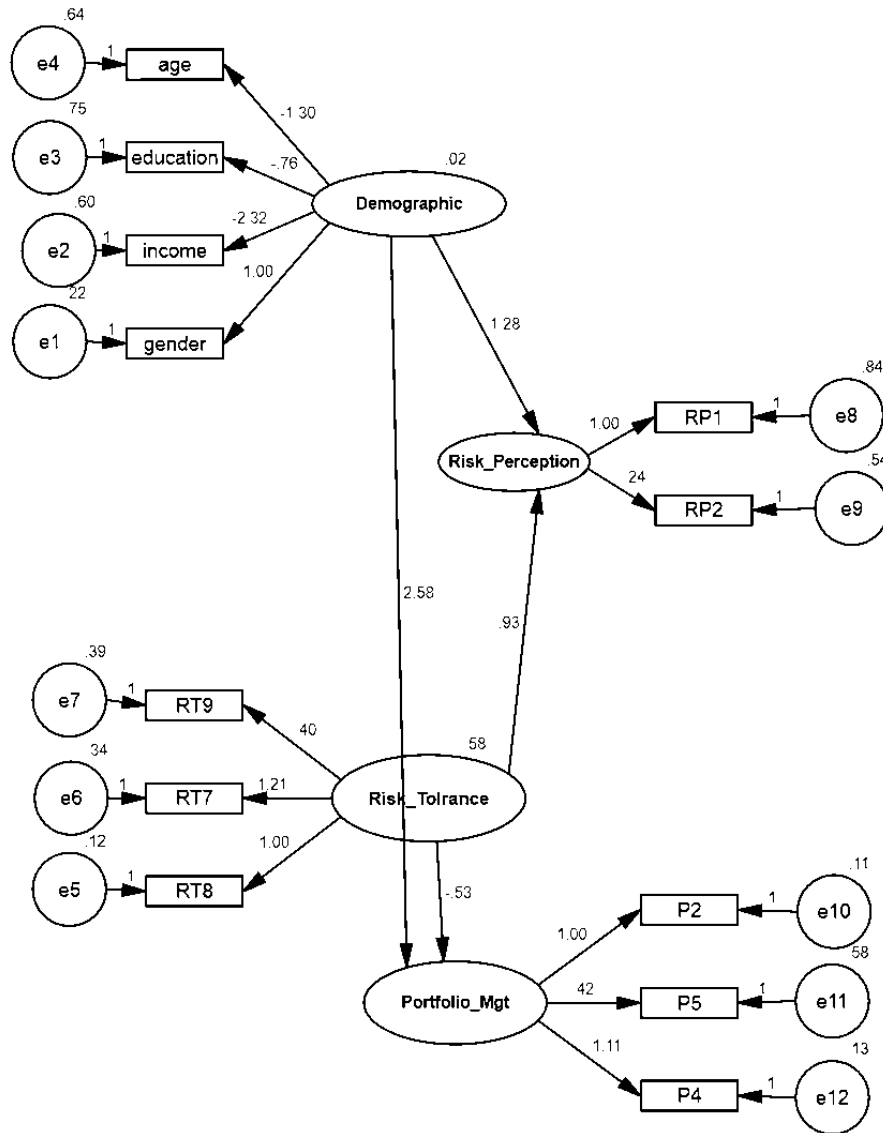
Risk tolerance, age, and education have a strong and highly significant negative relationship with portfolio management (−0.669**, −0.215**, and −0.254**, respectively). Gender has a significant and positive relationship with portfolio management. The relationship between portfolio management and risk tolerance is highly significant but negative.

6.1. SEM

SEM is used to estimate the links between latent variables and their dimensions. Following the literature review and data analysis, we

employed SEM to identify four important relationships between (i) risk tolerance and risk perception, (ii) risk tolerance and portfolio management, (iii) demographic characteristics and risk perception, and (iv) demographic characteristics and portfolio management (Figure 2).

Figure 2: SEM model



The analysis confirms the factors and yields a regression equation comprising risk perception and portfolio management as dependent variables denoted by Y and demographic characteristics and risk tolerance

as independent variables denoted by X. The level of significance is 0.05 with a confidence interval of 95 percent. The results indicate a significant relationship between the dependent and independent variables, where the p-value is less than 0.05.

$$Y = \alpha + \beta(\text{risk tolerance}) + \beta(\text{demographic characteristics})$$

As per our hypothesis, risk perception and portfolio management are influenced by risk tolerance and demographic characteristics.

Table 3 gives the results of the SEM. The model meets all the criteria (GFI = 0.908, AGFI = 0.970, NFI = 0.980, RFI = 0.949, TLI = 0.967, and IFI = 0.844) for fitness, with values higher than 0.9 except for IFI. The chi-square value is less than 3 with a p-value of 0.000. The RMSEA value is 0.0251, which is less than 0.08. All our hypotheses can, therefore, be accepted and the model is able to predict risk perception and portfolio management.

Table 3: Criteria for fitness of SEM

No.	Criteria	Results
1	Goodness of fit index (GFI)	0.908
2	Adjusted goodness of fit index (AGFI)	0.970
3	Normal fit index (NFI)	0.980
4	Relative fit index (RFI)	0.949
5	Incremental fit index (IFI)	0.844
6	Tucker-Lewis index (TLI)	0.967
7	Root mean square error of approximation (RMSEA)	0.0251

Source: Authors' calculations.

7. Findings

The results of the Kolomogrov-Smirnov test show that the data is not normal. We employ Kendall's Tau-b correlation test, which shows that the independent variables have a significant relationship with the dependent variables. The demographic characteristics gender and income have a negative and significant relationship while age and education have a positive and significant relationship with risk perception. Portfolio management has a significant and negative relationship with all the demographic characteristics, except gender where the relationship is positive. Risk tolerance has a negative and very strong relationship with portfolio management.

On the basis of the given data, we find that all four hypotheses can be accepted: demographic characteristics and risk tolerance affect risk perception and portfolio management. Older respondents in the sample were more risk-averse than younger respondents (who may lack experience and prefer to invest in risky assets). Males were more likely to invest in risky assets than females. These findings are in line with Faff, Hallahan, and McKenzie (2011).

8. Conclusion

This study has attempted to determine which variables affect investors' risk perception and portfolio management and to what extent. We have looked at the impact of risk tolerance and demographic characteristics on portfolio management and risk perception. Our results have shown that acting on a risk is influenced by risk perception and risk-related attitudes. Our conclusions are supported by Sitkin and Pablo (1992) and Sitkin and Weingart (1995).

We also find that risk tolerance and demographic characteristics (age, gender, and income), except education, affect risk perception and portfolio management. Investors in Pakistan are often not well educated and lack information on their investments, explaining why education does not seem to influence risk perception and portfolio management.

Investors tend to have little knowledge of portfolio management and how to minimize risk and maximize returns in Pakistan. They are only slightly familiar with the importance of risk and portfolio management. This reflects a need to improve the level of education and awareness among Pakistani investors.

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Appendix

Questionnaire

Dear respondent your valuable opinion is required to conduct a research in finance. Please share your experience and opinion. This input of yours is for purely academic purpose.

Gender: _____ City: _____ Age: _____

1. Age from which you are investing:
a) 20–30 b) 31–40 c) 41–50 d) 51–60
2. What is your marital status?
a) Single b) Married
3. Occupation:
a) Government employee b) Private employee c) Own business
4. Education level:
a) Graduation b) Master c) MS d) PhD
5. Employment status:
a) Employed b) Unemployed
6. Period of time you take to evaluate the performance of investment:
a) Monthly b) Quarterly c) Annually d) Over 5 yrs
7. What is your household's approximate annual gross income before taxes?
a) Less than 25,000 b) 25,000 to 49,999 c) 50,000 to 74,999 d) 75,000 to 99,999 e) greater than 100,000
8. Which type of investment you usually prefer?
a) Bonds b) Equities c) Bank deposits d) T-bills
9. Whose judgment analysis do you trust most while making investments?
a) Self b) Friends c) Expert opinion d) Media e) Broker

10. You have poor knowledge about Company X's stock and are therefore uncertain about investing in it. Suddenly many of your co-workers and competitors start buying it. How would this affect your attitude towards 'X'?

- a) Positive b) Negative c) No change

11. On a scale of 1 to 7 what levels of risk do you undertake?

1	2	3	4	5	6	7
Low risk	Medium risk	High risk	Neutral	Low profit	Medium profit	High profit

12. What you perceive about the performance of investment in future:

- a) Very Optimistic b) Positive c) Unsure d) Pessimistic

13. Between P/E ratio and intrinsic value of a stock, which has more weightage in your investment decision?

- a) P/E ratio b) Intrinsic value c) Equal weightage

14. Do you save a part of your income for investing in the share market?

- a) Yes b) Sometimes c) No

15. Can you name some stocks that have been a part of your portfolio in the past year like KSE/ISE/LSE?

16. What risk tolerance you show if the time of investment and response to market decline.

- a) More willingness b) Less willingness c) Risk factor has no influence

17. On a scale of 1 to 5, how would you rate your knowledge on a relatively new field which studies financial decision making, called behavioral finance.

1 Excellent	2 Very Good	3 Good	4 Average	5 Poor
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18. Do you favor investing in companies that are operating in Gujranwala and Gujrat, since we are more familiar with their operations?

- a) Yes b) No c) Indifferent

19. Time horizon within which you withdraw your investment:

- a) Currently b) Less than 3 years c) Between 6 to 15 years d) After 15 years

20. You are on a TV game show and can choose one of the following. Which would you take?
a) \$1,000 in cash b) A 25% chance at winning \$1,000 c) A 50% chance at winning \$5,000 d) A 5% chance at winning \$100,000
21. Any portfolio activities you have made:
a) Yes b) No
22. When you think of the word "risk" which of the following words comes to mind first?
a) Loss b) Uncertainty c) Opportunity d) Thrill
23. What is your attitude about financial risk:
a) Diversified investment portfolio b) I only invested with extra money I can afford to loss c) Associated with playing in stock d) The higher the rate of return the greater the risk
24. Do you consider the past performance of a stock before investing in it?
a) Always b) Sometimes c) Often d) Frequently e) Never
25. Do you end up sticking with a losing stock (wrong investment decision) for too long hoping for a reversal, or book profits in a winning stock and then felt you could have waited?
a) Always b) Sometimes c) Often d) Frequently e) Never
26. Have you put off an investment decision expecting new and favorable (positive) information release regarding the stock?
a) Always b) Sometimes c) Often d) Frequently e) Never

Why Are Multinational Sales Declining in Pakistan? Evidence from the Tobacco Industry

Aliya Bushra* and Nasra Wajiha**

Abstract

Pakistan's multinational companies have strong potential for growth and represent a large and increasing number of consumers. Unfortunately, their sales have been affected by certain factors. This study identifies these factors using a mixed-methods approach and qualitative data collected through semi-structured interviews and focus groups. We administered 100 questionnaires among the employees of two large tobacco manufacturers. The results indicate that brand switching, product development, product mix, point of sale, competition, and price are significant factors that affect sales in the tobacco industry.

Keywords: Mixed methods, profitability, brand switching, product mix, point of sale, promotion.

JEL classification: L10, L11, L19.

1. Introduction

The act of exchanging a product or service for money, i.e., completing a commercial activity, is known as a sale. A company's foremost purpose is to earn revenue or profit in order to survive in a dynamic market and under intense competition. Companies' sales depend on their customers' perception and level of satisfaction after purchasing a product. A company that provides better value to its customers will generate more revenue, and increase customer satisfaction and brand loyalty. Sales are a motivating factor for firms and a decline in sales will eventually affect company morale.

This study investigates why the sales of multinational firms are declining so rapidly in Pakistan, and uses the tobacco industry as a unit of analysis. The tobacco industry has strong potential for future growth and

* The author is a senior teaching fellow at the Department of Business Administration, Lahore School of Economics.

** The author is head of the Department of Psychology at the Government College for Women in Lahore.

caters to a large and increasing number of consumers. However, in Pakistan's case, the industry has witnessed decreasing sales in the last couple of years.

We have collected data for this study using a mixed-methods approach. Semi-structured interviews were conducted with a sample of employees at the Pakistan Tobacco Company (PTC) and Philip Morris (Pakistan) (PMP) Limited (formerly known as Lakson Tobacco Limited)—two of the largest cigarette manufacturers in the domestic market. We asked them to identify which factors they thought had affected their sales and what explained the rapid decrease in profitability. A focus group discussion was also conducted to collect information from customers concerning their brand preferences and purchasing decisions.

A quantitative survey was conducted to empirically test the reasons for the decrease in sales. Our research objectives are, therefore, to determine the reasons for the decline in sales and to observe which factors affect sales with a view to recommending policy measures.

2. Literature Review

Donovan, Jancey, and Jones (2002) investigate point-of-sale (POS) advertisement, brand user image, and its impact on the sales of cigarettes. They find that tobacco POS advertisement increases and facilitates brand imagery. The study's results are based on a questionnaire that was distributed (with the permission of the authorities) among a sample of 100 students from four western Australian schools. The students were divided into groups and asked to identify different brands (such as Nike, Coke, Cadbury, McDonalds, Benson & Hedges, and Marlboro) based on the brand name and, in a few cases, on pack and poster advertisements. They were found to be fully aware of the different brand names, especially for brands such as Nike and Cadbury that they routinely encountered. However, 88 percent were also well aware of the cigarette brand names.

Participants described Benson & Hedges (based on the advertisement) as interesting, "cool," "relaxed," and "classy." They appeared to be less impressed with Marlboro due to its outdoors image and element of adventure, perceiving it as "relaxed," "adventurous," and "out of date." The Tobacco Control Department reports that 20,000 youth take up smoking every year and 90 percent start before the age of 18. Although the advertisement of cigarettes is banned in many countries, Donovan et al. (2002) show that students easily recognize brand names and

product categories. Their brand awareness and self-identification gives tobacco companies the chance to quantify the effectiveness of POS advertisement in the form of brand imagery.

Katz and Lavack (2002) find that promotion in selected areas (bars, clubs) or at specific events gives tobacco companies a better chance to create and reinforce their brand image by targeting the desired market segment, providing brand trials and samples through promotional programs, and by using environmental and social influences to augment sales. The authors review more than 2,000 tobacco industry documents and interview a sample of bar managers in the US and overseas. Their model measures how the strategies above are carried out, the number of people exposed to them, and the impact of promotional items on product sales. The latter activity encourages word-of-mouth advertisement messages with strong consequences in terms of brand image and a long-term effect on people's environmental, social, and lifestyle elements.

DiFranza, Eddy, Brown, Ryan, and Bogojavlensky (2001) investigate the development of brand selection and consequent brand loyalty among youth. A sample of 721 individuals was asked about their past and current experience with cigarettes. The interviews were conducted in the form of consumer intercept marketing surveys at shopping malls, parks, and beaches. Respondents were asked which key elements made a particular brand their favorite and how they had selected that brand initially.

The study's results show that 69 percent said their friends and siblings had prompted them to smoke for the first time; 50 percent said they had subsequently smoked up to three cigarettes per day; and 67 percent had continued to purchase the same brand. Their favorite brand tended to be the brand they routinely purchased or had last purchased. Brand loyalty is thus associated with the initial brand purchased, which gives that particular cigarette company an advantage that can be augmented through print advertising, free samples, package design, and the appeal to health through low-tar cigarettes.

Randall, Ulrich, and Reibstein (1998) look at how product quality varies with brand equity. Based on a sample of 100 respondents, they find that high-quality and premium products have better brand equity than low-quality products. When the quality of similar products deviates, marketers refer to this as vertical differentiation. A deviation within the category of the product is called horizontal differentiation. The authors test whether high-

quality products are associated with greater brand equity or if there is a negative relation with low-quality product line. The results suggest that product quality is essential to creating brand equity and enhancing sales. Customer satisfaction and desired value are key to brand equity.

Polo, Sese, and Verhoef (2011) analyze customer retention and brand memorization, based on a longitudinal study of 650 consumers. Customer retention is an important part of brand equity and marketing mix. The study tests the relation between brand retention and its effect on sales. Brand retention is defined as the brand image with which customers can easily identify, and is an effective tool for brand recognition and recall. The results suggest that the higher the retention, the stronger will be the brand recognition. Moreover, brand retention by customers and different marketing efforts are not static. The study emphasizes pre- and post-purchase decisions in examining the effect of pricing, quality, image, recall, and mass advertising on overall sales through brand retention.

Gómez, McLaughlin, and Wittink (2004) find a positive relationship between customer satisfaction and the sales of a brand product. The results of their empirical study imply that dissatisfied consumers will eventually develop a negative perception of the brand product, causing sales to decline. Creating and retaining customer loyalty is, therefore, the foremost element in business operations. This makes it important to analyze the factors that determine customer satisfaction and retention, and the consequent advantages for firms who do so.

Honjo and Kawachi (2000) discuss the government's role in the tobacco industry and its effect on smoking rates, industry practices, and tobacco sales in the Japanese market. Based on a literature review for the period 1980–96, the authors find that there was significant use of cigarettes when Japan opened its market to overseas cigarette companies. Aggressive promotional marketing both by US and Japanese tobacco companies has led to higher sales. This implies that, if the government were to control illicit sales of tobacco and allow companies to work within certain limitations, then the industry would be able to contribute substantially to tax revenues.

Danneels (2002) examines the relation between product innovation and firm competence. Product innovation is linked to competence in technologies and customer demand, and can lead to firm renewal. Based on a sample of five high-technology firms (including interviews, observations, and company documents), the study suggests that product innovation based on customer and technological demands can help firms compete, survive, and prosper in a dynamic market.

Hudmon et al. (2006) gauge the effect of tobacco market penetration and development on sales. Their sample comprises 1,168 licensed stores (gas stations, large retail stores, pharmacies), 1,518 students, and 988 adult chain smokers. Their analysis of the data collected on cigarette sales indicates that tapping untouched market segments will eventually increase sales. Most smokers said that, when cigarettes were available in areas they visited frequently or by chance, they were likely to consume more. This makes it a useful tactic to ensure customer retention, while posters displayed at sales counters increase brand awareness among youth.

Reed, Anderson, and Burns (2006) find that the launch and advertisement of low-tar cigarettes has increased sales. Their study is based on 20 low-tar brands launched between 1960 and 1996. The authors review brand advertisements and sales, and conclude that increased awareness of low-tar cigarettes as a healthier alternative boosts sales among consumers who had decided to quit.

3. Methodology

Our qualitative data was collected through semi-structured interviews with employees of PTC and PMP, and with a focus group of consumers. Questionnaires were administered to a total sample of 100 respondents (50 employees and 50 consumers) to collect empirical data.

3.1. Sample Criteria and Instrument

The final sample of 100 employees was based on the following criteria: gender (male or female), age (18 to 60 years), level of education (the minimum being intermediate level), and designation (manager, assistant manager, department or division head, sales field leader, supervisor, retailer, customer).

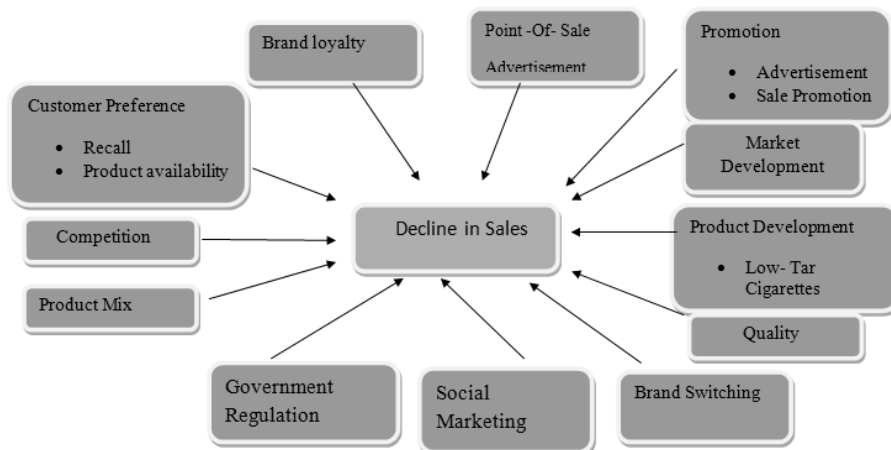
We used a structured questionnaire drawn from Randall et al. (1998) with some modifications. The instrument included 16 questions in all, of which 12 measured the main dependent variable (decline in sales). The remaining questions were on demographic variables. All the questions were close-ended and based on the Likert five-point scale (from 1 = strongly disagree to 5 = strongly agree). The questionnaire consisted of two sections: (i) decline in sales (dependent variable) and (ii) POS, promotion, product mix, market development, product development, brand switching, social marketing, government regulation, competition, and brand loyalty (independent variables) (see Appendix).

3.2. Theoretical Framework and Variables

The variables we have used are described below. Figure 1 illustrates the theoretical framework.

- **POS advertisement** or **brand image** refers to the image the brand portrays and defines the characteristics associated with it. POS advertisement is important because consumers are exposed to it at the point they purchase the product.
- **Promotions** are used to promote sales, and include different techniques such as samples and games. They are used to enhance product/consumer demand and to stimulate market demand or improve product availability.
- **Shelf space** is the space provided by a retailer and is the last point at which the consumer is exposed to the product before purchase.
- **Quality** refers to the quality of the product, including packaging.
- **Customer preference** indicates the choice of a brand relative to its competitors.
- **Competition** refers to the presence of substitutes and other brands of the same product. Competition is influenced by market structure.
- **Customer retention** reflects recurring customers and the firm's ability to maintain a long-term relationship with them. Firms take various steps toward customer retention such as building a strong relationship on the basis of trust, etc.

Figure 1: Theoretical framework



- **Customer satisfaction** refers to the utility a customer gains from his or her consumption of the product. A customer is deemed “satisfied” if the product delivers the utility he or she expects.
- **Government regulation** refers to the policies regarding business operations such as taxes and the laws a company has to follow to do business in the country.
- **Product mix** refers to the bundle of products a company produces to help it generate more profit.
- **Social marketing** and online advertisement refers to the use of the Internet and other social interaction sites to endorse a product and create a market among consumers.
- **Product quality** indicates the characteristics of a product that contribute to its ability to meet the given requirements.
- **Product innovation** refers to the addition of new features to a product or the creation of a new product in the market.

3.3. Research Hypotheses

Our hypotheses are as follows:

- H1: There is a negative relationship between pricing and sales decline.
- H2: There is a positive relationship between brand switching and sales decline.
- H3: There is a negative relationship between POS advertisement and sales decline.
- H4: There is a negative relationship between promotion and sales decline.
- H5: There is a negative relationship between product mix and sales decline.
- H6: There is a positive relationship between quality and sales decline.
- H7: There is a negative relationship between customer preference and sales decline.
- H8: There is a positive relationship between competition and sales decline.
- H9: There is a negative relationship between product development and sales decline.

- H10: There is a negative relationship between government regulation and sales decline.
- H11: There is a negative relationship between market development and sales decline.
- H12: There is a negative relationship between social marketing and sales decline.

3.4. Regression Model

The model we employ is given below:

$$S_t = a_0 + b_{1t}BS_t + b_{2t}POS_t + b_{3t}P_t + b_{4t}Q_t + b_{5t}C_t + b_{6t}CP_t + b_{7t}GR_t + b_{8t}PD_t + b_{9t}MD_t + b_{10t}SM_t + b_{11t}PM_t + b_{12t}PR_t + \varepsilon$$

where S is the dependent variable, i.e., sales, BS is brand switching, POS is POS advertisement, P is pricing, Q is quality, C is competition, CP is customer preference, GR is government regulation, PD is product development, MD is market development, SM is social marketing, PM is product mix, PR is promotions, ε is the error term, a_0 is a constant, t is the current time period, and β is a coefficient.

4. Results

4.1. Results of Qualitative Research

The focus group comprised smokers under the age of 30, who were selected as being the customers on which tobacco companies focus most. Their feedback revealed that they had always smoked the same brand (since they started smoking) because it was affordable and easily available. Most respondents came from a rural background and said they had started smoking as a result of peer pressure. They also thought that aggressive marketing, low pricing, and improved product quality led to increased sales. When asked to comment on the absence of the product in most urban areas, respondents said that it created a false customer perception about the quality of the product.

The semi-structured interviews were conducted with PTC and PMP employees. Noveen Akhtar, a senior trade marketing officer at PTC, was asked why PTC brands were seen as superior to PMP brands. He said that brand loyalty mattered the most in creating value for customers. Aggressive marketing also influenced their decisions. Giving the example of the brand Capstan, he said that PTC had halved the price and re-

launched the brand aggressively. Since then, Capstan sales had soared. As a product of Pall Mall, a renowned brand, people had liked its quality but found the price too high. The CEO had then decided to reduce the price by half. Capstan had taken the lead to the extent that it had even affected other PTC brands. A disadvantage of reducing the price, however, was that people usually perceived low-priced products as inferior in quality.

Usama Sher, a sales manger at PMP, said that new smokers usually started smoking as an experiment, influenced by friends or seeing their peers smoke a certain brand. Most youth smoked premium brands such as Dunhill, Benson, Marlboro, or other imported brands because they felt these products were better than medium Pakistani brands. Since the introduction of pictorial health warnings, an interesting observation was that people had started to give up brands such as Embassy, Morven, and K-2 and had moved to premium or more expensive brands that they perceived as being less damaging than cheaper products.

Bilal Ahmad, a senior trade marketing officer at PMP, said that if a company was unable to provide unique attributes to a product, it would fail to capture the market. Perception, quality, and target markets had remained almost the same for such brands. People were attracted to new flavors and so companies needed to provide variety or put forward unique selling propositions to customers.

4.2. Empirical Results of Quantitative Data

We estimate the model below as follows:

$$S_t = 0.220973 + 0.328446 * BS + 0.118844 * POS + 0.103101 * P + 0.035559 * Q + 0.097060 * C - 0.012802 * CP - 0.011788 * GR + 0.158107 * PD - 0.018275 * MD + 0.004015 * SM + 0.160249 * PM - 0.019661 * P$$

The analysis below is informed by the results obtained from the linear regression model above: of the 12 variables, six are significant (see Table 1).

Table 1: Results of regression model

Variable	Standardized coefficient	t	P-value
(Constant)		1.853	0.067
Brand switching	0.323	5.346	0.000***
POS advertisement	0.126	2.629	0.010***
Price	0.123	2.859	0.005***
Quality	0.043	1.589	0.116
Competition	0.121	4.287	0.000***
Customer preference	-0.016	-0.747	0.457
Government regulation	-0.014	-0.660	0.511
Product development	0.168	4.117	0.000***
Market development	-0.029	-1.547	0.125
Social marketing	0.005	0.268	0.789
Product mix	0.169	4.550	0.000***
Promotion	-0.027	-1.467	0.146

Note: *** = significant at 99%.

Source: Authors' calculations.

BS has a positive p-value of 0.0000, indicating a positive and highly significant relationship with S. This implies that brand switching has a strong, directly proportional impact on sales decline. Customers who change their brand present an opportunity for its competitors. Aggressive marketing in the form of reduced prices, enhanced quality, or a change in customer preferences may compel consumers to switch brands even if most prefer to remain loyal to their initial brand. Companies can protect their customer market through product innovations and by enhancing quality.

POS has a positive p-value of 0.01, indicating a positive and highly significant relationship with S. POS advertisement plays a vital role in sales because it creates a brand image during the consumer's purchase decision and creates further public awareness of the product. However, advertisement of cigarettes is banned in many countries (including Pakistan) and people often ignore advertisements displayed in shops. The restriction on POS advertisement prevents companies from using attractive messages to draw customers.

Although consumer awareness of brand names and product categories is usually passed on easily to customers through POS advertisement, we find that POS has a highly significant and positive

impact on sales decline as a result of excessive advertisement and the emphasis on a negative health image. Brand selection is also affected by word-of-mouth advertisement and peer influence, in turn affecting sales.

P has a positive p-value of 0.0053, which points to a positive and highly significant relationship with S. This implies that customers are influenced by pricing, given that inflation/recession decreases their purchasing power. Pricing usually attracts customers and, in some cases, retains loyal customers. In Pakistan's context, the current price war in the domestic tobacco market accounts for the decline in sales.

C has a positive p-value of 0.0000, indicating a positive and highly significant relationship with S. Competition within the industry affects the sales of cigarettes and firm performance because it influences customer loyalty through price wars. It also brings in innovation and new products, making it difficult for some companies to survive: the first mover has the advantage. Competition is directly proportional to sales decline due to price wars.

PD has a positive p-value of 0.0001, which shows a positive and highly significant relationship with S. Over time, customer preferences, tastes, expectations, and demand change, compelling companies to develop their products further. Consumers demand value for money and new product features, which suggests that product development is essential to creating brand equity and enhancing sales. For instance, the launch of low-tar cigarettes is likely to create consumer hype while failure to do so may cause a decline in sales. Product development is, therefore, directly proportional to sales.

PM has a positive p-value of 0.0000, indicating a positive and highly significant relationship with S. Packaging and size tend to attract customers and increase sales. Improvements in product mix attract new customers while maintaining the loyalty of existing customers, who are likely to value the change, given their long use of the product. Thus, a low product mix is directly proportional to sales decline.

The independent variables that are insignificant are: quality, customer preferences, government regulation, market development, social marketing, and promotion. The value of the adjusted R-squared term is 0.970921 (Table 2), which implies that 97 percent of the dependent variable is explained by the independent variables.

Table 2: ANOVA results

Model	Sum of squares	df	Mean square	F	Sig.
Regression	21.204	12	1.767	276.457	0.000
Residual	0.556	87	0.006		
Total	21.760	99			

Source: Authors' calculations.

5. Discussion

We find that brand switching has a positive and highly significant impact on sales; this result is in line with Sun, Neslin, and Srinivasan (2003). POS advertisement is also positive and highly significant, although Donovan et al. (2002) find that it has a negative relationship with sales decline. This difference may be because some companies are unable to use POS advertising (although it is an effective means even when restricted). It is possible that competitors employ this method for medium-range products in major shops. This implies that firms should focus on aggressively advertising their premium brands. The intensive use of this means of advertising by the beverages industry, for example, coupled with restrictions imposed by the government, implies that the potential of POS advertisement is wasted.

Price is positive and highly significant, although DiFranza et al. (1994) find that it has a negative but significant relationship with sales decline. Although significant, some firms may be unable to respond to their competitors in a price war. In our case, PMP was found to charge higher prices for medium products than PTC.

We find that quality is insignificant, unlike Randall et al. (1998) who present a positive and significant relationship between quality and sales decline. The difference may be a result of different cultural contexts (interviews conducted in the US versus our survey conducted in Pakistan). Competition is positive and highly significant. Polo et al. (2011) support this result, finding that competition has a positive and significant relationship with sales decline.

Customer preference is negative and insignificant. Cho and Pucik (2005), however, find that it has a significant and negative relationship with sales. We find that product development is positive and highly significant, unlike Reed et al. (2006), who show that it has a negative relationship with

sales decline. The positive relationship we find may be because of the fear of losing market share and sales due to lack of product development.

Product mix has a positive and highly significant relationship with sales decline. Polo et al. (2011) show a negative relationship between the two variables. The difference in results could be because PMP has a narrow product line and fewer varieties and flavors. The firm's packaging of its medium brands has remained the same but that of its premium brands has changed, thus attracting new customers and retaining old ones.

6. Conclusion

This study was conducted to determine which factors affect product sales in the tobacco industry, which is becoming increasingly competitive. Consumers have a very high degree of bargaining power due to the large availability of substitutes. Various factors can affect sales, all of which the company must keep in mind to make its own products more profitable. Customers are conscious of a product's value for money and companies thus have to ensure their product meets consumer preferences.

Pricing is a very important marketing pillar. Our results show that products can gain a considerable market share as a result of pricing. When the price of a particular brand was reduced by half, people perceived it to be superior. In countries such as Pakistan, where purchasing power is in constant decline, products such as cigarettes are very sensitive to changes in price. Brand equity is also related to product performance. Customers reported that they were loyal to those brands that provided more product variety.

Sales are expected to contribute to increased market share and the penetration of new markets as firms gain brand loyalty and customer satisfaction. In the case of PMP, we find that the company has failed to provide variety or to reposition its brands. It has thus been unable to utilize marketing tools as effectively as PTC: brands such as K-2 and Morven are still perceived as being lower-class. Lower prices strongly affect the perception of product quality. People tend to prefer older brands of whose quality they are sure. This indicates that firms should pay more attention to such issues and improve the segment and public image of their products.

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Appendix

Questionnaire

1. What is your gender?
 - Male
 - Female
2. What is your age?
 - 18 to 25
 - 26 to 33
 - 34 to 41
 - 42 to 49
 - 50 or above
3. What is your salary?
 - 15,000 to 25,000
 - 26,000 to 36,000
 - 37,000 to 47,000
 - 48,000 to 58,000
 - 59,000 or above

4. Do you think that sales decline affects business?

1	2	3	4	5
Disagree strongly	Disagree slightly	Neutral	Agree slightly	Agree strongly

5. Do you think a decrease in sales and brand switching is due to reduced customer loyalty?

1	2	3	4	5
Disagree strongly	Disagree slightly	Neutral	Agree slightly	Agree strongly

6. Does point-of-sale advertising affect the sale of a product?

1	2	3	4	5
Disagree strongly	Disagree slightly	Neutral	Agree slightly	Agree strongly

7. Do you think the low pricing of Red & White, Morven Gold, and K-2 by PMP is an effective strategy?

1	2	3	4	5
Disagree strongly	Disagree slightly	Neutral	Agree slightly	Agree strongly

8. How satisfied are you with the overall product quality of Red & White, Morven Gold, and K-2?

1	2	3	4	5
Disagree strongly	Disagree slightly	Neutral	Agree slightly	Agree strongly

9. Are customer satisfaction and product quality directly proportional to competition?

1	2	3	4	5
Disagree strongly	Disagree slightly	Neutral	Agree slightly	Agree strongly

10. Are changing customer preferences and taste directly proportional to sale decline?

1	2	3	4	5
Disagree strongly	Disagree slightly	Neutral	Agree slightly	Agree strongly

11. Do you think government policies and taxes etc. affect sales?

1	2	3	4	5
Disagree strongly	Disagree slightly	Neutral	Agree slightly	Agree strongly

12. Are you satisfied with the PMP product with respect to packing, label, and size (product mix)?

1	2	3	4	5
Disagree strongly	Disagree slightly	Neutral	Agree slightly	Agree strongly

13. Do you think that diversification or market development leads to increased sales and profits?

1	2	3	4	5
Disagree strongly	Disagree slightly	Neutral	Agree slightly	Agree strongly

14. Do you think that social marketing helps increase product sales?

1	2	3	4	5
Disagree strongly	Disagree slightly	Neutral	Agree slightly	Agree strongly

15. Do you think PMP should introduce new flavors and low-tar cigarettes (product mix)?

1	2	3	4	5
Disagree strongly	Disagree slightly	Neutral	Agree slightly	Agree strongly

16. How satisfied are you with PMP's sales promotions for its products?

1	2	3	4	5
Disagree strongly	Disagree slightly	Neutral	Agree slightly	Agree strongly

Source: Based on D. J. Faulds, W. G. Mangold, & P. S. Raju. (2009). Big Red, Ltd. *Journal of Business Case Studies*, 5(5), 29-54.

Assessing the Financial Performance of Investment Banks in Pakistan During the Current Financial Crisis

Mirza Asjad Baig,* Muhammad Ali Usman, Mirza Owais Baig*****

Abstract

Investment banks play a vital role in the economic development of a country through their impact on capital and money markets. In developing countries, they promote and support business investors in bringing about economic stability. The investment banking industry faced significant challenges as a result of the financial crisis in 2008. This study presents a detailed financial analysis of the recent performance of seven investment banks in Pakistan for the period 2007–11 with the help of financial ratios. The banks were assessed across several perspectives: profitability, efficiency, liquidity, leverage, and other financial measures such as institution size. Our findings show that all banks faced a significant squeeze on profitability, although the smaller banks performed better overall. This implies that successful performance does not necessarily depend on economies of scale.

Keywords: Investment banks, financial ratios, financial crisis, economic instability.

JEL classification: G32, G01, O16, G24.

1. Introduction

The banking sector plays a vital role in the development and welfare of a society, and are especially important for a healthy economy among developed countries. During the 18th century, industries expanded their business and trading activities with the beginning of large-scale production. The banking industry became important in promoting business operations as an essential facility. In today's global market, it is necessary for the banking sector to provide quality products/services and focus on customer satisfaction to augment its performance. Financial systems are important for sustainable economic development as they facilitate the mobilization of

* The author is based at the Economics Department, Institute of Business Management, Karachi.

** The author is based at the Finance Department at Middlesex University in the UK.

*** The author is based at the Finance Department at GBC, Karachi.

funds. Today's uncertain economic (micro and macro) environment requires effective and efficient financial systems for production and a competitive market to help economic transactions and retain a healthy relationship with investors. The allocation of resources becomes possible through the availability of an efficient and stable financial system, which improves the financial performance of organizations.

Pakistan's investment banking sector developed in the 1980s. Realizing the need for investment banking services, policymakers issued a charter for investment banks that visualized a wide range of business services, including capital and money market activities, corporate financial services, project financing, and money market operations. These banks performed well and continued to flourish till the mid-1990s, their growth bolstered by favorable economic conditions, the stock market boom, and broad-ranging financial liberalization measures.

Investment banks play a key role in capital formation, which is vital for breaking the vicious circle of poverty. They help government and corporate agencies raise funds by selling and issuing securities in a primary market; they also help private and public investors create wealth when investing in the capital market. Recently, the services provided by commercial and investment banks have begun to overlap. Greater competition within the banking sector has meant that investment banks are less able to generate fees and interest income from the advisory and financing services they provide. Our aim is to conduct a detailed financial analysis of the recent performance of investment banks in Pakistan during the global economic recession. The study has the following objectives:

- To identify which bank-specific factors affect the efficiency and performance of investment banks in the literature
- To evaluate their performance across several financial perspectives, such as profitability, efficiency, liquidity, and leverage.

2. Literature Review

Athanasoglou, Delis, and Staikouras (2006) have conducted a panel study on the profitability of credit institutions in southeastern Europe for the period 1988–2002. They find that bank-specific internal factors such as loans, assets, deposits, equity, capital ratio, credit risk, productivity growth, and size significantly affect a bank's profitability. However, the authors do not establish a positive or direct link between profitability and banking

reforms although some macroeconomic determinants, such as the economic and legal environment, do indicate mixed effects.

Amor-Tapia, Tascón, and Fanjul (2006) examine banking efficiency for a sample drawn from the Organization for Economic Co-operation and Development (OECD). They find that the profitability of commercial banks in the OECD countries depends on a higher leverage ratio. Thus, profitability improves with a lower overheads ratio by reducing the type of costs, which is generally considered to signal efficiency.

Vong and Chan (2006) examine the impact of internal and external banking determinants on Macao's banking industry over a 15-year period. Their results suggest that only highly capitalized banks are associated with low-risk high profitability. Larger banking networks also tend to be more profitable than smaller ones. Bank profitability is influenced by loan-loss provisions as well. Athanasoglou, Brissimis, and Delis (2008) carry out an empirical study to determine the impact of bank- and industry-related macroeconomic factors on the profitability of Greek banks. Their outcomes reveal that the equity-to-asset ratio is an important indicator in explaining bank profitability, while high credit risk can cause a decline in profit.

Abreu and Mendes (2002) consider the interest margins and profitability of different European banks for the period 1986–99. They conclude that highly capitalized banks have higher interest margins and lower bankruptcy costs. Al-Hashimi (2007) studies net interest rate margins for banks across 10 sub-Saharan African countries and finds that deviations across the region are explained by credit risk and insufficient operational practices. Macroeconomic risks, however, have a limited effect on net interest rate margins.

Naceur (2003) analyzes the determinants of profitability for the Tunisian banking sector over the period 1980–2000. The study emphasizes the correlation between profitability and high net interest margins and their association with large volumes of capital and large banking overheads. Loans and bank size have a positive and negative impact, respectively, on profitability. However, Hassan and Bashir (2003) and Staikouras and Wood (2003) find that higher loan ratios have a negative impact on profits.

Berger and Humphrey (1997) examine more than 100 studies on 21 different countries that apply frontier efficiency analysis to financial institutions. They find that the per-unit costs of labor and physical capital

are significantly correlated while natural differences exist in banks' operational efficiency across Asian countries. Kwan (2003) reports that a small number of banks dominate the industry in Asian countries, which is why researchers tend to rely on fewer observations and study the banking efficiency of a specific country. The operating costs of Asian banks declined over 1992–97, which, in turn, improved their operating performance.

Bourke (1989) and Molyneux and Thornton (1992) associate better quality management with profitability as well as with external factors such as the interest rate, inflation, and cyclical output, and on market characteristics such as ownership size and industry size.

The performance of an organization depends on certain factors such as market share, cost reduction, and profitability. Financial indicators that reflect performance include earnings per share (EPS), return on investment (ROI), return on equity (ROE), operating cash flows, and return on invested capital. Corporations measure their performance based on these markers (Sørensen, 2002). Rashid, Sambasivan, and Johari (2003) evaluate the financial performance of corporations based on the current ratio, ROI, and return on assets (ROA), and find that it has increased in the last few years. Ho and Wu (2006) use firms' financial statements to study a range of financial ratios, including profitability, liquidity, leverage, asset utilization, and growth.

Khawaja and Din (2007) use cross-sectional data to examine the factors determining interest spread in Pakistan's banking sector. They apply generalized least squares to various factors such as market share, equity, nonperforming loans, liquidity, administrative costs, interest rates, GDP growth, and inflation. The study does not find any evidence that interest spread affects the performance of the banking industry.

Raza, Farhan, and Akram (2011) observe that effective and efficient operations are a key element in assessing firm performance as they have a direct impact on survival. They classify investment banks in Pakistan based on their financial ratios over the period 2006–09. Rehman and Raof (2010) assess a sample of public, private, and foreign banks for the period 1998–2007, based on data envelopment analysis, and conclude that the efficiency of Pakistan's banking sector matches that of global banks. Akhtar (2002) has carried out a similar study, using deposits and capital as inputs and investment portfolios, loans, and advances as outputs.

Rizvi (2001) studies the productivity of the banking sector in Pakistan over the period 1993–98. Using data envelopment analysis, he determines the efficiency of the sector and finds that its total factor productivity is exhausted. However, domestic banks appear to operate better than foreign banks. Ataullah, Cockerill, and Le (2004) carry out a comparative analysis of commercial banks in Pakistan and India for the period 1988–98. They find that efficiency scores in an income-based model are much lower than in a loan-based model and suggest that both countries' banking systems still have ample room for improving their efficiency levels.

Burki and Niazi (2003) examine the impact of financial reforms on the efficiency of state-owned, private, and foreign banks in Pakistan, using data on 40 banks for the period 1991–2000. They suggest that factors such as bank size, the ration of interest income to earning assets, and the loans-to-deposits ratio have a positive impact on efficiency.

Using ANOVA, Tukey's HSD test, and Levene's test, Ali, Yahya, Nauman, Raza, and Gilani (2012) determine whether investment banks in Pakistan earned a profit during the period 2001–11. The study employs financial indicators such as equity, paid-up capital, total shares, taxation, total assets, and profitability. The authors conclude that investment banks have played a vital role in enhancing economic activity in Pakistan. Rehman, Fatima, and Ahmad (2011) explore the relationship between variables such as economic growth, lending, savings, inflation, the real interest rate, and deposits for the period 1973–2008. Applying regression analysis, they conclude that financial reforms have had a positive impact on Pakistan's economic growth.

Gul, Irshad, and Zaman (2011) examine the relationship between bank-specific and economic indicators, using data for the period 2005–09. Employing pooled ordinary least squares, they present strong evidence that both internal and external factors (loans, assets, deposits, equity, economic growth, inflation) affect profitability (ROA, ROE, net interest margins, and return on capital employed [ROCE]) in Pakistan. Aurangzeb (2012) applies ordinary least squares to data on deposits, investment, advances, profitability, and interest earnings for 1981–2010, and concludes that all these variables have a positive and significant impact on economic growth.

Akmal and Saleem (2008) investigate banking efficiency in Pakistan for the period 1996–2005, based on a sample of 30 commercial banks (state-owned, foreign, and private). Applying a two-stage data envelopment

analysis, they find that, in the last 10 years, total productivity has grown by only 5 percent as against the large growth in technology; this is very low compared to other sectors of the economy. Nasir and Khalid (2004) analyze patterns of investment and savings, applying ordinary least squares to data for 1971–2003. They show that government expenditure, the GDP growth rate, and growth in remittances have a positive and significant impact on national savings.

3. Methodology

The study's methodology uses financial ratios to examine the average efficiency and performance of investment banks in Pakistan. Much of the literature has looked at several aspects of banking, such as operations, financing products, efficiency, and financial performance (see, for example, Short, 1979; Bourke, 1989; Molyneux & Thornton, 1992; Demirgüç-Kunt & Huizinga, 2000; Bikker & Hu, 2002; Berger & Humphrey, 1997; Barajas, Steiner, & Salazar, 1999).

Currently, 20 investment banks (see Appendix) operate in Pakistan; of these, nine are listed on the Karachi Stock Exchange. We have selected seven¹ of the nine listed² investment banks based on size and public availability of data. Accordingly 35 percent of the total population is taken as a sample (i.e., seven banks out of 20).

This study is based on a secondary dataset that covers a five-year period from 2007 to 2011 for a sample of seven investment banks. The data were taken from the annual reports/financial statements of the individual banks and used to compute a range of financial ratios that reflect profitability, liquidity, leverage, and financial efficiency. These are, in turn, used to analyze the average financial performance of the sample banks during the financial crisis from 2007 to 2011. Following Ali et al. (2012), we use ROE, ROA, EPS, ROCE, the current ratio, capital ratio, total equity, and total assets; additionally, we employ the debt-to-asset, debt-to-equity, and asset turnover ratios and net profitability.

¹ Security Investment Bank, Trust Investment Bank, First Dawood Investment Bank, First Credit Investment Bank, Escorts Investment Bank Ltd, IGI Investment Bank Ltd, and Invest Capital Investment Bank Ltd.

² <http://www.kse.com.pk/>

4. Results

Table 1 compares the average financial ratios of the seven listed investment banks over 2007–11. In terms of average total assets, the top four banks are IGI, First Dawood, Trust Investment Bank, and Invest Capital. During 2007–11, all seven banks' performance was greatly affected by the global financial crisis. The three smaller banks—First Credit, Escorts, and Security—suffered smaller losses than the other larger banks. Based on average operating profit, Invest Capital performed best while First Dawood fared the worst.

All seven banks' average ROA (profitability ratio) follows a negative trend due to fluctuations in their main business operations. First Capital and First Dawood have a higher ROA than the other investment banks. First Credit (a small bank) has a higher average ROE than the larger banks; small banks appear to handle their expenditure more efficiently than larger banks. The declining trend in net income affects EPS, indicating that small banks' EPS is higher than that of larger banks. Larger banks have a better average operating profit margin, suggesting that the higher the margin, the better will be the bank's performance.

The asset turnover ratio (financial efficiency) follows a positive trend for all seven investment banks, but the smaller banks have a higher level of financial efficiency and also maintain a reasonable average current ratio (liquidity ratio) throughout the period. All the investment banks were able to meet their financial obligations to creditors. The average capital ratio (leverage ratio) of the smaller banks suggests that they were financially more stable over the five-year period. The leverage ratio indicates that Trust (a large bank) and Security (a small bank) financed their equity and assets ratio largely using their total liabilities.

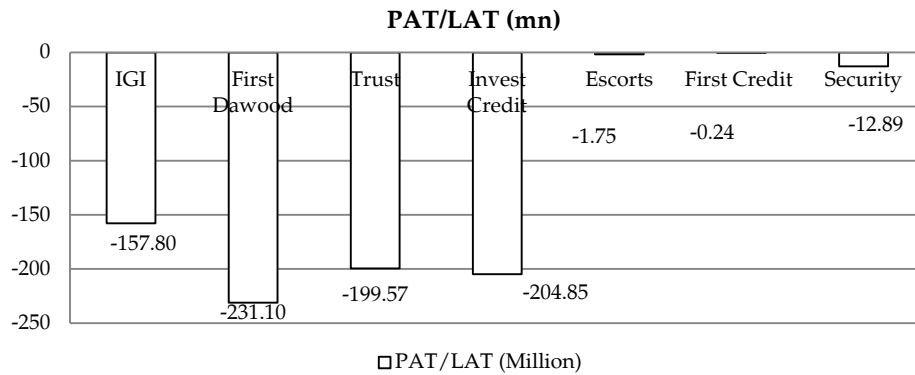
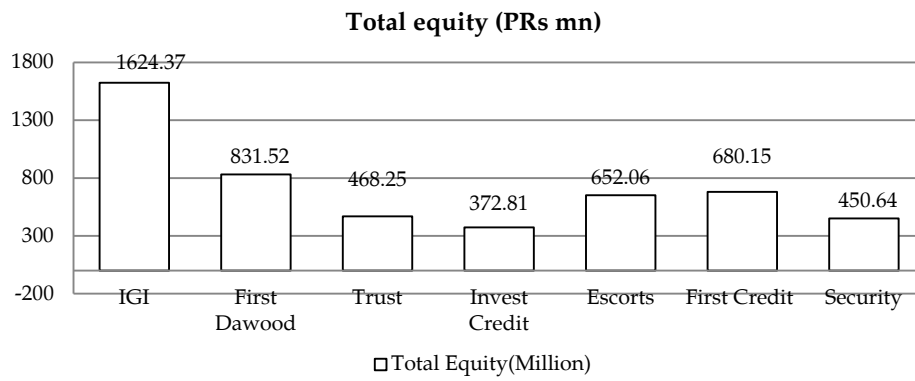
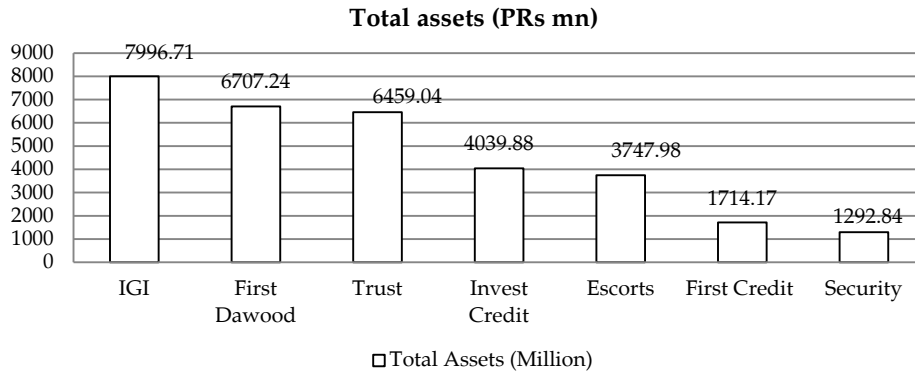
Table 1: Indicators for investment banks (average value for 2007–11)

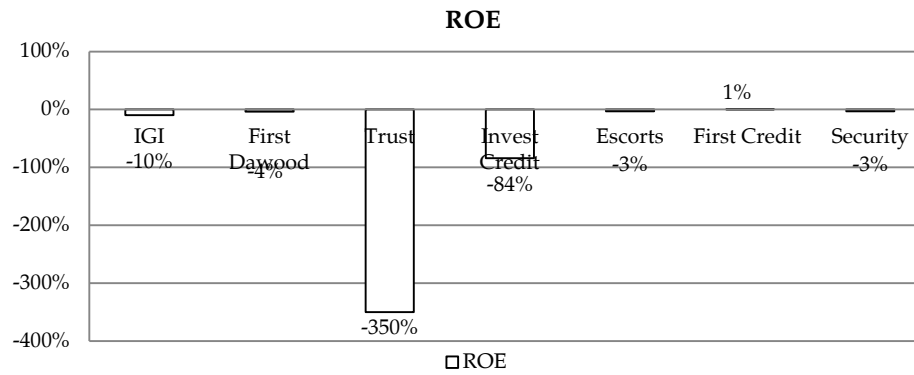
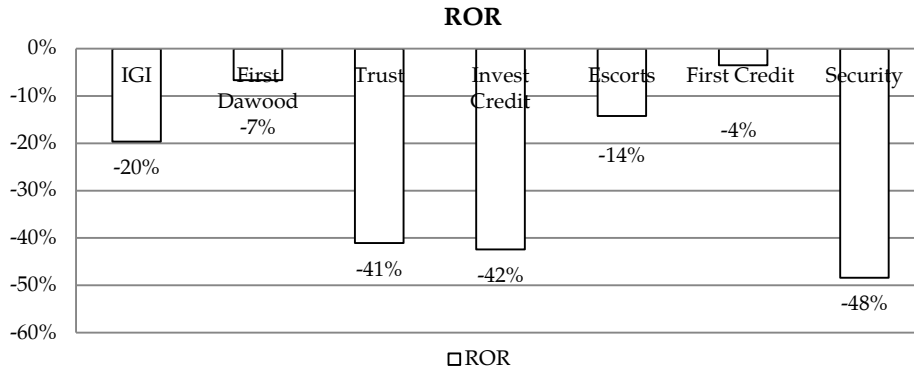
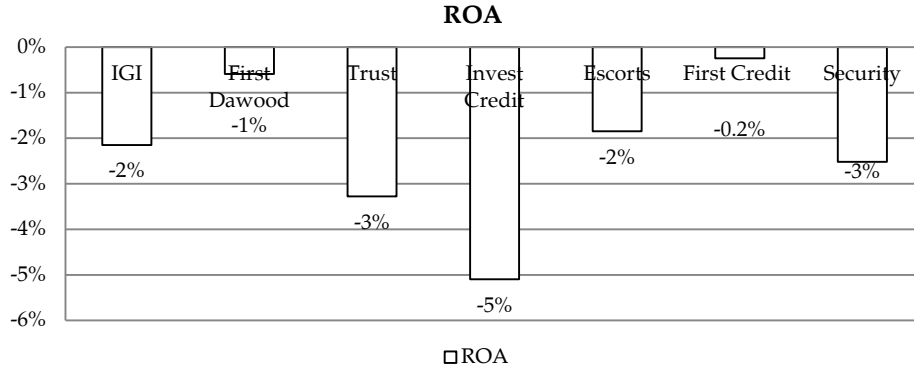
Financial ratio	IGI	First Dawood	Trust	Invest Capital	Escorts	First Credit	Security
Total equity (PRs mn)	1,624.37	831.52	468.25	372.81	652.06	680.15	450.64
Total assets (PRs mn)	7,996.71	6,707.24	6,459.04	4,039.88	3,747.98	1,714.17	1,292.84
PAT/LAT (PRs mn)	-157.80	-231.10	-199.57	-204.85	-1.75	-0.24	-12.89
ROA	-2.1	-0.6	-3.3	-5.1	-1.8	-0.2	-2.5
ROE	-9.7	-3.7	-350.1	-84.2	-3.3	0.5	-3.2
ROR	-19.7	-6.7	-41.1	-42.4	-14.2	-3.5	-48.4
Capital ratio	20.4	15.8	6.7	11.7	20.9	40.8	40.7
EPS/loss per share	-84.0	-63.7	-340.8	-36.6	-113.1	13.5	-18.1
ROCE	-8.7	-2.5	-15.4	-36.0	-3.1	-0.2	4.1
Asset turnover ratio (times)	0.09	0.08	0.10	0.09	0.12	0.10	0.11
Current ratio (times)	1.05	1.16	1.0	1.03	1.08	1.01	1.4
Debt to equity	412.6	533.5	4,297.5	439.7	439.2	162.8	847.6
Debt to assets	79.6	84.2	93.3	88.2	79.1	59.2	201.2
Operating profit ratio	-27.0	-133.0	-57.6	3.0	-23.2	-5.8	-53.0

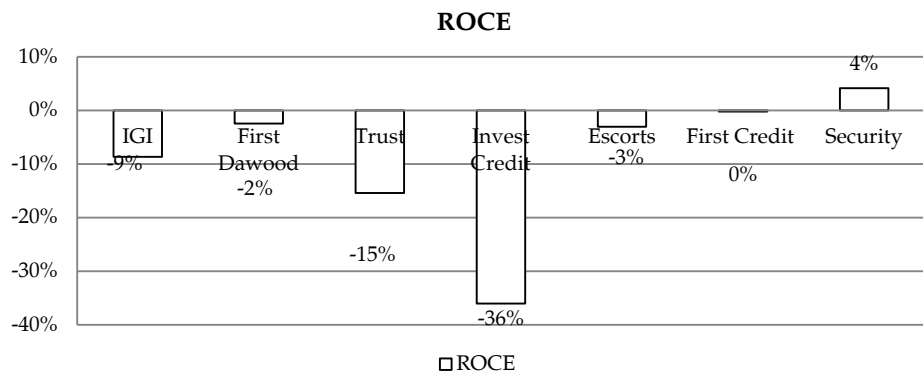
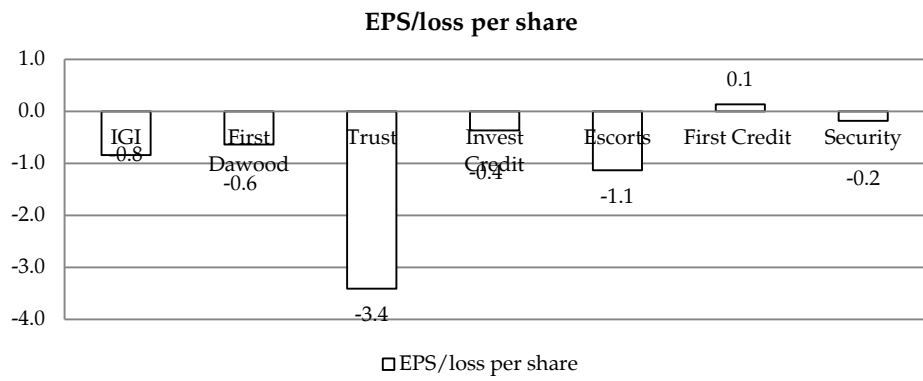
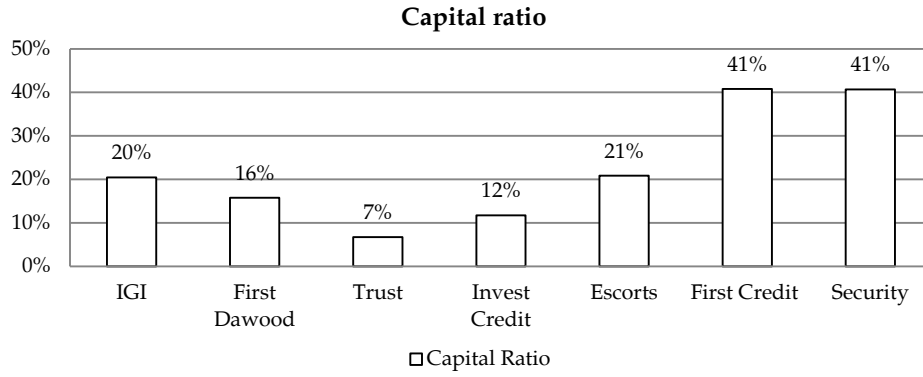
Note: All values given in percent unless otherwise stated. The average value of financial ratios was obtained by computing the ratio for each investment bank over the period 2007–11 (see Appendix).

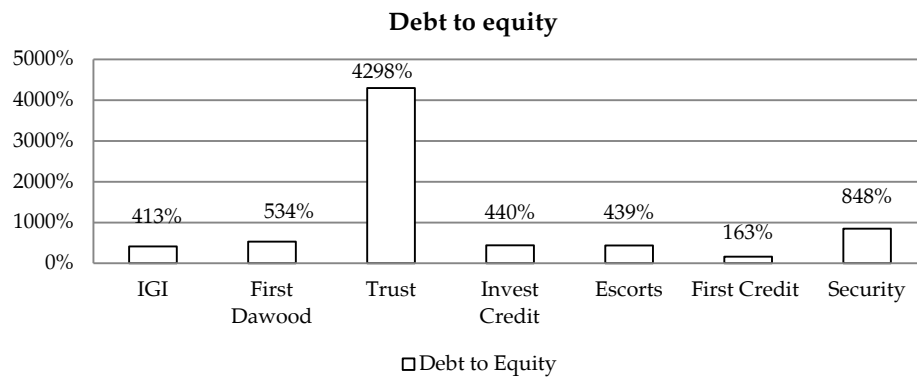
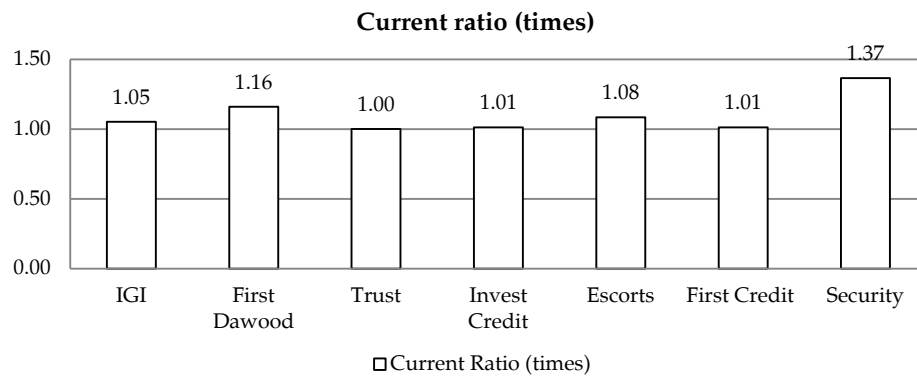
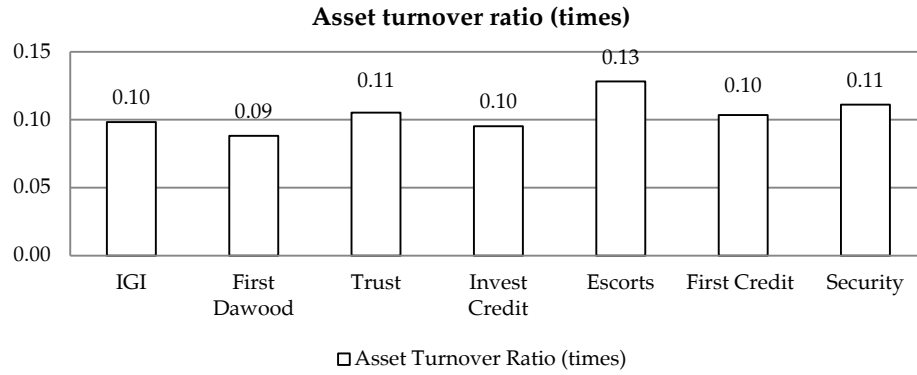
Source: Authors' calculations.

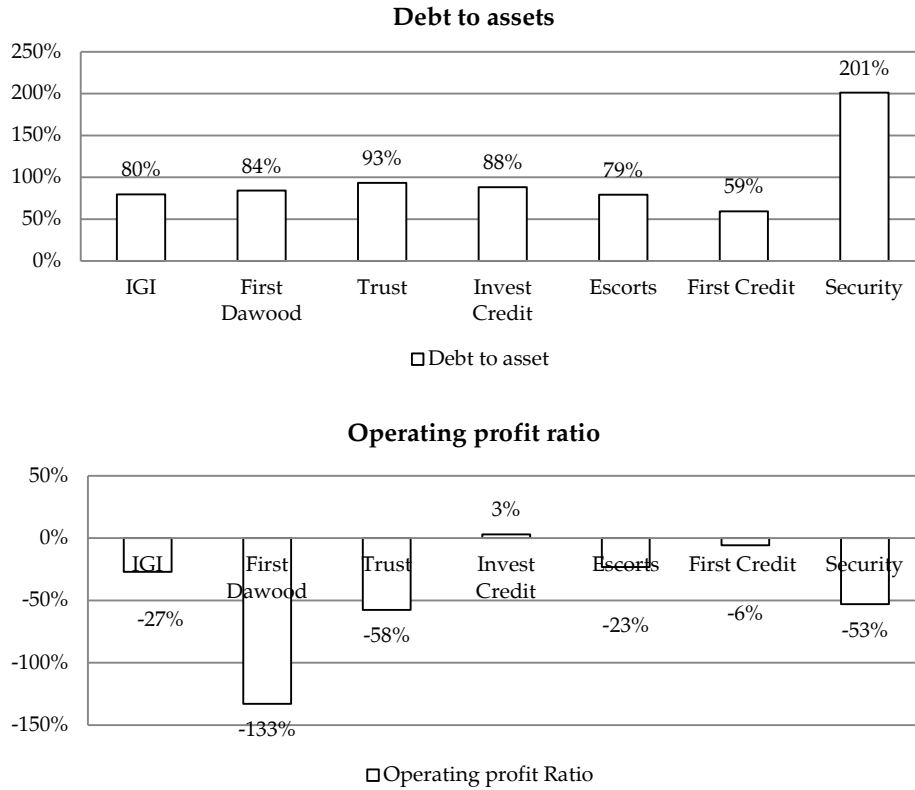
Figures 1a–n: Indicators for investment banks (average value for 2007–11)











Both the domestic and global economy faced enormous challenges during 2008–11. The period was marked by worsening international recessionary trends, an increase in the tax base, deteriorating law and order (especially in the north), a worsening geopolitical situation, high inflation, a lack of new investment, acute power shortages, and devastating floods. Additionally, the economy faced an increased current account deficit, rapidly shrinking foreign exchange reserves, slow capital flows, and a tight monetary stance. The closure of the country’s stock exchanges for over 100 days set a new negative world record and was associated with falling investment, low growth, and rising total debt, all of which had a negative impact on the local economy.

These factors led to a serious liquidity crunch in the country and a wave of defaults spread across the financial sector, increasing nonperforming loans to unprecedented levels. Nonbank financial institutions, which depend on resources borrowed from commercial banks, were deprived of fresh funds and their business cycles disrupted.

Overall, economic activity in the country was seriously affected during this period, discouraging investors. The pace of business activities slowed down because of the uncertain political and economic situation, while below-expectation macroeconomic figures also kept investors at bay. The financial markets reflected the state of the economy and were unable to sustain their resilience against the uncertainty of the political situation.

5. Conclusion and Recommendations

We have examined the financial performance and efficiency of investment banks in Pakistan, using a set of financial ratios for the five-year period 2007–11. The key financial ratios for each bank show that all banks suffered a significant squeeze on profitability during the financial crisis. However, the four larger banks in the sample were affected more than the three smaller banks. Bank size appears to play an important role in performance and efficiency in times of financial crisis. All seven banks maintained a reasonable average current ratio throughout the period, indicating that they were able to meet their financial obligations to creditors.

Our analysis shows that smaller investment banks perform better (in terms of lower losses) during a financial crisis, implying that success does not necessarily depend on economies of scale. We therefore recommend that banks focus on strategies to improve their performance, irrespective of size.

Although the outcomes achieved in this study may be acceptable in light of earlier studies, some limitations still apply. First, we have considered only a five-year period, which might not provide an accurate picture, especially of the pre-crisis period. Second, other variables that could have been incorporated include external factors that have a significant impact on bank performance. Third, the small sample size may have affected the validity of the results. Further studies in this area could extend the present study by comparing its results with financial sector averages and exploring the differences to derive further insight.

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Appendix

List of investment banks in Pakistan

No.	Name of investment bank	KSE
1	<i>Dawood Investment Bank Ltd</i>	<i>Listed</i>
2	<i>First Credit Investment Bank</i>	<i>Listed</i>
3	Al-towfeek Investment Bank Ltd	
4	Ammar Investment Bank Ltd	
5	Asset Investment Bank	
6	Atlas Investment Bank Ltd	
7	Crescent Investment Bank Ltd	
8	<i>Escorts Investment Bank Ltd</i>	<i>Listed</i>
9	Fidelity Investment Bank Ltd	
10	First International Investment Bank Ltd	
11	Franklin Investment Bank Ltd	
12	<i>IGI Investment Bank Ltd</i>	<i>Listed</i>
13	<i>Invest Capital Investment Bank Ltd</i>	<i>Listed</i>
14	Islamic Investment Bank Limited	
15	Jehangir Siddiqui Investment	<i>Listed</i>
16	National Investment Trust Ltd	
17	Orix Investment Bank Ltd	
18	Prudential Investment Bank	<i>Listed</i>
19	<i>Security Investment Bank</i>	<i>Listed</i>
20	<i>Trust Investment Bank</i>	<i>Listed</i>

Source: <http://www.globalbankingandfinance.com/Resources/List-Of-Investment-Banks-In-Pakistan.html>

KSE-listed investment banks in Pakistan

No.	Name of listed investment bank	Total assets
1	Dawood Investment Bank Ltd	148,239,234
2	First Credit Investment Bank	1,517,876,632
3	Escorts Investment Bank Ltd	2,364,875,518
4	IGI Investment Bank Ltd	9,314,957,000
5	Invest Capital Investment Bank Ltd	358,3982,000
6	Jehangir Siddiqui Investment	5,175,200 a
7	Prudential Investment Bank	Not available
8	Security Investment Bank	940,103,374
9	Trust Investment Bank	5,380,636,427

Note: a = value obtained from 2006 annual report.

Financial analysis of investment banks in Pakistan

Ratio	2007	2008	2009	2010	2011	Average
<i>Dawood Investment Bank</i>						
Total equity (PRs mn)	1,685.5	1,779.0	-518.7	620.7	591.1	831.5
Total assets (PRs mn)	12,362.6	11,064.2	5,136.4	3,148.1	1,824.9	6,707.2
PAT/LAT (mn)	188.5	113.7	-1,791.4	377.7	-44.0	-231.1
ROA	2	1.0	-35	12	-2	-0.6
ROE	11	6.4	345	61	-7	-3.7
ROR	15	8	-762	129	-23	-6.7
Capital ratio	14	16	-10	20	32	0.16
EPS/loss per share	3.31	2.00	-28.59	6.03	-0.33	-63.7
ROCE	5	1	-227	13	1	-2.5
Asset turnover ratio (times)	0.10	0.13	0.05	0.09	0.11	0.09
Current ratio (times)	1.11	1.22	0.79	1.75	1.98	1.16
Debt to equity	633	522	-1090	407	209	533.5
Debt to assets	86	84	110	80	68	84.2
Operating profit	14	2	-768	80	7	-133
<i>First Credit Investment Bank</i>						
Total equity (PRs mn)	547.5	550.2	786.2	801.5	715.4	680.1
Total assets (PRs mn)	2,058.5	1,729.3	1,800.5	1,464.7	1,517.9	1,714.2
PAT/LAT (mn)	55.7	16.0	7.7	7.9	-88.5	-0.2
ROA	3	1	0.4	1	-6	-0.2
ROE	10	3	1	1	-12	0.5
ROR	29	9	4	5	-64	-3.5
Capital ratio	27	32	44	55	47	40.8
EPS/loss per share	1.39	0.40	0.12	0.12	-1.36	13.5
ROCE	8	4	2	1	-15	-0.2
Asset turnover ratio (times)	0.09	0.10	0.12	0.11	0.09	0.10
Current ratio (times)	0.98	0.92	0.82	1.17	1.18	1.01
Debt to equity	276	214	129	83	112	162.8
Debt to assets	73	68	56	45	53	59.2
Operating profit	30	14	6	20	-99	-5.8
<i>Escorts Investment Bank Limited</i>						
Total equity (PRs mn)	798.1	848.3	604.7	524.8	484.4	652.1
Total assets (PRs mn)	5,934.7	6,496.9	2,107.6	1,825.0	2,375.7	3,748.0
PAT/LAT (mn)	130.2	137.8	-166.2	-79.4	-31.1	-1.8
ROA	2	2	-8	-4	-1	-2
ROE	16	16	-27	-15	-6	-3
ROR	15	16	-47	-44	-13	-14

Ratio	2007	2008	2009	2010	2011	Average
Capital ratio	13	13	29	29	20	21
EPS/loss per share	0.31	0.31	-3.77	-1.80	-0.70	-113
ROCE	8	5	-15	-8	-6	-3
Asset turnover ratio (times)	0.14	0.13	0.17	0.10	0.10	0.13
Current ratio (times)	1.20	1.14	1.14	0.97	0.97	1.08
Debt to equity	644	666	249	248	390	439
Debt to assets	87	87	71	71	80	79
Operating profit	17	9	-83	-45	-14	-23

IGI Investment Bank Limited

Total equity (PRs mn)	1,049.6	2,182.2	1,867.5	1,604.9	1,417.7	1,624.4
Total assets (PRs mn)	6,649.0	9,831.4	6,548.7	8,233.4	8,721.1	7,996.7
PAT/LAT (mn)	-39.2	-6.4	-375.1	-199.4	-169.0	-157.8
ROA	-1	-0.1	-6	-2	-2	-2.15
ROE	-4	-0.3	-20	-12	-12	-9.69
ROR	-7	-1	-49	-24	-18	-19.65
Capital ratio	16	22	29	19	16	20.45
EPS/loss per share	-0.64	-0.06	-1.77	-0.94	-0.80	-0.84
ROCE	-2	-1	-18	-17	-5	-8.68
Asset turnover ratio (times)	0.09	0.08	0.12	0.10	0.11	0.10
Current ratio (times)	1.16	1.13	1.01	0.96	1.01	1.05
Debt to equity	534	351	251	413	515	413
Debt to assets	84	78	71	81	84	80
Operating profit	-14	-6	-59	-46	-10	-27

Invest Capital Investment Bank Limited

Total equity (PRs mn)	432.8	570.7	998.6	234.0	-372.0	372.8
Total assets (PRs mn)	1,859.6	2,028.2	7,847.0	4,880.5	3,584.0	4,039.9
PAT/LAT (mn)	17.9	-19.5	165.4	-748.9	-439.1	-204.8
ROA	1	-1	2	-15	-12	-5
ROE	4	-3	17	-320	-118	-84
ROR	8	-7	114	-116	-212	-42
Capital ratio	23	28	13	5	-10	12
EPS/loss per share	0.51	-0.08	1.91	-2.63	-1.54	-37
ROCE	8	-1	6	-60	-134	-36
Asset turnover ratio (times)	0.12	0.15	0.02	0.13	0.06	0.10
Current ratio (times)	1.13	1.13	1.02	0.94	0.84	1.01
Debt to equity	330	255	686	1,986	-1,058	440
Debt to assets	77	72	87	95	110	88
Operating profit	15	-2	121	-109	-10	3

Security Investment Bank

Ratio	2007	2008	2009	2010	2011	Average
Total equity (PRs mn)	592.6	304.4	450.7	452.5	453.0	450.6
Total assets (PRs mn)	2,802.1	931.5	959.5	835.6	935.5	1,292.8
PAT/LAT (mn)	89.2	26.6	-192.7	9.8	2.6	-12.9
ROA	3	3	-20	1	0.3	-2.52
ROE	15	9	-43	2	1	-3.24
ROR	28	14	-300	12	4	-48.39
Capital ratio	21	33	47	54	48	40.67
EPS/loss per share	2.08	0.52	-3.75	0.19	0.05	-0.18
ROCE	16	9	-5	1	0	4
Asset turnover ratio (times)	0.11	0.21	0.07	0.10	0.07	0.11
Current ratio (times)	1.18	1.13	1.47	1.58	1.47	1.37
Debt to equity	3,728	206	113	85	107	848
Debt to assets	788	67	53	46	52	201
Operating profit	31	14	-315	4	1	-53
<i>Trust Investment Bank</i>						
Total equity (PRs mn)	1,022.7	982.6	160.1	48.1	127.8	468.2
Total assets (PRs mn)	6,443.7	8,089.4	6,475.3	5,906.2	5,380.6	6,459.0
PAT/LAT (mn)	103.0	149.8	-715.2	-701.8	166.4	-199.6
ROA	2	2	-11	-12	3	-3
ROE	10	15	-447	-1,459	130	-350
ROR	14	16	-107	-156	27	-41
Capital ratio	16	12	2	1	2	7
EPS/loss per share	1.76	2.56	-12.22	-11.99	2.84	-341
ROCE	3	2	-44	-49	10	-15
Asset turnover ratio (times)	0.11	0.12	0.10	0.08	0.11	0.11
Current ratio (times)	1.15	0.91	0.95	0.94	1.06	1.00
Debt to equity	530	723	3,944	12,180	4,109	4,298
Debt to assets	84	88	98	99	98	93
Operating profit	16	7	-141	-200	30	-58

Note: All values given in percent unless otherwise stated.

Source: Authors' calculations.

The Effect of PBL and 21st Century Skills on Students' Creativity and Competitiveness in Private Schools

Amina Talat* and Hina Fakhar Chaudhry

Abstract

In an environment of slow economic growth where many businesses have failed, one sector that has done exceedingly well is the private education business. This study examines the effect of project-based learning (PBL) and 21st century skills on students' creativity and competitiveness in private schools in Lahore. Today, enhancing 21st century skills to make students more competitive in an external environment is key to education systems around the world. The PBL framework also supports children's social and personal development. We have used primary research methods to survey teachers at a range of private schools. The results show that 21st century skills embedded in the PBL framework have a positive impact on students' creativity and competitiveness. Social development influences creativity and competitiveness the most while personal development is the least influential factor.

Keywords: PBL, 21st century skills, communication, collaboration, critical thinking, student creativity, student competitiveness, social development, personal development.

JEL classification: M10, M19, M29.

1. Introduction

The private sector has played an important role in the education sector in Pakistan. Following the Bhutto government's nationalization drive in the 1970s, the public school system broke down. The sector faced numerous problems, including insufficient funds, inefficient program implementation, and poor-quality management and teaching (Memon, 2007). This situation created a lucrative business opportunity for the private sector. The 1970s and 1980s saw many school systems mushroom across the country, notably the Beaconhouse School System, the City School, the Lahore University of Management Sciences, the Punjab Colleges Group, and the Roots School System (Dar, 2012).

* The author is an assistant professor at the Lahore School of Economics.

Rapid social and technological development in today's knowledge society has changed the dynamics of the working environment, the structure of educational institutions, and ways of collaboration. This requires students to develop new skills to successfully face such challenges. Bondelli (2007) argues that traditional educational systems relied wholly on intellectual learning and excluded experiential learning, which allows students to explore and learn by doing (e.g., a child who sows a seed and observes how it grows learns to identify the life cycle of the plant).

Supporting the philosophy of 'learning by doing' is the Reggio Emilia approach (Hewett, 2001), which holds that children have control over their learning path: they learn and express themselves through touch, movement, observation, and sound. This approach has been adopted by many educational institutions worldwide under the unique program of project-based learning (PBL). PBL encompasses performance-based assessment, the classroom environment, and a student-driven-teacher-facilitated learning relationship. Bell (2010) describes PBL students as those that drive their own lines of inquiry, work collaboratively to seek viable solutions using advanced technology, and communicate their findings to the relevant audience.

Today, enhancing 21st century skills to make students more competitive in an external environment is key to education systems around the world. The concept of 21st century skills is not new, but the practice of explicitly aligning these skills with the designed curricula and education policies is relatively recent. Critical thinking skills are highlighted in particular as an end per se to gain the desired educational and employment outcomes identified by Miller, Sadler, and Mohl (1993). To prepare their pupils for work and life in the 21st century, educators must cultivate their creativity and align assessment with learning outcomes. Moreover, while technology is often emphasized as a 21st century teaching aid, it should not be at the expense of the social and behavioral aspects on which 21st century professional skills are based.

2. Research Objectives

Given that the literature highlights the significance of PBL and 21st century skills in terms of the three C's of communication, collaboration, and critical thinking, our study has the following aims:

- To ascertain the relationship between PBL and 21st century skills

- To measure the mediating effect of 21st century skills on students' creativity and competitiveness
- To explore the effect of PBL on children's personal and social development
- To determine how this personal and social development enhances children's creativity and competitiveness.

3. Literature Review

The rapid social and technological development of the knowledge-based society has changed the way education is addressed and viewed. In generic terms, it is often referred to as the transmission of knowledge. Traditional education systems were limited to a few selected fields that were taught according to a set curriculum and textbooks. This system has now been replaced by modern, liberal education, which caters to individual needs, interests, and capabilities. Students are exposed to experimental learning that allows them to explore and learn by doing.

The concept of experimental learning is not new. The Reggio Emilia approach developed by Loris Malaguzzi in the 1940s in Italy was one of the earliest education techniques of learning by doing: it differed from the prevailing systems, which tended to dampen creativity and critical thinking. The Reggio Emilia approach holds that children communicate ideas through symbols, words, pictures, music, and drama, which enhance their creativity and conceptual clarity (Edwards & Springate, 1993).

Inspired by Malaguzzi's poem "The child has a hundred languages, and a hundred-hundred-hundred more," these multiple forms of illustration and representation became famous as the "hundred languages of children." The approach also supported the importance of an interrelationship between parents and teachers, the environment, and other related fields facilitating students in the learning process. Studies such as Edwards, Gandini, and Forman (1998), Katz (1990), and Malaguzzi (1993) support the Reggio Emilia philosophy as an approach that focuses on the importance of relationships in a child's learning process (Kocher, 2013).

The PBL approach values student choice and aligns 21st century skills with learning-by-doing (Bell, 2010). The setup and environment of PBL classrooms encourage students to think critically, contribute to team efforts, and work creatively when confronted with a new challenge (Boss, 2012). Such a setup not only provides the opportunity to explore extensively

but also helps students identify constraints they might face in real-life situations and develop the skills they will need to address these. Some educators have, however, questioned whether such assessment techniques support scores and ensure that a student's performance is reliable enough to justify high-stakes decisions pertaining to his or her future in a system still dominated by traditional evaluation and appraisal methods.

Originally applied in medical schools, PBL provides students the opportunity to learn by conducting in-depth inquiry and applying critical thinking skills in order to solve the problem at hand. PBL practices vary by grade and allow students to exercise choice. The approach also connects curricula to 21st century skills (communication, collaboration, and critical thinking (Ravitz, Hixson, English, & Mergendoller, 2012).

The *Harvard Business Review* defines the set of 21st century skills as the ability to "compete on analytics." In general, these skills incorporate the principal proficiencies of communication, collaboration, and critical thinking. Barnett Berry, founder of the Center for Teaching Quality, describes these skills as a combination of the three C's of creativity, communication, and collaboration.

Teaching that facilitates these skills aims to prepare pupils to solve real-life problems by mastering content while constructing, integrating, and gauging information from a range of subjects and sources with an understanding of and veneration for diverse cultures. Partnership for 21st Century Skills (2007) indicates a 99 percent universal agreement that teaching these skills is imperative for a country's economic prosperity.

Several frameworks have been developed to explore the set of 21st century skills. Of these skills, critical thinking that encompasses real-world problem solving is a key driver of high work quality (Microsoft Partners in Learning, Pearson Foundation, & Gallup, 2013). Assessment and Teaching of 21st Century Skills (ATC21S) (2010) describes critical thinking as "ways of thinking" that lead to creativity and innovation when making a decision or solving a problem. One of the earliest definitions developed by Ennis (1985) defines critical thinking as "thinking reflectively and reasonably in order to plan actions and decisions accordingly."

Collaboration and communication are synonymously depicted as "ways of working" under the ATC21S framework. Collaboration is seen as a key outcome of teaching strategies and methodologies, and refers to the ability to coordinate with one's peers in constructing viable solutions to a

problem (Roshchelle & Teasley, 1995). Specifically, collaboration is the process of "joint problem-solving" (Dillenbourg, 1999). However, effective interpretation and collaboration require one to be able to communicate information and ideas clearly. Effective communication also lays the groundwork for professional success and can entail using verbal and nonverbal means (Trilling & Fadel, 2009).

The literature highlights the importance of 21st century skills in nurturing creativity and competitiveness among students; how these skills are imparted is equally significant. Their constructs can be gauged by integrating several measures, such as designing complex tasks, setting open-ended problems, making student thinking and reasoning visible, and adopting innovative approaches that employ new technology and models (Lai & Viering, 2012).

Within the PBL framework, creativity and competitiveness are key to success. Creativity is the ability to innovate and helps prepare pupils for future challenges in work and life. As per the framework developed by the National Research Council, creativity is described as "cognitive nonroutine problem solving" (Lai & Viering, 2012). Robert Epstein at the University of California, San Diego, outlines four proficiencies crucial for creative expression:

- Capturing: developing new ideas
- Challenging: giving students stimulating problems to solve
- Broadening: increasing creativity by learning interesting facts and figures
- Surrounding: relating to interesting and diverse concepts and culture

Epstein argues that "capturing" is the most important proficiency and suggests that teachers should focus on it daily in order to encourage pupils to generate ideas (Henderson, 2008). Creativity should not be confined to a subject or curriculum boundaries; rather, it should be directed at finding viable solutions to a given problem as in PBL. This, in turn, will help equip students to solve problems both in their personal and work lives.

There are four main skill areas that affect creativity and innovation: (i) fluency, (ii) flexibility, (iii) elaboration, and (iv) originality (Torrance, 1981). By embedding creative, purposeful tasks into teaching programs, schools can help equip students with the primary tools of thinking and the

will to create. Creativity is also an important part of the liberal arts, academic values, and higher-order thinking skills (Angelo & Cross, 1993).

Being creative and performing well on international assessments, however, does not provide a complete picture. It is imperative that educationists should focus on how students will apply the knowledge they have acquired to real-world settings. This calls for competitive skills, which consist of basic academic success skills and discipline (specific knowledge and skills) (Angelo & Cross, 1993).

PBL is also found to support children's personal and social development by enhancing their managerial and leadership skills and by preparing them to implement complex skills such as planning, communicating, problem-solving, and decision-making. Increased self-reliance and the ability to work in a social environment make individuals more competitive and creative (Pekrun, Goetz, Titz, & Perry, 2002).

Developed economies, industries, and high-growth jobs require a competitive workforce that can communicate effectively, manage information, work in teams, and seek viable solutions to a problem. Accordingly, the education sector needs to impart 21st century skills that drive participation, accomplishment, and competitiveness in the global economy (Fincher et al., 2000). Modern businesses require human capital that helps build a knowledgeable and competitive workforce (Gayl, 2007). To be productive workers in a rapidly changing and increasingly competitive economy, individuals will need those skills and competencies that help them make effective, operative, and innovative use of what they have learned at school and work.

4. Theoretical Framework

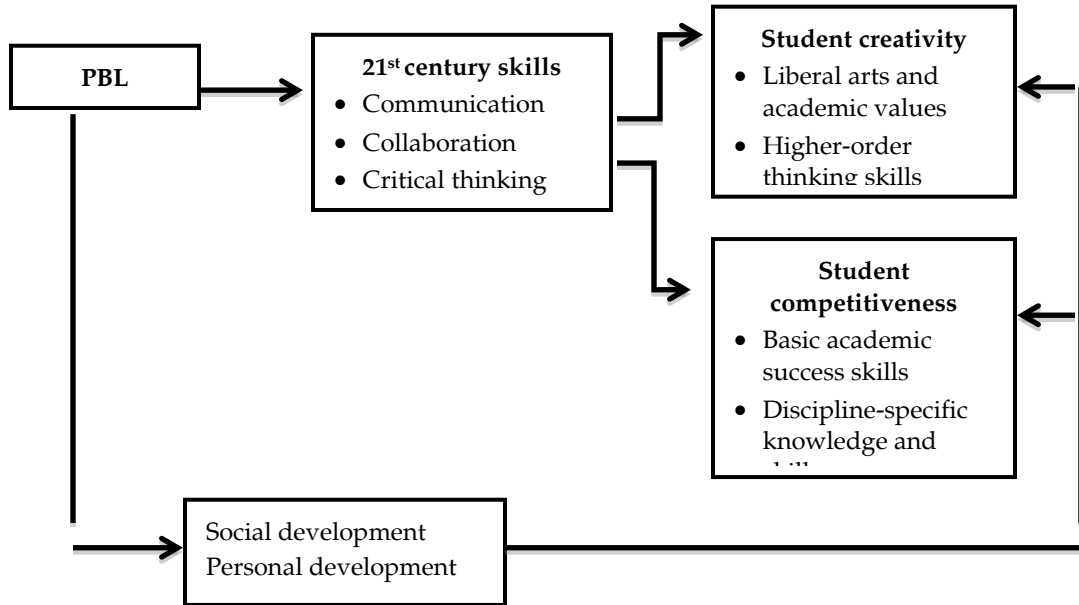
Based on the PBL framework developed in Section 3, we aim to determine the effect of PBL and 21st century skills in private sector schools in Lahore. There has been very limited work carried out in this domain and many schools still adopt a rigid education system that focuses on the scores and grades achieved. **PBL** plays a role in imparting **21st century skills** and in students' personal and social development, which, in turn, affect their creativity and competitiveness. Accordingly, in this study, creativity and competitiveness are the dependent variables, 21st century skills and social and personal development are the mediating variables, and PBL is the independent variable (see Figure 1).

Sprinthall and Sprinthall (1977) argue that **personal development** between the ages of 12 and 18 involves the ability to differentiate one's feelings from those of others. This allows one to accept and understand the viewpoint of other people and role-play when solving problems similar to real-life situations (Erikson, 1980). We will ascertain the impact of PBL on personal development as it helps children develop relationships by collaborating with peers and third parties and making decisions as part of a team. PBL also helps cultivate one's self-confidence and builds the capacity to take responsibility.

Following Combs and Slaby (1977), **social development** is defined as the ability to interact with others in a given social context in ways that are socially acceptable or valued and, at the same time, are personally or mutually beneficial or beneficial primarily for the other (Linke, 2009). The social penetration theory (Altman & Taylor, 1973) states that interpersonal relationships proceed on the basis of communication. Thus, in order to build social relationships, one needs to share one's thoughts with others. We aim to determine the impact of PBL on social development by measuring the constructs of work and career preparation that define it. Social development, in turn, enhances individual creativity and competitiveness in external environments.

Fogarty (2013) describes **creativity** as the "ideation of a thought." We expect 21st century skills to have a positive impact on student creativity, which, for our purposes, is measured by the constructs liberal arts and academic values, and higher-order thinking skills (Angelo & Cross, 1993).

Gayl (2007) defines **competitiveness** as the ability to apply one's acquired knowledge to real-world settings in order to develop effective solutions to given problems. Cultivating 21st century skills is imperative to producing a competitive individual. We measure student competitiveness by the constructs basic academic success skills and discipline-specific knowledge and skills (Angelo & Cross, 1993).

Figure 1: Relationship between study variables

5. Hypotheses

We present the following hypotheses:

- H1: The existence of PBL supports 21st century skills.
- H2: 21st century skills are positively related to student creativity.
- H3: 21st century skills are positively related to student competitiveness.
- H4: PBL supports student social development.
- H5: PBL supports student personal development.
- H6: Social development is positively associated with student creativity.
- H7: Social development is positively associated with student competitiveness.
- H8: Personal development is positively associated with student creativity.
- H9: Personal development is positively associated with student competitiveness.

6. Methodology

The study population comprised teachers working at elementary, primary, and middle private schools in Lahore. The sample included 30 teachers from each of the five private schools selected on a voluntary basis (see Table A1 in the Appendix). In the survey questionnaire used, PBL was measured as "practicing PBL and supporting 21st century skills" or "not practicing PBL or supporting 21st century skills" (see Ananiadou & Claro, 2009). The survey was carried out at the school level rather than country level. The following sections describe the instruments used.

6.1. New Millennium Learners Country Survey

The New Millennium Learners (NML) country survey was prepared and administered by Ananiadou and Claro in 2009. The purpose of the survey was to collect data on whether and how schools in OECD countries taught and assessed 21st century skills through their curricula and policy guidelines, how these skills were defined and assessed, and what impact they had on teacher training programs. These objectives also apply to our study. The survey uses yes/no options and certain open-ended questions. For our purposes, the selected items indicate the presence of PBL supporting 21st century skills in the five respondent schools.

6.2. Teaching Goals Inventory

The Teaching Goals Inventory questionnaire, which was used by the Middle State Commission on Higher Education in 2007, is a self-assessment tool through which teachers respond to instructional goals. For our study, the instrument was used to measure 21st century skills, student creativity, competitiveness, and social and personal development within the framework of several constructs. The instrument includes 52 items measured on a 1–5 rating scale (see Appendix). Overall, a total of 150 questionnaires were administered, of which 100 were later used to input data, resulting in a response rate of 66.67 percent.

7. Findings and Analysis

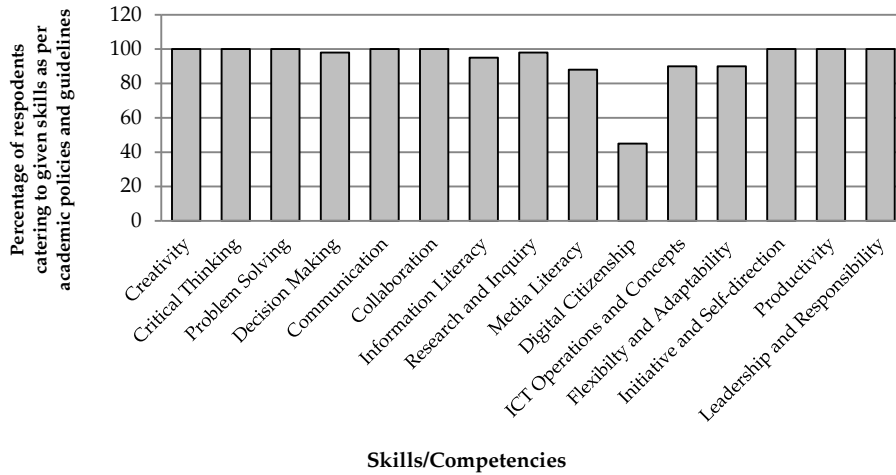
This section presents a qualitative, reliability, and path analysis.

7.1. Qualitative Analysis

The results of the NML questionnaire showed that all the selected schools applied PBL in their academic environments but in different ways.

Some were implementing PBL in the context of International Baccalaureate procedures and guidelines while others were imparting 21st century skills in the form of projects per theme. Figure 2 shows the percent of schools that reported covering key skills and competencies as part of their policies and assessment criteria.

Figure 2: Respondents covering key PBL skills



Respondents also reported that, under the PBL umbrella, their educational policies and teaching goals incorporated social and personal development in the shape of skills inculcating leadership, responsibility, collaboration, initiative, and self-direction. Based on these qualitative findings, we can deduce that PBL supports the 21st century skills framework adopted by these schools and contributes to students' social and personal development.

7.2. Reliability Analysis

Reliability measures the stability of outcomes when the purpose of the research is measured repeatedly. The reliability of data related to latent variables and operational constructs was measured using Cronbach's alpha methodology. As Table 1 shows, the Cronbach's alpha values for data on all five variables/constructs is above the threshold value of 0.70, which complies with the reliability criterion.

Table 1: Reliability of data

Scale	Cronbach's Alpha
Social development	0.95
21st century skills	0.89
Personal development	0.72
Student creativity	0.95
Student competitiveness	0.97

We also run a confirmatory factor analysis (CFA) to gauge whether the proposed model is a good fit and to measure the correlations between the designated variables (see Figure 3). Table 2 shows that the suggested model is a good fit and can be used in future studies. The value of the CMIN/DF (1.329) is below 3, suggesting a good fit. The comparative fit index (CFI) analyzes model fit by examining the discrepancy between the data and the hypothesized model while adjusting for the issue of sample size inherent in the chi-squared test of model fit and the normed fit index. The CFI value for the model is 0.915, indicating an acceptable model fit.

Table 2: Model fit summary

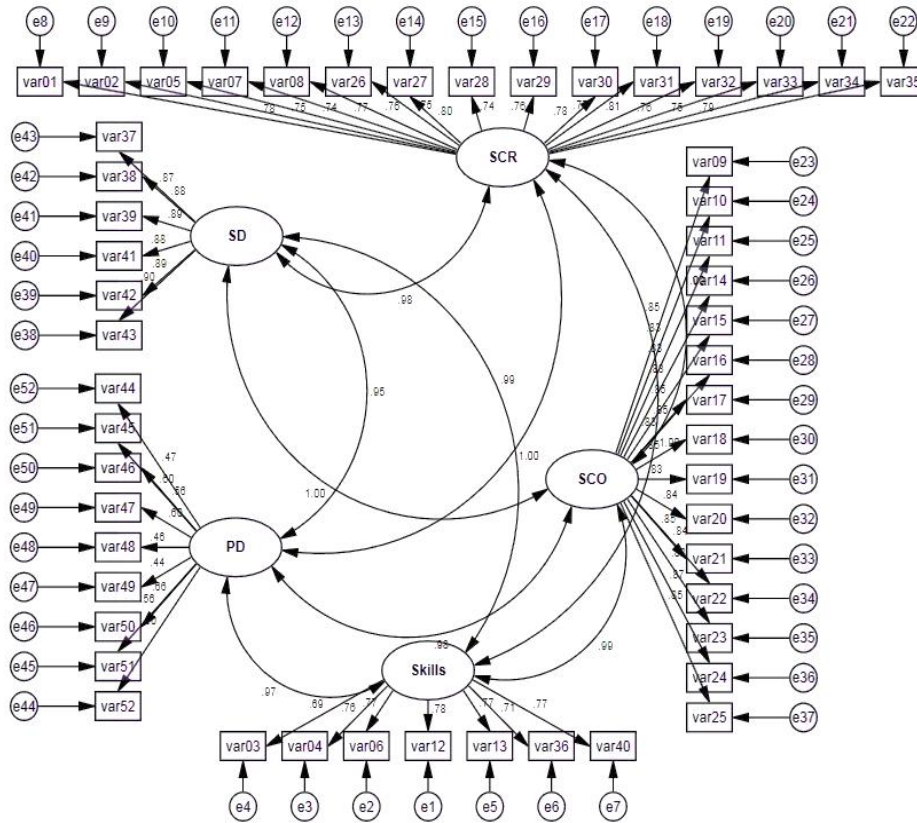
	CMIN/DF	P	GFI	AGFI	CFI	TLI	RMSEA
Default model	1.329	0	0.664	0.634	0.915	0.911	0.058

The root mean square error of approximation (RMSEA) avoids issues of sample size by analyzing the discrepancy between the hypothesized model—using optimally chosen parameter estimates—and the population covariance matrix. The RMSEA value for the model is 0.058, which is below the threshold value of 0.10 and thus lies within the acceptable range. The value of the goodness of fit index (GFI) is lower because of its sensitivity to a large number of items associated with the variables. This value could be improved in future studies by standardizing and developing another measuring scale with fewer items.

We find that significant relationships exist between the constructs. The model suggests that 21st century skills have an impact on student creativity and competitiveness. There is also a significant correlation between social and personal development and student creativity and competitiveness. The CFA indicates that academic tasks and curricula designed around the PBL approach support the framework of 21st century skills and enhance creativity and competitiveness when students are

exposed to real-life problems: they are encouraged to think critically and carry out in-depth inquiries to seek possible solutions. During this learning process, students not only develop higher-order thinking skills but also enhance their capacity to communicate and collaborate.

Figure 3: Confirmatory factor analysis



7.3. Path Analysis

Path analysis is a statistical technique used to test and estimate causal relationships. The value of CMIN/DF (1.567) is below 3, suggesting a good fit. The CFI value is 0.853, indicating an acceptable model fit. The RMSEA value is 0.076, which is below the threshold value of 0.10 and thus lies within the acceptable range.

Table 3: Model fit summary

	CMIN/DF	P	GFI	AGFI	CFI	TLI	RMSEA
Default model	1.567	0	0.641	0.61	0.853	0.846	0.076

Our hypotheses are confirmed as follows:

- H1: There is a significant and positive relationship between PBL and 21st century skills. The beta value of 0.56 is significant at a 0.05 level of significance. This implies that PBL supports the 21st century skills framework; 21st century skills thus mediate the effect of PBL on student creativity and competitiveness. This allows us to accept H1.
- H2: The relationship between 21st century skills and student creativity is significant at a 0.05 level with a regression weight of 0.583. This indicates a positive relationship between the two variables and allows us to accept H2.
- H3: The relationship between 21st century skills and student competitiveness is significant at a 0.05 level with a regression weight of 0.334. This indicates a positive, if weak, relationship between the two variables, and allows us to accept H3.
- H4: The relationship between PBL and social development is significant at a 0.05 level with a regression weight of 0.325. This indicates a positive, if weak, relationship between the two variables, and allows us to accept H4.
- H5: The relationship between PBL and social development is significant at a 0.05 level with a regression weight of 0.412. This indicates a positive, if weak, relationship between the two variables, and allows us to accept H5.
- H6: The relationship between social development and student creativity is significant at a 0.01 level with a regression weight of 0.715. This indicates a strong positive relationship between the two variables, and allows us to accept H6.
- H7: The relationship between social development and student competitiveness is significant at a 0.01 level with a regression weight of 0.911. This indicates the strongest positive relationship compared to all the other variables, and allows us to accept H7.
- H8: The relationship between personal development and student creativity is significant at a 0.05 level with a standardized regression weight of 0.406. This indicates a moderate and positive relationship

between the two variables. When personal development rises by 1 standard deviation, student creativity increases by 0.406 standard deviations. This allows us to accept H8.

- H9: The relationship between personal development and student competitiveness is significant at the two-tailed level with a standardized regression weight of 0.250. This indicates the weakest but positive relationship compared to all the other variables, and allows us to accept H9.

Social development exhibits the strongest relationships with student creativity and competitiveness (with regression weights of 0.71 and 0.91, respectively). This is an important finding, given that most other studies have focused on 21st century skills as the major influencing factor. Personal development, on the other hand, shows the weakest correlation.

8. Conclusion and Managerial Implications

We have found that PBL supports the 21st century skills framework along with personal and social development. 21st century skills influence student creativity more than they do student competitiveness. The study's key finding is that social development is the strongest influencing factor on creativity and competitiveness. Personal development, on the other hand, has a weak but positive impact on the dependent variables.

The study has several important implications for educationists who wish to initiate successful, modern, and challenging academic practices within the education environment and system. The PBL approach relates to modern skills and competencies that are required to make students more competitive. Students are encouraged to undergo an extended process of inquiry in response to a complex problem. While allowing for some degree of student "voice and choice," rigorous projects are carefully planned, managed, and assessed to help students learn key academic content, practice 21st century skills (such as collaboration, communication, and critical thinking), and create high-quality, authentic products.

The study provides theoretical as well as quantitative evidence of how the PBL approach has overtaken the traditional education system and why it is imperative for children's learning process. Educationists and education policymakers should understand the implications of PBL and update their teaching goals and policies in line with the constructs of 21st century skills and social development in order to achieve a better and more challenging education system.

Given that our study was limited to selected private schools in Lahore, the results do not estimate the presence and impact of PBL and 21st century skills on the overall education system of Pakistan. Moreover, the variables assigned to measure the given constructs were chosen subjectively based on the literature and on other instruments that might not be representative of the exact nature of the study.

Social development emerges as the strongest influential factor, which provides a new path for future research. Additionally, since PBL was measured in terms of "practicing" or "not practicing", future research could aim to develop constructs that measure PBL itself.

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*Appendix***Table A1: Respondents' demographic characteristics**

		Frequency	Percent	Valid percent	Cumulative percent
Gender					
Valid	Male	33	33.0	33.0	33.0
	Female	67	67.0	67.0	100.0
	Total	100	100.0	100.0	
Marital status					
Valid	Single	51	51.0	51.0	51.0
	Married	49	49.0	49.0	100.0
	Total	100	100.0	100.0	
Qualification					
Valid	BA/BS	28	28.0	28.0	28.0
	MA/MS	56	56.0	56.0	84.0
	MPhil	14	14.0	14.0	98.0
	PhD	2	2.0	2.0	100.0
	Total	100	100.0	100.0	
Language					
Valid	Urdu	29	29.0	29.0	29.0
	Punjabi	12	12.0	12.0	41.0
	Balochi	1	1.0	1.0	42.0
	English	54	54.0	54.0	96.0
	Other	4	4.0	4.0	100.0
	Total	100	100.0	100.0	
Age					
Valid	25 or below	26	26.0	26.0	26.0
	Above 25	41	41.0	41.0	67.0
	40-45	25	25.0	25.0	92.0
	50 or above	8	8.0	8.0	100.0
	Total	100	100.0	100.0	
Income					
Valid	10,000-25,000	2	2.0	2.0	2.0
	25000-40,000	38	38.0	38.0	40.0
	40,000-50,000	17	17.0	17.0	57.0
	50,000 or above	43	43.0	43.0	100.0
	Total	100	100.0	100.0	

Screening questionnaire

PBL and 21st century skills

1. Is there specific coverage of 21st century skills or competencies in the regulations or guidelines/recommendations for compulsory education in your school?

Yes
No If no, go to question 14.

2. Are any of the following skills/competencies covered by these policies?

Creativity	<input type="checkbox"/>
Problem solving	<input type="checkbox"/>
Communication	<input type="checkbox"/>
Information literacy	<input type="checkbox"/>
Media literacy	<input type="checkbox"/>
ICT operations and concepts	<input type="checkbox"/>
Initiative and self-direction	<input type="checkbox"/>
Leadership and responsibility	<input type="checkbox"/>
Critical thinking	<input type="checkbox"/>
Decision making	<input type="checkbox"/>
Collaboration	<input type="checkbox"/>
Research and inquiry	<input type="checkbox"/>
Digital citizenship	<input type="checkbox"/>
Flexibility and adaptability	<input type="checkbox"/>
Productivity	<input type="checkbox"/>

3. What level(s) of education is/are covered by these policies? (Tick all that apply)

Early years	<input type="checkbox"/>
Primary years	<input type="checkbox"/>
Middle years	<input type="checkbox"/>

4. When did these regulations/guidelines come into effect?

5. Please briefly explain the policy context and rationale that led to the introduction of these regulations or guidelines regarding 21st century skills and competencies.

6. Please briefly describe the process through which the specific list of competencies and skills was established.

7. How are these skills taught (e.g., included in the curriculum as a separate subject, taught across subjects)?

8. Are there specific guidelines or regulations regarding the teaching of these skills?

Yes

No

9. If yes, please briefly describe them.

10. Are there regulations or guidelines regarding the assessment or evaluation of these skills?

Yes

No

11. If yes, please briefly describe them.

12. Have these regulations or guidelines had an impact on teacher training programs?

Yes

No

13. If yes, please briefly explain them.

14. Are there currently any discussion or plans in your school to introduce regulations or guidelines on the teaching and evaluation of PBL and 21st century skills in the near future?

Yes

No

15. If yes, please provide some detail on these discussions or plans.

Research questionnaire

The effect of PBL and 21st century skills on student creativity and competitiveness in private schools in Lahore

Please rate the importance of each of the 52 goals listed below to the specific course you have selected. Assess each goal in terms of what you deliberately aim to have your students accomplish, rather than in terms of the goal's general worthiness or overall importance to your institution's mission. There are no "right" or "wrong" answers; only personally accurate or inaccurate ones.

For each goal, circle only one response on the 1 to 5 rating scale. You may find it helpful to quickly read through all 52 goals before rating their relative importance.

In relation to the course you are focusing on, indicate whether each goal rated is:

(5) Essential	A goal you always/nearly always try to achieve (76–100% of the time)
(4) Very important	A goal you very often try to achieve (51–75% of the time)
(3) Important	A goal you sometimes try to achieve (26–50% of the time)
(2) Unimportant	A goal you rarely try to achieve (1–25% of the time)
(1) Not applicable	A goal you never try to achieve.

Section I

Demographics

Survey questionnaire (please encircle your choice of code in the given sections).

1. Gender

1	2
Male	Female

2. Qualification

1	2	3	4
Bachelor's degree	Master's degree	MPhil	PhD

3. Language

1	2	3	4	5	6	7
Urdu	Punjabi	Pashto	Sindhi	Balochi	English	Other

4. Age

1	2	3	4
25 or below	Above 25	40–45	50 or above

5. Marital status

1	2
Single	Married

6. Income

1	2	3	4	5
10,000 or below	10,000–25,000	25,000–40,000	40,000–50,000	50,000 or above

Section II

Rate the importance of each goal to what you aim to have students accomplish in your course.

		Essential	Very important	Important	Unimportant	Not applicable
1	Develop ability to apply principles and generalizations already learned to new problems and situations	5	4	3	2	1
2	Develop analytic skills	5	4	3	2	1
3	Develop problem-solving skills	5	4	3	2	1
4	Develop ability to draw reasonable inferences from observations	5	4	3	2	1
5	Develop ability to synthesize and integrate information and ideas	5	4	3	2	1
6	Develop ability to think holistically to see the whole as well as the parts	5	4	3	2	1
7	Develop ability to think creatively	5	4	3	2	1
8	Develop ability to distinguish between fact and	5	4	3	2	1

	Essential	Very important	Important	Unimportant	Not applicable
opinion					
9 Improve skill at paying attention	5	4	3	2	1
10 Develop ability to concentrate	5	4	3	2	1
11 Improve memory skills	5	4	3	2	1
12 Improve listening skills	5	4	3	2	1
13 Improve speaking skills	5	4	3	2	1
14 Improve reading skills	5	4	3	2	1
15 Improve writing skills	5	4	3	2	1
16 Develop appropriate study skills, strategies, and habits	5	4	3	2	1
17 Improve mathematical skills	5	4	3	2	1
18 Learn terms and facts of this subject	5	4	3	2	1
19 Learn concepts and theories in this subject	5	4	3	2	1
20 Develop skill in using materials, tools, and/or technology central to this subject	5	4	3	2	1
21 Learn to understand perspectives and values of this subject	5	4	3	2	1
22 Prepare for transfer or graduate study	5	4	3	2	1
23 Learn techniques and methods used to gain new knowledge in this subject	5	4	3	2	1
24 Learn to evaluate methods and materials in this subject	5	4	3	2	1
25 Learn to appreciate important contributions to this subject	5	4	3	2	1
26 Develop an appreciation of the liberal arts and sciences	5	4	3	2	1
27 Develop an openness to new ideas	5	4	3	2	1
28 Develop an informed concern about contemporary social issues	5	4	3	2	1
29 Develop a commitment to exercise the rights and responsibilities of citizenship	5	4	3	2	1
30 Develop a lifelong love of learning	5	4	3	2	1
31 Develop aesthetic appreciations	5	4	3	2	1
32 Develop an informed historical perspective	5	4	3	2	1
33 Develop an informed understanding of the role of	5	4	3	2	1

	Essential	Very important	Important	Unimportant	Not applicable
science and technology					
34 Develop an informed appreciation of other cultures	5	4	3	2	1
35 Develop capacity to make informed ethical choices	5	4	3	2	1
36 Develop ability to work productively with others	5	4	3	2	1
37 Develop management skills	5	4	3	2	1
38 Develop leadership skills	5	4	3	2	1
39 Develop a commitment to accurate work	5	4	3	2	1
40 Improve ability to follow directions, instructions, and plans	5	4	3	2	1
41 Improve ability to organize and use time effectively	5	4	3	2	1
42 Develop a commitment to personal achievement	5	4	3	2	1
43 Develop ability to perform skillfully	5	4	3	2	1
44 Cultivate a sense of responsibility for one's own behavior	5	4	3	2	1
45 Improve self-esteem/self-confidence	5	4	3	2	1
46 Develop a commitment to one's own values	5	4	3	2	1
47 Develop respect for others	5	4	3	2	1
48 Cultivate emotional health and well-being	5	4	3	2	1
49 Cultivate physical health and well-being	5	4	3	2	1
50 Cultivate an active commitment to honesty	5	4	3	2	1
51 Develop capacity to think for oneself	5	4	3	2	1
52 Develop capacity to make wise decisions	5	4	3	2	1

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1. The first page of the manuscript should have the title of the paper, the names(s) of author(s), and a footnote giving the current affiliation of the author(s) and any acknowledgments.
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Contact Info

Ms. Sehrish Nisar
Assistant Editor, Lahore Journal of Business
Lahore School of Economics, Lahore, Pakistan
T +92 (0) 42 111-656-111 Ext. 198
ljb@lahoreschool.edu.pk, ljbs@ymail.com

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