

## Artículo de investigación

**Impact of Market Risk, Interest rate, Exchange rate on Banks stock return:  
Evidence from listed Banks of Pakistan**

Impacto del riesgo de mercado, la tasa de interés y la tasa de cambio en el rendimiento de las acciones de los bancos: evidencia de los bancos de Pakistán registrados

Impacto do Risco de Mercado, Taxa de Juros, Taxa de Câmbio no Retorno de Ações Bancárias:  
Evidências dos Bancos listados do Paquistão

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**Abstract**

The main purpose of this research is to find the relationship between market risk, Exchange rate, Interest rate, and bank stock returns in Pakistan. The KSE-100 index used as Market risk, US dollar against Pak rupees used as Exchange rate, three-month T-bill rate used as the interest rate and the continuously compounded return used as banks stock return. The time-series data from January 2007 to December 2018 is used in this study. The ordinary least square (OLS) method is used to check the relationship between bank stock return, market risk, interest rate, and Exchange rate. The result of this shows that market risk is positively significant, exchange rate rarely negatively significant, and the interest rate insignificant exempt of one bank. When the prices of the stock market are increasing the bank stock prices also increase. These empirical findings are helpful for the policymaker, investor, banking management as well as Government.

**Keyword:** Banking stock price, OLS, market risk, Exchange rate, interest rate.

**Resumen**

El objetivo principal de esta investigación es encontrar la relación entre el riesgo de mercado, el tipo de cambio, la tasa de interés y el rendimiento de las acciones bancarias en Pakistán. El índice KSE-100 se utilizó como riesgo de mercado, el dólar estadounidense frente a las rupias de Pakistán se usó como tipo de cambio, la tasa de T-bill a tres meses se usó como tasa de interés y el rendimiento compuesto continuo se usó como rendimiento de acciones de los bancos. Los datos de series de tiempo de enero de 2007 a diciembre de 2018 se utilizan en este estudio. El método de mínimos cuadrados ordinarios (OLS) se utiliza para verificar la relación entre el rendimiento de las acciones bancarias, el riesgo de mercado, la tasa de interés y la tasa de cambio. El resultado de esto muestra que el riesgo de mercado es positivamente significativo, la tasa de cambio rara vez es significativamente negativa y la tasa de interés es exenta de importancia de un banco. Cuando los precios del mercado de valores están aumentando, los precios de las acciones bancarias también aumentan. Estos hallazgos empíricos son útiles para los responsables políticos, los inversionistas, la administración bancaria y el gobierno.

**Palabra clave:** Precio de las acciones bancarias, MCO, riesgo de mercado, tipo de cambio, tasa de interés.

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## Resumo

O principal objetivo desta pesquisa é encontrar a relação entre risco de mercado, taxa de câmbio, taxa de juros e retornos de ações bancárias no Paquistão. O índice KSE-100 usado como risco de mercado, dólar norte-americano contra rupias de Pak usado como taxa de câmbio, taxa T de três meses usada como taxa de juros e retorno continuamente combinado usado como retorno de ações de bancos. Os dados de séries temporais de janeiro de 2007 a dezembro de 2018 são usados neste estudo. O método de mínimos quadrados ordinários (OLS) é usado para verificar a relação entre retorno de ações bancárias, risco de mercado, taxa de juros e taxa de câmbio. O resultado disso mostra que o risco de mercado é positivamente significativo, a taxa de câmbio raramente é negativamente significativa e a taxa de juros insignificante isenta de um banco. Quando os preços do mercado de ações estão aumentando, os preços das ações do banco também aumentam. Essas descobertas empíricas são úteis para o formulador de políticas, o investidor, o gerenciamento bancário e o governo.

**Palavras-chave:** Banking price, OLS, risco de mercado, taxa de câmbio, taxa de juros.

## Introduction

The capital market has been playing a vital role to move funds from savers to borrowers. Thus, the sufficient growth of the economy is centered on the stock market. Also, globalization has brought international stock markets reliability. Such integrity is beneficial for global economic growth. A combination of real financial situation and financial market as well as the integration between International financial crises, which has already started the tumbling economy, is knocking the door (Abiola and Olusegun 2017). Economic indicators from the rupee are depreciated or devaluate against the dollar, as inflation and interest rates are increased the industrial production began to decline, there is a growing lack of symptoms have been.

The micro and macro-economic variable are essential for researchers. Researchers, economists, and students work on the macro-economic factors and the relationship between stock prices to discover, have tried a lot. Stock prices change, which lead to many factors. Stock deals, which takes place in the stock market; therefore, banks deals with an imperative role in the growth of the market and in-between works. The difference between the rates of interest and more profitable banker lends to others. Commercial banks operate on a commercial basis. The Bank is an intermediate party between borrowers and lenders. According to Crowther, 'forgive a bank or savings that are out of their income from those who collect money. It lends to those who need it "Banking Sector centuries now one of the pillars of economic success (Cushman 2007, Ali, Rehman et al. 2010). The history of the imperial colonies newly acquired banks that provide finance for projects about how to give you some information? The time and cost savings with banks to provide an avenue for both have an

essential role. Commercial banks, savings through branch banking network to help mobilize. Low-income people in developing countries, but banks to suit the needs of individual depositor's deposit by introducing a variety of projects to induce them to save. They also mobilize savings few idle rich (Cooper, Robinson et al. 2006). Thus they help in the developing country's capital formation. Commercial banks finance in several ways to the industrial sector. Commercial banks in Pakistan provide short-term and medium-term financing to small enterprises to start the business. Moreover, large-scale industries insured shares and debentures. Thus they not only offer finance for sectors in countries such as under-develop help in the development of the capital market.

In the last year, the liberalization of economic markets has affected representation to many sources of risk, but the failure of banks especially the hostile effects fluctuations in interest rates have been collected since the bank's return on equity. The impact of change in exchange rates and interest rates, bank manager, investors, academic communities, and regular authorities (Elyasiani, Mansur et al. 2007, Kasman, Vardar et al. 2011). They by comparing information from bank examinations extraordinary effect estimates CAMEL rate remained unchanged, the banks' stock returns, better or weakened). In Asian countries, systematic risk less significant than firm-specific risks. When the foreign exchange risk increases, then interest rate risk decreases (Wetmore and Brick 1994). However, the result varies depending on the practice of bank (Money center, superregional, or Regional) (Wetmore and Brick 1994).

This research can be supported theoretically, and empirically hold it occurs (Elyasiani and Mansur 2005). Different from the existing literature on these issues, these issues can be arranged according to work described that continuously variations are observed in market risk, interest rate risk, and foreign exchange risk. This type of risk is wide-ranging from bank to bank and period. Interest risk and foreign exchange risk are indirectly proportional to each other when interest risk decreases, foreign exchange risk increases and when a positive change occurs in the interest risk than foreign exchange risk show an adverse reaction according to the interest risk. The market in bank stock prices of banks and supervisory economic situation continues to reflect alterations in the predictable risk of commercial banks are expected to remain volatile coefficient is advisable. A positive relationship is observed between foreign exchange risk and foreign or less developed countries. After three years, (Kallunki and Martikainen 1997) abnormal return and the rejection of test data on the frequency characteristics of trading time series and cross-sectional investigation of the effects of the test statistics revealed that uses both.

(Cooper, Robinson et al. 2006) in this article, we check out the forecasting of a cross-section of bank stock returns by taking advantages of a remarkable set of industries to feature that spread in the financial services sectors (Cooper, Robinson et al. 2006, Elyasiani, Mansur et al. 2007). To be exploitable using simple-cross sectional trading strategies, out of sample testing illustrates this under direction appears.

(Adubi and Okunmadewa 1999, Elyasiani, Mansur et al. 2007, Akel 2014) to the market shares of the bank, interest rates, and exchange rate sensitivity was variable. First, the interest rate sensitivity of the banking institutions, markets, and exchange rate risk assessment. Second, risk and accounting variables and measures of financial ratios based on their estimate of the strength of the relationship between markets. Add to sample the bank market and in a positive direction is sensitive to exchange rates and even the exchange rate, the interest rate is much stronger and more reliable search (Akel 2014, Abiola and Olusegun 2017). (Chuku, Ogbonna et al. 2008) found that the relation of monetary and fiscal policy uses the quarterly data in Nigeria from 1970 to 2008 (Bartram, Brown et al. 2010). As a preparatory exercise, this article is about examined the budgetary policy's nature in which Nigeria using a vector Auto-regression model. Moreover, these

studies have viewed a state-space model with Markov-switching to compute time parameter by applying the relationship between monetary and fiscal policies in an opposite manner of Nigeria evidence from 1980 to 1994 shows as a sample period. The results of this research all about the existence of the fiscal policy in Nigeria, which is implied that inflation predominantly findings from the fiscal problem and not from lack of monetary control.

(Yunos, Shamsuddin et al. 2008) has been stated that the utter destruction of most Government controls the financial statement of Australian in 1983 and financial system of globalization has created new opportunities for bank of Australia in 1990 but to lay open them to new means of risk. In this research to market, interest rate, and GARCH-in-Mean mode foreign exchange rates Australian publicly listed investment banks shown a different result. Small banks monetarily change the interest rate and exchange rate to exempt from both large and small bank while highly sensitive variation to stock returns and interest rate. This research is mainly showing to the primary focus of bank on interest rate exposure, as a primary source of historical profit depends on net interest income and traditional bank return (Cushman 2007). Literature focused on modeling interest rate in danger. The observation of the stock return volatility of bank share to the volatility return of stock and bank has no significant trade between the time variations (Chu and Chang 2012). The different European economies including US and Japan markets in the financial sector, interest rate and exchange rate sensitivities risk of stock return in 16 countries banking, financial services, and insurance, i.e. research are examining. The econometrics having four variables GARCH-in-Mean model in which incorporate long and short term interest in turn in some cases a positive and significant relationship between stock market returns on mean returns in each sector in some cases whereas meaningful negative or mixed respectively relationship between the interest rate and exchange rate.

(Bekaert and Harvey 2000, Mohsin, Majeed et al. 2018) found that an efficient banking system is a pre-requisite for the quick development of any economy. India is one of the advanced emerging economies has a well-organized banking system (Bartram, Brown et al. 2010).

### Data description

In this study we checked the relationship between banks stocks returns and macroeconomic

variables like as market rate, exchange rate, and interest rate. Currently, 21th bank is listed on Pakistan stocks exchange out of which 14th listed banks used in this study. We collected monthly data from January 2007 to December 2018. The data has been taken from Pakistan stocks market, State bank of Pakistan, and yahoo finance. The interest rate is taken from the three-month T-bill rate, and the exchange rate is used against the US dollar. Karachi stocks Exchange index "100" is taken for market index.

### Research methodology

To check the relationship between bank stocks returns, market risk, exchange rate and interest rate multiply regression are used.

$$R_{t-1} = \beta_0 + \beta_i^m R_{m,t-1} + \beta_i^l l_{t-1} + \beta_i^F E_t + \varepsilon_{it}$$

Where  $R_{t-1}$  is the returns of bank stocks;  $\beta_0$  is a constant value;  $R_{m,t-1}$  is the market returns;  $l_{t-1}$  Is the risk of the return-free interest rate or T-bill rate?  $E_t$  is the returns of the exchange rate against the US dollar;  $\varepsilon_{it}$  is used for the error term.

### Result Discussion

#### Descriptive Statistic of all Banks

Table# 1

	Mean	Median	Std. Dev.	Skewness	Kurtosis	Jarque-Bera	Observations
ABL	0.00711	0.005616	0.106965	-0.21546	6.176287	61.21881*	143
AFL	0.001525	0.004779	0.111282	-0.52905	4.416241	18.62161*	143
AKBL	-0.0059	0.005072	0.118309	-0.80392	4.834973	35.46578*	143
BAHL	0.001693	0.015485	0.093454	-0.72513	4.204062	21.02186*	143
BIPL	-0.00072	0	0.131926	0.616376	6.677093	89.61744*	143
BOK	0.000241	0	0.130958	0.722492	6.299657	77.31363*	143
BOP	-0.00706	-0.01328	0.152785	0.816046	6.790313	101.4716*	143
FBL	-0.00213	-0.00161	0.112013	-0.64685	6.659757	89.77701*	143
JSBL	-0.00354	-0.00522	0.15018	0.495346	7.169728	109.4433*	143
MCB	0.007549	0.00088	0.108965	-0.33164	5.795532	49.18559*	143
NBP	-0.003	0	0.122769	-0.17036	4.95046	23.35898*	143
SBL	-0.00614	-0.01284	0.185837	0.263568	10.23087	313.19*	143
SCBL	-0.00805	0.000541	0.122193	-1.46123	10.65641	400.17*	143
SILK	-0.01871	-0.0221	0.146629	-1.53921	11.10796	448.1593*	143
MR	0.00942	0.019691	0.071254	-2.24546	14.36456	889.7077*	143
IR	-0.0021	9.04E-05	0.54808	-0.3636	70.9946	27550.11*	143
EXR	0.004328	0.000948	0.012762	1.493213	8.171227	212.4761*	143

### Explanation of variables

#### Bank stock returns (dependent variable)

Data on bank stock returns collected from those 13 Pakistani banks which listed on KSE 100 index. Monthly data of those 11 banks used for that study.

#### Market Risk (independent variable)

Market risk also called systematic risk. Monthly slope KSE 100 index point was used as a market risk variable.

#### Interest rate (independent variable)

"Monthly T-bill rate "is used as a proxy of variables interest rate. Data of this variable obtained from the state bank of Pakistan.

#### Exchange rate (independent variable)

We have been collecting data from State Bank of Pakistan.US\$ used as a proxy with the Pakistani currency exchange rate.

In the above table has been shown that the descriptive statistic of all banks and macroeconomic variables. The above shows that the mean, median, stander deviation, kurtosis, and jarque- Bera test mean value of some banks is negative, and some banks positive and skewness is also. The amount of kurtosis more than 3, which indicate the data series is leptokurtic. The jarque-Bera test is significant at level 1%, which shows that the data is not normally distributed. Hamrita & Trifi (2011) they applied the maximum overlap discrete wavelet variance, wavelet correlation, and cross-correlation to analyze the association with the

lag/lead relationship, these different time scales. They found that the relationship of the exchange rate is not significant from zero at all scales. (Naseem, Mohsin et al. 2019) they found that the exchange rate is significant at 1% level value and the coefficient is a positive relationship between variables, these variables indicated the exchange rate is high the stock prices in Pakistan stock exchange is also elevated by using the mean, median stander deviation, kurtosis, and jarque-Bera test.

### The result of Ordinary least square of all Banks

Table# 2

Bank Name	Consent	Market beta	Interest beta	Exchange beta
Allied Bank Limited	0.00863 (0.00935)	0.274818* 0.124157	-0.022362* 0.016005	-0.959862* 0.692319
Askari Bank Limited	-0.00112 (0.01028)	0.301561** 0.136485	-0.004308 0.017594	-1.763622** 0.761063
Bank Al-Habib Limited	-0.00113 (0.00819)	0.321446* 0.108841	-0.006183 0.014017	-0.054173 0.635543
Bank Al-Falah Limited	0.00261 (0.00986)	0.229724** (0.130919)	-0.018282 0.016876	-0.760686 0.730025
Bank Of Punjab Limited	-0.00384 (0.01361)	0.267368*** 0.180623	-0.008431 0.023284	-1.329135 1.007183
National Bank of Pakistan	-0.00155 (0.01094)	0.235323*** 0.145215	-0.008862 0.018719	-0.851108 0.809744
Faysal Bank Limited	-0.00184 (0.00994)	0.240956** 0.131979	-0.017105 0.017013	-0.598402 0.735938
Muslim commercial bank	0.00459 (0.00952)	0.394693* 0.126341	-0.00489 0.016286	-0.177942 0.704495
Silk bank Limited	-0.01513 (0.01267)	0.466203* 0.168147	-0.01216 0.021675	-1.84845** 0.937615
JS Bank Limited	-0.00656 (0.01185)	0.96911* 0.157322	0.016918 0.02028	-1.402706*** 0.877254
Standard Chartered Bank Limited	-0.01598 (0.00924)	0.939388* 0.122605	0.001636 0.015805	-0.211417 0.683663
Samba Bank Limited	-0.01535 (0.01534)	1.056195* 0.203699	0.027866 0.026258	-0.158503 1.135857
Bank Islami Pakistan Limited	-0.00407 (0.01005)	0.944969* 0.133451	0.012125 0.017203	-1.276644** 0.744146

The above table shows the result of the regression analysis of all banks. The above result of all thirteen banks disclosing the market risk is positively significant in all banks at 1%, 5% and 10% level of significance. The market coefficient value is ranged by 0.22 to 1.05. The interest coefficients are insignificant in all banks except Allied bank and the values of interest rate coefficient also positive and negative. The

exchange rate coefficient is only significant in five banks out of thirteen banks at level 1% and 5%. But the value of coefficient is negative in all banks. Elyasiani& Mansur (2005) found the variables results almost are same according to this study. They have reported that exchange and market beta highly significant used by ARCH, GARCH model. (Naseem, Mohsin et al. 2018) found that the causal relation from exchange

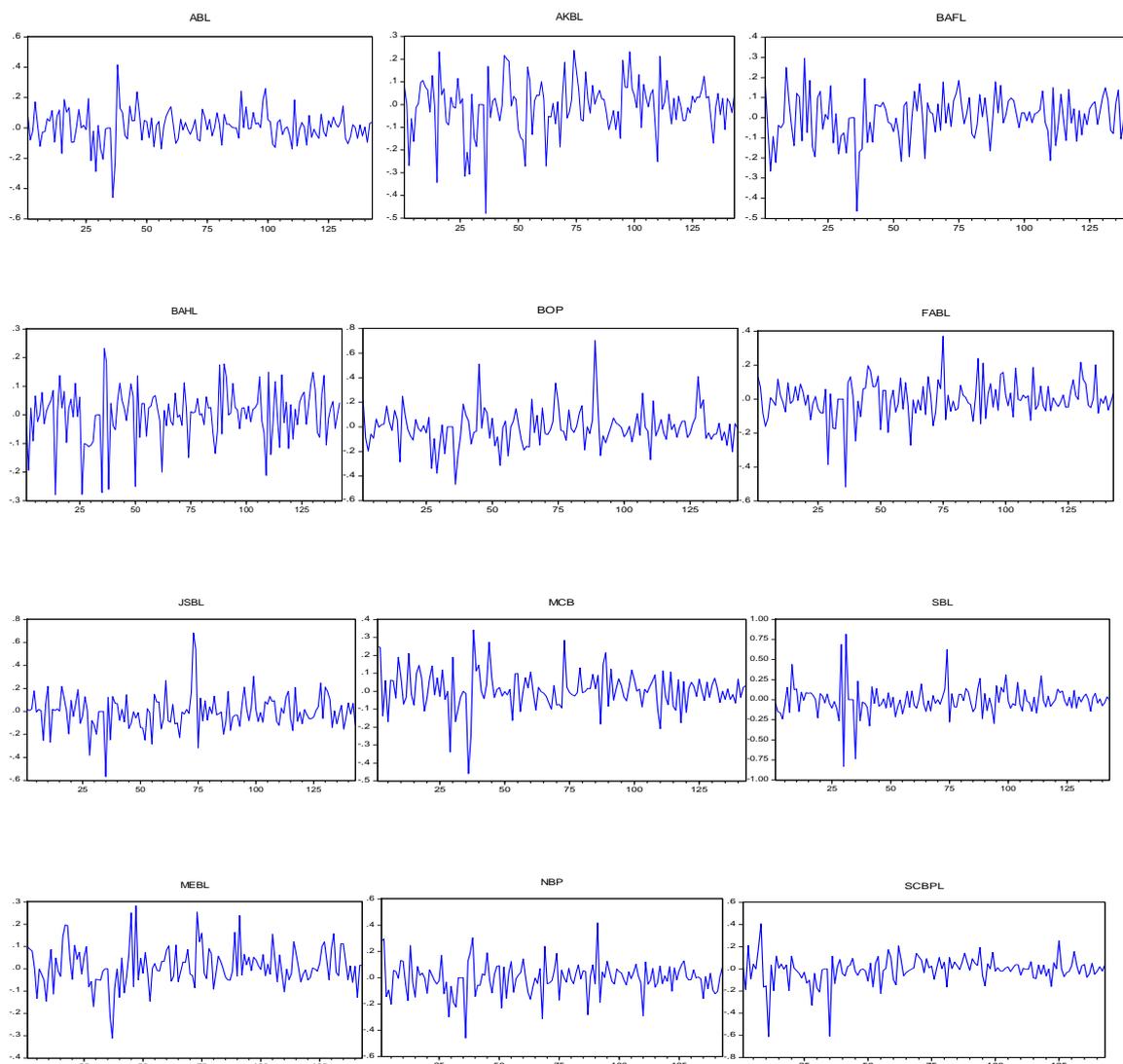
rates to stock prices is substantial for some countries. The equity market to foreign exchange market for Hong Kong, Korea, and Singapore found a causal relation. In that study no country showed a significant causality in stocks prices to exchange rates during Asian crisis except Malaysia.

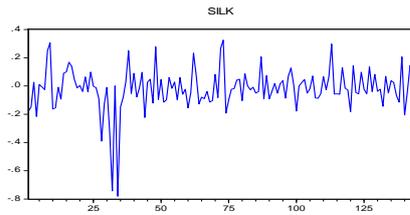
### Conclusion

The vigorous banking system is an excellent sign for the economy of a country. This sector plays a vital role in financial intermediation between investors and the savers, which define the rate of economic growth. The main objective of this study is to find the relationship between market risk, interest rate, exchange rate, and banks stock

return. In this research, 13 banks sample are used, which is listed on the Pakistan stock exchange. To find the relationship, the ordinary least square method is used. The study is essential for the management of banks, investor, and policymaker and also for bank regulators to appreciate spillover applicably so that they can calculate capital adequacy as (Abdullah, Siddiqua et al. 2017). The result of this research indicates that the market risk is positively significant in all banks, interest rate insignificant exempt of the allied bank, and the exchange rate rare significant negatively. The KSE-100 index of market is high and share price of banking sector also go to high. The market price and the bank stock return positively relation.

### Graphical presentation





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