Catalysts of Growth: Analyzing the Interplay of Interest Rates and Inflation in Shaping Pakistan's Automotive Industry Performance (2010-2022)

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Abstract

Background: *The outcome of any business entity is its net profit which is the final outcome of its investing, financing and operating activities. There are several internal and external factors that can influence the business operations.*

Research Aim: *This study investigates with the aim to examine the effect of interest rate and inflation rates on the performance of the automobile sector of Pakistan.*

Methodology: *Data was collected through secondary data analysis covering from 2010 to 2022 through Government reports and industry publications). The data was examined using IBM SPSS 23 and the model of this study was analyzed using the test of Linear Regression and Pearson's correlation.*

Results: *The findings of this study*

showed that the day-to-day rising inflation rate has a negative impact on the economic growth of the automobile industry in Pakistan.

Conclusion: *To conclude, the automobile industry is one of the key contributors to the economy of Pakistan. In shaping the performance of the automobile industry, interest rate and inflation rate plays a crucial role in Pakistan.*

Introduction

The automobile industry has a huge influence on the economy as it affects the growth of the economy of any country. The automobile industry's competitiveness is connected with domestic competition that energies a corporation to adapt to changes that could enhance their production (Rampersad, 2014). The automobile industries of economies of developing countries like Pakistan face global competition. The automobile industry has a complex structure as it evolves a variety of roles and departments for its development process and is sensitive to business fluctuations. This sensitivity can be defined as the demand of the consumer decreases the economic crisis of the country increases which ultimately decreases the sales and production of the industry. Pakistan's automobile industry day-by-day faces new challenges because of the instability in the economic condition of the country. Globalization demands such a model for the automobile industry which includes improved efficiency of fuels, minimization of cost, user comfort enhancement progress along with enhanced consideration towards safety and environment.

Since the automobile industry comes in the fast-emerging sector of Pakistan. For the global manufacturers of automobiles, significant investments are necessary for the development of plants. Finding innovative ideas and ways along with identifying the on-time challenges are supposed to be the key to the prosperity of the industry. In Pakistan's economy, increased inflation rates tax notices and interest rates are the factors that are behind the decreased growth in the Automobile sector. Due to increasing inflation, the sale of the automobile industry is decreasing because it affects the consumer's ability to buy vehicles in Pakistan, ultimately decreasing automobile production (Ghumman,

2019).

Research Gap

The automobile industry in Pakistan is flooded with multiple types of taxation, lack of framework, currency devaluation, Federal Excise Duty, recession in the global market and overall inflation are some of the factors for the decreasing growth. Among these factors, the increasing inflation has been seen as a resulting factor in the decline of production during the years 2019 and 2020 (Ghumman, 2019).

Research Objectives

To examine the impact of interest rates on the production of the automotive industry in Pakistan.

To examine the impact of the inflation rate on the production of the automotive industry in Pakistan.

Related Work

Interest Rate

Interest Rate has a direct link to the Automobile Financing and Long-term loan plans for investments, which is why it has a high potential to impact the manufacturing sectors. It was observed that from 2019 in Pakistan, the Government increased the interest rate for some financial reasons, this increase affected almost all the sectors but greatly affected the manufacturing industries because the investors hold their money in the Banks in order to get more profits from the increased interest rate and there was a decrease in sale observed because the consumer restrict themselves from buying automobile because the heavy interest rate have increased the sum in the perspective of Automobile financing. According to Ghumman (2019), the analyst in the automobile sector has determined that an increase in the interest rate has impacted a decrease in leasing which dropped the overall economic activity and resulted in reduced demand. It was found that a basic increase in the interest rate decreases the sales of

automobiles, this is because the commercial banks fail to provide the loans for the car buyers (Bernanke, 1993).

H1: There is a significant impact of the interest rate on the sales of the automobile industry in Pakistan.

Inflation Rate

The inflation rate is the rise of the prices of goods and services in any economy, this rise can be due to an increase in the cost of production which includes raw materials and wages of labourers (Musarat et al., 2021). This affects the consumers' willingness to pay and results in an increase in demand for products, because the inflation rate shows the consumer strength to purchase therefore it impacts the sales of the automobile in Pakistan. On the contrary, increases in the inflation rate, interest rate and unemployment were found to have a negative impact on car sales (Muhammad et al., 2012).

H2: There is a significant impact of the inflation rate on the production of the automobile industry of Pakistan.

Automobile Sale

The automobile industry is capital intensive as it requires a lot of capital to operate in terms of establishing a manufacturing unit and balancing or for the expansion of the existing industry. According to the data of Good Car Bad Car Automotive Sales Data, the overall number of units sold in the year 2019 was 162,689 which decreased to 104,387 due to the pandemic situation, many of the macroeconomic variables including interest rate, inflation rate and exchange rate affected the growth of sales of automobile industry during pandemic (Feriansyah & Ghozali, 2022).
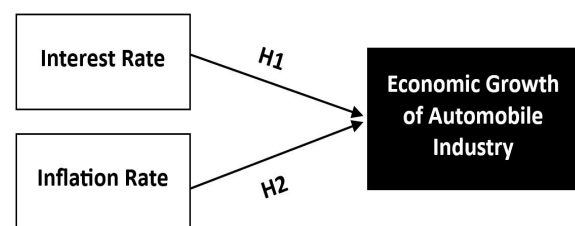
Figure 1. Research Framework

Growth Analysis of the Automobile Industry of Pakistan from 2010-2020

According to Ghumman (2019), the growth trend in the automobile sector of Pakistan from 2010 to 2020 has a combination of positive and negative growth rates. This industry has observed a fluctuation in the growth of automobiles between the years 2010-2022, this fluctuation is due to various factors like heavy tax rate, depreciation of rupee, inflation, interest rate and heavy policy rates. Some industries experienced positive growth rates due to these factors while others such as cars produced locally experienced negative growth due to the shift of policy in favour of imported cars. Similarly, the production of trucks also influenced negative growth due to the imposition of heavy tax duties. The year 2020 has experienced a continuous disruption in the automobile industry and faced an immense decline with a growth of 36%. The other factors including economic uncertainty and an increase in customs duty impact the performance and production of this industry in Pakistan. This growth further decreased in 2022 by 36.69% which was recorded as 57.53% in 2021.

Methodology

Research Design and Data Collection

This study utilizes the secondary source of data by adopting a quantitative analysis. Annual time series data on the variables including interest rate, sales, production and inflation rate of Pakistan over the years 2010-2022 are selected for the econometric analysis. The sources of data include from Federal Board of Revenue (FBR), Country Economy, Macrotrends, Pakistan Automotive Manufacturers Association (PAMA) and Good Car Bad Car Automotive sales data.

Statistical Tool

The data has been examined using the statistical tool IBM SPSS Statistics 23 since the research will

be concluded based on the quantitative approach.

Data Analysis

For the quantitative analysis of time series of econometric analysis Linear Regression and Pearson's correlation and ANOVA tests are utilised to examine the impact of variables.

Results and Analysis

This section focuses on measuring the impact of Interest rates and inflation rates on the sales of the Automobile industry in Pakistan. The data for interest rate was taken from Macrotrends, the data on inflation rate was collected from the Federal Board of Revenue (FBR) and Country Economy, while the data on sales of the Automobile industry was collected from Pakistan Automotive Manufacturers Association (PAMA) and Good Car Bad Car Automotive sales data.

Descriptive Statistics of Data

The descriptive statistics in Table 1 show the maximum and minimum values of all variables. Using SPSS, Frequency, Mean, Standard Deviation and Variance are calculated. In this data, the Interest Rate and Inflation Rate are independent variables while Sales is the independent variable. It can be noticed that the value of the inflation rate has a lower mean but is more volatile as compared to the interest rate.

Table 1. Descriptive Statistics of the Variables

	N	Mean	Std. Dev.	Variance
Interest Rate	13	9.88%	3.266%	10.673
Inflation Rate	13	8.82%	4.652%	21.649
Sales	13	49.21%	16.137%	260.430

Pearson Correlation

To prove the above-stated hypothesis, the Pearson correlation test was performed, Table 2 shows that the interest rate has a significant impact on automobile sales with a significant value of 0.000 which is $p > 0.05$ with a coefficient of correlation -0.41, the negative sign means that the interest rate has an inverse relation with the sales, it shows the

strength of the correlation between the variables. The test further showed that the value of inflation has a strong impact on the sales of automobiles with a significant value of 0.000 which is p>0.05 with a coefficient of correlation is -.084 which shows the strength of correlation between the variables, the negative sign shows that there is an inverse relation between inflation and sales

Table 2. Analysis of Pearson Correlation Statistics

	Interest Rate	Sales	Inflation	Sales rate
Pearson Correlation	1	-.041	1	-.084
Sig. (2-tailed)		.000		.000
N	13	13	13	13
Pearson Correlation	-.041	1	-.084	1
Sig. (2-tailed)	.000		.000	
N	13	13	13	13

Model Summary, ANOVA, and Coefficient Statistics Between Interest Rate and Sales

Table 3 shows the model summary of the interest rate and sales, the R-square value that is closer to 1 is considered a better-fit model, the value of R represents that there is a simple correlation between the variables with 0.358,

the R^2 value indicates the total variation in the dependent variables. In the current case, there is a 12.8% variation, which is considered to fall among the normal variation.

Table 3. Model Summary

Model	R	R^2	Adjusted R^2	Std. Error of the Estimate
1	.358[a]	.128	0.49	10.338%

a. Predictors: (Constant), Interest Rate

ANOVA stats show the regression analysis of the variables. Table 4 indicates that the significance value is .000 which is less than the p-value <0.05, this suggests that the overall regression model is positively valid and fit. The valid regression models mean that Interest rate is impacting sales in the automobile industry.

Table 4. Analysis of Variance (ANOVA)

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	173.151	1	173.151	1.62	.000[b]
Residual	1157.710	11	106.883		
Total	1348.681	12			

a. Dependent Variable: Sales
b. Predictors: (Constant), Interest Rate

Coefficient statistics determines the constant change

which is the impact of the independent variable on the dependent variables. Table 5 shows the significance value of 0.000 and the value of B is -1.163 which means that there is a slope between interest rate and sales and the negative sign indicates that when the interest rate increases the sales will decrease.

Table 5. Coefficient Table of Regression Analysis

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
Constant	56.559	9.474		5.970	.000
Interest Rate	-1.163	.914	-.358	-1.273	.000

a. Dependent Variable: Sales

Model Summary, ANOVA, and Coefficient Statistics Between Inflation Rate and Sales

Table 6 shows the model summary of the inflation rate and sales, the R-square value that is closer to 1 is considered a better-fit model, and the value of R represents that there is a simple correlation between the variables with .555 the R^2 value indicates the total variation in the dependent variables in this case there is 30.8% variation, which is considered to be a normal variation.

Table 6. Model Summary

Model	R	R^2	Adjusted R^2	Std. Error of the Estimate
1	.555[a]	.308	.245	9.2118%

a. Predictors: (Constant), Inflation rate

ANOVA stats show the regression analysis of the variables. Table 7 indicates that the significance value is .000 which is less than the p-value <0.05, this suggests that the overall regression model is positively valid and fit. The valid regression models mean that the Inflation rate is impacting sales of the automobile industry.

Table 7. Analysis of Variance (ANOVA)

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	415.414	1	415.414	4.895	.000[b]
Residual	933.447	11	84.859		
Total	1348.861	12			

a. Dependent Variable: Sales
b. Predictors: (Constant), Inflation rate

Coefficient statistics determines the constant change which is the impact of the independent variable on the

dependent variables. Table 8 shows the significance value of 0.000 and the value of B is -1.265 which means that there is a slope between interest rate and sales and the negative sign indicates that when the inflation rate increases the sales will decrease

Table 8. Coefficient Table of Regression Analysis

Model	Unstandardized Coefficients B	Std. Error	Standardized Coefficients Beta	t	Sig.
Constant	56.227	5.655		9.944	.000
Inflation Rate	-1.265	.572	-.555	-2.213	.000

a. Dependent Variable: Sales

To sum up, Linear Regression and Pearson Correlation tests were performed, the findings of this study indicate that interest rate has a significant and inverse impact on the Sales of the Automobile industry with a p-value equal to 0.000 which is less than 0.05 and the coefficient of correlation is -.041 which indicates that in order to increase the sales of automobile industry in Pakistan the interest rate should be minimized. Similarly, the inflation rate also showed a significant impact on the Sales of the Automobile industry with a significance value of 0.000 which is p<0.05 and a coefficient of correlation -0.84 which indicates the strength of the impact imposed by the inflation rate on sales, this tells us that to increase the sales of automobile industry in Pakistan, inflation rate showed should be minimized.

Discussion

It is clear from the above research that macroeconomic variables like interest and inflation determine the sales of the industry. By introducing the above hypothesis, this study has significantly advanced the existing literature to investigate the econometric variables like interest rate and inflation in the context of Sales of the Automobile industry in Pakistan. The findings of this study showed an inverse impact of interest rate and inflation rate on the sales of the automobile industry of Pakistan. The results of

this study were in line with the study carried out by Ahmed (2020).

The robustness of these findings was examined by Linear Regression and Pearson's Correlation and they found evidences that there is a significant association between the interest rate and inflation rate on sales of the automobile industry. The finding is inconsistent with the study of Johan (2019), which states that there is a significant relation between the interest rate and inflation rate on sales because it affects the consumer's willingness to buy. There has been a constant fluctuation in sales over these years due to the high price of inventories which has resulted in low production and low sales in the recent year.

Pearson's correlation suggested that there is an inverse relationship between interest rate and inflation on sales which means that a little fluctuation in interest rate and inflation rate decrease the sale of the automobile industry. Our study findings were in line with the result of Pehlivanoğlu and

Riyanti (2018) who state that a 1% increase in interest rate results in a decrease in car sales and Patra (2017) which state that there is a negative relationship between the interest rate and automobile sale trend. Further the findings of this research state that if the interest rate is high, there will be a shortage of capital in the market. This result was inconsistent with the study carried out by Nwandu (2016) which stated that when the interest rate of the country is high the business investors will prefer to keep their capital in the bank, this creates a shortage of capital in the market and ultimately affects the manufacturing sector. This capital shortage in the economy is due to the hike in interest rates (The Express Tribune, 2020). The Government of Pakistan increased the interest rate which affected the business sectors and decreased the economic performance of the country because the interest rate was high and was above the normal profit margin percentage. This study further claims that an increase in inflation would badly

affect the economy decreasing sales of the automobile industry. This outcome was similar to the study of Muhammad et al. (2012) which stated that if there is an increase in the inflation rate along with the increase in the interest rate then there is a substantial negative effect on the economy of Pakistan.

The success of factor of automobile industry depends upon effective policy, implementation, monitoring and readiness to adapt to changes in the economic condition. The right balance between the automobile industry and economic stability is crucial in achieving sustainable growth in this sector. Other factors that could affect the sales of automobile includes global oil prices, currency exchange rate and geopolitical events.

Conclusion and Recommendations

For Pakistan's economy, the automobile industry is one of the key contributors that can enforce development if this sector thrives in a positive direction. In shaping the consumer behavior and performance of the automobile industry, interest rate and inflation rate play a crucial role in Pakistan. This control in the economy can be maintained by regulating the interest rate and inflation rate properly by the Government and State Bank of Pakistan so that it cannot impact the sales of the automobile industry (Ghumman, 2019). Since the world is penetrating towards higher technology transformation there is always a need for constant aggrandizement in the industries but the Government of Pakistan should also try to regulate the interest and inflation rate that could increase the sales of the automobile industry in Pakistan. Some of the key recommendations are given below:

The State Bank of Pakistan (SBP) should regulate the monetary policy by adjusting the interest rate, this could encourage consumers to borrow loans to

purchase vehicles.

The government could lessen the inflation rate by reducing the budget deficit and increasing the efficiency of public spending. Lowering the inflation could make the vehicle purchase more affordable.

The government should offer some tax incentives such as reduced sales tax and import duty that could lower the overall cost of the vehicle and increase sales.

The government can act in collaboration with banks to provide special programs for financing with lower interest rates making it easier for the consumer to buy it.

The domestic industries of Pakistan should be supported through incentives and reduced costs that could lead to an increase in production which can drive sales.

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