**NIIT UNIVERSITY**

**NEEMRANA 301705, Dist. Alwar (Rajasthan)**



***Gems and Jewellery Industry in India***

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***Project* *Based* *Learning***

***2017-2018***

***Contents***

* Group Members
* Preface
* Demand and Supply
* Production Function
* Cost Function
* Gross Domestic Product
* Asian Contribution
* Inflation
* Employment
* Business Trends
* Capital Investment
* Impact of Monetary Policy
* Impact of Fiscal Policy
* Technological Innovation
* Impact of Currency
* Bank Credit
* Non-Performing Assets
* Interest Rate Analysis
* State-wise Analysis
* Major Transport Used
* Import and Export
* Information and Communication Technology
* Market Leaders

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| --- | --- | --- | --- | --- |
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| 2. | Desu Lohith | U101116FEC159 | Production Function | Y |
| 3. | Archana  Gujar | U101116FEC158 | Cost Function | Y |
| 4. | Vaibhav Vijay  Singh | U101116FCS268 | GDP  Contribution | Y |
| 5. | Sai Vamsi Krishna Reddy | U101116FCS186 | Asian Contribution | Y |
| 6. | Tavva G N R S  N Prudhvith | U101116FCS142 | Inflation | Y |
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| 8. | Peguda  Likitha | U101116FCS084 | Business Trends | Y |
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| 11. | P.Sai Krishna Vamsi | U101116FCS088 | Impact of  Fiscal Policy | Y |
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| 15. | Biren Sharma | U101116FCS246 | Non-Performing Assets | Y |
| 16. | Siddhant Shah | U101116FCS129 | Interest Rate  Analysis | Y |
| 17. | Yogesh Sharma | U101116FCS247 | State-wise  Analysis | Y |
| 18. | Javed Akhtar | U101116FCS269 | Major  Transport used | Y |
| 19. | Yarlagadda Sai Kaushik | U101116FEC277 | Import and Export | Y |
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**I declare that above information supplied by group members is correct to the best of my knowledge. In case of any discrepancy in the information, I will be responsible for the same.**

**Signature**

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**Date: 30/04/2018.**

**Acknowledgement:**

**“I would specially like to thank Our Course In-charge ‘DR.GURENDRA BHARDWAJ’ for giving a very good opportunity to learn through this project and helping us throughout this project and I would also like to thank my group members who did a very good job in doing lot of research and making this Project Based Learning a success. I learned a lot through the course of this project which would definitely help me in the future.”**

**PREFACE**

This report is a part of Project Based Learning in NIIT University. The whole project is divided into 21 subtopics. The main objective of this project is to understand how the Gems and Jewellery Industry influences the Indian economy. After reading this report one can get brief knowledge about this industry and get to know how this industry works. The project was completed based on the data collected from various government sites and blogs.

The timeline of this project was two months in which each member contributed their part by researching and analyzing various subtopics associated with this industry in detail.

The Gems and Jewellery Industry plays a very important role in the economy of India. This industry is considered as a small scale oriented industry with traditional and skill mindset. Gems and Jewellery are used both as an investment and improving aesthetics, due to which it gained importance. Gems and Jewellery are the leading foreign exchange earner in the country. This industry is one the fastest growing industries in India.

Demand and Supply:

Demand overall has increased in the last few years even after the increase in prices over the period of time. Another astonishing fact observed is that the demand does not depend on the price unlike the demand and supply rule. To fulfill the demands our country also takes help of importing the precious metals.

Production Function:

The production function calculated varied from company to company which was calculated by regression values between profit/loss – Capital Cost and profit/loss – employee cost. Certain companies were found to be labor intensive and some were found to be capital intensive on the basis of the data obtained.

Cost Function**:**

The cost function analysis of companies comprised analysis of total variable cost and total fixed cost and upon observation was found that it is a variable intensive industry that is the price of the product is largely dependent on the variable cost and not the fixed ones.

GDP Contribution:

An industry as mammoth as the Gems and Jewellery industry contributes significantly to the GDP of India. Variables such as import as contribution to GDP, Foreign Direct Investment and current account balance are used to calculate the contribution this industry has on the GDP. This industry is definitely a boon for GDP.

Asian Contribution:

Asian contribution refers to the contribution of the Asian countries in terms of production of the precious metals. The variables on which the research is done are production, price and reserves of gold, silver and diamond. Upon analyzing the data and finding regression values it has been seen that production has increased in some countries for some metals and decreased in some of them with India giving a healthy contribution.

Inflation:

Inflation or the general rising in prices and reduce in sale is also observed in Gems and Jewellery industry. The variables on which it is being studied are cost, import and export of Gems and Jewellery. Plotting Inflation vs. Imports and Inflation vs. Exports we have found different results for different impacts.

Employment:

This Gems and Jewellery industry requires a large number of people to work in both skilled as well as unskilled sector. Combining variables such as wages, contribution to funds and staff welfare expenses we have formulated employment for a number of companies. Since the companies are growing at a very fast rate they will need more and more employees to cover the work load.

Business Trends:

The business trends are changing and our research depends on the following variables like investments, share capital, net sales, reserves and surplus, and total assets. Studying these factors for the companies we have found that each company has its own dependency on certain factors based on the data collected.

Capital Investment**:**

Capital investments or the investments done in the industry to increase its value have been significant in the Gems and Jewellery industry. Accounting induced as well as autonomous investments we have formulated certain results to see whether they have benefited the company or not.

Monetary Policies:

Monetary policies by the government such as the repo rate, bank rate, reverse repo rate, cash reserve ratio, and marginal standing facility each of which explained in detail play a role in making sure the industry runs smoothly. The Demonetization that recently occurred also had its own impact which is also shown based on the data collected.

Impact of Fiscal policy:

Fiscal policy is governed by central government itself. The Goods and Service Tax (GST) is the most recent fiscal policy introduced by the government which has greatly influenced this industry.

Technological Innovation:

Innovation is one the key factors that contribute to the upsurge of the industry and technology is the one most intangible factors that is brought in by the industry to capitalise on the opportunities created by the series of policy changes.

Impact of currency :

Earlier, Gems and Jewellery were used as a currency. With the introduction of Fiat currency, the price of gems and jewellery in India are also dependent on currency rates.

Bank Credit:

Since Gems and Jewellery are a type of investment of money. The banking sector comes into play due to shortage of money. This shortage is fulfilled by credit. Bank credits can be boon or bane to this industry depending upon its utilisation.

Non-Performing Assets:

A Debt is declared non-performing when the credit installment has not been paid for a period of 90 days. Non-Performing assets have led to great downfall in this industry in recent years.

Interest Rate:

The investment is inversely effected by the change in interest rate. So, this industry is very conscious about the lending interest rate of various Gems and Jewellery. However, the value of these precious metals is so high and stable that people will opt for these loans irrespective of the interest rate.

State wise Analysis:

The contribution of the Gems and Jewellery industry to the economy as a whole can be known by combining the contribution of each state through this industry. We can also know each state's position in terms of this industry.

Major Transport used:

Since Gems and Jewellery have very high monetary value the transportation has to be secured and safe during all the stages from extracting the raw material till it reaches the buyer. The transportation expenditure should be minimal and efficient so that Import and Export of these goods do not get disturbed.

Import and Export:

India is called the golden bird of the world and whitely so as it is one of the largest exporters of jewellery in the world. India also occupies higher position in the import list of these goods.

Information and communication technology:

ICT helps in the development of every industry as the communication to the consumer is constantly improving. Through ICT, The consumer can sit at home and check for different jewellery which eases their life. This also helps in improving the quality of the product and service.

Market Leaders:

Every industry must possess healthy competition so that a better service provider as well as the consumer is benefitted. The gems and jewellery industry in India also has certain notable market leaders who, through their unique methods of promotions and quality of their product are leading the market.

Through the urbanization of the India's population, there is an expectation that it will boost household income, thereby leading to higher demand for gems and jewellery. The Indian middle class is also expected to rise and this rise of young Indian middle class worker is expected to lead to an increase in demand for gems and jewellery which can be a huge gain for the industry.

**Demand and Supply**

In a country of a billion people such as India, the demand for the precious metals has always been on an increasing side. Be it the gems and jewellery for personal purposes, in rituals and as an asset or providing a key factor in India’s financial model, the demand never ceases. We even have to export huge amounts to cater the requirements of the country.

**Variables Used**:

1. **Imports:** Imports have become an absolute necessity owing to the tremendous growth in the demand for precious metals for jewellery. The industry has

Seen an exponential increase in the imports regardless of the fact that

The prices are also increasing.

1. **Prices:** Well, that is an obvious observation that the price per gram for gold and per kilogram for silver has also seen an increase in the last seven years.

A table given below will give the details of prices.

1. **Demand:** The demand for the metal is in two forms.

* Coins or Bars: A significant demand comes for coins or bars that

keep as investment or token. Since they have high

value, they are used as a tool to get loans also.

* Jewellery

Here are the details of my research work that explores these three categories:

**Data Analysis:**

* + 1. **Gold:**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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| |  |  |  |  |  | | --- | --- | --- | --- | --- | | **Year** | **Jewellery (in tonnes)** | **Coins (in tonnes)** | **Gold Imports (In Million$)** | **Gold Price per gram INR** | | 2010 | 650 | 340 | 8652 | 19227.08 | | 2011 | 610 | 350 | 10963 | 25722.42 | | 2012 | 590 | 310 | 11335 | 30163.93 | | 2013 | 600 | 340 | 5663 | 29190.39 | | 2014 | 620 | 210 | 5468 | 27414.55 | | 2015 | 650 | 200 | 4184 | 26534.26 | | 2016 | 500 | 160 | 4291 | 29665.28 | |

1. **Regression analysis of Gold Jewellery vs Price:**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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| |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | | *Regression Statistics* | |  |  |  |  |  |  |  | | Multiple R | 0.622001 |  |  |  |  |  |  |  | | R Square | 0.386885 |  |  |  |  |  |  |  | | Adjusted R Square | 0.264262 |  |  |  |  |  |  |  | | Standard Error | 43.65676 |  |  |  |  |  |  |  | | Observations | 7 |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  |  | | ANOVA | |  |  |  |  |  |  |  | |  | *Df* | *SS* | *MS* | *F* | *Significance F* |  |  |  | | Regression | 1 | 6013.293 | 6013.293 | 3.155073 | 0.135849 |  |  |  | | Residual | 5 | 9529.564 | 1905.913 |  |  |  |  |  | | Total | 6 | 15542.86 |  |  |  |  |  |  | |  |  |  |  |  |  |  |  |  | |  | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* | *Lower 95.0%* | *Upper 95.0%* | | Intercept | 829.7452 | 128.7955 | 6.442346 | 0.00134 | 498.6658 | 1160.825 | 498.6658 | 1160.825 | | X Variable 1 | -0.00845 | 0.004758 | -1.77625 | 0.135849 | -0.02068 | 0.00378 | -0.02068 | 0.00378 | |

1. **Correlation** **:**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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| |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | *Column 1* | *Column 2* | *Column 3* | *Column 4* | | Column 1 | 1 |  |  |  | | Column 2 | 0.415482 | 1 |  |  | | Column 3 | 0.185921 | 0.745434 | 1 |  | | Column 4 | -0.622 | -0.36111 | -0.19496 | 1 | |

* + 1. **Silver:**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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| |  |  |  |  |  | | --- | --- | --- | --- | --- | | **Year** | **Jewellery (in tonnes**) | **Coins (in tonnes)** | **Silver Imports (In Million$**) | **Silver Price per kg INR** | | 2010 | 610 | 54 | 87 | 37289.54 | | 2011 | 679 | 58 | 100 | 57315.87 | | 2012 | 724 | 58 | 70 | 57602.3 | | 2013 | 932 | 106 | 39 | 46636.8 | | 2014 | 1398 | 159 | 35 | 40558.48 | | 2015 | 1553 | 204 | 44 | 36318.1 | | 2016 | 1677 | 201 | 51 | 42748.31 | |

1. **Regression analysis for Jewellery vs Cost:**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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| |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | | *Regression Statistics* | |  |  |  |  |  |  |  | | Multiple R | 0.540512 |  |  |  |  |  |  |  | | R Square | 0.292153 |  |  |  |  |  |  |  | | Adjusted R Square | 0.150583 |  |  |  |  |  |  |  | | Standard Error | 414.1528 |  |  |  |  |  |  |  | | Observations | 7 |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  |  | | ANOVA | |  |  |  |  |  |  |  | |  | *Df* | *SS* | *MS* | *F* | *Significance F* |  |  |  | | Regression | 1 | 353966.1 | 353966.1 | 2.063671 | 0.210341 |  |  |  | | Residual | 5 | 857612.8 | 171522.6 |  |  |  |  |  | | Total | 6 | 1211579 |  |  |  |  |  |  | |  |  |  |  |  |  |  |  |  | |  | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* | *Lower 95.0%* | *Upper 95.0%* | | Intercept | 2328.96 | 882.1244 | 2.640172 | 0.045967 | 61.38693 | 4596.533 | 61.38693 | 4596.533 | | X Variable 1 | -0.02741 | 0.019081 | -1.43655 | 0.210341 | -0.07646 | 0.021639 | -0.07646 | 0.021639 | |
|  |

1. **Regression analysis for Silver Bars vs Cost:**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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| |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | | *Regression Statistics* | |  |  |  |  |  |  |  | | Multiple R | 0.596956 |  |  |  |  |  |  |  | | R Square | 0.356357 |  |  |  |  |  |  |  | | Adjusted R Square | 0.227628 |  |  |  |  |  |  |  | | Standard Error | 59.36608 |  |  |  |  |  |  |  | | Observations | 7 |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  |  | | ANOVA |  |  |  |  |  |  |  |  | |  | *Df* | *SS* | *MS* | *F* | *Significance F* |  |  |  | | Regression | 1 | 9756.344 | 9756.344 | 2.768282 | 0.157034 |  |  |  | | Residual | 5 | 17621.66 | 3524.331 |  |  |  |  |  | | Total | 6 | 27378 |  |  |  |  |  |  | |  |  |  |  |  |  |  |  |  | |  | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* | *Lower 95.0%* | *Upper 95.0%* | | Intercept | 327.0451 | 126.4467 | 2.586426 | 0.049049 | 2.003453 | 652.0868 | 2.003453 | 652.0868 | | X Variable 1 | -0.00455 | 0.002735 | -1.66382 | 0.157034 | -0.01158 | 0.00248 | -0.01158 | 0.00248 | |

1. **Correlation**:

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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| |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | *Column 1* | *Column 2* | *Column 3* | *Column 4* | | Column 1 | 1 |  |  |  | | Column 2 | 0.991155 | 1 |  |  | | Column 3 | -0.73553 | -0.74601 | 1 |  | | Column 4 | -0.54051 | -0.59696 | 0.479151 | 1 | |

**Conclusions:**

We see that for both, silver as well as gold the regression values are less than 0.5 and somewhat near to 0.3. This indicates that the demand is less dependent on the price ironical to the definition that demand has major dependency on the price.

“Gold and silver are the most complicated assets to price. Stocks, currencies and other commodities mostly depend on fundamental data of the stock, the country or on physical demand and supply of the commodity. ... But for us, the production/demand/inventory formula does not really apply to gold because gold is itself a currency”

So as per my research the gold demand does not depend on the prices of gold.

**Production Function**

A production function is the interconnection between the quantities of input and output for efficient production for all possible process set up as functional forms. In particular, the production function tells us the maximum quantity of output the firm can produce given the quantities of the inputs that it might employ. Production Functions describe how output is made from different combinations of inputs,

Where **Q** is the quantity of output, **K** is the quantity of capital used, and **L**

is quantity of labour used.

***Q = f(K, L)***

The production function portrays the level of output, the marginal and average productivities of factors, and marginal rates f substitutions between pairs of factors, for all relevant patterns of factor inputs.

1. **Factors of Production :-**Production of goods and services involves transforming resource such as labour, Power, raw materials, and the services provided by facilities and machines into finished products.

The productive resources, such as labour and capital equipment, that a firm uses to manufacture goods and services are called inputs or factors of production, and the amount of goods and services produced is the firm’s output.

1. **Production in short run :-**The short run refers to the case in which the level of capital is fixed, typically expressed as:-

**Q=f(KI,L)**

First, we consider how production changes as we vary the amount of labor.

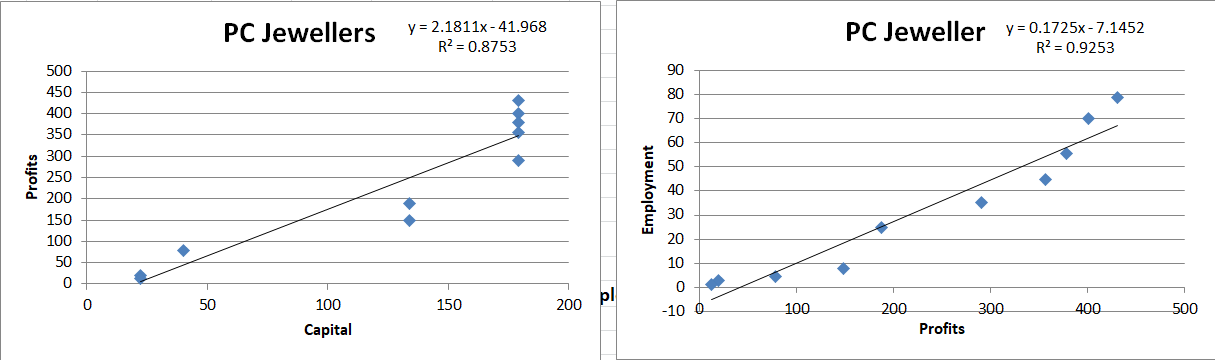
1. **Production in long run :-**The production in long run can be defined as for a period of time during which all the factors of inputs or resources in production are fully adjustable to get the desired output.

During the past years, there is a drastic change in production of gems and jewellery industry. It increases due to change in methods of producing jewellery in previous years there was a huge man-force in production sector but now as the technology and investments increases the man-force is replaced by machines and increases production.

**Data Analysis:-**

1. **PC Jewellery:-**

|  |  |  |  |
| --- | --- | --- | --- |
| **Year** | **Equity capital** | **Profits** | **Employment** |
| 2017 | 179.14 | 430.53 | 78.6 |
| 2016 | 179.1 | 400.88 | 70.17 |
| 2015 | 179.1 | 378.23 | 55.54 |
| 2014 | 179.1 | 356.31 | 44.74 |
| 2013 | 179.1 | 290.66 | 35.3 |
| 2012 | 133.96 | 187.79 | 24.89 |
| 2011 | 133.97 | 148.43 | 7.69 |
| 2010 | 40.16 | 78.4 | 4.42 |
| 2009 | 22.16 | 19.07 | 3.04 |
| 2008 | 22.16 | 11.89 | 1.24 |

****

**R-square is a statistical measure of how close the data are to be fitted regression line.**

1. Regression for Profit/Loss and Capital Share = 0.875

Here Profit/Loss is dependent on Capital Share as Regression value is more than 0.67.

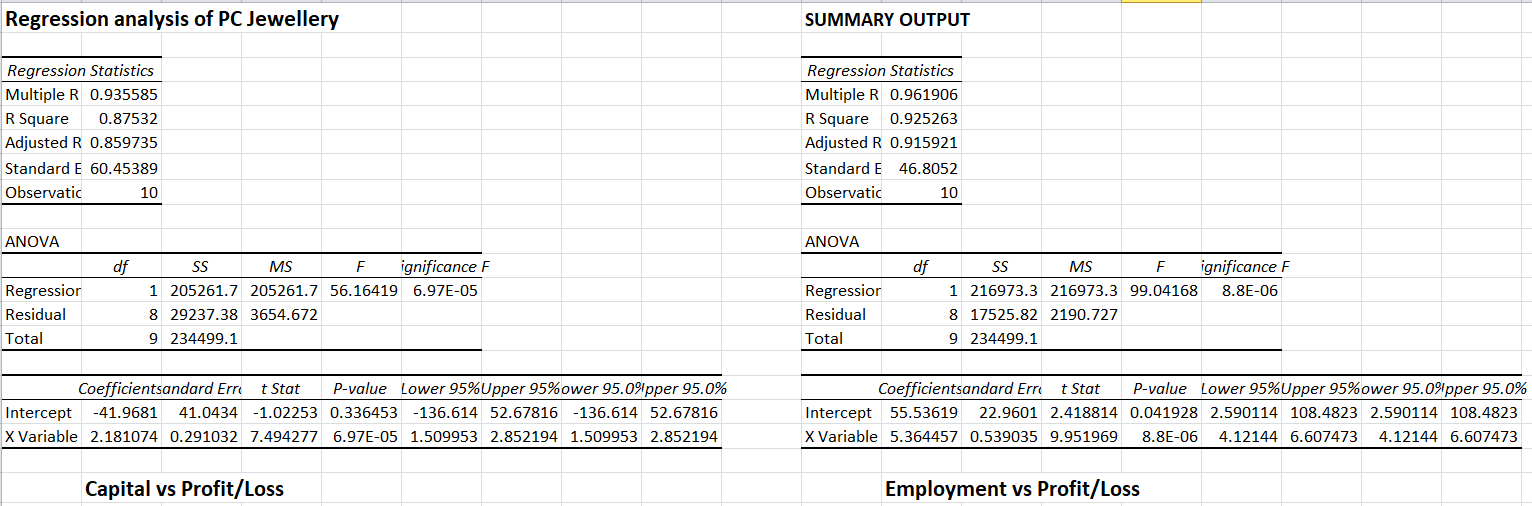
1. Regression for Profit/Loss and Employee Cost = 0.925

Here Net Profit is dependent on Employee Cost as Regression value is more than 0.67.

Here, Profit/Loss is more dependent on Employee Cost than Capital Share as

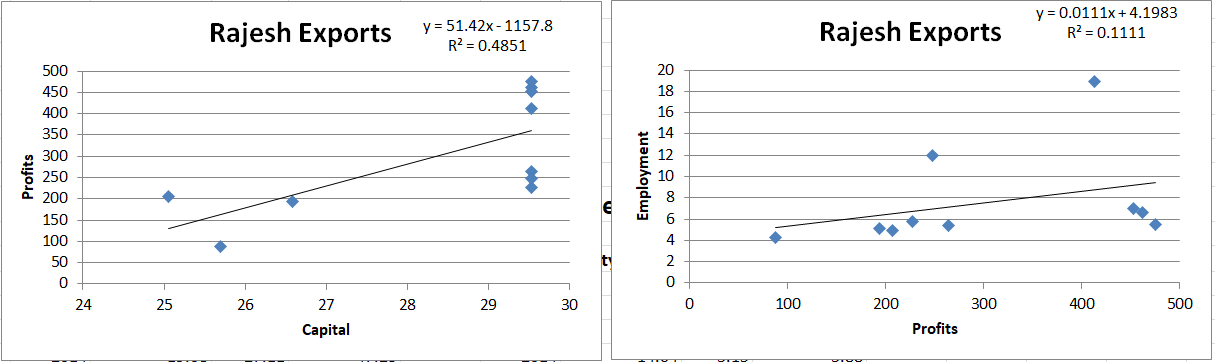
Regression for Profit/Loss and Employee Cost (i.e., 0.925) is more than Regression for Profit/Loss and Capital Share (i.e., 0.875).

By this we can say that PC Jewellery is dependent on labour intensive rather than capital intensive.

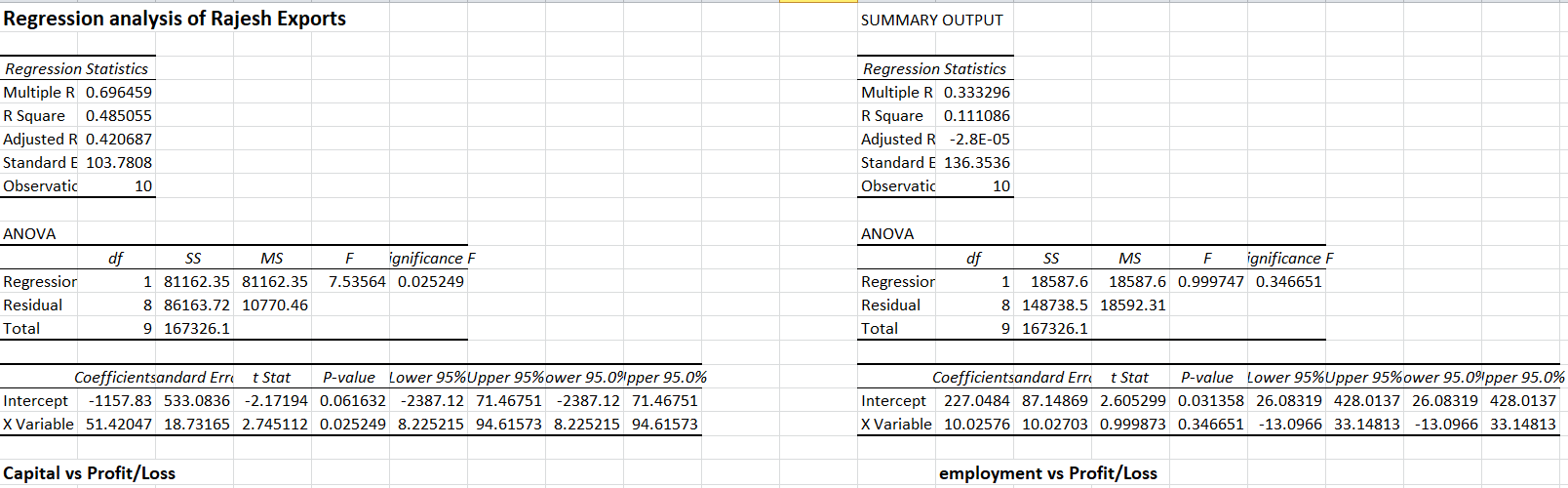
****

1. **Rajesh Exports :-**

|  |  |  |  |
| --- | --- | --- | --- |
| **Year** | **Equity capital** | **Profits** | **Employment** |
| 2017 | 29.53 | 461.34 | 6.61 |
| 2016 | 29.53 | 475.29 | 5.49 |
| 2015 | 29.53 | 263.94 | 5.42 |
| 2014 | 29.53 | 226.99 | 5.78 |
| 2013 | 29.53 | 452.6 | 7.01 |
| 2012 | 29.53 | 412.43 | 18.91 |
| 2011 | 29.53 | 247.99 | 11.96 |
| 2010 | 26.58 | 193.4 | 5.13 |
| 2009 | 25.7 | 87.19 | 4.3 |
| 2008 | 25.06 | 206.56 | 4.92 |

****

1. Regression for Profit/Loss and Capital Share = 0.485
2. Regression for Profit/Loss and Employee Cost= 0.111

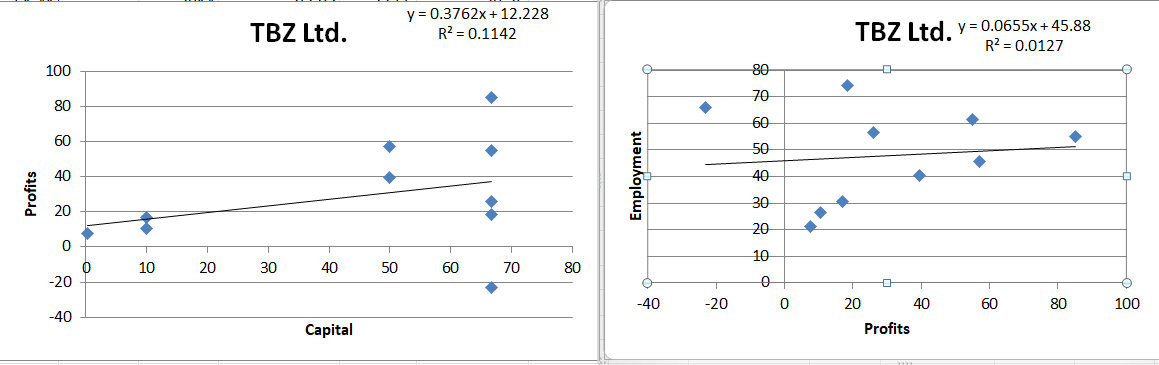


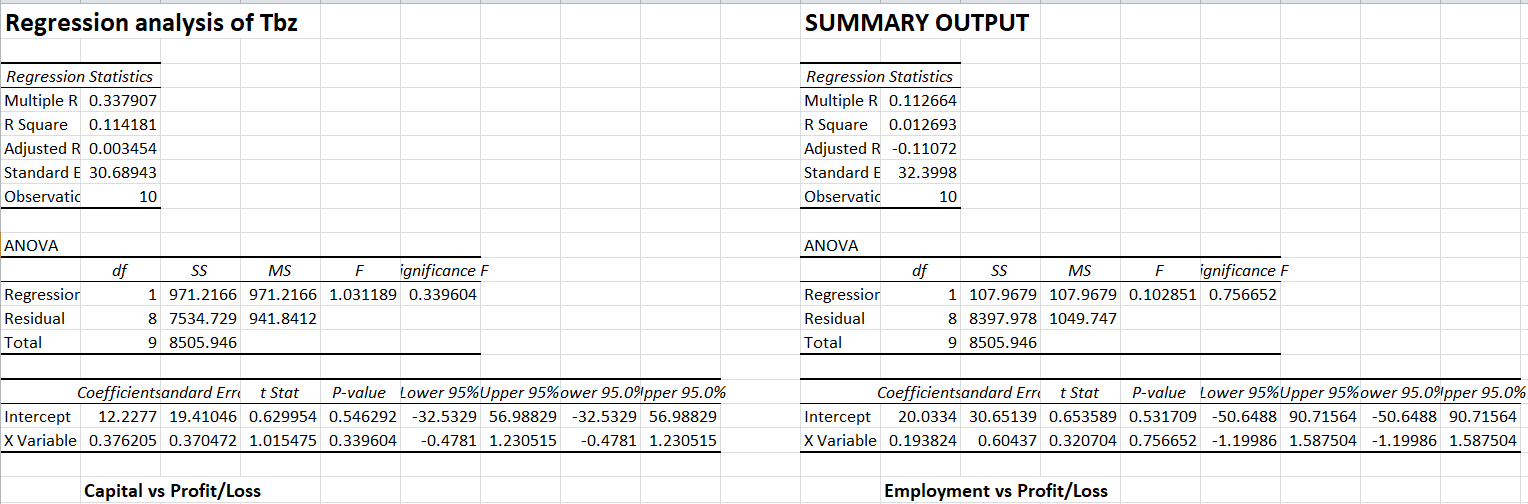
By comparing both the regression values Capital share is greater than Employment cost.

Hence we can conclude that Rajesh exports are dependent on Capital intensive rather than Labour intensive.

1. **Tribhovandas Bhimji Zaveri Ltd (Tbz) :-**

|  |  |  |  |
| --- | --- | --- | --- |
| **Year** | **Equity capital** | **Profits** | **Employment** |
| 2017 | 66.73 | 18.53 | 74.34 |
| 2016 | 66.73 | -23.13 | 65.96 |
| 2015 | 66.72 | 26.04 | 56.72 |
| 2014 | 66.7 | 55.06 | 61.41 |
| 2013 | 66.67 | 85 | 55.1 |
| 2012 | 50 | 57.19 | 45.75 |
| 2011 | 50 | 39.42 | 40.52 |
| 2010 | 10 | 16.94 | 30.72 |
| 2009 | 10 | 10.43 | 26.43 |
| 2008 | 0.2 | 7.5 | 21.04 |



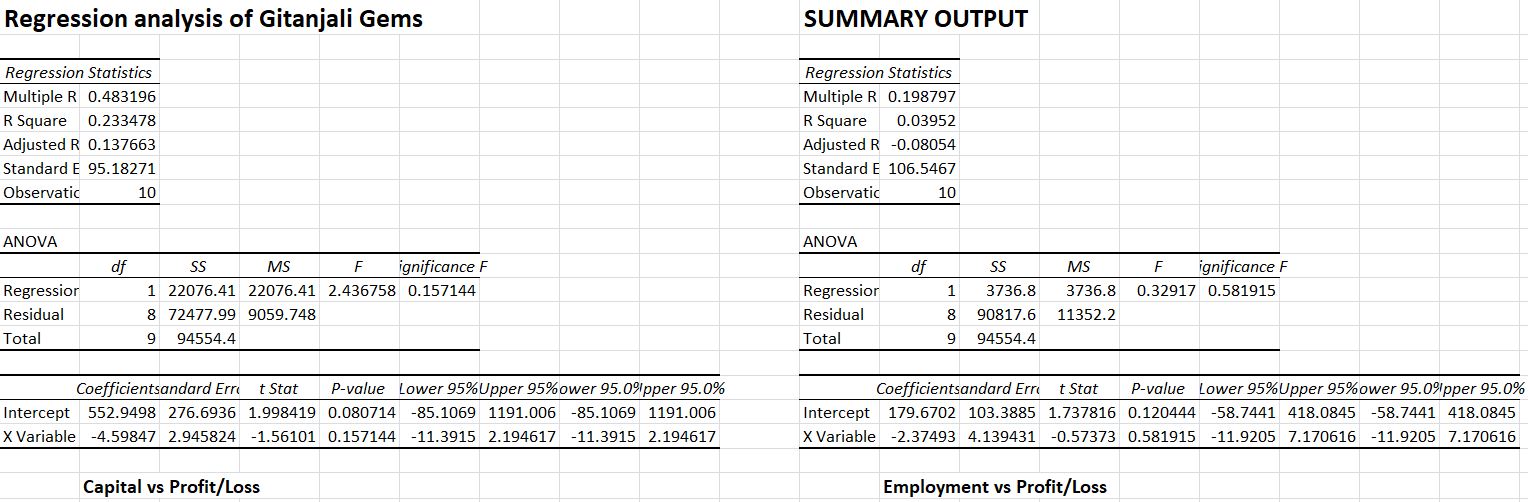
****

1. Regression for Profit/Loss and Capital Share = 0.114
2. Regression for Profit/Loss and Employee Cost = 0.012

By comparing both the regression values we can say that TBZ is dependent on Capital intensive rather than Labour intensive.

1. **Gitanjali Gems :-**

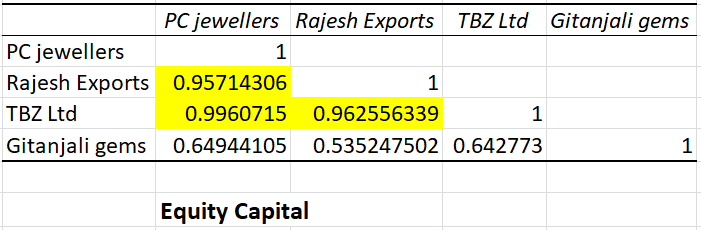
|  |  |  |  |
| --- | --- | --- | --- |
| **Year** | **Equity capital** | **Profits** | **Employment** |
| 2017 | 118.62 | 39.72 | 38.76 |
| 2016 | 102.44 | 44.86 | 35.17 |
| 2015 | 98.12 | 18.86 | 24.29 |
| 2014 | 92.07 | -22.65 | 20.26 |
| 2013 | 92.07 | 265.16 | 23.86 |
| 2012 | 91.12 | 258.34 | 26.51 |
| 2011 | 84.87 | 224.6 | 24.8 |
| 2010 | 84.27 | 142.09 | 15.05 |
| 2009 | 85.06 | 126.77 | 15.8 |
| 2008 | 85.06 | 138.16 | 11.63 |

****

1. Regression for Profit/Loss and Capital Share = 0.233
2. Regression for Profit/Loss and Employee Cost = 0.039

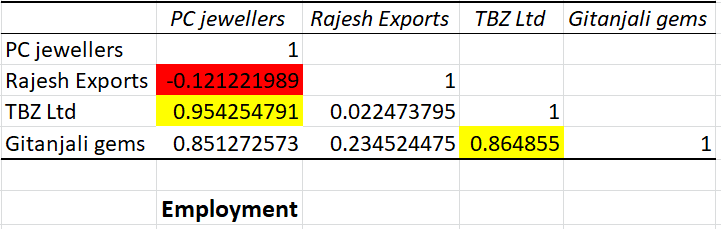
By the above regression values we can conclude that Gitanjali Gems is dependent on Capital intensive rather than Labour intensive.

**Correlation of Equity capital of PC J, Rajesh exports, Tbz :-**

****

The values in gold color indicate that there is a positive strong correlation between PC Jewellers, Rajesh exports, TBZ Ltd.

**Correlation of Employment of PC J, Rajesh exports, Tbz :-**



The gold color indicates that there is positive strong correlation between TBZ Limited, PC Jewellers and Gitanjali Gems, TBZ Ltd. While the red color indicates that there is negative week correlation between Rajesh exports and PC Jewellers.

**Conclusion:-**

From the above analysis of different gems and jewellery companies we can conclude that Gems and Jewellery industry is more dependent on Capital intensive/share because as the capital share increases the machinery is being replaced by employment and the production increases drastically.

**COST FUNCTION**

­In economics, Cost Function is the relationship between production expenses and output of company or any business. It consists of two main parameters fixed cost and variable cost. The analysis done with help of cost function will help us in minimizing the expenditure and maximizing the production.

|  |
| --- |
| **Total Cost = Variable Cost + Fixed Cost** |

In Gems and Jewellery Industry cost function analysis plays a vital role. I have selected four jewellery companies for analysis. This includes TITAN, TBZ Jewellers, PC Jewellers, and ATLAS Jewellery India. This report shows the analysis of cost function with two parameters Net Sales and Profit before tax.

**Fixed Cost:** In economics, fixed costs are not dependent on the level of goods and services produced by the business. These quantities tend to change with time such as, a rent payment for a month of occupancy. This rental cost you have to pay whether you use service or not. Another example can be the fixed maintenance cost for machinery used in industries. As time period increases, total fixed cost increases.

**Variable Cost:** Variable cost is a corporate expense that changes in proportion to the good and services that a business produces. They vary with output or the level of production. When output is zero, variable cost will be zero as production increases the total variable cost will rise. It includes the factors such as cost of raw materials used to design a particular product and components, packaging and distribution costs, labor pay, wages, utilities etc.

**Variable Cost in Gems & Jewellery Industry:** Gold, silver, diamond and many more materials are used for jewellery production. Their prices keep on varying with time. Hence factors which I used for calculation of variable cost are as follows-

* Cost of materials consumed
* Purchases of stock-in-trade
* Changes in inventories of finished goods, stock-in-trade and work-in-progress
* Employee benefits expense.

Sum of all these quantities resulted into Total Variable Cost.

**Fixed Cost in Gems & Jewellery Industry:** Jewellery companies have to pay variety of fixed costs. They include-

* Finance costs
* Depreciation
* Amortisation expense
* Some other expenses

The addition of these 3 factors resulted into Total Fixed Cost. The addition of these parameters gives us the idea of minimum amount of money we need to expend in order to start the production.

**DATA ANALYSIS:**

* Total Cost = TVC + TFC

TVC: *Total Variable Cost*

TFC: *Total Foxed Cost*

NOTE: Values are represented in

1. TITAN data (*in Lakh Rupees*)
2. TBZ data (*in Lakh Rupees*)
3. PCJ data (*in Crore Rupees*)
4. ATLAS data (*in Thousand Rupees*)

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| YEAR | TITAN | | | | TBZ | | | |
| TVF | TFC | Net sales | profit | TVF | TFC | Net sales | profit |
| 2017 | 997,492 | 157460 | 1,263,931 | 103,342 | 151641.72 | 17350.91 | 169,982.05 | 1,662.77 |
| 2016 | 886,997 | 158826 | 1,126,453 | 87,066 | 147801.46 | 20601.92 | 165,431.05 | -2,159.60 |
| 2015 | 937,926 | 153864 | 1,190,321 | 105,589 | 171235.44 | 20689.04 | 193,372.52 | 3,776.82 |
| 2014 | 858,512.13 | 143493.02 | 1,092,739 | 101,006 | 156605.15 | 18100.25 | 181,773.98 | 8,299.41 |
| 2013 | 799,965.46 | 120751.9 | 1,021,344 | 100,627 | 140140.36 | 13925.18 | 140,316.45 | 12,356.46 |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| YEAR | PCJ | | | | ATLAS | | | |
| TVF | TFC | Net sales | profit | TVF | TFC | Net sales | profit |
| 2017 | 7150.96 | 491.23 | 8,478.93 | 566.4 | 84508 | 83751 | -81,425 | -81,425 |
| 2016 | 6314.93 | 455.03 | 7,330.18 | 538.67 | 156269 | 108203 | -49725 | -49725 |
| 2015 | 5437.88 | 430.51 | 6361.28 | 539.32 | 1855524 | 151397 | 47742 | 47742 |
| 2014 | 4568.25 | 368.35 | 5324.83 | 469.38 | 671954 | 40162 | 17555 | 17555 |
| 2013 | 4546.45 | 275.83 | 4018.42 | 364.53 | 180 | 131 | -312 | -313 |

By analyzing the above data, we can observe that the total variable cost is always greater than total fixed cost. It has a higher amount of impact on cost of jewellery. Cost of any jewellery mainly varies with change in variable cost. Here, we can conclude that Gems and Jewellery Industry in India is a **‘Variable Cost Intensive Industry’.**

**Regression analysis:**

1. **Titan:**

|  |  |
| --- | --- |
| *Regression Statistics for TITAN* | |
| Multiple R | 0.817344 |
| R Square | 0.668051 |
| Adjusted R Square | 0.557401 |
| Standard Error | 50191.57 |
| Observations | 5 |
| ANOVA | |
|  | *Df* | *SS* | *MS* | *F* | *Significance F* |
| Regression | 1 | 1.52E+10 | 1.52E+10 | 6.037529 | 0.091099 |
| Residual | 3 | 7.56E+09 | 2.52E+09 |  |  |
| Total | 4 | 2.28E+10 |  |  |  |
|  | | | | | |
|  | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* | *Lower 95.0%* | *Upper 95.0%* |
| Intercept | 322658.5 | 234486.6 | 1.376021 | 0.262544 | -423582 | 1068899 | -423582 | 1068899 |
| X Variable 1 | 3.904711 | 1.58913 | 2.457138 | 0.091099 | -1.15261 | 8.962031 | -1.15261 | 8.962031 |

1. **TBZ:**

|  |  |
| --- | --- |
| *Regression Statistics for TBZ* | |
| Multiple R | 0.688045 |
| R Square | 0.473406 |
| Adjusted R Square | 0.297874 |
| Standard Error | 9723.17 |
| Observations | 5 |
| ANOVA | |
|  | *df* | *SS* | *MS* | *F* | *Significance F* |
| Regression | 1 | 2.55E+08 | 2.55E+08 | 2.696985 | 0.199079 |
| Residual | 3 | 2.84E+08 | 94540044 |  |  |
| Total | 4 | 5.39E+08 |  |  |  |
|  | | | | | |
|  | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* | *Lower 95.0%* | *Upper 95.0%* |
| Intercept | 101435.4 | 31990.86 | 3.170762 | 0.050451 | -373.786 | 203244.6 | -373.786 | 203244.6 |
| X Variable 1 | 2.870352 | 1.747817 | 1.64225 | 0.199079 | -2.69198 | 8.432684 | -2.69198 | 8.432684 |

1. **PCJ:**

|  |  |
| --- | --- |
| *Regression Statistics for PCJ* | |
| Multiple R | 0.886659 |
| R Square | 0.786164 |
| Adjusted R Square | 0.714885 |
| Standard Error | 603.9487 |
| Observations | 5 |
| ANOVA | |
|  | *df* | *SS* | *MS* | *F* | *Significance F* |
| Regression | 1 | 4023030 | 4023030 | 11.02943 | 0.045018 |
| Residual | 3 | 1094262 | 364754.1 |  |  |
| Total | 4 | 5117292 |  |  |  |
|  | | | | | |
|  | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* | *Lower 95.0%* | *Upper 95.0%* |
| Intercept | 811.0921 | 1468.153 | 0.552458 | 0.61913 | -3861.23 | 5483.41 | -3861.23 | 5483.41 |
| X Variable 1 | 11.8573 | 3.570337 | 3.321059 | 0.045018 | 0.494893 | 23.21971 | 0.494893 | 23.21971 |

1. **ATLAS**

|  |  |
| --- | --- |
| *Regression Statistics ATLAS* | |
| Multiple R | 0.656963 |
| R Square | 0.4316 |
| Adjusted R Square | 0.242133 |
| Standard Error | 673374.4 |
| Observations | 5 |
| ANOVA | |
|  | *df* | *SS* | *MS* | *F* | *Significance F* |
| Regression | 1 | 1.03E+12 | 1.03E+12 | 2.277971 | 0.228365 |
| Residual | 3 | 1.36E+12 | 4.53E+11 |  |  |
| Total | 4 | 2.39E+12 |  |  |  |
|  | | | | | |
|  | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* | *Lower 95.0%* | *Upper 95.0%* |
| Intercept | -109660 | 532779.4 | -0.20583 | 0.850102 | -1805202 | 1585882 | -1805202 | 1585882 |
| X Variable 1 | 8.645348 | 5.728071 | 1.509295 | 0.228365 | -9.58393 | 26.87463 | -9.58393 | 26.87463 |

The regression statistics table is calculated for fixed and variable cost. By taking a look at ‘R square’ value in the regression table of TITAN, we can estimate that they are not much dependent on each other as the value is small. This also holds same for R square value of TBZ and ATLAS. But we can observe that for PCJ company the R square holds quite a better value and we can say that the fixed and variable cost for PCJ are dependent on each other.

**Correlation of Data:**

Correlation Table is drawn for four different variables-

1. TVC
2. TFC
3. Net Sales
4. Profit

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **TITAN** | | | | | | |
|  | *TVF* | *TFC* | *Net sales* | | *profit* | |
| TVF | 1 |  |  | |  | |
| TFC | 0.817344 | 1 |  | |  | |
| Net sales | 0.999969 | 0.812965 | 1 | |  | |
| profit | 0.270961 | -0.2183 | 0.277725 | | 1 | |
| **TBZ** | | | | | |
|  | *TVF* | *TFC* | *Net sales* | *profit* | |
| TVF | 1 |  |  |  | |
| TFC | 0.688045 | 1 |  |  | |
| Net sales | 0.945132 | 0.780658 | 1 |  | |
| profit | -0.23834 | -0.78055 | -0.38763 | 1 | |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **PCJ** | | | | |
|  | *TVF* | *TFC* | *Net sales* | *profit* |
| TVF | 1 |  |  |  |
| TFC | 0.886659 | 1 |  |  |
| Net sales | 0.960337 | 0.976466 | 1 |  |
| profit | 0.80878 | 0.987475 | 0.93128 | 1 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **ATLAS** | | | | |
|  | *TVF* | *TFC* | *Net sales* | *profit* |
| TVF | 1 |  |  |  |
| TFC | 0.656963 | 1 |  |  |
| Net sales | 0.760613 | 0.066252 | 1 |  |
| profit | 0.760618 | 0.066258 | 1 | 1 |

The correlation table plays a key role in evaluating the extent to which the variables are related to each other. Higher the value , stronger the relationship between variables. A strong correlation is when, the correlation value is greater than 0.67 and is weaker when it is lesser than 0.67. Hence correlation analysis is done for all the four gems and jewellery companies mentioned in the report. Here I have considered two external variables ‘Net Sales’ and ‘Profit before tax’.

From the correlation table for TITAN you can observe that Net sales are strongly correlated to TVC and TFC. But at same time profit has a very weak relation with them. This same economic scenario can be seen with TBZ analysis. But in case of PCJ, all the four variables are strongly correlated with each other. Their correlation values are above 0.8 to 1. Net sales and profit before tax for ATLAS company both have a strong correlation for TVF. But at the opposite condition can be observed for TFC. They are very weakly correlated to TFC.

**Gross Domestic Product**

**Introduction:** Gross Domestic Product is the market value of all goods and services produced in a period of time. As one can imagine, economic production and growth which GDP represents have a large impact on nearly everyone within that economy. The Gems and Jewellery industry contributes to the country’s GDP and to the manufacturing sector in a significant way contributing about 6-7% in the country’s GDP. The GDP value increases or decreases depending on the variables which are there in the industry.

So, the variables are:

Current Account Balance

Import as a percent of GDP (Gold Industry)

Import as a percent of GDP (Silver Industry)

Foreign Direct Investment (FDI)

India is the largest consumer of gold besides the largest player of diamonds. The sector has grown at an impressive clip over the years, with growth of around 6.1 per cent CAGR between 2016 and 2017.

**Current Account Balance:** It consists of the trade balance (difference between the total value of exports of goods and services and total value of imports of goods and services), the net factor income and net cash transfers. When the country’s current account balance is positive, the country is a net lender to the rest of the world and when negative, the country is net borrower from the rest of the world. In the case of gold as we are heavy importers we take the value in negative. The ratio of the current account balance to the Gross Domestic Product (or % of GDP) provides an indication of the country's level of international competitiveness.

**Foreign Direct Investment:** A foreign direct investment is an investment made by a company or any individual in one country by an entity based in another country. The Indian government presently allows 100 percent investment in the Gems and Jewellery industry.

**Import as a Percent of GDP:** More imports of different items lead to decline in GDP as net export value decreases. Today, India’s current account deficit, which is the net outflow of money, stands at 5.4 percent of the GDP and this figure will go up if money keeps flowing out of the country. To prevent people from purchasing gold and putting pressure on the Indian economy, the Indian government raised the import duty on gold from 4 percent at the beginning of this year to 10 percent step by step. To reduce the current account deficit and increase the GDP of our country, it is important to reduce imports.

**Data Analysis:**

1. **Gold**

**GDP vs Import as a percent of GDP:**

|  |  |  |
| --- | --- | --- |
| Year | GDP Growth Rate (in %) | Import as a percent of GDP (Gold) |
| 2007-08 | 9 | 1.3 |
| 2008-09 | 6.7 | 1.7 |
| 2009-10 | 8.9 | 2.1 |
| 2010-11 | 9.1 | 2.4 |
| 2011-12 | 7.8 | 2.7 |

**CORRELATION:**

|  |  |  |
| --- | --- | --- |
|  | *Column 1* | *Column 2* |
| Column 1 | 1 |  |
| Column 2 | 0.008689 | 1 |

**REGRESSION ANALYSIS:**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *Regression Statistics* | |  |  |  |  |  |  |  |
| Multiple R | 0.008689 |  |  |  |  |  |  |  |
| R Square | 0.07568 |  |  |  |  |  |  |  |
| Adjusted R Square | -0.33323 |  |  |  |  |  |  |  |
| Standard Error | 0.640809 |  |  |  |  |  |  |  |
| Observations | 5 |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| ANOVA | |  |  |  |  |  |  |  |
|  | *Df* | *SS* | *MS* | *F* | *Significance F* |  |  |  |
| Regression | 1 | 9.3E-05 | 9.3E-05 | 0.000227 | 0.988936 |  |  |  |
| Residual | 3 | 1.231907 | 0.410636 |  |  |  |  |  |
| Total | 4 | 1.232 |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
|  | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* | *Lower 95.0%* | *Upper 95.0%* |
| Intercept | 2.001395 | 2.58087 | 0.775473 | 0.494578 | -6.21209 | 10.21488 | -6.21209 | 10.21488 |
| X Variable 1 | 0.004651 | 0.309025 | 0.015051 | 0.988936 | -0.97881 | 0.988108 | -0.97881 | 0.988108 |

1. **Silver:**

**GDP Vs Import as a Percent of GDP:**

|  |  |  |
| --- | --- | --- |
| Year | GDP Growth Rate (in %) | Import as a percent of GDP (Silver) |
| 2007 | 9 | 0.57 |
| 2008 | 6.7 | 0.73 |
| 2009 | 8.9 | 1 |
| 2010 | 9.1 | 0.75 |
| 2011 | 7.8 | 0.82 |

**CORRELATION:**

|  |  |  |
| --- | --- | --- |
|  | *Column 1* | *Column 2* |
| Column 1 | 1 |  |
| Column 2 | 0.032463 | 1 |

**REGRESSION ANALYSIS:**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *Regression Statistics* | |  |  |  |  |  |  |  |
| Multiple R | 0.032463 |  |  |  |  |  |  |  |
| R Square | 0.001054 |  |  |  |  |  |  |  |
| Adjusted R Square | -0.33193 |  |  |  |  |  |  |  |
| Standard Error | 0.180016 |  |  |  |  |  |  |  |
| Observations | 5 |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| ANOVA |  |  |  |  |  |  |  |  |
|  | *Df* | *SS* | *MS* | *F* | *Significance F* |  |  |  |
| Regression | 1 | 0.000103 | 0.000103 | 0.003165 | 0.958675 |  |  |  |
| Residual | 3 | 0.097217 | 0.032406 |  |  |  |  |  |
| Total | 4 | 0.09732 |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
|  | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* | *Lower 95.0%* | *Upper 95.0%* |
| Intercept | 0.733465 | 0.725019 | 1.01165 | 0.386213 | -1.57387 | 3.040799 | -1.57387 | 3.040799 |
| X Variable 1 | 0.004884 | 0.086811 | 0.056257 | 0.958675 | -0.27139 | 0.281157 | -0.27139 | 0.281157 |

**3)** **Gems and jewellery industry:**

**a) GDP Vs Current Account Balance as a ratio of GDP**

|  |  |  |
| --- | --- | --- |
| Year | GDP Growth Rate (in %) | Current Account Balance as a Ratio of GDP |
| 2007 | 9 | -1.3 |
| 2008 | 6.7 | -2.3 |
| 2009 | 8.9 | -2.8 |
| 2010 | 9.1 | -2.7 |
| 2011 | 7.8 | -4.2 |

**CORRELATION:**

|  |  |  |
| --- | --- | --- |
|  | *Column 1* | *Column 2* |
| Column 1 | 1 |  |
| Column 2 | 0.237554 | 1 |

**REGRESSION ANALYSIS:**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *Regression Statistics* | |  |  |  |  |  |  |  |
| Multiple R | 0.237554 |  |  |  |  |  |  |  |
| R Square | 0.056432 |  |  |  |  |  |  |  |
| Adjusted R Square | -0.25809 |  |  |  |  |  |  |  |
| Standard Error | 1.172644 |  |  |  |  |  |  |  |
| Observations | 5 |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| ANOVA | |  |  |  |  |  |  |  |
|  | *df* | *SS* | *MS* | *F* | *Significance F* |  |  |  |
| Regression | 1 | 0.246721 | 0.246721 | 0.179421 | 0.700406 |  |  |  |
| Residual | 3 | 4.125279 | 1.375093 |  |  |  |  |  |
| Total | 4 | 4.372 |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
|  | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* | *Lower 95.0%* | *Upper 95.0%* |
| Intercept | -4.64814 | 4.722847 | -0.98418 | 0.397595 | -19.6783 | 10.38207 | -19.6783 | 10.38207 |
| X Variable 1 | 0.239535 | 0.565499 | 0.423581 | 0.700406 | -1.56014 | 2.039205 | -1.56014 | 2.039205 |

* 1. **GDP Vs FDI:**

|  |  |  |
| --- | --- | --- |
| Year | GDP Growth Rate (in %) | Foreign Direct Investment (FDI) in (US $ MILLION) |
| 2007 | 9 | 142.58 |
| 2008 | 6.7 | 167.54 |
| 2009 | 8.9 | 251.04 |
| 2010 | 9.1 | 282 |
| 2011 | 7.8 | 301.9 |

**CORRELATION:**

|  |  |  |
| --- | --- | --- |
|  | *Column 1* | *Column 2* |
| Column 1 | 1 |  |
| Column 2 | 0.195132 | 1 |

**REGRESSION** **ANALYSIS**:

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *Regression Statistics* | |  |  |  |  |  |  |  |
| Multiple R | 0.195132 |  |  |  |  |  |  |  |
| R Square | 0.038076 |  |  |  |  |  |  |  |
| Adjusted R Square | -0.28256 |  |  |  |  |  |  |  |
| Standard Error | 79.78912 |  |  |  |  |  |  |  |
| Observations | 5 |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| ANOVA | |  |  |  |  |  |  |  |
|  | *df* | *SS* | *MS* | *F* | *Significance F* |  |  |  |
| Regression | 1 | 756.0056 | 756.0056 | 0.118751 | 0.753136 |  |  |  |
| Residual | 3 | 19098.91 | 6366.304 |  |  |  |  |  |
| Total | 4 | 19854.92 |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
|  | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* | *Lower 95.0%* | *Upper 95.0%* |
| Intercept | 118.9579 | 321.3524 | 0.370179 | 0.73584 | -903.729 | 1141.645 | -903.729 | 1141.645 |
| X Variable 1 | 13.25953 | 38.47773 | 0.344603 | 0.753136 | -109.194 | 135.7129 | -109.194 | 135.7129 |

As the value of R square is also less than 0.7 we can say that there is no effect of import on GDP growth rate. Same is the case with FDI and Current Account Balance.

**CONCLUSIONS:**

According the above data we can see that there is a lot fluctuation in the growth of GDP in the recent few years. We need to see that there is a proper balance of import and export in the gems and jewellery industry so that there is a stable growth and the economy is maintained. Government needs to make new policies in order to make sure that there is proper investment from our as well as other countries for our growth rate to increase rather than decrease.

**ASIAN CONTRIBUTION**

**Introduction:** Gems and Jewellery are part of many cultures and customs around the world. Gems and jewellery have been important part for both aesthetic as well as investment purposes. Gems and Jewellery Industry has gradually become important for the Indian economy due to its contribution in India’s trade. Asia Pacific is considered to be one of the leading regions in the global gems and jewellery market with India and china leading the charts in the regions with maximum number of consume of gems and jewellery. China and India are also leading the market in this region contributing more than half of the region’s revenue for all category of gems and jewellery products.

**Data Analysis:**

1. **Gold:** Six countries in Asia produce 91 percent of Gold in the continent. China is the leader of the world’s gold-producing nations. China is followed by Indonesia. Indonesia is the home to the one of the largest gold mines in the world known as the Grasberg Mine. In India, there are three gold mines ( Hutti, Gadag, Kolar). India stands on 10th position in world by holding 557.7 tonnes of production.

**Variables**:

* Production
* Price
* Reserves

1. **Production:**



**Correlation:**



**Regression:**







**Scatter Curves:**



1. **Price:**



**Correlation:**



**Regression:**







**Scatter Curve:**



1. **Reserves:**



**Correlation:**



**Scatter Curve:**



**Regression:**







In the above data, it shows steady growth of production in China from 2006-17 but, there is a downfall in the production of India and Japan from 2006-17. China became top producer of gold in 2012. The production rose up to 397 metric tons in 2013 and 458.1 metric tons leaving china in leading position. Despite India being world’s biggest buyer of gold, its contribution to world production is insignificant 0.5 per cent. The reserves in China were gradually increasing from 2006-17 while coming to India and Japan they were constant for many years.

1. **SILVER:**

India has become the largest silver coin manufacture in Asia, overtaking China. The share of silver coin manufacturing in the region moved up to 56 percent in 2017 from 23 per cent in 2016.

**VARIABLES:**

* Production
* Price

1. **Production:**



**REGRESSION:**







**Correlation:**



**Scatter Curve:**



1. **Prices:**



**REGRESSION**:







**Correlation:**



**Scatter Curve:**



In the above data, the production of silver in china is high from 2006-17 and its curve is going on, while coming to India it is gradually increasing from 2006-2017. In 2017 its production almost became 10 times to its production in 2006. And coming to Japan it doesn’t show any fluctuations in its production it had been increased gradually after its fall in 2008.

1. **DIAMOND:**

Diamonds are highly traded commodity that multiple organizations have been created for grading and certifying them based on carat, cut, color, clarity. Meanwhile, when it comes to India most diamond mines were depleted decades ago and two were active till date Kollur and Panna.

**VARIABLES:**

* Production
* Price

**Data Analysis:**

**a)Production:**



**Correlation:**



**Regression:**



**Scatter Curve:**



**b)Prices:**



**Correlation:**



**Regression:**



**Scatter Curve:**



Diamond production in India there is gradual increment from 2006-2017.but for china there is a sudden fall of production in the year 2009 and 2012. At the period of 2006-2010 the production of diamond is much more when compared to India. After 2012 fall of production in china India is ahead of china in production of diamonds in Asia.

**Conclusion:** The gems and jewellery market is expected to reach a market value of around USD22 billion by 2022.India is expected to increase its contribution giving a healthy competition to other countries in Asia and also in global level. The changing life styles and evolving consumer preferences have driven the growth of this market. Online sales are expected to account for 1-2 per cent of the fine jewellery segment by 2021-22.The demand for jewellery is expected to be significantly supported by the recent positive developments in industry.

**INFLATION**

Inflation is the rate at which the general level of prices for goods and services is rising and, consequently, the purchasing occurs of currency is falling.

**Factors causing Inflation:**

1. High demand low supply condition (Cost Push Inflation).
2. Inadequate amount of Raw-materials.
3. Increase in wages of the labor.
4. When more money but same low supply of goods (Demand Push Inflation).
5. Tax burden.

**Measurement Of Inflation:**

The concept of C.P.I. is used to understand the pricing levels of each year

**Consumer Price Index:** A statistical estimate constructed using the prices of a sample of representative items whose prices are collected periodically**.** Economists add up the regularly consumed products per each year and divide each year’s price with a fixed base year this gives the idea of increasing or decreasing of prices.

**Objectives:**

1. To study the relation between Import/Exports and Inflation.

2. How does the price effect during inflation and how it reduces purchasing power of money in gems and gold industry?

**Hypothesis:**

1. If price of X increases then Inflation also increases. (X=gold, silver, Cut diamond)

2. If imports are increased then inflation decreases and Similarly if exports are increased inflation automatically increases.

**Variables:**

1. Price of gold rate

2. Imports of gold rate

3. Exports of gold rate

**Analysis :**

1. **Gold:**
2. **Inflation Rate per year Vs Price of Gold per year:**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| |  |  |  | | --- | --- | --- | | Year | Inflation | Gold rate | | 2005 | 14.97% | 15105 | | 2006 | 9.47% | 16320 | | 2007 | 6.49% | 20775 | | 2008 | 11.17% | 28040 | | 2009 | 9.13% | 29610 | | 2010 | 5.86% | 28470 | | 2011 | 6.32% | 26245 | | 2012 | 2.23% | 28340 | | 2013 | 5.36% | 26560 | | 2014 | 4.56% | 31346 | | | | | | |  | | | |  |
| **Regression:** | | | | |  |  | | | | | |  |  |  |  |  |
|  | | | | | | |  |  |  | | |  |  |  |  |  |
| **Regression Statistics** | | |  |  | | | | | | | |  |  |  |  |  |
| Multiple R | 0.663422 | |  |  | | | | | | | |  |  |  |  |  |
| R Square | 0.440129 | |  |  | | | | | | | |  |  |  |  |  |
| Adjusted R Square | 0.384142 | |  |  | | | | | | | |  |  |  |  |  |
| Standard Error | 4782.768 | |  |  | | | | | | | |  |  |  |  |  |
| Observations | 12 | |  |  | | | | | | | |  |  |  |  |  |
|  |  | |  |  | | | | | | | |  |  |  |  |  |
| ANOVA |  | |  |  | | | | | | | |  |  |  |  |  |
|  | *Df* | | *SS* | *MS* | | | | | | | | *F* |  |  |  |  |
| Regression | 1 | 1.8E+08 | | 1.8E+08 | | | | | | | | 7.861252 |  |  |  |  |
| Residual | 10 | 2.29E+08 | | 22874867 | | | | | | | |  |  |  |  |  |
| Total | 11 | 4.09E+08 | |  | | | | | | | |  |  |  |  |  |
|  |  |  | |  | | | | | | | |  |  |  |  |  |
|  | *Coefficients* | *Standard Error* | | *t Stat* | | | | | | | | *P-value* | *95%* | *Upper 95%* | *Lower 95.0%* | *Upper 95.0%* |
| Intercept | 35005.13 | 3273.76 | | 10.69264 | | | | | | | | 8.58E-07 | 7710.74 | 42299.52 | 27710.74 | 42299.52 |
| X Variable 1 | -116551 | 41569.06 | | -2.80379 | | | | | | | | 0.018673 | -209173 | -23929.4 | -209173 | -23929.4 |

Here we have a weakly relationship between price of gold rate and inflation rate which means increase in price of gold rate does not effect the inflation. So, purchasing power is important because, all else being equal, [inflation](https://www.investopedia.com/terms/i/inflation.asp) decreases the amount of goods or services you would be able to purchase. So, my claim is false.

1. **Inflation Rate vs Import of gold:**

|  |  |  |
| --- | --- | --- |
| Year | Inflation | Import |
| 2005 | 14.97% | 7503 |
| 2006 | 9.47% | 8652 |
| 2007 | 6.49% | 10693 |
| 2008 | 11.17% | 9335 |
| 2009 | 9.13% | 5663 |
| 2010 | 5.86% | 3468 |
| 2011 | 6.32% | 4184 |
| 2012 | 2.23% | 2291 |
| 2013 | 5.36% | 6754 |
| 2014 | 4.56% | 6189 |

**Regression:**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Regression Statistics** | |  |  |  |  |  |  |  |
| Multiple R | 0.511904 |  |  |  |  |  |  |  |
| R Square | 0.262046 |  |  |  |  |  |  |  |
| Adjusted R Square | 0.18825 |  |  |  |  |  |  |  |
| Standard Error | 2094.33 |  |  |  |  |  |  |  |
| Observations | 12 |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| ANOVA |  |  |  |  |  |  |  |  |
|  | *df* | *SS* | *MS* | *F* | *Significance F* |  |  |  |
| Regression | 1 | 15575336 | 15575336 | 3.550971 | 0.088877 |  |  |  |
| Residual | 10 | 43862190 | 4386219 |  |  |  |  |  |
| Total | 11 | 59437526 |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
|  | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* | *Lower 95.0%* | *Upper 95.0%* |
| Intercept | 4392.856 | 1433.55 | 3.064321 | 0.011956 | 1198.709 | 7587.004 | 1198.709 | 7587.004 |
| X Variable 1 | 34301.23 | 18202.71 | 1.884402 | 0.088877 | -6256.94 | 74859.4 | -6256.94 | 74859.4 |

Here, it is a weak relationship and conclude that these are inversely related to each other. Normally, as the imports increases prices automatically decreases. So, I proved that my objective is true.

1. **Inflation Rate Vs Export of gold:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Year |  | Inflation |  | export |
| 2005 |  | 14.97% |  | 9755 |
| 2006 |  | 9.47% |  | 7901 |
| 2007 |  | 6.49% |  | 10029 |
| 2008 |  | 11.17% |  | 13267 |
| 2009 |  | 9.13% |  | 8367 |
| 2010 |  | 5.86% |  | 9904 |
| 2011 |  | 6.32% |  | 8557 |
| 2012 |  | 2.23% |  | 9904 |
| 2013 |  | 5.36% |  | 8758 |
| 2014 |  | 4.56% |  | 9746 |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | |  |  |  |  |  | |  |  |  |
| **Regression:** |  |  |  |  |  |  | |  |  |  |
| **Regression Statistics** | |  |  |  |  |  | |  |  |  |
| Multiple R | 0.836208 |  |  |  |  |  | |  |  |  |
| R Square | 0.67794 |  |  |  |  |  | |  |  |  |
| Adjusted R Square | 0.586266 |  |  |  |  |  | |  |  |  |
| Standard Error | 1417.906 |  |  |  |  |  | |  |  |  |
| Observations | 12 |  |  |  |  |  | |  |  |  |
|  |  |  |  |  |  |  | |  |  |  |
| ANOVA |  |  |  |  |  |  | |  |  |  |
|  | *df* | *SS* | *MS* | *F* | *Significance F* |  | |  |  |  |
| Regression | 1 | 1187999 | 1187999 | 0.59091 | 0.459837 |  | |  |  |  |
| Residual | 10 | 20104587 | 2010459 |  |  |  | |  |  |  |
| Total | 11 | 21292587 |  |  |  |  | |  |  |  |
|  |  |  |  |  |  |  | |  |  |  |
|  | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* | | *Lower 95.0%* | *Upper 95.0%* |  |
| Intercept | 8822.864 | 970.5438 | 9.09064 | 3.78E-06 | 6660.358 | 10985.37 | | 6660.358 | 10985.3 |  |
| X Variable 1 | 9473.252 | 12323.63 | 0.768706 | 0.459837 | -17985.5 | 36932 | -17985.5 | | 36932 |  |
|  |  |  |  |  |  |  | |  |  |  |

Here, there is slightly strong relationship between the inflation rate and exports of gold as normally when exports increases then price increases which leads to increase in price. There is a direct relationship between these two variables. So, my claim is true.

1. **SILVER:**
   * + 1. **Inflation rate vs silver rate**:

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| |  |  |  | | --- | --- | --- | | Year | Inflation | Silver rate | | 2005 | 14.97% | 19520 | | 2006 | 9.47% | 23625 | | 2007 | 6.49% | 26165 | | 2008 | 11.17% | 23225 | | 2009 | 9.13% | 46900 | | 2010 | 5.86% | 46290 | | 2011 | 6.32% | 44030 | | 2012 | 2.23% | 33070 | | 2013 | 5.36% | 37825 | | 2014 | 4.56% | 36990 |   **Regression:** | | | |  |
| **Regression Statistics** | |  |  | | |  | |  | | |  | |  |  |
| Multiple R | 0.324125 |  |  | | |  | |  | | |  | |  |  |
| R Square | 0.274707 |  |  | | |  | |  | | |  | |  |  |
| Adjusted R Square | 0.202178 |  |  | | |  | |  | | |  | |  |  |
| Standard Error | 21.54319 |  |  | | |  | |  | | |  | |  |  |
| Observations | 12 |  |  | | |  | |  | | |  | |  |  |
|  |  |  |  | | |  | |  | | |  | |  |  |
| ANOVA |  |  |  | | |  | |  | | |  | |  |  |
|  | *Df* | *SS* | *MS* | | | *F* | | *Significance F* | | |  | |  |  |
| Regression | 1 | 1757.827 | 0.080258 | | | |  | |  |  | |
| Residual | 10 | 4641.089 | 464.1089 | | |  | |  | | |  | |  |  |
| Total | 11 | 6398.917 |  | | |  | |  | | |  | |  |  |
|  |  |  |  | | |  | |  | | |  | |  |  |
|  | *Coefficients* | *Standard Error* | *t Stat* | | | *P-value* | | *Lower 95%* | | | *Upper 95%* | | *Lower 95.0%* | *Upper 95.0%* |
| Intercept | 14.48381 | 19.48271 | 0.743419 | | | 0.474332 | | -28.9264 | | | 57.89399 | | -28.9264 | 57.89399 |
| X Variable 1 | 0.000962 | 0.000494 | 1.946158 | | | 0.080258 | | -0.00014 | | | 0.002063 | | -0.00014 | 0.002063 |

Here, there is a negative relationship between the inflation rate and silver rate which means we can conclude that there is an indirect relationship between these variables.

So, my claim is false.

* + - 1. **Inflation rate vs Imports of silver**:

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| |  |  |  | | --- | --- | --- | | Year | Inflation | Imports Of Silver | | 2005 | 14.97% | 21 | | 2006 | 9.47% | 26 | | 2007 | 6.49% | 32 | | 2008 | 11.17% | 87 | | 2009 | 9.13% | 100 | | 2010 | 5.86% | 70 | | 2011 | 6.32% | 39 | | 2012 | 2.23% | 35 | | 2013 | 5.36% | 44 | | 2014 | 4.56% | 51 | | | | |
|  | | | |
| **Regression:** |  |  |  | |  |  |  |  |  |
| *Regression Statistics* | |  |  | |  |  |  |  |  |
| Multiple R | 0.0253547 |  |  | |  |  |  |  |  |
| R Square | 0.035766 |  |  | |  |  |  |  |  |
| Adjusted R Square | 0.0297407 |  |  | |  |  |  |  |  |
| Standard Error | 25.77728 |  |  | |  |  |  |  |  |
| Observations | 12 |  |  | |  |  |  |  |  |
|  |  |  |  | |  |  |  |  |  |
| ANOVA |  |  |  | |  |  |  |  |  |
|  | *df* | *SS* | *MS* | | *F* | *Significance F* |  |  |  |
| Regression | 1 | 1.566959 | 1.566959 | | 0.002358 | 0.962225 |  |  |  |
| Residual | 10 | 6644.683 | 664.4683 | |  |  |  |  |  |
| Total | 11 | 6646.25 |  | |  |  |  |  |  |
|  |  |  |  | |  |  |  |  |  |
|  | *Coefficients* | *Standard Error* | *t Stat* | | *P-value* | *Lower 95%* | *Upper 95%* | *Lower 95.0%* | *Upper 95.0%* |
| Intercept | 50.97309 | 17.64431 | 2.888925 | | 0.016137 | 11.65912 | 90.28707 | 11.65912 | 90.28707 |
| X Variable 1 | 10.87977 | 224.0413 | 0.048561 | | 0.962225 | -488.315 | 510.0749 | -488.315 | 510.0749 |

Here, there is an negative relationship between the inflation rate and imports of silver. There is an indirect relationship between the variables.

So, my claim is true.

* + - 1. **Inflation rate vs Export of silver**:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Year | | Inflation | | Exports Of Silver | | |
| 2005 | | 14.97% | | 232 | | |
| 2006 | | 9.47% | | 241 | | |
| 2007 | | 6.49% | | 420 | | |
| 2008 | | 11.17% | | 574 | | |
| 2009 | | 9.13% | | 774 | | |
| 2010 | | 5.86% | | 934 | | |
| 2011 | | 6.32% | | 1475 | | |
| 2012 | | 2.23% | | 2052 | | |
| 2013 | | 5.36% | | 2960 | | |
| 2014 | | 4.56% | | 4021 | | |
|  | | |  | |  | |  |  | |  |  |  |
| **Regression:** |  | |  | |  | |  |  | |  |  |  |
| ***Regression Statistics*** | | |  | |  | |  |  | |  |  |  |
| Multiple R | 0.546941 | |  | |  | |  |  | |  |  |  |
| R Square | 0.699144 | |  | |  | |  |  | |  |  |  |
| Adjusted R Square | 0.429059 | |  | |  | |  |  | |  |  |  |
| Standard Error | 2139.866 | |  | |  | |  |  | |  |  |  |
| Observations | 12 | |  | |  | |  |  | |  |  |  |
|  |  | |  | |  | |  |  | |  |  |  |
| ANOVA |  | |  | |  | |  |  | |  |  |  |
|  | *df* | | *SS* | | *MS* | | *F* | *Significance F* | |  |  |  |
| Regression | 1 | | 19544530 | | 19544530 | | 4.268271 | 0.065725 | |  |  |  |
| Residual | 10 | | 45790271 | | 4579027 | |  |  | |  |  |  |
| Total | 11 | | 65334801 | |  | |  |  | |  |  |  |
|  |  | |  | |  | |  |  | |  |  |  |
|  | *Coefficients* | | *Standard Error* | | *t Stat* | | *P-value* | *Lower 95%* | | *Upper 95%* | *Lower 95.0%* | *Upper 95.0%* |
| Intercept | 5013.383 | | 1464.718 | | 3.422763 | | 0.006517 | 1749.787 | | 8276.98 | 1749.787 | 8276.98 |
| X Variable 1 | -38424.1 | | 18598.48 | | -2.06598 | | 0.065725 | -79864.1 | | 3015.918 | -79864.1 | 3015.918 |

Here, there is a positive relationship between the inflation rate and export of silver rate i.e, which has an indirect relationship between those variables. So, my claim is true.

1. **DIAMOND:**
   * + 1. **Inflation rate Vs Diamond rate**

|  |  |  |
| --- | --- | --- |
| Year | Inflation | Diamond rate |
| 2005 | 14.97% | 14346 |
| 2006 | 9.47% | 15156 |
| 2007 | 6.49% | 19374 |
| 2008 | 11.17% | 30574 |
| 2009 | 9.13% | 26672 |
| 2010 | 5.86% | 21607 |
| 2011 | 6.32% | 24498 |
| 2012 | 2.23% | 23160 |
| 2013 | 5.36% | 20668 |
| 2014 | 4.56% | 22784 |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Regression:** | |  |  |  |  |  |  |  |
| **Regression Statistics** | |  |  |  |  |  |  |  |
| Multiple R | 0.125515 |  |  |  |  |  |  |  |
| R Square | 0.050857 |  |  |  |  |  |  |  |
| Adjusted R Square | 0.277857 |  |  |  |  |  |  |  |
| Standard Error | 5081.656 |  |  |  |  |  |  |  |
| Observations | 10 |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| ANOVA |  |  |  |  |  |  |  |  |
|  | *df* | *SS* | *MS* | *F* | *Significance F* |  |  |  |
| Regression | 1 | 11069316 | 11069316 | 0.428657 | 0.531018 |  |  |  |
| Residual | 8 | 2.07E+08 | 25823227 |  |  |  |  |  |
| Total | 9 | 2.18E+08 |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
|  | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* | *Lower 95.0%* | *Upper 95.0%* |
| Intercept | 24161.07 | 3831.375 | 6.30611 | 0.000231 | 15325.91 | 32996.24 | 15325.91 | 32996.24 |
| X Variable 1 | -30137.3 | 46030.84 | -0.65472 | 0.531018 | -136285 | 76010.03 | -136285 | 76010.03 |

Here we can’t establish a relation between price of diamond rate and inflation rate which means increase in price of diamond rate does not effect the inflation. Hence, my claim is false.

* + - 1. **Inflation Rate vs Imports of diamond:**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Year | Inflation | | Imports of diamond | | | | |
| 2005 | 14.97% | | 5,461 | | |  | |
| 2006 | 9.47% | | 8,982 | | |  | |
| 2007 | 6.49% | | 11,610 | | |  | |
| 2008 | 11.17% | | 20,808 | | |  | |
| 2009 | 9.13% | | 14,472 | | |  | |
| 2010 | 5.86% | | 5,559 | | |  | |
| 2011 | 6.32% | | 6,541 | | |  | |
| 2012 | 2.23% | | 6,640 | | |  | |
| 2013 | 5.36% | | 2,771 | | |  | |
| 2014 | 4.56% | | 2,634 | | |  | |
|  | | | |  |  | |  | |  |  |  |  |
| **Regression:** | |  | |  |  | |  | |  |  |  |  |
| **Regression Statistics** | | | |  |  | |  | |  |  |  |  |
| Multiple R | | 0.206924 | |  |  | |  | |  |  |  |  |
| R Square | | 0.165587 | |  |  | |  | |  |  |  |  |
| Adjusted R Square | | 0.328526 | |  |  | |  | |  |  |  |  |
| Standard Error | | 3494.523 | |  |  | |  | |  |  |  |  |
| Observations | | 10 | |  |  | |  | |  |  |  |  |
|  | |  | |  |  | |  | |  |  |  |  |
| ANOVA | |  | |  |  | |  | |  |  |  |  |
|  | | *df* | | *SS* | *MS* | | *F* | | *Significance F* |  |  |  |
| Regression | | 1 | | 47928615 | 47928615 | | 1.587577 | | 0.243184 |  |  |  |
| Residual | | 8 | | 2.42E+08 | 30189786 | |  | |  |  |  |  |
| Total | | 9 | | 2.89E+08 |  | |  | |  |  |  |  |
|  | |  | |  |  | |  | |  |  |  |  |
|  | | *Coefficients* | | *Standard Error* | *t Stat* | | *P-value* | | *Lower 95%* | *Upper 95%* | *Lower 95.0%* | *Upper 95.0%* |
| Intercept | | 3809.385 | | 4142.662 | 0.91955 | | 0.384696 | | -5743.61 | 13362.38 | -5743.61 | 13362.38 |
| X Variable 1 | | 62710.62 | | 49770.69 | 1.259991 | | 0.243184 | | -52060.8 | 177482.1 | -52060.8 | 177482.1 |

Here, we can’t establish a relation between inflation and imports of diamond so we can say that they are indirectly proportional.

Hence, my claim is proved.

* + - 1. **Inflation Vs Export of diamond :**

|  |  |  |
| --- | --- | --- |
| Year | Inflation | Exports |
| 2005 | 14.97% | 14,346 |
| 2006 | 9.47% | 15,156 |
| 2007 | 6.49% | 19,374 |
| 2008 | 11.17% | 30,574 |
| 2009 | 9.13% | 26,672 |
| 2010 | 5.86% | 28,607 |
| 2011 | 6.32% | 24,498 |
| 2012 | 2.23% | 23,160 |
| 2013 | 5.36% | 25,668 |
| 2014 | 4.56% | 22,784 |

**Regression:**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Regression Statistics** | |  |  |  |  |  |  |  |
| Multiple R | 0.798391 |  |  |  |  |  |  |  |
| R Square | 0.751508 |  |  |  |  |  |  |  |
| Adjusted R Square | 0.724467 |  |  |  |  |  |  |  |
| Standard Error | 4386.226 |  |  |  |  |  |  |  |
| Observations | 10 |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| ANOVA |  |  |  |  |  |  |  |  |
|  | *df* | *SS* | *MS* | *F* | *Significance F* |  |  |  |
| Regression | 1 | 29128112 | 29128112 | 1.004022 | 0.34568 |  |  |  |
| Residual | 8 | 2.32E+08 | 29011427 |  |  |  |  |  |
| Total | 9 | 2.61E+08 |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
|  | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* | *Lower 95.0%* | *Upper 95.0%* |
| Intercept | 26777.86 | 4061.009 | 6.593892 | 0.00017 | 17413.15 | 36142.56 | 17413.15 | 36142.56 |
| X Variable 1 | -48887.7 | 48789.71 | -1.00201 | 0.34568 | -161397 | 63621.54 | -161397 | 63621.54 |

Here, we can establish a relation between the inflation rate and the exports of diamond so there is a direct relationship between them. Hence, my claim is proved.

**Conclusion:**

As years pass by prices of goods and services are increasing inflation decreases the amount of goods or services you would be able to purchase which affectsevery aspect of economics, from consumers buying goods, to investors and stock prices, to a country’s economic prosperity. So, when purchasing power decreases due to high increase in inflation serious negative consequences arise, including rising costs of goods and services contributing to a high cost of living, as well as high interest rates that affect the global market, and falling credit ratings as a result i.e all the above factors lead to economic crisis.

**EMPLOYMENT**

The Gems and Jewellery Industry in India is one of the largest in the world and contributes to about 29% of the global consumption. Any Industry, specially, a highly profitable like Gems and Jewellery Industry, can remain flourishing if it keeps on providing employment opportunities to the deserving peoples. India that was once called the golden bird can even in today’s time justify that title by providing employment to the large sections of skilled as well as unskilled employable youth. This Industry is extremely export oriented and labour intensive. As per my research, the Industry currently employs around 4.5 million skilled and semi-skilled workers. It provides employment in various fields ranging from skilled labours for craftsmanship to other labours for purpose of transport, mining, extraction, selling etc.

**Variables: -**

1. **Salaries, Wages & Bonus:** Salaries, wages and bonus are payments from an employer to an employee in return for work, which may be previously specified. Salary is commonly paid in fixed intervals whereas bonus is for particular occasion such as annual bonus, festival bonus or incentive based on employee’s working.
2. **Contribution to funds:** Company sets up a program to encourage employees for making donations to a charity that the company supports. Often the company [will](http://www.investinganswers.com/node/4974) match the amount [funds](http://www.investinganswers.com/node/5054). This rise a significant amount of [money](http://www.investinganswers.com/node/5074) for a charity and send the global message that the company is socially responsible and is behind a cause at a grassroots level.
3. **Staff Welfare Expenses:** There are many expenses which are incurred in respect of the employees of the business firm which are neither official nor personal. For example: - Medical expenses for the health of the employees, Tea and refreshment expenses for the employees, concessional foods given to employees, personal accident insurance premium paid for employees etc. The staff welfare expenses are shown in expenses side of profit and loss account since these are indirect expense.

Let us see the data pointing towards this fastest growing employment intensive industry.

**DATA ANALYSIS:**

**Number of Employees:**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Year** | **2012** | **2013** | **2014** | **2015** | **2016** |
| **Gitanjali Gems** | 442 | 476 | 512 | 423 | 648 |
| **PC Jewellers** | 1607 | 2236 | 2444 | 2516 | 2504 |
| **Tribhovandas Bhimji Zaveri** | 1667 | 1496 | 1476 | 1501 | 1376 |
| **Thangamayil Jewellery** | 970 | 1002 | 1014 | 1077 | 1213 |
| **Rajesh Export** | 362 | 375 | 358 | 328 | 350 |

1. **Gitanjali Gems**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Year** | **Salaries, Wages & Bonus** | **Contribution to funds** | **Staff Welfare Expenses** | **Other Employee Cost** |
| **2009-10** | 138.35 | 5.15 | 5.01 | 1.99 |
| **2010-11** | 227.4 | 5.89 | 4.66 | 10.02 |
| **2011-12** | 239.91 | 7.52 | 4.93 | 12.76 |
| **2012-13** | 224.1 | 6.94 | 4.9 | 2.62 |
| **2013-14** | 187.3 | 5.13 | 9.71 | 0.46 |
| **2014-15** | 215.8 | 5.69 | 11.64 | 9.75 |
| **2015-16** | 231.82 | 6.98 | 11.71 | 5.75 |
| **2016-17** | 351.44 | 10.26 | 12.83 | 13.07 |

\*all values in millions.

**Correlation Table:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Salaries, Wages & Bonus | Contribution to funds | Staff Welfare Expenses | Other Employee Cost |
| Salaries, Wages & Bonus | 1 |  |  |  |
| Contribution to funds | 0.935259345 | 1 |  |  |
| Staff Welfare Expenses | 0.48735254 | 0.371471238 | 1 |  |
| Other Employee Cost | 0.718068658 | 0.637017397 | 0.190571328 | 1 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Salaries, Wages & Bonus | |  | Contribution to funds | |
| Mean | 227.015 |  | Mean | 6.695 |
| Median | 225.75 |  | Median | 6.415 |
| Mode | #N/A |  | Mode | #N/A |
|  |  |  |  |  |
| Staff Welfare Expenses | |  | Other Employee Cost | |
| Mean | 8.17375 |  | Mean | 7.0525 |
| Median | 7.36 |  | Median | 7.75 |
| Mode | #N/A |  | Mode | #N/A |

**Regression:**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *Regression Statistics* | |  |  |  |  |  |  |  |
| Multiple R | 0.48735254 |  |  |  |  |  |  |  |
| R Square | 0.237512498 |  |  |  |  |  |  |  |
| Adjusted R Square | 0.110431248 |  |  |  |  |  |  |  |
| Standard Error | 56.63970527 |  |  |  |  |  |  |  |
| Observations | 8 |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| ANOVA |  |  |  |  |  |  |  |  |
|  | *df* | *SS* | *MS* | *F* | *Significance F* |  |  |  |
| Regression | 1 | 5995.7975 | 5995.797524 | 1.868981 | 0.220594653 |  |  |  |
| Residual | 6 | 19248.3372 | 3208.056213 |  |  |  |  |  |
| Total | 7 | 25244.1348 |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
|  | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* | *Lower 95.0%* | *Upper 95.0%* |
| Intercept | 161.0849322 | 52.21830915 | 3.084836235 | 0.021529 | 33.3113327 | 88.8585317 | 33.3113327 | 288.8585317 |
| X Variable 1 | 8.066073441 | 5.900104143 | 1.367106961 | 0.220594 | -6.370961309 | 22.50310819 | -6.370961309 | 22.50310819 |

Above shows the regression, keeping Salary, Wages&Bonus dependent and all other factors independent.

1. **Tribhovandas Bhimji Zaveri:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Year** | **Salaries, Wages & Bonus** | **Contribution to funds** | **Staff Welfare Expenses** | **Other Employee Cost** |
| **2010-11** | 381.88 | 12.13 | 8.45 | 9.68 |
| **2011-12** | 446.41 | 11.12 | 17.05 | 10.44 |
| **2012-13** | 491.5 | 10.6 | 17.8 | 17.26 |
| **2013-14** | 537.3 | 19.4 | 29.4 | 19.5 |
| **2014-15** | 637.4 | 27.7 | 29.9 | 20.4 |
| **2015-16** | 673.86 | 28.26 | 25.97 | 11.42 |
| **2016-17** | 722.04 | 29.31 | 27.89 | 13.72 |

\*all values in millions.

**Correlation Table:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Salaries, Wages & Bonus | Contribution to funds | Staff Welfare Expenses | Other Employee Cost |
| Salaries, Wages & Bonus | 1 |  |  |  |
| Contribution to funds | 0.941310111 | 1 |  |  |
| Staff Welfare Expenses | 0.839431642 | 0.802096666 | 1 |  |
| Other Employee Cost | 0.300105327 | 0.25436325 | 0.654283352 | 1 |

**Regression:**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | |  |  |  |  |  |  |  |  |
| *Regression Statistics* | | |  |  |  |  |  |  |  |
| Multiple R | 0.839431642 | |  |  |  |  |  |  |  |
| R Square | 0.704645481 | |  |  |  |  |  |  |  |
| Adjusted R Square | 0.645574578 | |  |  |  |  |  |  |  |
| Standard Error | 74.88136553 | |  |  |  |  |  |  |  |
| Observations | 7 | |  |  |  |  |  |  |  |
|  |  | |  |  |  |  |  |  |  |
| ANOVA |  | |  |  |  |  |  |  |  |
|  | *Df* | | *SS* | *MS* | *F* | *Significance F* |  |  |  |
| Regression | 1 | | 66887.43888 | 66887.43888 | 11.92880821 | 0.018162925 |  |  |  |
| Residual | 5 | | 28036.09452 | 5607.218903 |  |  |  |  |  |
| Total | 6 | | 94923.5334 |  |  |  |  |  |  |
|  |  | |  |  |  |  |  |  |  |
|  | *Coefficients* | | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* | *Lower 95.0%* | *Upper 95.0%* |
| Intercept | 263.9898048 | | 89.09552554 | 2.962997336 | 0.031409958 | 34.96246519 | 493.0171444 | 34.96246519 | 493.0171444 |
| X Variable 1 | 13.05420789 | | 3.779653577 | 3.453810679 | 0.018162925 | 3.338299059 | 22.77011672 | 3.338299059 | 22.77011672 |

Above shows the regression, keeping Contributions to Funds dependent and all other factors independent.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Salaries, Wages & Bonus** | |  | **Contribution to funds** | |
| Mean | 555.77 |  | Mean | 19.78857143 |
| Median | 537.3 |  | Median | 19.4 |
| Mode | #N/A |  | Mode | #N/A |
|  |  |  |  |  |
| **Staff Welfare Expenses** | |  | **Other Employee Cost** | |
| Mean | 22.35142857 |  | Mean | 14.63142857 |
| Median | 25.97 |  | Median | 13.72 |
| Mode | #N/A |  | Mode | #N/A |

1. **Thangamayil Jewellery:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Year** | **Salaries, Wages & Bonus** | **Contribution to funds** | **Staff Welfare Expenses** | **Director's Remuneration** |
| **2009-10** | 28.85 | 4.22 | 9.6 | 9.21 |
| **2010-11** | 46.26 | 6.18 | 14.24 | 14.4 |
| **2011-12** | 79.67 | 8.79 | 25.79 | 14.4 |
| **2012-13** | 126.99 | 16.79 | 47.31 | 27 |
| **2013-14** | 111.84 | 17.09 | 34.03 | 14.4 |
| **2014-15** | 150 | 17.5 | 27.88 | 18 |
| **2015-16** | 182.68 | 18.64 | 23.37 | 18 |
| **2016-17** | 202.87 | 20.35 | 21.87 | 18 |

\*all values in millions.

**Correlation Table:**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | | Salaries, Wages & Bonus | | Contribution to funds | | Staff Welfare Expenses | | Other Employee Cost | |
| Salaries, Wages & Bonus | | 1 | |  | |  | |  | |
| Contribution to funds | | 0.948206529 | | 1 | |  | |  | |
| Staff Welfare Expenses | | 0.391781846 | | 0.596013843 | | 1 | |  | |
| Other Employee Cost | | 0.567458328 | | 0.640462135 | | 0.826386826 | | 1 | |
| **Salaries, Wages & Bonus** | | |  | | **Contribution to funds** | | | |
| Mean | 116.145 | |  | | Mean | | 13.695 | |
| Median | 119.415 | |  | | Median | | 16.94 | |
| Mode | #N/A | |  | | Mode | | #N/A | |
|  |  | |  | |  | |  | |
| **Staff Welfare Expenses** | | |  | | **Other Employee Cost** | | | |
| Mean | 25.51125 | |  | | Mean | | 16.67625 | |
| Median | 24.58 | |  | | Median | | 16.2 | |
| Mode | #N/A | |  | | Mode | | 14.4 | |

**Regression:**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | |  |  |  |  |  |  |  |  |
| *Regression Statistics* | | |  |  |  |  |  |  |  |
| Multiple R | 0.391781846 | |  |  |  |  |  |  |  |
| R Square | 0.153493015 | |  |  |  |  |  |  |  |
| Adjusted R Square | 0.012408517 | |  |  |  |  |  |  |  |
| Standard Error | 61.79384719 | |  |  |  |  |  |  |  |
| Observations | 8 | |  |  |  |  |  |  |  |
|  |  | |  |  |  |  |  |  |  |
| ANOVA |  | |  |  |  |  |  |  |  |
|  | *df* | | *SS* | *MS* | *F* | *Significance F* |  |  |  |
| Regression | 1 | | 4154.318498 | 4154.318498 | 1.087950962 | 0.337117352 |  |  |  |
| Residual | 6 | | 22910.8773 | 3818.47955 |  |  |  |  |  |
| Total | 7 | | 27065.1958 |  |  |  |  |  |  |
|  |  | |  |  |  |  |  |  |  |
|  | *Coefficients* | | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* | *Lower 95.0%* | *Upper 95.0%* |
| Intercept | 62.83874461 | | 55.58014684 | 1.130596952 | 0.301383462 | 73.16097539 | 198.8384646 | -73.16097539 | 198.8384646 |
| X Variable 1 | 2.089519541 | | 2.003280561 | 1.043048878 | 0.337117352 | -2.812331404 | 6.991370486 | -2.812331404 | 6.991370486 |

Above shows the regression, keeping Salary, Wages&Bonus dependent and all other factors independent.

1. **PC Jewellers:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Year** | **Salaries, Wages & Bonus** | **Contribution to funds** | **Staff Welfare Expenses** | **Other Employee Cost** |
| **2009-10** |  |  |  |  |
| **2010-11** |  |  |  |  |
| **2011-12** | 226.05 | 3.22 | 7.28 | 12.41 |
| **2012-13** | 318.17 | 6.88 | 8.96 | 19.04 |
| **2013-14** | 406.31 | 5.54 | 11.18 | 24.38 |
| **2014-15** | 489.76 | 11.86 | 23.27 | 30.57 |
| **2015-16** | 571.2 | 36.2 | 80.2 | 38.9 |
| **2016-17** | 695.8 | 41 | 70.7 | 26.2 |

\*all values in millions.

**Correlation Table**:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Salaries, Wages & Bonus** | **Contribution to funds** | **Staff Welfare Expenses** | **Other Employee Cost** |
| Salaries, Wages & Bonus | 1 |  |  |  |
| Contribution to funds | 0.906795119 | 1 |  |  |
| Staff Welfare Expenses | 0.866852362 | 0.981713923 | 1 |  |
| Other Employee Cost | 0.744655904 | 0.66332408 | 0.744566317 | 1 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Salaries, Wages & Bonus** | |  | **Contribution to funds** | |
| Mean | 451.215 |  | Mean | 17.45 |
| Median | 448.035 |  | Median | 9.37 |
| Mode | #N/A |  | Mode | #N/A |
|  |  |  |  |  |
|  |  |  |  |  |
| **Staff Welfare Expenses** | |  | **Other Employee Cost** | |
| Mean | 33.59833333 |  | Mean | 25.25 |
| Median | 17.225 |  | Median | 25.29 |
| Mode | #N/A |  | Mode | #N/A |

**Regression:**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | |  |  |  |  |  |  |  |  |
| *Regression Statistics* | | |  |  |  |  |  |  |  |
| Multiple R | 0.866852362 | |  |  |  |  |  |  |  |
| R Square | 0.751433017 | |  |  |  |  |  |  |  |
| Adjusted R Square | 0.689291271 | |  |  |  |  |  |  |  |
| Standard Error | 95.29004226 | |  |  |  |  |  |  |  |
| Observations | 6 | |  |  |  |  |  |  |  |
|  |  | |  |  |  |  |  |  |  |
| ANOVA |  | |  |  |  |  |  |  |  |
|  | *df* | | *SS* | *MS* | *F* | *Significance F* |  |  |  |
| Regression | 1 | | 109799.8791 | 109799.8791 | 12.0922418 | 0.0254122 |  |  |  |
| Residual | 4 | | 36320.76862 | 9080.192154 |  |  |  |  |  |
| Total | 5 | | 146120.6478 |  |  |  |  |  |  |
|  |  | |  |  |  |  |  |  |  |
|  | *Coefficients* | | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* | *Lower 95.0%* | *Upper 95.0%* |
| Intercept | 300.5079946 | | 58.23782417 | 5.160014112 | 0.006697957 | 138.8138727 | 462.2021164 | 138.8138727 | 462.2021164 |
| X Variable 1 | 4.48555004 | | 1.289918568 | 3.477390085 | 0.0254122 | 0.904161945 | 8.066938136 | 0.904161945 | 8.066938136 |

Above shows the regression, keeping Salary, Wages&Bonus dependent and all other factors independent.

1. **Rajesh Export:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Year** | **Salaries, Wages & Bonus** | **Contribution to funds** | **Staff Welfare Expenses** |
| **2009-10** | 46.38 | 0 | 2.75 |
| **2010-11** | 116.58 | 0 | 2.97 |
| **2011-12** | 184.38 | 0.3 | 4.45 |
| **2012-13** | 64.88 | 0.37 | 4.81 |
| **2013-14** | 53.5 | 0.22 | 4.02 |
| **2014-15** | 50.36 | 0.39 | 3.43 |
| **2015-16** | 50.66 | 0.319 | 3.89 |
| **2016-17** | 59.89 | 1.97 | 4.27 |

**Correlation Table:**

|  |  |  |  |
| --- | --- | --- | --- |
|  | Salaries, Wages & Bonus | Contribution to funds | Staff Welfare Expenses |
| Salaries, Wages & Bonus | 1 |  |  |
| Contribution to funds | -0.161252752 | 1 |  |
| Staff Welfare Expenses | 0.208025509 | 0.419012376 | 1 |

**Regression:**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | |  |  |  |  |  |  |  |  |
| *Regression Statistics* | | |  |  |  |  |  |  |  |
| Multiple R | 0.208025509 | |  |  |  |  |  |  |  |
| R Square | 0.043274613 | |  |  |  |  |  |  |  |
| Adjusted R Square | -0.116179619 | |  |  |  |  |  |  |  |
| Standard Error | 51.16230928 | |  |  |  |  |  |  |  |
| Observations | 8 | |  |  |  |  |  |  |  |
|  |  | |  |  |  |  |  |  |  |
| ANOVA |  | |  |  |  |  |  |  |  |
|  | *df* | | *SS* | *MS* | *F* | *Significance F* |  |  |  |
| Regression | 1 | | 710.3909453 | 710.3909453 | 0.271392061 | 0.621058861 |  |  |  |
| Residual | 6 | | 15705.49134 | 2617.58189 |  |  |  |  |  |
| Total | 7 | | 16415.88229 |  |  |  |  |  |  |
|  |  | |  |  |  |  |  |  |  |
|  | *Coefficients* | | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* | *Lower 95.0%* | *Upper 95.0%* |
| Intercept | 24.93853401 | | 104.0697291 | 0.239632929 | 0.818591259 | -229.7109194 | 279.5879874 | -229.7109194 | 279.5879874 |
| X Variable 1 | 13.96278941 | | 26.8023959 | 0.520953032 | 0.621058861 | -51.62031075 | 79.54588956 | -51.62031075 | 79.54588956 |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Salaries, Wages & Bonus** | |  | **Contribution to funds** | |  | **Staff Welfare Expenses** | |
| Mean | 78.32875 |  | Mean | 0.446125 |  | Mean | 3.82375 |
| Median | 56.695 |  | Median | 0.3095 |  | Median | 3.955 |
| Mode | #N/A |  | Mode | 0 |  | Mode | #N/A |

Above shows the regression, keeping Salary, Wages & Bonus dependent and all other factors independent.

**Conclusion:**

* **Gitanjali Gems:** Gitanjali Group is one of the largest branded jewelry retailers in the world. But they don’t have many showrooms. The value of R Square for Gitanjali is 0.24, it suggests that the employment by the company have not made a major impact on the company.
* **PC Jewellers:** It is one of the fastest growing companies in this sector. Due to this it is creating lot of employment and hence the value of R Square is 0.75, it suggests that the employment by the company have made a major impact on the company.
* **Tribhovandas Bhimji Zaveri (TBZ):** TBZ has 31 showrooms in 23 cities giving employment to average 1500 people in a year which is a major contribution in employment. The value of R Square for tbz is 0.70. It is clear from the value of R Square that he employment by the company have made a major impact on the company.
* **Thangamayil Jewellery:** Thangamayil Jewellery is a listed Indian jewellery retailer based out of Madurai. They have around 31 showrooms all over India. Its business is also based on their online store. The value of R Square is 0.15, it suggests that the employment by the company have made a small impact on the company.
* **Rajesh Export:** Rajesh Exports is India’s 5th largest company by revenue with whopping revenue of $36 billion. They are the largest processor, export of Gold in the world. The value of R Square for Rajesh exports is 0.04. Since the company’s major business is not only selling jewelleries, it is more export of gold and processing of gold, the employment by the company have made a negligible impact on the company.

With reference to above data, I would like to conclude that employment plays important role and have a major impact on the industry. The companies which are growing rapidly will need more manpower for smooth functioning. The company which have sufficient number of employees will gain benefit and those companies who are unable to do the same will slowly perish away. The Gems and Jewellery industry in India is fast growing industry and is expected to provide employment opportunities to more than 8.23 million persons by 2022.

**CAPITAL INVESTMENT**

Capital is the financial value of the assets, such as cash. Investment is the item which was purchased with the hope.

Capital Investment is defined on the funds invested in an enterprise or a firm for the purpose of increasing its business objectives. Capital Investment may also be defined as a firm's acquisition of fixed assets or capital assets such as machinery and manufacturing plants that is expected to be productive over coming years. There are many sources of Capital Investment including banks, equity investors, financial institutions, and angel investors and venture capital.

**Types of Investment:**

1. **Autonomous Investment:** The level of income does not affect the autonomous investment.
2. **Induced Investment:** It is that investment, which is a function of income levels, and there is a positive relationship between two. It is said that high incomes create demand for goods and services. It depends on the level of income.

In national income determination, we mostly consider autonomous investment only. Because, national Income determination is a short run analysis and in the short run, induced investment has a very little role to play. So, we take autonomous investment only.

Changes to property, plant and equipment (PPE), a large line item on the balance sheet, fall under the Cash Flow from Investing Activities mentioned under Cash Flow Statement in Annual Report.

**Objectives:**

* To see if capital invested in Gems and Jewellery Industries in India have affected their growth or not.
* To see if capital investment is a function of productivity or not.

**Data Analysis:**

1. **CUMULATIVE FOREIGN DIRECT INVESTMENTS INFLOW ON GEMS AND JEWELLERY SECTOR FROM [2008-2017]:**

|  |  |
| --- | --- |
| **FINANCIAL YEAR** | **CUMULATIVE FDI INFLOW (US $ MILLION)** |
| 2008 | 167.54 |
| 2009 | 251.04 |
| 2010 | 282 |
| 2011 | 301.9 |
| 2012 | 338.15 |
| 2013 | 390.76 |
| 2014 | 433.32 |
| 2015 | 696.48 |
| 2016 | 772.05 |
| 2017 | 895.96 |
| 2018 | 1111.52 |

**GRAPH FOR THE ABOVE TABLE:**

As we can see that the investments on Gems and Jewellery Sector has been increasing gradually as there are most positive incomes in the outputs of this sector. Indian government was also taking many initiatives like Make in India etc.

1. **Analysis of Investment and Income of Companies:**
2. **Malabar Gold and Diamonds:**

|  |  |  |
| --- | --- | --- |
| **FINANCIAL YEAR** | **CASH FLOW FROM INVESTING ACTIVITIES** | **TOTAL INCOME** |
| 2007 - 2008 | 0 | 2500000 |
| 2008 - 2009 | 0 | 605000 |
| 2009 - 2010 | 32780 | 598000 |
| 2010 - 2011 | 9396689 | 1259048 |
| 2011 - 2012 | 48253922 | 4023746 |
| 2012 - 2013 | 3616274 | 3399228 |
| 2013 - 2014 | 46854610 | 1974811 |
| 2014 - 2015 | 7056400 | 7827064 |
| 2015 - 2016 | 53471 | 3500000 |
| 2016 - 2017 | 0 | 45000000 |

**Regression:**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *Regression Statistics* | |  |  |  |  |  |  |  |
| Multiple R | 0.19151 |  |  |  |  |  |  |  |
| R Square | 0.036676 |  |  |  |  |  |  |  |
| Adjusted R Square | -0.08374 |  |  |  |  |  |  |  |
| Standard Error | 14048749 |  |  |  |  |  |  |  |
| Observations | 10 |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| ANOVA |  |  |  |  |  |  |  |  |
|  | *df* | *SS* | *MS* | *F* | *Significance F* |  |  |  |
| Regression | 1 | 6.01E+13 | 6.01E+13 | 0.304581 | 0.596101 |  |  |  |
| Residual | 8 | 1.58E+15 | 1.97E+14 |  |  |  |  |  |
| Total | 9 | 1.64E+15 |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
|  | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* | *Lower 95.0%* | *Upper 95.0%* |
| Intercept | 8613571 | 5250964 | 1.640379 | 0.139556 | -3495172 | 20722315 | -3495172 | 20722315 |
| X Variable 1 | -0.13403 | 0.242856 | -0.55189 | 0.596101 | -0.69406 | 0.425998 | -0.69406 | 0.425998 |

**Value of R2 is 0.036676**

**Correlation:**

|  |  |  |
| --- | --- | --- |
|  | **CASH FLOW FROM INVESTING ACTIVITIES** | **TOTAL INCOME** |
| CASH FLOW FROM INVESTING ACTIVITIES | 1 |  |
| TOTAL INCOME | -0.19151041 | 1 |

**Value of Correlation is -0.19151041**

**Conclusion:**

The total income of Malabar Gold and Diamonds is not affected by the cash flow from investing activities as the company is not investing much but then also their total income is increasing due to increase in their sales.

1. **Rajesh Exports LTD:**

|  |  |  |
| --- | --- | --- |
| **FINANCIAL YEAR** | **CASH FLOW FROM INVESTING ACTIVITIES** | **TOTAL INCOME** |
| 2007 - 2008 | 1345816449 | 86670905116 |
| 2008 - 2009 | 2585568513 | 1.23611E+11 |
| 2009 - 2010 | 4136634077 | 1.85294E+11 |
| 2010 - 2011 | 11110395 | 2.08644E+11 |
| 2011 - 2012 | 16021211 | 2.58503E+11 |
| 2012 - 2013 | 5489392 | 3.12286E+11 |
| 2013 - 2014 | 1163331360 | 2.35382E+11 |
| 2014 - 2015 | 511741048 | 3.79236E+11 |
| 2015 - 2016 | 4691229241 | 3.86227E+11 |
| 2016 - 2017 | 966055999 | 4.49914E+11 |

**Correlation:**

|  |  |  |
| --- | --- | --- |
|  | **CASH FLOW FROM INVESTING ACTIVITIES** | **TOTAL INCOME** |
| CASH FLOW FROM INVESTING ACTIVITIES | 1 |  |
| TOTAL INCOME | -0.069611339 | 1 |

**Value of Correlation is -0.069611339**

**Regression:**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *Regression Statistics* | |  |  |  |  |  |  |  |
| Multiple R | 0.069611 |  |  |  |  |  |  |  |
| R Square | 0.004846 |  |  |  |  |  |  |  |
| Adjusted R Square | -0.11955 |  |  |  |  |  |  |  |
| Standard Error | 1.25E+11 |  |  |  |  |  |  |  |
| Observations | 10 |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| ANOVA |  |  |  |  |  |  |  |  |
|  | *Df* | *SS* | *MS* | *F* | *Significance F* |  |  |  |
| Regression | 1 | 6.12E+20 | 6.12E+20 | 0.038955 | 0.848461 |  |  |  |
| Residual | 8 | 1.26E+23 | 1.57E+22 |  |  |  |  |  |
| Total | 9 | 1.26E+23 |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
|  | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* | *Lower 95.0%* | *Upper 95.0%* |
| Intercept | 2.7E+11 | 5.47E+10 | 4.935795 | 0.001141 | 1.44E+11 | 3.96E+11 | 1.44E+11 | 3.96E+11 |
| X Variable 1 | -4.82075 | 24.42501 | -0.19737 | 0.848461 | -61.1449 | 51.50342 | -61.1449 | 51.50342 |

**Value of R2 is 0.004846**

**Conclusion:**

Rajesh Exports Limited has a total income which is much larger than the cash flow from investing activities as they are increasing their sales by selling products in wholesale and also producing higher quality products and thus, increasing customer loyalty. So, the cash flow from investing activities has a little effect on total income.

1. **PC Jewellers:**

|  |  |  |
| --- | --- | --- |
| **FINANCIAL YEAR** | **CASH FLOW FROM INVESTING ACTIVITIES** | **TOTAL INCOME** |
| 2007 - 2008 | 33500000 | 3213400000 |
| 2008 - 2009 | 66900000 | 6299760000 |
| 2009 - 2010 | 153400000 | 10030060000 |
| 2010 - 2011 | 87090000 | 19938460000 |
| 2011 - 2012 | 382915150 | 36732170289 |
| 2012 - 2013 | 5830198350 | 46130695174 |
| 2013 - 2014 | 2461860183 | 53947327607 |
| 2014 - 2015 | 2229107000 | 64077054000 |
| 2015 - 2016 | 863600000 | 73086300000 |
| 2016 - 2017 | 6445900000 | 84795500000 |

**Regression:**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *Regression Statistics* | |  |  |  |  |  |  |  |
| Multiple R | 0.677127 |  |  |  |  |  |  |  |
| R Square | 0.458501 |  |  |  |  |  |  |  |
| Adjusted R Square | 0.390813 |  |  |  |  |  |  |  |
| Standard Error | 2.28E+10 |  |  |  |  |  |  |  |
| Observations | 10 |  |  |  |  |  |  |  |
| ANOVA |  |  |  |  |  |  |  |  |
|  | *Df* | *SS* | *MS* | *F* | *Significance F* |  |  |  |
| Regression | 1 | 3.54E+21 | 3.54E+21 | 6.773791 | 0.031488 |  |  |  |
| Residual | 8 | 4.18E+21 | 5.22E+20 |  |  |  |  |  |
| Total | 9 | 7.71E+21 |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
|  | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* | *Lower 95.0%* | *Upper 95.0%* |
| Intercept | 2.47E+10 | 9.28E+09 | 2.66006 | 0.028803 | 3.28E+09 | 4.61E+10 | 3.28E+09 | 4.61E+10 |
| X Variable 1 | 8.163001 | 3.136418 | 2.602651 | 0.031488 | 0.930408 | 15.39559 | 0.930408 | 15.39559 |

**Value of R2 is 0.458501**

**Correlation:**

|  |  |  |
| --- | --- | --- |
|  | **CASH FLOW FROM INVESTING ACTIVITIES** | **TOTAL INCOME** |
| CASH FLOW FROM INVESTING ACTIVITIES | 1 |  |
| TOTAL INCOME | 0.677126667 | 1 |

**Value of Correlation is 0.677126667**

**Conclusion:**

The total income of PC Jewellers is affected to some extent by cash flow from investing activities as PC Jewellers spends more on other factors that increase their total income as compared to amount spent on investing activities.

1. **Gitanjali Gems:**

|  |  |  |
| --- | --- | --- |
| **FINANCIAL YEAR** | **CASH FLOW FROM INVESTING ACTIVITIES** | **TOTAL INCOME** |
| 2007 - 2008 | 4685420000 | 48362320000 |
| 2008 - 2009 | 2505590000 | 50888760000 |
| 2009 - 2010 | 614860000 | 65276340000 |
| 2010 - 2011 | 688800000 | 94564020000 |
| 2011 - 2012 | 298640000 | 78530120000 |
| 2012 - 2013 | 5886440000 | 1.03998E+11 |
| 2013 - 2014 | 1928222000 | 73430846000 |
| 2014 - 2015 | 15862000 | 72098303000 |
| 2015 - 2016 | 233662000 | 86144399000 |
| 2016 - 2017 | 104908000 | 1.06113E+11 |

**Correlation:**

|  |  |  |
| --- | --- | --- |
|  | **CASH FLOW FROM INVESTING ACTIVITIES** | **TOTAL INCOME** |
| CASH FLOW FROM INVESTING ACTIVITIES | 1 |  |
| TOTAL INCOME | -0.141158786 | 1 |

**Value of Correlation is -0.141158786**

**Regression:**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *Regression Statistics* | |  |  |  |  |  |  |  |
| Multiple R | 0.141159 |  |  |  |  |  |  |  |
| R Square | 0.019926 |  |  |  |  |  |  |  |
| Adjusted R Square | -0.10258 |  |  |  |  |  |  |  |
| Standard Error | 2.11E+10 |  |  |  |  |  |  |  |
| Observations | 10 |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| ANOVA |  |  |  |  |  |  |  |  |
|  | *df* | *SS* | *MS* | *F* | *Significance F* |  |  |  |
| Regression | 1 | 7.25E+19 | 7.25E+19 | 0.162647 | 0.697295 |  |  |  |
| Residual | 8 | 3.57E+21 | 4.46E+20 |  |  |  |  |  |
| Total | 9 | 3.64E+21 |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
|  | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* | *Lower 95.0%* | *Upper 95.0%* |
| Intercept | 8.03E+10 | 8.81E+09 | 9.111229 | 1.69E-05 | 5.99E+10 | 1.01E+11 | 5.99E+10 | 1.01E+11 |
| X Variable 1 | -1.36628 | 3.38779 | -0.4033 | 0.697295 | -9.17854 | 6.445977 | -9.17854 | 6.445977 |

**Value of R2 is 0.019926**

**Conclusion:**

Gitanjali Gems is an International company and has a well settled and expanded business all over the world that even though there is lesser cash flow from investing activities, their total income increases continuously.

1. **Tribhovandas Bhimji Zaveri:**

|  |  |  |
| --- | --- | --- |
| **FINANCIAL YEAR** | **CASH FLOW FROM INVESTING ACTIVITIES** | **TOTAL INCOME** |
| 2007 - 2008 | 123200000 | 4394000000 |
| 2008 - 2009 | 250730000 | 6688800000 |
| 2009 - 2010 | 101830000 | 8852500000 |
| 2010 - 2011 | 117722687 | 11944737307 |
| 2011 - 2012 | 56816408 | 13870789605 |
| 2012 - 2013 | 605629000 | 16642200000 |
| 2013 - 2014 | 557881000 | 18309572000 |
| 2014 - 2015 | 263643000 | 19487068000 |
| 2015 - 2016 | 108694000 | 16594052000 |
| 2016 - 2017 | 6964000 | 17036068000 |

**Correlation:**

|  |  |  |
| --- | --- | --- |
|  | **CASH FLOW FROM INVESTING ACTIVITIES** | **TOTAL INCOME** |
| CASH FLOW FROM INVESTING ACTIVITIES | 1 |  |
| TOTAL INCOME | 0.342791886 | 1 |

**Value of Correlation is 0.342791886**

**REGRESSION:**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *Regression Statistics* | |  |  |  |  |  |  |  |
| Multiple R | 0.342792 |  |  |  |  |  |  |  |
| R Square | 0.117506 |  |  |  |  |  |  |  |
| Adjusted R Square | 0.007195 |  |  |  |  |  |  |  |
| Standard Error | 5.19E+09 |  |  |  |  |  |  |  |
| Observations | 10 |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| ANOVA |  |  |  |  |  |  |  |  |
|  | *df* | *SS* | *MS* | *F* | *Significance F* |  |  |  |
| Regression | 1 | 2.87E+19 | 2.87E+19 | 1.06522 | 0.332217 |  |  |  |
| Residual | 8 | 2.16E+20 | 2.69E+19 |  |  |  |  |  |
| Total | 9 | 2.44E+20 |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
|  | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* | *Lower 95.0%* | *Upper 95.0%* |
| Intercept | 1.15E+10 | 2.46E+09 | 4.661903 | 0.001619 | 5.8E+09 | 1.72E+10 | 5.8E+09 | 1.72E+10 |
| X Variable 1 | 8.646395 | 8.377517 | 1.032095 | 0.332217 | -10.6722 | 27.96498 | -10.6722 | 27.96498 |

**Value of R2 is 0.117506**

**Conclusion:**

Tribhovandas Bhimji Zaveri has an increase on total income but it is not much dependent on cash flow from investing activities as the company is increasing their sales by spending more on other expenses such as advertisement expenses and communication expenses, thus increasing total income.

1. **Tara Jewels:**

|  |  |  |
| --- | --- | --- |
| **FINANCIAL YEAR** | **CASH FLOW FROM INVESTING ACTIVITIES** | **TOTAL INCOME** |
| 2007 - 2008 | 60280000 | 6118770000 |
| 2008 - 2009 | 85800000 | 7476670000 |
| 2009 - 2010 | 161260000 | 7877000000 |
| 2010 - 2011 | 223640000 | 10915540000 |
| 2011 - 2012 | 184286505 | 13991000000 |
| 2012 - 2013 | 302393175 | 16355000000 |
| 2013 - 2014 | 483565356 | 14221200000 |
| 2014 - 2015 | 222712703 | 14189400000 |
| 2015 - 2016 | 292654624 | 13677000000 |
| 2016 - 2017 | 30389756 | 11970000000 |

**Correlation:**

|  |  |  |
| --- | --- | --- |
|  | **CASH FLOW FROM INVESTING ACTIVITIES** | **TOTAL INCOME** |
| CASH FLOW FROM INVESTING ACTIVITIES | 1 |  |
| TOTAL INCOME | 0.653747808 | 1 |

**Value of Correlation: 0.653747808**

**Regression:**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *Regression Statistics* | |  |  |  |  |  |  |  |
| Multiple R | 0.653748 |  |  |  |  |  |  |  |
| R Square | 0.427386 |  |  |  |  |  |  |  |
| Adjusted R Square | 0.355809 |  |  |  |  |  |  |  |
| Standard Error | 2.78E+09 |  |  |  |  |  |  |  |
| Observations | 10 |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| ANOVA |  |  |  |  |  |  |  |  |
|  | *df* | *SS* | *MS* | *F* | *Significance F* |  |  |  |
| Regression | 1 | 4.6E+19 | 4.6E+19 | 5.971022 | 0.040339 |  |  |  |
| Residual | 8 | 6.17E+19 | 7.71E+18 |  |  |  |  |  |
| Total | 9 | 1.08E+20 |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
|  | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* | *Lower 95.0%* | *Upper 95.0%* |
| Intercept | 8.24E+09 | 1.66E+09 | 4.974445 | 0.001087 | 4.42E+09 | 1.21E+10 | 4.42E+09 | 1.21E+10 |
| X Variable 1 | 16.78062 | 6.867263 | 2.443567 | 0.040339 | 0.944684 | 32.61656 | 0.944684 | 32.61656 |

**Value of R2 is 0.427386**

**Conclusion:**

The total income of Tara Jewels is dependent on the cash flow from investing activities but to only some extent as it depends more on employment and other affecting factors.

**Overall Conclusion:**

As we can see, in the data, the income brought in by Gems and Jewellery Industry is varying directly with the investments. So investment is a function of productivity. We also see that with every fiscal year, the investment increases, therefore sustaining and contributing to the growth of the company.

**Business Trends**

The Gems and jewellery industry plays a vital role in the Indian economy. The change in the way a business is developing is business trend. It represents the market size, imports, and exports and also measures the increase and decrease of revenue, expenses, profit, and loss.

**The trends in gems and jewellery industry:**

* **Focusing on quality:** Hall marking and stricter quality norms are introduced in the industry. Industry is adapting jewellery of higher quality and design standards. Hallmarking operates on basis of trust and manages the quality.
* **Focusing on Technology:** New manufacturing technology is introduced. CAD, CAM software and 3D printing are the technologies used in manufacturing. The modern manufacturing units use cutting edge technology, including laser machines, computerized yield planning machines, advanced bruiting lathes, diamond impregnated scaives, and many more. India has a great demand for gems & jewellery machinery, equipment and technology.
* **Multiple occasions for purchases:** With vast diversifications of our country there are many occasions where people buy jewellery as a sign of prosperity .Women buy jewellery for other occasions than wedding.
* **Growth of lab created diamonds:** The demand is increasing for Artificial or synthetic diamonds. Today there is no difference between lab created diamond and mined diamond. With the advancement of technology the industry has reached gem quality levels and using it in producing jewellery and diamond.
* **Gold Monetization scheme (GMS):** In November 2015, the Gold Monetization Scheme (GMS) in the form of Gold Deposit Scheme (DPS) and Gold Metal Loan (GML), is launched. It allows individuals trust and mutual funds to deposit gold with banks in return for interest. The designated banks accept gold deposits under long term (12-15 years), medium term (5-7 years), short term (1-3 years) Government Deposit schemes.
* **Sovereign Gold Bond Scheme:** Sovereign Gold Bond Scheme is also launched by the government, under which gold bonds denominated in grams of gold are issued to individuals by the Reserve Bank of India (RBI) in consultation with Ministry of Finance.
* **Gold schemes:** Tanishq Golden Harvest: Under this scheme if we pay for installments for 10 months and after the 10 months the company will offer a discount which will vary from 55 percent to 75 percent of the first installment.

**GRT Golden Eleven**: One can buy a plan from GRT golden Eleven and the amount paid per month is fixed and not variable. If the member does not want to purchase after 12 months the amount would be refunded.

**Malabar Gold and Diamonds smart buy**: For Smart Buy Products it offers online payment options including net banking, fund transfer, credit card and debit card. But it does not offer COD (cash on delivery) orders for Smart Buy Products. The Products would be manufactured and delivered by promise delivery date in Smart Buy Products.

**Data Analysis:**

Business trends of Gems and jewellery industry affect the variables: Investments, Total assets, Reserves and surplus, Share capital, Net sales.

1. **Investments:**

Investment is termed as purchase of goods that are not consumed today but are used in the future to create wealth. The assets of a company intend to hold for more than one year is represented by investments shown on balance sheet.

1. **Share Capital:**

Share capital is the money that shareholders invest to start or expand the business. At the accounting share capital is the par value of all equity resources either preferred or common stock –sold to shareholders. When a company chooses to go for the equity route it can obtain authorization to issue and sell additional shares thereby increasing its share capital.

1. **Net sales:**

The amount of sales generated by a company after deduction in returns, allowances for missing or damaged foods and discounts allowed are termed as net sales. At the end of accounting period one can determine net sales of a company. When net sales increase the income of a company also increases.

1. **Reserves and surplus:**

Surplus determines many excess assets including profit, capital, income, goods.  
When expenses are less than income, surplus budget occurs. Surplus is a balance between profit and loss.  
Reserves are the funds for a specific purpose which the company intends to use in future. In financial accounting except for basic share capital reserves are a part of shareholders equity.

1. **Total assets :**

The sum current and non-current assets that a company holds are termed as total assets. An asset represents a present economic resource of a company to which it has a right of access that other individuals or firms do not have. Assets are items of economic value, which are expended over time to yield a benefit for the owner.

**Data Analysis:**

1. **Rajesh Exports Ltd:**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Year** | **Reserves and surplus** | **Net sales** | **Total assets** | **Share capital** | **Investments** |
| **Mar-17** | 3,712.00 | 44,947.73 | 9,176.46 | 29.53 | 731.52 |
| **Mar-16** | 3,250.66 | 38,618.69 | 7,741.02 | 29.53 | 636.08 |
| **Mar-15** | 2,810.91 | 37,919.26 | 6,666.94 | 29.53 | 167.83 |
| **Mar-14** | 2,582.51 | 23,537.49 | 5,701.04 | 29.53 | 116.8 |
| **Mar-13** | 2,385.04 | 31,074.43 | 5,143.17 | 29.53 | 3.42 |
| **Mar-12** | 1,959.09 | 25,653.85 | 5,245.28 | 29.53 | 3.42 |
| **Mar-11** | 1,567.25 | 20,533.76 | 4,131.00 | 29.53 | 3.42 |
| **Mar-10** | 1,117.63 | 17,894.96 | 3,230.50 | 26.58 | 4.42 |
| **Mar-09** | 888.13 | 11,376.91 | 2,864.34 | 25.7 | 384.91 |
| **Mar-08** | 763.86 | 8,187.62 | 1,759.73 | 25.06 | 136.3 |
| **Mar-07** | 301.68 | 6,598.81 | 3,632.45 | 7.39 | 6.3 |

**Regression Analysis between reserves and surplus and net sales:**

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *Regression Statistics* | | | | | | | | | |  | |
| Multiple R | | | 0.968866445 | | | | | | |  | |
| R Square | | | 0.938702188 | | | | | | |  | |
| Adjusted R Square | | | 0.93189132 | | | | | | |  | |
| Standard Error | | | 288.4539558 | | | | | | |  | |
| Observations | | | 11 | | | | | | |  | |
| ANOVA |  |  | |  |  |  |  |  |  | |
|  | *df* | *SS* | | *MS* | *F* | *Significance F* |  |  |  | |
| Regression | 1 | 11467754 | | 11467754 | 137.8242 | 9.28E-07 |  |  |  | |
| Residual | 9 | 748851.16 | | 83205.68 |  |  |  |  |  | |
| Total | 10 | 12216605 | |  |  |  |  |  |  | |
|  |  |  | |  |  |  |  |  |  | |
|  | *Coefficients* | *Standard Error* | | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* | *Lower 95.0%* | *Upper 95.0%* | |
| Intercept | -72.47435856 | 192.21476 | | -0.37705 | 0.714874 | -507.294 | 362.3456 | -507.294 | 362.3456 | |
| X Variable 1 | 0.083110634 | 0.0070794 | | 11.73985 | 9.28E-07 | 0.067096 | 0.099125 | 0.067096 | 0.099125 | |

From the above table we can see that, reserves and surplus and net sales are strongly related. Net sales have an impact on reserves and surplus.

**Correlation:**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | *Column 1* | *Column 2* | *Column 3* | *Column 4* | *Column 5* |
| Column 1 | 1 |  |  |  |  |
| Column 2 | 0.968866 | 1 |  |  |  |
| Column 3 | 0.940616 | 0.937111 | 1 |  |  |
| Column 4 | 0.660328 | 0.625002 | 0.405282 | 1 |  |
| Column 5 | 0.601616 | 0.562034 | 0.646665 | 0.252511 | 1 |

Correlation between Reserves and surplus, Net sales, Total assets, share capital.

**Regression Analysis between Total assets and share capital:**

|  |  |  |
| --- | --- | --- |
| *Regression Statistics* | |  |
| Multiple R | 0.40528215 |  |
| R Square | 0.16425362 |  |
| Adjusted R Square | 0.07139292 |  |
| Standard Error | 2135.63607 |  |
| Observations | 11 |  |
|  |  |  |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  |  |  |  |
|  | *df* | *SS* | *MS* | *F* | *Significance F* |  |  |  |
| Regression | 1 | 8067471.9 | 8067471.9 | 1.7688173 | 0.2162466 |  |  |  |
| Residual | 9 | 41048473 | 4560941.4 |  |  |  |  |  |
| Total | 10 | 49115945 |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
|  | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* | *Lower 95.0%* | *Upper 95.0%* |
| Intercept | 1406.66188 | 2796.9081 | 0.5029346 | 0.627087 | -4920.384 | 7733.708 | -4920.38 | 7733.708 |
| X Variable 1 | 136.627262 | 102.72967 | 1.3299689 | 0.2162466 | -95.76339 | 369.0179 | -95.7634 | 369.0179 |

From the above table we can say that total assets and share capital are not strongly related. Share capital does not have much impact on total assets.Advanced technology like prototyping, laser etc. are used extensively by Rajesh Exports Ltd. to produce international class jewellery. Each piece of jewellery produced is subjected to strict quality control measures to ensure consistency. Among all the companies in the world this company has advanced R&D (Research and Development) facility in gold refining, bar making and jewellery making. One of the largest and wide variety ranges of jewellery designs is manufactured to cater the diverse global and domestic markets. It has a capability of producing handmade jewellery, casting jewellery, machine chains, stamped jewellery, studded jewellery, tube jewellery and electro-formed jewellery.

1. **Vaibhav global limited:**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Year** | **Reserves and surplus** | **Net sales** | **Total assets** | **Share capital** | **Investments** |
| **Mar-17** | 467.01 | 478.29 | 571.92 | 32.53 | 467.01 |
| **Mar-16** | 443.59 | 360.6 | 566.69 | 32.5 | 292.56 |
| **Mar-15** | 421.18 | 403.78 | 513.06 | 32.38 | 270.07 |
| **Mar-14** | 401.69 | 348.27 | 506.52 | 32.18 | 212.28 |
| **Mar-13** | 357.26 | 249.13 | 546.52 | 76.06 | 214.94 |
| **Mar-12** | 304.49 | 176.69 | 507.58 | 75.7 | 258.35 |
| **Mar-11** | 281.47 | 145.44 | 518.4 | 75.7 | 258.35 |
| **Mar-10** | 263.74 | 121.31 | 509.09 | 75.7 | 277.25 |
| **Mar-09** | 260.21 | 171.66 | 519.05 | 75.7 | 277.25 |
| **Mar-08** | 502.8 | 311.47 | 755.54 | 75.7 | 375.98 |
| **Mar-07** | 600.17 | 278.17 | 735.42 | 71.59 | 527.09 |

**Regression Analysis between reserves and surplus and net sales:**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *Regression Statistics* | |  |  |  |  |  |  |  |
| Multiple R | 0.680652 |  |  |  |  |  |  |  |
| R Square | 0.463287 |  |  |  |  |  |  |  |
| Adjusted R Square | 0.403652 |  |  |  |  |  |  |  |
| Standard Error | 84.50227 |  |  |  |  |  |  |  |
| Observations | 11 |  |  |  |  |  |  |  |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ANOVA |  |  |  |  |  |  |  |  |
|  | *df* | *SS* | *MS* | *F* | *Significance F* |  |  |  |
| Regression | 1 | 55473.6667 | 55473.667 | 7.76873202 | 0.021149 |  |  |  |
| Residual | 9 | 64265.6999 | 7140.6333 |  |  |  |  |  |
| Total | 10 | 119739.367 |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
|  | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* | *Lower 95.0%* | *Upper 95.0%* |
| Intercept | 212.6932752 | 68.938491 | 3.0852615 | 0.01302878 | 56.74357 | 368.643 | 56.743574 | 368.643 |
| X Variable 1 | 0.645026774 | 0.23142095 | 2.7872445 | 0.02114886 | 0.121516 | 1.16854 | 0.1215162 | 1.168537 |

From the above table we can see that, reserves and surplus and net sales are not strongly related. Net sales do not have much impact on reserves and surplus.

**Correlation:**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | *Column 1* | *Column 2* | *Column 3* | *Column 4* | *Column 5* |
| Column 1 | 1 |  |  |  |  |
| Column 2 | 0.680652 | 1 |  |  |  |
| Column 3 | 0.679907 | 0.021418 | 1 |  |  |
| Column 4 | 0.183126 | 0.466666 | -0.27624 | 1 |  |
| Column 5 | 0.746542 | 0.372077 | 0.537963 | 0.529486 | 1 |

Correlation between Reserves and surplus, Net sales, Total assets, share capital.

**Regression Analysis between Total assets and share capital:**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *Regression Statistics* | |  |  |  |  |  |  |  |
| Multiple R | 0.217888 |  |  |  |  |  |  |  |
| R Square | 0.047475 |  |  |  |  |  |  |  |
| Adjusted R Square | -0.05836 |  |  |  |  |  |  |  |
| Standard Error | 93.4165 |  |  |  |  |  |  |  |
| Observations | 11 |  |  |  |  |  |  |  |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ANOVA |  |  |  |  |  |  |  |  |
|  | *df* | *SS* | *MS* | *F* | *Significance F* |  |  |  |
| Regression | 1 | 3914.533926 | 3914.5339 | 0.4485728 | 0.5198251 |  |  |  |
| Residual | 9 | 78539.77669 | 8726.6419 |  |  |  |  |  |
| Total | 10 | 82454.31062 |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
|  | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* | *Lower 95.0%* | *Upper 95.0%* |
| Intercept | 513.5886 | 86.21439689 | 5.957109 | 0.0002135 | 318.55804 | 708.61907 | 318.55804 | 708.6191 |
| X Variable 1 | 0.915478 | 1.366884056 | 0.6697558 | 0.5198251 | -2.176628 | 4.007585 | -2.176628 | 4.007585 |

From the above table we can say that total assets and share capital are not strongly related. Share capital does not have much impact on total assets.

In Vaibhav Global limited, latest CAD / CAM software have been deployed for achieving precision in design and reducing turnaround time. The business model is based not merely on some study of demand, supply, socio-economic classes and disposable incomes, but also on a study of women, their moods, wishes, dreams and responses. The product development team travel worldwide to track changes in trend, and based on trends they develop new products and drive demand.

1. **Asian star jewels:**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Year** | **Reserves**  **and surplus** | **Net sales** | **Total assets** | **Share capital** | **Investments** |
| **Mar-17** | 632.16 | 3,493.86 | 1,427.25 | 16.01 | 37.74 |
| **Mar-16** | 521.49 | 3,300.83 | 1,331.28 | 16.01 | 4.37 |
| **Mar-15** | 485.3 | 3,221.26 | 1,340.37 | 16.01 | 4.78 |
| **Mar-14** | 448.44 | 3,250.19 | 1,281.94 | 16.01 | 4.78 |
| **Mar-13** | 410.51 | 2,462.21 | 1,215.49 | 16.01 | 7.39 |
| **Mar-12** | 382.02 | 1,835.40 | 1,014.22 | 10.67 | 4.37 |
| **Mar-11** | 357.25 | 1,667.33 | 1,000.64 | 10.67 | 3.87 |
| **Mar-10** | 334.37 | 1,467.02 | 907.47 | 10.67 | 3.95 |
| **Mar-09** | 309.27 | 1,465.57 | 872.25 | 35.87 | 13.06 |
| **Mar-08** | 293.73 | 1,486.17 | 872.25 | 35.87 | 28.9 |
| **Mar-07** | 254.15 | 1,199.15 | 845.19 | 35.87 | 6.62 |

**Regression Analysis between reserves and surplus and net sales:**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *Regression Statistics* | |  |  |  |  |  |  |  |
| Multiple R | 0.933042 |  |  |  |  |  |  |  |
| R Square | 0.870567 |  |  |  |  |  |  |  |
| Adjusted R Square | 0.856186 |  |  |  |  |  |  |  |
| Standard Error | 42.49591 |  |  |  |  |  |  |  |
| Observations | 11 |  |  |  |  |  |  |  |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ANOVA |  |  |  |  |  |  |  |  |
|  | *df* | *SS* | *MS* | *F* | *Significance F* |  |  |  |
| Regression | 1 | 109318.729 | 109318.729 | 60.53413622 | 2.8E-05 |  |  |  |
| Residual | 9 | 16253.1197 | 1805.90219 |  |  |  |  |  |
| Total | 10 | 125571.849 |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
|  | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* | *Lower 95.0%* | *Upper 95.0%* |
| Intercept | 139.634369 | 36.146783 | 3.86298192 | 0.003829584 | 57.8647 | 221.40407 | 57.864665 | 221.40407 |
| X Variable 1 | 0.11641165 | 0.01496223 | 7.78036864 | 2.76289E-05 | 0.08256 | 0.1502586 | 0.0825647 | 0.1502586 |

From the above table we can see that, reserves and surplus and net sales are strongly related. Net sales have an impact on reserves and surplus.

**Correlation:**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | *Column 1* | *Column 2* | *Column 3* | *Column 4* | *Column 5* |
| Column 1 | 1 |  |  |  |  |
| Column 2 | 0.933042 | 1 |  |  |  |
| Column 3 | 0.949703 | 0.985353 | 1 |  |  |
| Column 4 | -0.5325 | -0.45197 | -0.52425 | 1 |  |
| Column 5 | 0.306487 | 0.144532 | 0.132294 | 0.351108 | 1 |

Correlation between Reserves and surplus, Net sales, Total assets, share capital.

**Regression Analysis between Total assets and share capital:**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | |  |  |  |  |  |  |  |  |
| *Regression Statistics* | |  |  |  |  |  |  |  |  |
| Multiple R | 0.524255 |  |  |  |  |  |  |  |  |
| R Square | 0.274843 |  |  |  |  |  |  |  |  |
| Adjusted R Square | 0.19427 |  |  |  |  |  |  |  |  |
| Standard Error | 198.2432 |  |  |  |  |  |  |  |  |
| Observations | 11 |  |  |  |  |  |  |  |  |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ANOVA |  |  |  |  |  |  |  |  |
|  | *df* | *SS* | *MS* | *F* | *Significance F* |  |  |  |
| Regression | 1 | 134057.856 | 134057.856 | 3.4111093 | 0.097829348 |  |  |  |
| Residual | 9 | 353703.327 | 39300.3697 |  |  |  |  |  |
| Total | 10 | 487761.183 |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
|  | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* | *Lower 95.0%* | *Upper 95.0%* |
| Intercept | 1321.589 | 133.674779 | 9.88659951 | 3.934E-06 | 1019.195649 | 1623.9824 | 1019.1956 | 1623.982 |
| X Variable 1 | -11.05808 | 5.98731388 | -1.8469189 | 0.0978293 | -24.60232789 | 2.486162 | -24.60233 | 2.486162 |

From the above table we can say that total assets and share capital are not strongly related. Share capital does not have much impact on total assets.

Asian star jewels are equipped with machinery imported from Germany, Japan, and advanced technology like CAD/CAM, Rapid Prototyping etc. This company is expanding their jewellery operations. They create highly desirable diamonds to reach the expectations of the customer’s. They use innovative styles and settings like prong, pave, Invisible, channel, Pressure they offer remarkable range of Gold and Platinum diamond studded jewellery.

1. **Tribhovandas Bhimji Zaveri Ltd. (TBZ):**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Year** | **Reserves and surplus** | **Net sales** | **Total assets** | **Share capital** | **Investments** |
| **Mar-17** | 394.23 | 1,700.24 | 1,006.68 | 66.73 | 3.08 |
| **Mar-16** | 375.7 | 1,654.78 | 1,088.34 | 66.73 | 3.08 |
| **Mar-15** | 398.83 | 1,934.20 | 1,044.27 | 66.72 | 3.08 |
| **Mar-14** | 380.97 | 1,824.34 | 1,011.11 | 66.7 | 3.03 |
| **Mar-13** | 343.4 | 1,658.34 | 824.08 | 66.67 | 3.03 |
| **Mar-12** | 109.58 | 1,385.47 | 363.15 | 50 | 3.03 |
| **Mar-11** | 57.1 | 1,193.93 | 315.71 | 50 | 2.98 |
| **Mar-10** | 58.46 | 884.9 | 264.45 | 10 | 0.01 |
| **Mar-09** | 41.53 | 668.74 | 227.21 | 10 | 0 |
| **Mar-08** | 5.89 | 439.35 | 135.89 | 0.2 | 0 |
| **Mar-07** | 0 | 305.16 | 90.5 | 0.2 | 0 |

**Regression Analysis between reserves and surplus and net sales:**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *Regression Statistics* | |  |  |  |  |  |  |  |
| Multiple R | 0.917807 |  |  |  |  |  |  |  |
| R Square | 0.842369 |  |  |  |  |  |  |  |
| Adjusted R Square | 0.824855 |  |  |  |  |  |  |  |
| Standard Error | 74.01214 |  |  |  |  |  |  |  |
| Observations | 11 |  |  |  |  |  |  |  |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ANOVA |  |  |  |  |  |  |  |  |
|  | *df* | *SS* | *MS* | *F* | *Significance F* |  |  |  |
| Regression | 1 | 263456.853 | 263456.85 | 48.095402 | 6.7962E-05 |  |  |  |
| Residual | 9 | 49300.1743 | 5477.7971 |  |  |  |  |  |
| Total | 10 | 312757.028 |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
|  | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* | *Lower 95.0%* | *Upper 95.0%* |
| Intercept | -149.9155 | 54.7593742 | -2.7377132 | 0.0229332 | -273.789771 | -26.04115 | -273.7898 | -26.04115 |
| X Variable 1 | 0.2794809 | 0.04029956 | 6.9350848 | 6.796E-05 | 0.18831693 | 0.3706448 | 0.1883169 | 0.3706448 |

From the above table we can see that, reserves and surplus and net sales are strongly related. Net sales have an impact on reserves and surplus.

**Correlation:**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | *Column 1* | *Column 2* | *Column 3* | *Column 4* | *Column 5* |
| Column 1 | 1 |  |  |  |  |
| Column 2 | 0.917807 | 1 |  |  |  |
| Column 3 | 0.992896 | 0.92062 | 1 |  |  |
| Column 4 | 0.885819 | 0.97124 | 0.891206 | 1 |  |
| Column 5 | 0.773575 | 0.914577 | 0.782933 | 0.97403 | 1 |

Correlation between Reserves and surplus, Net sales, Total assets, share capital.

**Regression Analysis between Total assets and share capital:**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *Regression Statistics* | | |  |  | |  | |  |  |  | |  | |
| Multiple R | | 0.891206 |  |  | |  | |  |  |  | |  | |
| R Square | | 0.794248 |  |  | |  | |  |  |  | |  | |
| Adjusted R Square | | 0.771386 |  |  | |  | |  |  |  | |  | |
| Standard Error | | 195.9298 |  |  | |  | |  |  |  | |  | |
| Observations | | 11 |  |  | |  | |  |  |  | |  | |
| ANOVA |  | |  | |  | |  | |  | |  | |  | |  |
|  | *df* | | *SS* | | *MS* | | *F* | | *Significance F* | |  | |  | |  |
| Regression | 1 | | 1333689.25 | | 1333689.25 | | 34.74189 | | 0.0002307 | |  | |  | |  |
| Residual | 9 | | 345496.552 | | 38388.5058 | |  | |  | |  | |  | |  |
| Total | 10 | | 1679185.81 | |  | |  | |  | |  | |  | |  |
|  |  | |  | |  | |  | |  | |  | |  | |  |
|  | *Coefficients* | | *Standard Error* | | *t Stat* | | *P-value* | | *Lower 95%* | | *Upper 95%* | | *Lower 95.0%* | | *Upper 95.0%* |
| Intercept | 68.775292 | | 104.830746 | | 0.65606031 | | 0.5281995 | | -168.3683 | | 305.91891 | | -168.3683 | | 305.9189 |
| X Variable 1 | 12.368899 | | 2.09847755 | | 5.89422516 | | 0.0002307 | | 7.6218132 | | 17.115985 | | 7.6218132 | | 17.11599 |

From the above table we can say that total assets and share capital are strongly related. Share capital has an impact on total assets.

TBZ has introduced a Gold Plan that is if a customer purchases 100 gm. of gold (24kt/standard) from TBZ and places it under their ‘Gold Plan’, he/she will get 105gm of gold after 12 months. Consumers can place a minimum of 10 gm. of gold coins and bars and thereafter, in multiples of 5gm up to an overall maximum of 500gm.TBZ has introduced Kalpavruksha plan. Through Kalpavruksha plan we can exquisite 22kt gold, diamonds or platinum jewellery through easy installments. We can pay for 12, 15 or 18 months.

**Conclusion:**

From the above data analysis, we conclude that net sales of a company are independent while total expenditure of a company depends on net sales. With analyzed regression we say that total assets and share capital show fluctuated impact on each other. Increase in net sales results in increase of reserves and surplus.

**Impact Of Monetary Policy**

**Introduction:**

The primary objective of monetary policy has been defined explicitly – “to maintain price stability while keeping in mind the objective of growth.”

Amendments to the Reserve Bank of India (RBI) Act, which came into force on June 27, 2016, will empower the conduct of monetary policy in India. The amendments also provide for the constitution of a monetary policy committee (MPC) that shall determine the policy rate required. The Government and the RBI have constituted the six members MPC. All conditions are in place for the MPC to take its first decision on October 4 under the Reserve Bank’s fourth bi-monthly monetary policy review for 2016-17. The amended RBI Act establishes the procedures for MPC meetings. Monetary policy is the macroeconomic policy laid down by the central bank. It involves management of money supply and interest rate and is the demand side economic policy used by the government of a country to achieve macroeconomic objectives like inflation, consumption, growth and liquidity.

The Basic Major Monetary Policy Variables are as follows:

1. **Repo Rate**: The rate at which Central Bank of a Country (RBI in India) lends money to commercial banks in case of any fund shortage. It is used to control inflation.
2. **Bank Rate**: A Bank Rate is the interest rate at which central bank lends money to domestic banks in form of very short term loans.
3. **Reverse Repo Rate**: Reverse repo rate is the rate at which RBI borrows money from banks. Reverse repo is the exact opposite of repo. In a reverse repo transaction, banks purchase government securities form RBI and lend money to the banking regulator, thus earning interest.
4. **Cash Reserve Ratio:** The Cash Reserve Ratio is the amount of funds that the banks are bound to keep withReservebank of India as a portion of their Net Demand and Time Liabilities (NDTL). The objective of CRR is to ensure the liquidity and solvency of the Banks.
5. **Statutory Liquidity Ratio**: The **Statutory Liquidity Ratio (SLR)** refers to the proportion of deposits the commercial bank is required to maintain with them in the form of **liquid assets** in addition to the CRR.
6. **Marginal Standing Facility**: Marginal Standing Facility (MSF) is a new scheme announced by the RBI in its Monetary Policy (2011-12) and refers to the penal rate at which banks can borrow money from the central bank over and above what is available to them through the LAF window. MSF, being a penal rate, is always fixed above the repo rate.

**DEMONETIZATION IN INDIA (2016):**

The retail demand of gold in India was affected due to the cash crunch after the demonetization move. Demonetization effects on gold prices were seen immediately after the announcement of demonetization on the 8th of November as there was an immediate rush to buy this precious metal which lifted the gold prices to 3 year highs. The actions that were taken by the IT Department have put immense pressure on the gold prices domestically. Traders and investors can certainly witness sharp swings in the gold prices. The gold demand is also expected to its seven- year low due to the demonetization in India.

1. **GOLD:**

**Basic Monetary Policy Rates and Gold Prices Over 10 years:**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Year** | **Gold Prices** | **Bank Rate** | **Repo Rate** | **Cash Reserve Ratio** | **Marginal Standing Facility** | **Statutory Liquidity Ratio** | **Reverse Repo Rate** |
| 2007 | 9240.32 | 6 | 7.5 | 6.21875 | 0 | 25 | 6 |
| 2008 | 9995.62 | 6 | 7.892857 | 7.575 | 0 | 24.5 | 5.5 |
| 2009 | 12889.74 | 6 | 5.4375 | 5.25 | 0 | 24.5 | 3.9375 |
| 2010 | 15756.09 | 6 | 5.5 | 5.5625 | 0 | 24.5 | 4.178571 |
| 2011 | 19227.08 | 6 | 7.375 | 6 | 8.9 | 24 | 6.375 |
| 2012 | 25722.42 | 8.16 | 8.25 | 5 | 9.25 | 23.5 | 7.25 |
| 2013 | 30163.93 | 9 | 7.625 | 4.125 | 9 | 23 | 6.625 |
| 2014 | 29190.39 | 8.875 | 7.875 | 4 | 8.875 | 22.5 | 6.875 |
| 2015 | 27414.55 | 8.45 | 7.45 | 4 | 8.45 | 21.75 | 6.45 |
| 2016 | 26534.26 | 7.17 | 6.5 | 4 | 7.166667 | 21.125 | 5.833333 |
| 2017 | 29665.28 | 6.5 | 6.125 | 4 | 6.5 | 20.1875 | 5.833333 |

**Correlation:**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | *Reverse Repo Rate* | *Bank Rate* | *Gold Prices* | *Repo Rate* | *C.R.R* | *Marginal Standing Facility* | *S.L.R* |
| *Reverse Repo Rate* | 1 |  |  |  |  |  |  |
| *Bank Rate* | 0.694831 | 1 |  |  |  |  |  |
| *Gold Prices* | 0.596429 | 0.791098 | 1 |  |  |  |  |
| *Repo Rate* | 0.860281 | 0.524112 | 0.188 | 1 |  |  |  |
| *C.R.R* | -0.31573 | -0.68893 | -0.88448 | 0.128603 | 1 |  |  |
| *Marginal Standing Facility* | 0.807393 | 0.748794 | 0.878549 | 0.473937 | -0.66478 | 1 |  |
| *S.L.R* | -0.34234 | -0.43554 | -0.82416 | 0.068284 | 0.787695 |  | 1 |

**Regression:** (Dependent Variable: Repo Rate)

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *Regression Statistics* | |  |  |  |  |  |  |  |
| Multiple R | 0.999312 |  |  |  |  |  |  |  |
| R Square | 0.998625 |  |  |  |  |  |  |  |
| Adjusted R Square | 0.996563 |  |  |  |  |  |  |  |
| Standard Error | 0.058008 |  |  |  |  |  |  |  |
| Observations | 11 |  |  |  |  |  |  |  |
| ANOVA |  |  |  |  |  |  |  |  |
|  | *Df* | *SS* | *MS* | *F* | *Significance F* |  |  |  |
| Regression | 6 | 9.77707 | 1.629512 | 484.2702 | 1.13E-05 |  |  |  |
| Residual | 4 | 0.01346 | 0.003365 |  |  |  |  |  |
| Total | 10 | 9.790529 |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
|  | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* | *Lower 95.0%* | *Upper 95.0%* |
| Intercept | 1.329269 | 0.821508 | 1.618084 | 0.180954 | -0.9516 | 3.610142 | -0.9516 | 3.610142 |
| X Variable 1 | 0.522953 | 0.040037 | 13.06175 | 0.000198 | 0.411793 | 0.634114 | 0.411793 | 0.634114 |
| X Variable 2 | -6.2E-05 | 1.27E-05 | -4.87823 | 0.008171 | -9.7E-05 | -2.7E-05 | -9.7E-05 | -2.7E-05 |
| X Variable 3 | 0.709694 | 0.045359 | 15.64602 | 9.75E-05 | 0.583756 | 0.835632 | 0.583756 | 0.835632 |
| X Variable 4 | 0.514054 | 0.043644 | 11.77826 | 0.000297 | 0.392878 | 0.635229 | 0.392878 | 0.635229 |
| X Variable 5 | 0.01906 | 0.016005 | 1.19083 | 0.299556 | -0.02538 | 0.063498 | -0.02538 | 0.063498 |
| X Variable 6 | -0.15367 | 0.031564 | -4.86854 | 0.008228 | -0.24131 | -0.06604 | -0.24131 | -0.06604 |

1. **Silver:**

**Basic Monetary Policy Rates And Silver Prices over 11 years:**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Year** | **Silver Prices** | **Bank Rate** | **Repo Rate** | **Cash Reserve Ratio** | **Marginal Standing Facility** | **Statutory Liquidity Ratio** | **Reverse Repo Rate** |
| 2007 | 19056.57 | 6 | 7.5 | 6.21875 | 0 | 25 | 6 |
| 2008 | 19427.45 | 6 | 7.892857 | 7.575 | 0 | 24.5 | 5.5 |
| 2009 | 21247.57 | 6 | 5.4375 | 5.25 | 0 | 24.5 | 3.9375 |
| 2010 | 25320.69 | 6 | 5.5 | 5.5625 | 0 | 24.5 | 4.178571 |
| 2011 | 37289.54 | 6 | 7.375 | 6 | 8.9 | 24 | 6.375 |
| 2012 | 57315.87 | 8.16 | 8.25 | 5 | 9.25 | 23.5 | 7.25 |
| 2013 | 57602.30 | 9 | 7.625 | 4.125 | 9 | 23 | 6.625 |
| 2014 | 46636.80 | 8.875 | 7.875 | 4 | 8.875 | 22.5 | 6.875 |
| 2015 | 40558.48 | 8.45 | 7.45 | 4 | 8.45 | 21.75 | 6.45 |
| 2016 | 36318.10 | 7.17 | 6.5 | 4 | 7.166667 | 21.125 | 5.833333 |
| 2017 | 42748.31 | 6.5 | 6.125 | 4 | 6.5 | 20.1875 | 5.833333 |

**Correlation:**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | *Reverse Repo Rate* | *Bank Rate* | *Silver Prices* | *Repo Rate* | *C.R.R* | *Marginal Standing Facility* | *S.L.R* |
| Reverse Repo Rate | 1 |  |  |  |  |  |  |
| Bank Rate | 0.694831 | 1 |  |  |  |  |  |
| Silver Prices | 0.747871 | 0.826371 | 1 |  |  |  |  |
| Repo Rate | 0.860281 | 0.524112 | 0.439561 | 1 |  |  |  |
| Cash Reserve Ratio | -0.31573 | -0.68893 | -0.67419 | 0.128603 | 1 |  |  |
| Marginal Standing Facility | 0.807393 | 0.748794 | 0.900532 | 0.473937 | -0.66478 | 1 |  |
| Statutory Liquid Ratio | -0.34234 | -0.43554 | -0.52255 | 0.068284 | 0.787695 | -0.61393 | 1 |

**Regression:** (Dependent Variable: Bank Rate)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| *Regression Statistics* | |  |  |  |  |  |
| Multiple R | 0.995564 |  |  |  |  |  |
| R Square | 0.991147 |  |  |  |  |  |
| Adjusted R Square | 0.977867 |  |  |  |  |  |
| Standard Error | 0.188894 |  |  |  |  |  |
| Observations | 11 |  |  |  |  |  |
|  |  |  |  |  |  |  |
| ANOVA | |  |  |  |  |  |
|  | *Df* | *SS* | *MS* | *F* | *Significance F* |  |
| Regression | 6 | 15.97863 | 2.663104 | 74.63658 | 0.000465 |  |
| Residual | 4 | 0.142724 | 0.035681 |  |  |  |
| Total | 10 | 16.12135 |  |  |  |  |
|  |  |  |  |  |  |  |
|  | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* |
| Intercept | 4.984634 | 1.406572 | 3.543817 | 0.023931 | 1.079364 | 8.889904 |
| X Variable 1 | 3.38E-05 | 1.09E-05 | 3.100968 | 0.036187 | 3.54E-06 | 6.41E-05 |
| X Variable 2 | 2.089165 | 0.237083 | 8.811944 | 0.000915 | 1.430916 | 2.747414 |
| X Variable 3 | -1.19822 | 0.11657 | -10.279 | 0.000505 | -1.52187 | -0.87457 |
| X Variable 4 | 0.004982 | 0.043691 | 0.114025 | 0.914712 | -0.11632 | 0.126288 |
| X Variable 5 | 0.074575 | 0.069552 | 1.072223 | 0.344002 | -0.11853 | 0.267682 |
| X Variable 6 | -1.6156 | 0.284992 | -5.66896 | 0.004776 | -2.40687 | -0.82434 |

1. **Platinum:**

**Basic Monetary Policy Rates And Platinum Prices Over 11 years :**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Year** | **Repo Rate** | **Platinum Prices** | **B**ank Rate | **Reverse Repo Rate** | **Cash Reserve Ratio** | **Marginal Standing Facility** | **Statutory Liquidity Ratio** |
| 2007 | 7.5 | 69234.54 | 6 | 6 | 6.21875 | 0 | 25 |
| 2008 | 7.892857 | 70421.83 | 6 | 5.5 | 7.575 | 0 | 24.5 |
| 2009 | 5.4375 | 71183.8 | 6 | 3.9375 | 5.25 | 0 | 24.5 |
| 2010 | 5.5 | 73552.64 | 6 | 4.178571 | 5.5625 | 0 | 24.5 |
| 2011 | 7.375 | 79995.99 | 6 | 6.375 | 6 | 8.9 | 24 |
| 2012 | 8.25 | 83400 | 8.16 | 7.25 | 5 | 9.25 | 23.5 |
| 2013 | 7.625 | 86823.23 | 9 | 6.625 | 4.125 | 9 | 23 |
| 2014 | 7.875 | 80000 | 8.875 | 6.875 | 4 | 8.875 | 22.5 |
| 2015 | 7.45 | 67946 | 8.45 | 6.45 | 4 | 8.45 | 21.75 |
| 2016 | 6.5 | 68145.33 | 7.17 | 5.833333 | 4 | 7.166667 | 21.125 |
| 2017 | 6.125 | 60926.3 | 6.5 | 5.833333 | 4 | 6.5 | 20.1875 |

**Correlation:**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | *Bank Rate* | *Platinum Prices* | *Repo Rate* | *Reverse Repo Rate* | *Cash Reserve Ratio* | *Marginal Standing Facility* | *S.L.R* |
| Bank Rate | 1 |  |  |  |  |  |  |
| Platinum Prices | 0.50859 | 1 |  |  |  |  |  |
| Repo Rate | 0.52411 | 0.49847 | 1 |  |  |  |  |
| Reverse Repo Rate | 0.69483 | 0.44149 | 0.860281 | 1 |  |  |  |
| Cash Reserve Ratio | -0.68893 | -0.02215 | 0.128603 | -0.31573 | 1 |  |  |
| Marginal Standing Facility | 0.74879 | 0.43022 | 0.473937 | 0.807393 | -0.664782 | 1 |  |
| Statutory Liquid Ratio | -0.43554 | 0.35265 | 0.068284 | -0.34234 | 0.7876952 | -0.61393 | 1 |

**Regression:** (Dependent Variable: Cash Reserve Ratio)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| *Regression Statistics* | |  |  |  |  |  |
| Multiple R | 0.994571 |  |  |  |  |  |
| R Square | 0.989171 |  |  |  |  |  |
| Adjusted R Square | 0.972929 |  |  |  |  |  |
| Standard Error | 0.196147 |  |  |  |  |  |
| Observations | 11 |  |  |  |  |  |
|  |  |  |  |  |  |  |
| ANOVA | |  |  |  |  |  |
|  | *df* | *SS* | *MS* | *F* | *Significance F* |  |
| Regression | 6 | 14.058 | 2.343 | 60.89911 | 0.000693 |  |
| Residual | 4 | 0.153894 | 0.038473 |  |  |  |
| Total | 10 | 14.2119 |  |  |  |  |
|  |  |  |  |  |  |  |
|  | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* |
| Intercept | 5.296974 | 2.16911 | 2.442003 | 0.071055 | -0.72544 | 11.31939 |
| X Variable 1 | 3.63E-05 | 2.33E-05 | 1.556185 | 0.194649 | -2.8E-05 | 0.000101 |
| X Variable 2 | 1.555655 | 0.231362 | 6.723899 | 0.002548 | 0.913291 | 2.198019 |
| X Variable 3 | -1.07392 | 0.290035 | -3.70273 | 0.020786 | -1.87919 | -0.26865 |
| X Variable 4 | -0.78397 | 0.101374 | -7.73344 | 0.001506 | -1.06543 | -0.50251 |
| X Variable 5 | -0.01769 | 0.056894 | -0.31094 | 0.771379 | -0.17565 | 0.140272 |
| X Variable 6 | -0.08117 | 0.141026 | -0.57555 | 0.595751 | -0.47272 | 0.310383 |

1. **DIAMOND:**

**Basic Monetary Policy Rates And Diamond Prices Over 11 years :**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Year** | **Repo Rate** | **Diamond Prices** | **B**ank Rate | **Reverse Repo Rate** | **Cash Reserve Ratio** | **Marginal Standing Facility** | **Statutory Liquidity Ratio** |
| 2007 | 7.5 | 4100.12 | 6 | 6 | 6.21875 | 0 | 25 |
| 2008 | 7.892857 | 4295.8 | 6 | 5.5 | 7.575 | 0 | 24.5 |
| 2009 | 5.4375 | 3845.04 | 6 | 3.9375 | 5.25 | 0 | 24.5 |
| 2010 | 5.5 | 4500.99 | 6 | 4.178571 | 5.5625 | 0 | 24.5 |
| 2011 | 7.375 | 7155.25 | 6 | 6.375 | 6 | 8.9 | 24 |
| 2012 | 8.25 | 6550.92 | 8.16 | 7.25 | 5 | 9.25 | 23.5 |
| 2013 | 7.625 | 6633 | 9 | 6.625 | 4.125 | 9 | 23 |
| 2014 | 7.875 | 7402.14 | 8.875 | 6.875 | 4 | 8.875 | 22.5 |
| 2015 | 7.45 | 6799.8 | 8.45 | 6.45 | 4 | 8.45 | 21.75 |
| 2016 | 6.5 | 7387.58 | 7.17 | 5.833333 | 4 | 7.166667 | 21.125 |
| 2017 | 6.125 | 6536.52 | 6.5 | 5.833333 | 4 | 6.5 | 20.1875 |

**Regression:** (Dependent Variable: Repo Rate)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| *Regression Statistics* | |  |  |  |  |  |
| Multiple R | 0.995315 |  |  |  |  |  |
| R Square | 0.990652 |  |  |  |  |  |
| Adjusted R Square | 0.97663 |  |  |  |  |  |
| Standard Error | 0.151262 |  |  |  |  |  |
| Observations | 11 |  |  |  |  |  |
|  |  |  |  |  |  |  |
| ANOVA | |  |  |  |  |  |
|  | *Df* | *SS* | *MS* | *F* | *Significance F* |  |
| Regression | 6 | 9.699009 | 1.616501 | 70.65076 | 0.000518 |  |
| Residual | 4 | 0.091521 | 0.02288 |  |  |  |
| Total | 10 | 9.790529 |  |  |  |  |
|  |  |  |  |  |  |  |
|  | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* |
| Intercept | -2.59716 | 1.734863 | -1.49704 | 0.208729 | -7.41391 | 2.219594 |
| X Variable 1 | 4.25E-05 | 0.000143 | 0.296635 | 0.78151 | -0.00035 | 0.00044 |
| X Variable 2 | 0.409145 | 0.084351 | 4.850518 | 0.008336 | 0.17495 | 0.64334 |
| X Variable 3 | 0.790414 | 0.110977 | 7.122349 | 0.002054 | 0.482293 | 1.098534 |
| X Variable 4 | 0.571227 | 0.109655 | 5.209301 | 0.006475 | 0.266775 | 0.875678 |
| X Variable 5 | -0.05201 | 0.0533 | -0.97579 | 0.384423 | -0.19999 | 0.095975 |
| X Variable 6 | -0.03426 | 0.064684 | -0.52967 | 0.624377 | -0.21385 | 0.145331 |

**Correlation:**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | *Cash Reserve Ratio* | *Diamond Prices* | *Repo Rate* | *Reverse Repo Rate* | *Bank Rate* | *Marginal Standing Facility* | *Statutory Liquid Ratio* |
| Cash Reserve Ratio | 1 |  |  |  |  |  |  |
| Diamond Prices | -0.68204 | 1 |  |  |  |  |  |
| Repo Rate | 0.128603 | 0.364266 | 1 |  |  |  |  |
| Reverse Repo Rate | -0.31573 | 0.725569 | 0.860281 | 1 |  |  |  |
| Bank Rate | -0.68893 | 0.656436 | 0.524112 | 0.694831 | 1 |  |  |
| Marginal Standing Facility | -0.66478 | 0.954162 | 0.473937 | 0.807393 | 0.748794 | 1 |  |
| Statutory Liquid Ratio | 0.787695 | -0.71634 | 0.068284 | -0.34234 | -0.43554 | -0.61393 | 1 |

**Conclusion:**

With reference to the above data and the data analysis in the following report we can conclude that perhaps the biggest influence on gems and jewellery prices is monetary policy, which is controlled by the Central Bank of India. The basic monetary policy rates impact the gems and jewellery industry as seen by the above analysis through the regression statistics. The Monetary Policy Committee sets the different policy rates whenever the committee sits for a meeting. Monetary Policy Committee can also move the gold markets.  If the MPC takes a stance that implies rates could rise in the near future, the prices tend to react poorly since; once again, the opportunity cost of forgoing interest-bearing assets rises. However, if the MPC insinuates that rates are planning to hold steady, prices tend to rise since the opportunity cost of forgoing interest-based assets instead for gems and jewellery remains low.

**IMPACT OF FISCAL POLICY**

**Fiscal Policy:**

It is the combined government decisions regarding a country’s taxing and spending. It is the idea of finding a balance between tax rates and public savings. The major examples of Fiscal policy are tax cuts and increased government spending. Both these policies increase aggregate demand while contributing to deficits or drawing down of budget surpluses.

**Variables involved:**

1. **Total Transfer Payments:** In economics, transfer payment is a redistribution of income or wealth made without goods or services being received in return. For example, private pension payments, veteran benefits, disability payments, welfare etc. Here, we take Total transfer payments of India in crores of rupees.
2. **Fiscal Deficit:** It is the difference between total revenue and total expenditure of the government. Here, we take Fiscal Deficit also in crores of rupees.
3. **Gold Rate:** The average price of gold (per 10 grams) in the financial year is presented in rupees.
4. **Silver Rate:** The average price of silver (per 1Kg) in the financial year is presented in rupees.

**Objectives:**

* To find the relation (if any) between price of gold (per 10 grams) and Total Transfer Payments and Fiscal Deficit of India.
* To find the relation (if any) between price of silver (per 1Kg) and Total Transfer Payments and Fiscal Deficit of India.

**Data Analysis:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Year** | **Gold (per 10 grams)** | **Silver (per 1kg)** | **Total Transfer Payments** | **Fiscal Deficit** |
| 2000-01 | 4473.6 | 483.59 | 206100 | 118816 |
| 2004-05 | 6145.38 | 676.17 | 296351 | 125794 |
| 2005-06 | 6900.56 | 801.17 | 338948 | 146435 |
| 2006-07 | 9240.32 | 1247.74 | 402318 | 142573 |
| 2007-08 | 9995.62 | 1448.96 | 462434 | 126912 |
| 2008-09 | 12889.74 | 1374.98 | 613634 | 336992 |
| 2009-10 | 15756.09 | 1576.3 | 694243 | 418482 |
| 2010-11 | 19227.08 | 2391.16 | 806612 | 373592 |
| 2011-12 | 25722.42 | 3545.64 | 1010950 | 515990 |
| 2012-13 | 30163.93 | 3050.71 | 1010950 | 490190 |
| 2013-14 | 29190.39 | 2145.41 |  | 502858 |
| 2014-15 | 27414.55 | 1814.04 |  | 531177 |
| 2015-16 | 26534.26 | 1526.03 |  | 555649 |

\* Gold and Silver in rupees, Total Transfer Payments, Fiscal Deficit in crores of rupees.

**Derived Data:**

Rate of change of data = ((This Year’s Data - Previous Year’s Data)/Previous Year’s Data) \*100

This was derived for the easier visualization of the data on the graph. Comparing rate of change is better than comparing crores of rupees and thousands of rupees.

|  |  |  |  |
| --- | --- | --- | --- |
| **Year** | **Rate of change of gold price (per 10 grams)** | **Rate of change of Total Transfer Payments** | **Rate of change of Fiscal Deficit** |
| 2000-01 |  |  |  |
| 2004-05 | 37.36990343 | 43.78990781 | 5.872946405 |
| 2005-06 | 12.28858102 | 14.37383373 | 16.40857275 |
| 2006-07 | 33.90681336 | 18.69608318 | -2.637347629 |
| 2007-08 | 8.173959343 | 14.94240874 | -10.98454827 |
| 2008-09 | 28.9538818 | 32.69655778 | 165.5320222 |
| 2009-10 | 22.23745398 | 13.13633208 | 24.18158295 |
| 2010-11 | 22.02951367 | 16.18583119 | -10.72686519 |
| 2011-12 | 33.78224879 | 25.3328738 | 38.11591255 |
| 2012-13 | 17.26707674 | 0 | -5.000096901 |
| 2013-14 | -3.227497213 |  | 2.584304045 |
| 2014-15 | -6.083646022 |  | 5.631609719 |
| 2015-16 | -3.211032098 |  | 4.607127191 |

|  |  |  |  |
| --- | --- | --- | --- |
| **Year** | **Rate of change of Silver price** | **Rate of change of Total Transfer Payments** | **Rate of change of Fiscal Deficit** |
| 2000-01 |  |  |  |
| 2004-05 | 39.82299055 | 43.78990781 | 5.872946405 |
| 2005-06 | 18.48647529 | 14.37383373 | 16.40857275 |
| 2006-07 | 55.73973064 | 18.69608318 | -2.637347629 |
| 2007-08 | 16.12675718 | 14.94240874 | -10.98454827 |
| 2008-09 | -5.105731007 | 32.69655778 | 165.5320222 |
| 2009-10 | 14.64166752 | 13.13633208 | 24.18158295 |
| 2010-11 | 51.6944744 | 16.18583119 | -10.72686519 |
| 2011-12 | 48.28116897 | 25.3328738 | 38.11591255 |
| 2012-13 | -13.95883395 |  | -5.000096901 |
| 2013-14 | -29.67505925 |  | 2.584304045 |
| 2014-15 | -15.44553256 |  | 5.631609719 |
| 2015-16 | -15.87671716 |  | 4.607127191 |

**Visualizing the derived data:**

**Correlation:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | ***Gold (per 10 grams)*** | ***Silver (per 1kg)*** | ***Total Transfer Payments*** | ***Fiscal Deficit*** |
| **Gold (per 10 grams)** | 1 |  |  |  |
| **Silver (per 1kg)** | 0.798130097 | 1 |  |  |
| **Total Transfer Payments** | 0.981259726 | 0.965014136 | 1 |  |
| **Fiscal Deficit** | 0.948116285 | 0.725666412 | 0.957395511 | 1 |

**Result:**

* As the co-relation value of Total Transfer Payments and price of Gold (per 10 grams) is 0.98, by which we can clearly conclude that there positive and strong relation between price of Gold (per 10 grams) and Total Transfer Payments.
* As the co-relation value of Fiscal Deficit and price of Gold (per 10 grams) is 0.95, by which we can clearly conclude that there positive and strong relation between price of Gold (per 10 grams) and Fiscal Deficit.
* As the co-relation value of Fiscal Deficit and price of Silver (per 1 Kg) is 0.73, by which we can clearly conclude that there positive and moderate relation between price of Silver (per 1Kg) and Fiscal Deficit.
* As the co-relation value of Total Transfer Payments and price of Silver (per 1Kg) is 0.97, by which we can clearly conclude that there positive and strong relation between price of Silver (per 1Kg) and Total Transfer Payments.

**Regression Analysis:**





* The R-square value clearly shows the positive and strong relationship between Total Transfer payments and Price of Gold. We can conclude without any doubt that a change in these variables can directly impact the price of gold.



* The increase in the value of R-square when a variable is added clearly shows the positive relation with the new variable added also. Here, the new variable is Fiscal Deficit. If you take initial variable to be total transfer payments. And it can be total transfer payments if we take initial variable to be Fiscal Deficit. In both the cases the R-square value is increasing.





* The R-square value clearly shows the positive and strong relationship between Total Transfer payments and Price of Silver. We can conclude without any doubt that a change in these variables can directly impact the price of Silver.



* The increase in the value of R-square when a variable is added clearly shows the positive relation with the new variable added also. Here, the new variable is Fiscal Deficit. If you take initial variable to be total transfer payments. And it can be total transfer payments if we take initial variable to be Fiscal Deficit. In both the cases the R-square value is increasing.

**Conclusion:**

* The rate of gold is strongly dependent on the government’s decision of increasing or decreasing total transfer payments. Even the fiscal deficit from the year has an equal impact of gold rate.
* The rate of silver is strongly dependent on the government’s decision on total transfer payments. But, the fiscal deficit seems to have a really low impact on the silver rate.

**Technological Innovations**

Technology is one of the driving factors of any industry, the state of technological innovation in any industry helps present a good picture of its health. In recent times the technological innovations in the gems and jewellery industry have brought many profit soaring and efficiency improving solutions, ranging from CAD to Smart Jewellery, from Brick & Mortar stores to E-Commerce and now using Virtual Reality! I measured the impact of Technological Innovations under Gems & Jewellery Industry in India by noting when a specific technology was introduced in industry and taking a look at the data of the company’s Revenue, Net Worth and other such factors.

Here are some of the notable technologies I used for my analysis:

* **Virtual Reality** – Being used for showcasing the jewellery by rendering it real time in the customer’s headsets.
* **3D Printing** – To avoid wastage usually incurred by normal carving and sawing methods used in jewellery crafting, 3D Printing saves a huge amount of materials resulting in capital savings for the company.
* **Smart Jewellery** – In the increasing IoT world, even Jewellery has not been spared, many companies are integrating devices ranging from fitness trackers to music playback devices.
* **Custom computer aided Jewellery** – As the purchasing power of the consumers increase so do their demands, recently the trend of custom jewelleries has been increasing, coupled with CAD technology it makes it all the more easier for manufacturers to produce such designs.
* **E-Commerce** – The shift from normal brick & mortar stores to e-commerce has been a boon for the industry as it allowed the companies to milk a larger and wider market at a very cheaper cost.

We will do a company wise breakdown of these technologies ranging from Financial Year 2013 – 2017.

**Analysis:**

1. **PCJ:**





**Correlation:**



**Regression Analysis:**



1. **Gitanjali Jewellers:**





**Correlation:**



**Regression Analysis:**



1. **TBZ Jewellers:**





**Correlation:**



**Regression Analysis:**



1. **Rajesh Exports:**





**Correlation:**



**Regression:**



**Conclusion:**

1. **PCJ:**

Due to the efforts made by the company in the domain of technological innovations, we see that the value of R Square after regression was 0.93, it suggests that the technological innovations carried out by the company have made quite an impact on the company.

1. **Gitanjali:**

Gitanjali has been suffering from the aftermath of scams, that coupled with its lack of cutting edge technology and only doing barely enough upgrades to keep its production lines running show a grimmer picture overall. The value of R Square after regression was 0.41, it suggests that the technological innovations carried out by the company have not made a major impact on the company.

1. **TBZ:**

TBZ is the smallest company and have smaller budget for R&D (covered under intangible assets) of all 4 companies compared here, that gives them a smaller headroom to experiment and mass deploy consumer facing technologies such as Virtual Reality and only leave them with Hit and Miss chance of production line technologies. The value of R Square after regression was 0.37, it suggests that the technological innovations carried out by the company have made small impact on the company.

1. **Rajesh Exports:**

Rajesh Exports is India’s 5th largest company by revenue. With a whopping $36 billion revenue ranking them at 295th at Fortune Global 500, not only they have deeper pockets as compared to anyone else, but they also much larger international facilities such as Valcambi, they have also developed multiple in-house facilities for alloying of their materials and produce one of the cheapest Gems and Jewellery in the world. The value of R Square after regression was 0.95, which suggests that the technological innovations carried out by the company have made major impact on the company. With reference to above data, I would like to conclude that technological innovations have a major impact on the industry. The companies which adapt latest technologies and/or develop their own, are the ones which benefit the most. While companies who are unable to adopt or develop technologies as fast as market leaders lose out.

**IMPACT OF CURRENCY**

**Introduction:**

* Dollar is the standard international currency.
* Gold prices are inversely proportional to strength of dollar in International market.
* Gold is used as a security against a weakening currency. Thus its demand increases when value of dollar decreases. There is an inverse relationship.
* India consumes a huge amount of gold and other precious metals as household demand for jewellery and ornaments is highest and way more than the rest of the world thus leading to booming gems and jewellery industry.
* This also leads to huge demand for raw material which met through export and currency plays an important role as illustrated by data below.

**Objectives:**

* To analyze the effect of currency on Gems and Jewellery industry in India.
* To analyze the relation between various major currencies and rupee and how it affects Gems and Jewellery industry.
* To analyze the relation between currencies and other variables.

**Data Analysis:**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | **Rupee v/s Other Currencies** | | | | | | | **Year** | **Dollar** | **Pound** | **Euro** | **Franc** | **Yen** | |  |  |  |  |  |  | | **2007-08** | 40.2607 | 80.8412 | 57.059 | 41.95 | 40.065 | | **2008-09** | 45.9933 | 78.3164 | 65.0581 | 43.61 | 51.89 | | **2009-10** | 47.4433 | 75.781 | 67.0513 | 44.1 | 48.43 | | **2010-11** | 45.5626 | 70.8812 | 60.2325 | 47.428 | 54.01 | | **2011-12** | 47.9229 | 76.3912 | 65.8939 | 54.5 | 62.42 | | **2012-13** | 54.4099 | 85.9713 | 70.0693 | 57 | 57.76 | | **2013-14** | 60.5019 | 96.3058 | 81.1745 | 67.89 | 58.83 | | **2014-15** | 61.1436 | 98.5731 | 77.5209 | 65.64 | 52.11 | | **2015-16** | 65.4685 | 98.726 | 72.2894 | 66.8 | 59.06 | | **2016-17** | 67.072 | 87.6897 | 73.6087 | 67.11 | 57.96 | |

Graph showing Rupee v/s Other Major Currencies past 10 years.

**Correlation:**



This data above shows that the strength of rupee has fallen against major global currencies.

1. **Gold:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Year** | **Rupees per**  **10gms.** | **$ per troy**  **oz.** | **Import**  **($ Million)** |
| **2007-08** | 9995.62 | 765.78 | 2694 |
| **2008-09** | 12889.74 | 867.19 | 4677 |
| **2009-10** | 15756.09 | 1023.03 | 7503 |
| **2010-11** | 19227.08 | 1293.53 | 8652 |
| **2011-12** | 25722.42 | 1644.87 | 10963 |
| **2012-13** | 30163.93 | 1653.51 | 11335 |
| **2013-14** | 29190.39 | 1326.68 | 5663 |
| **2014-15** | 27414.55 | 1247.4 | 5468 |
| **2015-16** | 26534.26 | 1147.43 | 4184 |
| **2016-17** | 29665.28 | 1258.03 | 4291 |

**Correlation:**

|  |  |  |  |
| --- | --- | --- | --- |
|  | *Rupees* | *Dollar* | *Imports* |
| Column 1 | 1 |  |  |
| Column 2 | 0.794704 | 1 |  |
| Column 3 | 0.333409 | 0.811983 | 1 |

**Regression of Gold Price in Rupee v/s Value of Dollar in Rupees:**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| *Regression Statistics* | | | | | |
| Multiple R | | | 0.820045 | | |
| R Square | | | 0.672474 | | |
| Adjusted R Square | | | 0.631533 | | |
| Standard Error | | | 4570.859 | | |
| Observations | | | 10 | | |  | | | |  | | |  | | |
|  | | |  | | |  | | | |  | | | |  | | |  | | |  |
| ANOVA | | |  | | |  | | | |  | | | |  | | |  | | |  |
|  | | | *df* | | | *SS* | | | | *MS* | | | | *F* | | | *Significance F* | | |  |
| Regression | | | 1 | | | 3.43E+08 | | | | 3.43E+08 | | | | 16.42551 | | | 0.00367 | | |  |
| Residual | | | 8 | | | 1.67E+08 | | | | 20892753 | | | |  | | |  | | |  |
| Total | | | 9 | | | 5.1E+08 | | | |  | | | |  | | |  | | |  |
|  | | |  | | |  | | | |  | | | |  | | |  | | |  |
|  | | | *Coefficients* | | | *Standard Error* | | | | *t Stat* | | | | *P-value* | | | *Lower 95%* | | | *Upper 95%* |
| Intercept | | | -12477.4 | | | 8788.488 | | | | -1.41974 | | | | 0.193455 | | | -32743.7 | | | 7788.929 |
| X Variable 1 | | | 655.7427 | | | 161.7983 | | | | 4.05284 | | | | 0.00367 | | | 282.6351 | | | 1028.85 |
|  | | |  | | |  | | | |  | | | |  | | |  | | |  |
|  | | |  | | |  | | | |  | | | |  | | |  | | |  |
|  | | |  | | |  | | | |  | | | |  | | |  | | |  |
| **Dependent Variable:** Gold Price in Rupee.  **Independent Variable:** Value of Dollar in Rupees.  **Gold Price in Rupee vs.**  **Value of Pound in Rs**. | | | | | | |  | |  | |  | | | | |  | | |  | | |
|  |  | | |  | | | |  | | | |  | | |  | | |
| *Regression Statistics* | | | | |  | | | |  | |  | | | | |  | | |  | | |
| Multiple R | | 0.612008 | | |  | | | |  | |  | | | | |  | | |  | | |
| R Square | | 0.374554 | | |  | | | |  | |  | | | | |  | | |  | | |
| Adjusted R Square | | 0.296373 | | |  | | | |  | |  | | | | |  | | |  | | |
| Standard Error | | 6316.4 | | |  | | | |  | |  | | | | |  | | |  | | |
| Observations | | 10 | | |  | | | |  | |  | | | | |  | | |  | | |
|  | |  | | |  | | | |  | |  | | | | |  | | |  | | |
| ANOVA | |  | | |  | | | |  | |  | | | | |  | | |  | | |
|  | | *df* | | | *SS* | | | | *MS* | | *F* | | | | | *Significance F* | | |  | | |
| Regression | | 1 | | | 1.91E+08 | | | | 1.91E+08 | | 4.79087 | | | | | 0.060033 | | |  | | |
| Residual | | 8 | | | 3.19E+08 | | | | 39896911 | |  | | | | |  | | |  | | |
| Total | | 9 | | | 5.1E+08 | | | |  | |  | | | | |  | | |  | | |
|  | |  | | |  | | | |  | |  | | | | |  | | |  | | |
|  | | *Coefficients* | | | *Standard Error* | | | | *t Stat* | | *P-value* | | | | | *Lower 95%* | | | *Upper 95%* | | |
| Intercept | | -15875.7 | | | 17716.92 | | | | -0.89608 | | 0.396373 | | | | | -56731 | | | 24979.57 | | |
| X Variable 1 | | 453.5929 | | | 207.2331 | | | | 2.188806 | | 0.060033 | | | | | -24.2874 | | | 931.4731 | | |
|  | |  | | |  | | | |  | |  | | | | |  | | |  | | |
|  | |  | | |  | | | |  | |  | | | | |  | | |  | | |
|  | |  | | |  | | | |  | |  | | | | |  | | |  | | |

Dependent Variable:Gold Price in Rupee.

Independent Variable:Value of Pound in Rupees.

**Gold price in Rupees vs Gold price in dollar:**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| *Regression Statistics* | |  |  |  |  |  |
| Multiple R | 0.794704 |  |  |  |  |  |
| R Square | 0.631555 |  |  |  |  |  |
| Adjusted R Square | 0.585499 |  |  |  |  |  |
| Standard Error | 4847.982 |  |  |  |  |  |
| Observations | 10 |  |  |  |  |  |
|  |  |  |  |  |  |  |
| ANOVA | |  |  |  |  |  |
|  | *df* | *SS* | *MS* | *F* | *Significance F* |  |
| Regression | 1 | 3.22E+08 | 3.22E+08 | 13.71287 | 0.006016 |  |
| Residual | 8 | 1.88E+08 | 23502934 |  |  |  |
| Total | 9 | 5.1E+08 |  |  |  |  |
|  |  |  |  |  |  |  |
|  | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* |
| Intercept | -2487.48 | 6960.77 | -0.35736 | 0.730069 | -18539 | 13564.09 |
| X Variable 1 | 20.56309 | 5.552954 | 3.70309 | 0.006016 | 7.757952 | 33.36822 |

Dependent Variable: Gold Price in Rupee.

Independent Variable:Gold price in dollar.

**Gold price in Rupees vs Total import value:**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| *Regression Statistics* | |  |  |  |  |  |
| Multiple R | 0.333409 |  |  |  |  |  |
| R Square | 0.111162 |  |  |  |  |  |
| Adjusted R Square | 5.67E-05 |  |  |  |  |  |
| Standard Error | 7529.846 |  |  |  |  |  |
| Observations | 10 |  |  |  |  |  |
|  |  |  |  |  |  |  |
| ANOVA | |  |  |  |  |  |
|  | *df* | *SS* | *MS* | *F* | *Significance F* |  |
| Regression | 1 | 56727517 | 56727517 | 1.00051 | 0.346477 |  |
| Residual | 8 | 4.54E+08 | 56698586 |  |  |  |
| Total | 9 | 5.1E+08 |  |  |  |  |
|  |  |  |  |  |  |  |
|  | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* |
| Intercept | 17102.05 | 6041.509 | 2.830757 | 0.022124 | 3170.302 | 31033.79 |
| X Variable 1 | 0.848829 | 0.848613 | 1.000255 | 0.346477 | -1.10808 | 2.805734 |

Dependent Variable:Gold Price in Rupee.

Independent Variable: Total Import Value.

1. **Silver:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Year** | **Rupees per**  **Kg.** | **Cents per**  **troy oz.** | **Import**  **($ Million)** |
| **2007-08** | 19427.45 | 1448.96 | 21 |
| **2008-09** | 21247.57 | 1374.98 | 26 |
| **2009-10** | 25320.69 | 1576.3 | 32 |
| **2010-11** | 37289.54 | 2391.16 | 87 |
| **2011-12** | 57315.87 | 3545.64 | 100 |
| **2012-13** | 57602.3 | 3050.71 | 70 |
| **2013-14** | 46636.8 | 2145.41 | 39 |
| **2014-15** | 40558.48 | 1814.04 | 35 |
| **2015-16** | 36318.1 | 1526.03 | 44 |
| **2016-17** | 42748.31 | 1779.08 | 51 |

**Correlation:**

|  |  |  |  |
| --- | --- | --- | --- |
|  | *Rupees* | *Dollar* | *Imports* |
| Column 1 | 1 |  |  |
| Column 2 | 0.859223 | 1 |  |
| Column 3 | 0.733119 | 0.883626 | 1 |

**Silver price in Rupees vs Value of dollar in Rupees:**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| *Regression Statistics* | |  |  |  |  |  |
| Multiple R | 0.425583 |  |  |  |  |  |
| R Square | 0.181121 |  |  |  |  |  |
| Adjusted R Square | 0.078761 |  |  |  |  |  |
| Standard Error | 12990.9 |  |  |  |  |  |
| Observations | 10 |  |  |  |  |  |
|  |  |  |  |  |  |  |
| ANOVA | |  |  |  |  |  |
|  | *df* | *SS* | *MS* | *F* | *Significance F* |  |
| Regression | 1 | 2.99E+08 | 2.99E+08 | 1.769454 | 0.22012 |  |
| Residual | 8 | 1.35E+09 | 1.69E+08 |  |  |  |
| Total | 9 | 1.65E+09 |  |  |  |  |
|  |  |  |  |  |  |  |
|  | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* |
| Intercept | 5673.181 | 24977.89 | 0.227128 | 0.826021 | -51925.9 | 63272.29 |
| X Variable 1 | 611.6953 | 459.8493 | 1.330208 | 0.22012 | -448.719 | 1672.11 |

Dependent Variable:Silver Price in Rupee.

Independent Variable: Value of Dollar in Rupee.

**Silver price in Rupees vs Value of Euro in Rupees:**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| *Regression Statistics* | |  |  |  |  |  |
| Multiple R | 0.464776 |  |  |  |  |  |
| R Square | 0.216017 |  |  |  |  |  |
| Adjusted R Square | 0.118019 |  |  |  |  |  |
| Standard Error | 12711.09 |  |  |  |  |  |
| Observations | 10 |  |  |  |  |  |
|  |  |  |  |  |  |  |
| ANOVA | |  |  |  |  |  |
|  | *df* | *SS* | *MS* | *F* | *Significance F* |  |
| Regression | 1 | 3.56E+08 | 3.56E+08 | 2.204301 | 0.175925 |  |
| Residual | 8 | 1.29E+09 | 1.62E+08 |  |  |  |
| Total | 9 | 1.65E+09 |  |  |  |  |
|  |  |  |  |  |  |  |
|  | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* |
| Intercept | -19641.5 | 39330.64 | -0.49939 | 0.630944 | -110338 | 71055.12 |
| X Variable 1 | 841.907 | 567.0595 | 1.484689 | 0.175925 | -465.735 | 2149.548 |

Dependent Variable:Silver Price in Rupee.

Independent Variable:Value of Euro in Rupee.

**Silver price in Rupees vs. Silver price in Dollar:**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| *Regression Statistics* | |  |  |  |  |  |
| Multiple R | 0.859223 |  |  |  |  |  |
| R Square | 0.738265 |  |  |  |  |  |
| Adjusted R Square | 0.705548 |  |  |  |  |  |
| Standard Error | 7344.472 |  |  |  |  |  |
| Observations | 10 |  |  |  |  |  |
|  |  |  |  |  |  |  |
| ANOVA | |  |  |  |  |  |
|  | *df* | *SS* | *MS* | *F* | *Significance F* |  |
| Regression | 1 | 1.22E+09 | 1.22E+09 | 22.56524 | 0.001445 |  |
| Residual | 8 | 4.32E+08 | 53941262 |  |  |  |
| Total | 9 | 1.65E+09 |  |  |  |  |
|  |  |  |  |  |  |  |
|  | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* |
| Intercept | 5581.24 | 7298.008 | 0.764762 | 0.466371 | -11248 | 22410.48 |
| X Variable 1 | 15.91361 | 3.350029 | 4.750289 | 0.001445 | 8.188424 | 23.63879 |

Dependent Variable: Silver Price in Rupee.

Independent Variable: Silver Price in Dollar.

**Silver price in Rupees vs. Total Import Value:**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| *Regression Statistics* | |  |  |  |  |  |
| Multiple R | 0.733119 |  |  |  |  |  |
| R Square | 0.537463 |  |  |  |  |  |
| Adjusted R Square | 0.479646 |  |  |  |  |  |
| Standard Error | 9763.435 |  |  |  |  |  |
| Observations | 10 |  |  |  |  |  |
| ANOVA | |  |  |  |  |  |
|  | *df* | *SS* | *MS* | *F* | *Significance F* |  |
| Regression | 1 | 8.86E+08 | 8.86E+08 | 9.295922 | 0.015847 |  |
| Residual | 8 | 7.63E+08 | 95324659 |  |  |  |
| Total | 9 | 1.65E+09 |  |  |  |  |
|  |  |  |  |  |  |  |
|  | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* |
| Intercept | 19641.53 | 6897.36 | 2.847689 | 0.021556 | 3736.193 | 35546.87 |
| X Variable 1 | 372.3758 | 122.1336 | 3.048921 | 0.015847 | 90.73517 | 654.0164 |

Dependent Variable:Silver Price in Rupee.

Independent Variable:Total import value.

1. **Platinum:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Year** | **$ Per**  **Ounce** | **Rs Per**  **Ounce** | **Import**  **$ Mill.** |
| **2009** | 1205 | 71183.8 | 4 |
| **2010** | 1611 | 73552.64 | 31 |
| **2011** | 1719 | 79995.99 | 8 |
| **2012** | 1550 | 83400 | 10 |
| **2013** | 1484 | 86823.23 | 12 |
| **2014** | 1318 | 80000 | 21 |
| **2015** | 1050 | 67946 | 23 |
| **2016** | 988 | 68145.33 | 30 |
| **2017** | 950 | 60926.3 | 49 |
| **2018** | 985 | 62340 | 11.5 |

**Platinum price in Rupees vs Value of dollar in Rupees:**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| *Regression Statistics* | |  |  |  |  |  |
| Multiple R | 0.715678 |  |  |  |  |  |
| R Square | 0.512196 |  |  |  |  |  |
| Adjusted R Square | 0.45122 |  |  |  |  |  |
| Standard Error | 6567.886 |  |  |  |  |  |
| Observations | 10 |  |  |  |  |  |
|  |  |  |  |  |  |  |
| ANOVA | |  |  |  |  |  |
|  | *df* | *SS* | *MS* | *F* | *Significance F* |  |
| Regression | 1 | 3.62E+08 | 3.62E+08 | 8.400019 | 0.019944 |  |
| Residual | 8 | 3.45E+08 | 43137125 |  |  |  |
| Total | 9 | 7.07E+08 |  |  |  |  |
|  |  |  |  |  |  |  |
|  | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* |
| Intercept | 109533 | 12628.21 | 8.673673 | 2.43E-05 | 80412.29 | 138653.7 |
| X Variable 1 | -673.817 | 232.4887 | -2.89828 | 0.019944 | -1209.94 | -137.697 |

Dependent Variable:Platinum Price in Rupees.

Independent Variable:Value of Dollar in Rupees.

**Correlation:**

|  |  |  |  |
| --- | --- | --- | --- |
|  | *Dollar* | *Rupee* | *Import* |
| Column 1 | 1 |  |  |
| Column 2 | 0.819298 | 1 |  |
| Column 3 | -0.42782 | -0.52708 | 1 |

**Platinum price in Rupees vs Value of Franc in Rupees:**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| *Regression Statistics* | |  |  |  |  |  |
| Multiple R | 0.60735 |  |  |  |  |  |
| R Square | 0.368874 |  |  |  |  |  |
| Adjusted R Square | 0.289983 |  |  |  |  |  |
| Standard Error | 7470.693 |  |  |  |  |  |
| Observations | 10 |  |  |  |  |  |
|  |  |  |  |  |  |  |
| ANOVA | |  |  |  |  |  |
|  | *df* | *SS* | *MS* | *F* | *Significance F* |  |
| Regression | 1 | 2.61E+08 | 2.61E+08 | 4.675753 | 0.06256 |  |
| Residual | 8 | 4.46E+08 | 55811255 |  |  |  |
| Total | 9 | 7.07E+08 |  |  |  |  |
|  |  |  |  |  |  |  |
|  | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* |
| Intercept | 101256.6 | 13083.13 | 7.739477 | 5.54E-05 | 71086.83 | 131426.3 |
| X Variable 1 | -500.429 | 231.4284 | -2.16235 | 0.06256 | -1034.1 | 33.24589 |

Dependent Variable:Platinum Price in Rupee.

Independent Variable:Value of Franc in Rupees.

**Platinum price in Rupees vs Platinum price in dollar:**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| *Regression Statistics* | |  |  |  |  |  |
| Multiple R | 0.819298 |  |  |  |  |  |
| R Square | 0.67125 |  |  |  |  |  |
| Adjusted R Square | 0.630156 |  |  |  |  |  |
| Standard Error | 5391.823 |  |  |  |  |  |
| Observations | 10 |  |  |  |  |  |
| ANOVA | |  |  |  |  |  |
|  | *df* | *SS* | *MS* | *F* | *Significance F* |  |
| Regression | 1 | 4.75E+08 | 4.75E+08 | 16.3346 | 0.003727 |  |
| Residual | 8 | 2.33E+08 | 29071758 |  |  |  |
| Total | 9 | 7.07E+08 |  |  |  |  |
|  |  |  |  |  |  |  |
|  | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* |
| Intercept | 41234.58 | 8146.744 | 5.061479 | 0.000975 | 22448.15 | 60021 |
| X Variable 1 | 25.03635 | 6.194651 | 4.041609 | 0.003727 | 10.75147 | 39.32124 |

Dependent Variable:Platinum Price in Rupee.

Independent Variable:Platinum Price in Dollar.

**Platinum price in Rupees vs. Total import value:**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| *Regression Statistics* | |  |  |  |  |  |
| Multiple R | 0.527076 |  |  |  |  |  |
| R Square | 0.277809 |  |  |  |  |  |
| Adjusted R Square | 0.187535 |  |  |  |  |  |
| Standard Error | 7991.51 |  |  |  |  |  |
| Observations | 10 |  |  |  |  |  |
|  |  |  |  |  |  |  |
| ANOVA | |  |  |  |  |  |
|  | *df* | *SS* | *MS* | *F* | *Significance F* |  |
| Regression | 1 | 1.97E+08 | 1.97E+08 | 3.077399 | 0.11747 |  |
| Residual | 8 | 5.11E+08 | 63864238 |  |  |  |
| Total | 9 | 7.07E+08 |  |  |  |  |
|  |  |  |  |  |  |  |
|  | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* |
| Intercept | 80198.25 | 4611.537 | 17.39079 | 1.22E-07 | 69564.03 | 90832.47 |
| X Variable 1 | -339.194 | 193.3554 | -1.75425 | 0.11747 | -785.072 | 106.6843 |

Dependent Variable:Platinum Price in Rupee.

Independent Variable:Total import value.

1. **Rough Diamond:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Import** | | **Export** | |
| **Year** | **Value($ millions)** | **Price($)** | **Value($ millions)** | **Price($)** |
| **2008** | 9,59,15,69,934.28 | 64.9 | 82,95,88,202.61 | 22.07 |
| **2009** | 6,95,49,49,715.74 | 58.09 | 71,21,80,968.00 | 31.75 |
| **2010** | 11,23,47,92,996.71 | 68 | 96,78,08,804.49 | 29.33 |
| **2011** | 14,27,97,16,473.72 | 108.1 | 1,79,98,59,861.20 | 48.55 |
| **2012** | 14,73,70,22,076.16 | 98.97 | 1,80,35,60,231.67 | 52.37 |
| **2013** | 15,97,57,07,279.58 | 100.21 | 1,84,68,05,887.63 | 37.77 |
| **2014** | 17,17,75,04,517.28 | 111.83 | 1,71,64,46,489.02 | 47.05 |
| **2015** | 13,36,47,85,432.60 | 102.73 | 1,54,04,39,867.05 | 44.97 |
| **2016** | 16,66,57,15,229.80 | 111.61 | 1,78,74,88,611.87 | 46.45 |

**Import Diamond price (Rupees) vs Value of dollar in Rupees:**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| *Regression Statistics* | |  |  |  |  |  |
| Multiple R | 0.751689 |  |  |  |  |  |
| R Square | 0.565036 |  |  |  |  |  |
| Adjusted R Square | 0.502899 |  |  |  |  |  |
| Standard Error | 15.21798 |  |  |  |  |  |
| Observations | 9 |  |  |  |  |  |
|  |  |  |  |  |  |  |
| ANOVA | |  |  |  |  |  |
|  | *df* | *SS* | *MS* | *F* | *Significance F* |  |
| Regression | 1 | 2105.889 | 2105.889 | 9.093295 | 0.01951 |  |
| Residual | 7 | 1621.109 | 231.5871 |  |  |  |
| Total | 8 | 3726.999 |  |  |  |  |
|  |  |  |  |  |  |  |
|  | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* |
| Intercept | -11.4547 | 34.55078 | -0.33153 | 0.749947 | -93.1543 | 70.24489 |
| X Variable 1 | 1.871844 | 0.620739 | 3.015509 | 0.01951 | 0.40403 | 3.339659 |

Dependent Variable:Imported RoughDiamond Price per carat in Dollar.

Independent Variable:Value of Dollar in Rupee.

**Export Diamond price (Rupees) vs Value of dollar in Rupees:**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| *Regression Statistics* | |  |  |  |  |  |
| Multiple R | 0.584145 |  |  |  |  |  |
| R Square | 0.341225 |  |  |  |  |  |
| Adjusted R Square | 0.247114 |  |  |  |  |  |
| Standard Error | 8.946489 |  |  |  |  |  |
| Observations | 9 |  |  |  |  |  |
|  |  |  |  |  |  |  |
| ANOVA | |  |  |  |  |  |
|  | *df* | *SS* | *MS* | *F* | *Significance F* |  |
| Regression | 1 | 290.2062 | 290.2062 | 3.62578 | 0.098603 |  |
| Residual | 7 | 560.2776 | 80.03966 |  |  |  |
| Total | 8 | 850.4838 |  |  |  |  |
|  |  |  |  |  |  |  |
|  | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* |
| Intercept | 1.776451 | 20.31203 | 0.087458 | 0.932757 | -46.2539 | 49.80677 |
| X Variable 1 | 0.694873 | 0.364926 | 1.904148 | 0.098603 | -0.16804 | 1.557785 |

Dependent Variable:Exported RoughDiamond Price per carat in Dollar.

Independent Variable:Value of Dollar in Rupee.

**Correlation:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | *Import* | *Import Price* | *Export* | *Export Price* |
| Column 1 | 1 |  |  |  |
| Column 2 | 0.936432 | 1 |  |  |
| Column 3 | 0.934232 | 0.958444 | 1 |  |
| Column 4 | 0.740968 | 0.86894 | 0.861921 | 1 |

**NOTE: All the diamond prices are per carat.**

**Imported Rough diamond price vs total Import value:**



Dependent Variable: imported RoughDiamond Price per carat in Dollar.

Independent Variable:Total import value.

**Conclusions:**

* A large part of demand of Silver, Gold, Platinum, and Diamond in India is met through import.
* Thus due to above point the price of these commodities are directly proportional to price in International Market. This has also been proven by regression variable.
* As shown by regression the price of gold and other precious metals in India and strength of rupee against dollar are related to each other. There is an inverse relationship.
* The price of gold, silver, platinum and diamond are mainly dependent on Dollar and not other major currencies such as euro, pound, franc and yen. This has been proved by regression data where the value of R^2 of other major currencies was too low as compared to R^2 value of dollar.
* Similarly imports also affect trade price of precious metals as the quantity demanded is huge and there is also import duty imposed.
* Export does not affect the trade price of precious materials as the amount exported by India is very small as compared to import.
* What India export are generally finished products in the form of jewellery and precious items.
* Since 2008 economic slowdown there has been sharp decline in strength of dollar and that of rupee also and demand for precious metal has increased in India thus leading to increase in prices.
* There are other factors and variables aside from mathematical and economical ones which we are not able to calculate using formulas but affect the currency and gems and jewellery market. Such as foreign relations, natural disasters, wars.
* A good example of this is year 2011.It can be seen that there was an sudden increase in prices of precious metals and value of dollar weakened :-

1. Japan tsunami which caused weakened the dollar currency
2. High tensions in Middle East.

**BANK CREDITS**

Bank credit is an agreement between banks and borrowers where banks trust a borrower to repay funds plus interest for a loan, credit card or line of credit at a later date. It is money banks lend or have already lent to customers. Bank credit is the total borrowing capacity banks provide to borrowers.

In gems and jewellery industry bank credit plays an very important role. As credit given by the bank helps in expending or staring a new Business model which can enhance industry’s outlook, all these bank credits acts as the investment for the industry.

**Factors affecting Bank Credits**:

* + - 1. **Interest Coverage:** The interest coverage ratio is used to determine how easily a company can pay their interest expenses on outstanding debt. The ratio is calculated by dividing a company's earnings before interest and taxes (EBIT) by the company's interest expenses for the same period.
      2. **Debt Equity Ratio**: The debt-to-equity ratio (D/E) is a financial ratio indicating the relative proportion of shareholders' equity and debt used to finance a company's assets. Closely related to leveraging, the ratio is also known as risk, gearing or leverage.
      3. **Statuary Liquidity Ratio:** Statutory liquidity ratio (SLR) is the Indian government term for the reserve requirement that the commercial banks in India are required to maintain in the form of cash, gold reserves, government approved securities before providing credit to the customers.

**Effect of Bank Credit**:

1. **Net Profit Margin**: Net margin is the percentage of revenue remaining after all operating expenses, interest, taxes and preferred stock dividends (but not common stock dividends) have been deducted from a company's total revenue.

**DATA ANALYSIS:**

1. **Growth in bank credits in Gems and Jewellery VS Growth in bank credits to other industries:**

|  |  |  |
| --- | --- | --- |
| **Year** | **Growth of bank credit to gems and jewellery Sector** | **Growth of bank credit to other industries** |
| 2009 | 14 | 23 |
| 2010 | 11 | 24 |
| 2011 | 25 | 25 |
| 2012 | 29 | 21 |
| 2013 | 19 | 15 |
| 2014 | 14 | 13 |
| 2015 | 3 | 6 |
| 2016 | 1 | 3 |
| 2017 | 2 | -2 |

**REGRESSION:**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| *Regression Statistics* | |  |  |  |  |  |
| Multiple R | 0.782032 |  |  |  |  |  |
| R Square | 0.611574 |  |  |  |  |  |
| Adjusted R Square | 0.556085 |  |  |  |  |  |
| Standard Error | 6.635805 |  |  |  |  |  |
| Observations | 9 |  |  |  |  |  |
|  |  |  |  |  |  |  |
| ANOVA |  |  |  |  |  |  |
|  | *df* | *SS* | *MS* | *F* | *Significance F* |  |
| Regression | 1 | 485.3182 | 485.3182 | 11.02146 | 0.012767 |  |
| Residual | 7 | 308.2374 | 44.03391 |  |  |  |
| Total | 8 | 793.5556 |  |  |  |  |
|  |  |  |  |  |  |  |
|  | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* |
| Intercept | 4.05398 | 3.778059 | 1.073032 | 0.318849 | -4.87971 | 12.98767 |
| X Variable 1 | 0.775544 | 0.233607 | 3.319859 | 0.012767 | 0.22315 | 1.327938 |
|  |  |  |  |  |  |  |

After Regression it is clear that there no relationship between bank credits to other industries and bank credits to gems and jewellery industry as r square is less than 0.7.

**Correlation:**

|  |  |  |
| --- | --- | --- |
|  | *Column 1* | *Column 2* |
| Column 1 | 1 |  |
| Column 2 | 0.782032 | 1 |

As seen above in the table correlation is more than 0.7 so there may or may not be a relation between bank credits of others industries and bank credits to gems and jewellery industry.

1. **Effect interest coverage on bank credit:**

|  |  |  |
| --- | --- | --- |
| **Year** | **Growth of bank credit to gems and jewellery Sector** | **Interest coverage** |
| 2010 | 11 | 2.96 |
| 2011 | 25 | 4.06 |
| 2012 | 29 | 3.15 |
| 2013 | 19 | 3.3 |
| 2014 | 14 | 2.34 |
| 2015 | 3 | 2.24 |
| 2016 | 1 | 2.44 |

**Correlation:**

|  |  |  |
| --- | --- | --- |
|  | *Column 1* | *Column 2* |
| Column 1 | 1 |  |
| Column 2 | 0.765863 | 1 |

As seen above in the table correlation is more than 0.7 so there may or may not be a relation between interest coverage and bank credits to gems and jewellery industry.

**Regression:**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| *Regression Statistics* | |  |  |  |  |  |
| Multiple R | 0.765863 |  |  |  |  |  |
| R Square | 0.586546 |  |  |  |  |  |
| Adjusted R Square | 0.503855 |  |  |  |  |  |
| Standard Error | 0.457152 |  |  |  |  |  |
| Observations | 7 |  |  |  |  |  |
| ANOVA |  |  |  |  |  |  |
|  | *df* | *SS* | *MS* | *F* | *Significance F* |  |
| Regression | 1 | 1.482403 | 1.482403 | 7.093243 | 0.044706 |  |
| Residual | 5 | 1.04494 | 0.208988 |  |  |  |
| Total | 6 | 2.527343 |  |  |  |  |
|  |  |  |  |  |  |  |
|  | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* |
| Intercept | 2.240565 | 0.310341 | 7.219686 | 0.000795 | 1.442808 | 3.038322 |
| X Variable 1 | 0.047118 | 0.017692 | 2.663314 | 0.044706 | 0.001641 | 0.092596 |

After Regression it is clear that there no relationship between interest coverage and bank credits to gems and jewellery industry as r square is less than 0.7

1. **Effect of Debt Equity ratio on bank credit:**

|  |  |  |
| --- | --- | --- |
| **Year** | **Growth of bank credit to gems and jewellery Sector** | **Total Debt/Equity** |
| 2010 | 11 | 1.33 |
| 2011 | 25 | 1.21 |
| 2012 | 29 | 1.13 |
| 2013 | 19 | 0.96 |
| 2014 | 14 | 1.13 |
| 2015 | 3 | 103 |
| 2016 | 1 | 95 |

**Correlation:**

|  |  |  |
| --- | --- | --- |
|  | *Column 1* | *Column 2* |
| Column 1 | 1 |  |
| Column 2 | -0.81088 | 1 |

As seen above in the table correlation is more than 0.7 so there may or may not be a relation between Debt Equity ratio and bank credits to gems and jewellery industry.

**Regression:**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| *Regression Statistics* | |  |  |  |  |  |
| Multiple R | 0.810877 |  |  |  |  |  |
| R Square | 0.657522 |  |  |  |  |  |
| Adjusted R Square | 0.589026 |  |  |  |  |  |
| Standard Error | 30.64381 |  |  |  |  |  |
| Observations | 7 |  |  |  |  |  |
|  |  |  |  |  |  |  |
| ANOVA |  |  |  |  |  |  |
|  | *df* | *SS* | *MS* | *F* | *Significance F* |  |
| Regression | 1 | 9014.329 | 9014.329 | 9.599481 | 0.026905 |  |
| Residual | 5 | 4695.217 | 939.0434 |  |  |  |
| Total | 6 | 13709.55 |  |  |  |  |
|  |  |  |  |  |  |  |
|  | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* |
| Intercept | 82.64797 | 20.80278 | 3.97293 | 0.010605 | 29.17273 | 136.1232 |
| X Variable 1 | -3.67427 | 1.185898 | -3.0983 | 0.026905 | -6.72272 | -0.62582 |

After Regression it is clear that there no relationship between Debt Equity ratio and bank credits to gems and jewellery industry as r square is less than 0.7.

1. **Effect of Statuary liquidity ratio on bank credits:**

|  |  |  |
| --- | --- | --- |
| **Year** | **Growth of bank credit to gems and jewellery Sector** | **Statutory Liquidity Ratio** |
| 2012 | 29 | 23.5 |
| 2013 | 19 | 23 |
| 2014 | 14 | 22.5 |
| 2015 | 3 | 21.5 |
| 2016 | 1 | 21.125 |
| 2017 | 2 | 20.125 |

**CORRELATION:**

|  |  |  |
| --- | --- | --- |
|  | *Column 1* | *Column 2* |
| Column 1 | 1 |  |
| Column 2 | 0.923126 | 1 |

As seen above in the table correlation is much greater than 0.7 so there high possibility of relation between Statutory Liquidity Ratio and bank credits to gems and jewellery industry.

**Regression:**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| *Regression Statistics* | |  |  |  |  |  |
| Multiple R | 0.923126 |  |  |  |  |  |
| R Square | 0.852162 |  |  |  |  |  |
| Adjusted R Square | 0.815202 |  |  |  |  |  |
| Standard Error | 0.544469 |  |  |  |  |  |
| Observations | 6 |  |  |  |  |  |
|  |  |  |  |  |  |  |
| ANOVA |  |  |  |  |  |  |
|  | *df* | *SS* | *MS* | *F* | *Significance F* |  |
| Regression | 1 | 6.835047 | 6.835047 | 23.05659 | 0.008637 |  |
| Residual | 4 | 1.185786 | 0.296447 |  |  |  |
| Total | 5 | 8.020833 |  |  |  |  |
|  |  |  |  |  |  |  |
|  | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* |
| Intercept | 20.78833 | 0.329817 | 63.02989 | 3.8E-07 | 19.87261 | 21.70405 |
| X Variable 1 | 0.103235 | 0.0215 |  |  |  |  |

After Regression it is clear that Statutory Liquidity Ratio and bank credits to gems and jewellery industry are highly related and there is a positive relationship as r square is much larger than 0.7.

1. **Effect Bank credit on Net Profit margin:**

|  |  |  |
| --- | --- | --- |
| **Year** | **Growth of bank credit to gems and jewellery Sector** | **NET MARGIN** |
| 2010 | 11 | 2.5 |
| 2011 | 25 | 3.2 |
| 2012 | 29 | 2.9 |
| 2013 | 19 | 2.8 |
| 2014 | 14 | 2.3 |
| 2015 | 3 | 2 |
| 2016 | 1 | 2.1 |

**Correlation:**

|  |  |  |
| --- | --- | --- |
|  | *Column 1* | *Column 2* |
| Column 1 | 1 |  |
| Column 2 | 0.917711 | 1 |

As seen above in the table, correlation is much greater than 0.7 so there high possibility of relation between bank credits and the net profit margin of the gems and jewellery industry.

**Regression:**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| *Regression Statistics* | |  |  |  |  |  |
| Multiple R | 0.917711 |  |  |  |  |  |
| R Square | 0.842193 |  |  |  |  |  |
| Adjusted R Square | 0.810631 |  |  |  |  |  |
| Standard Error | 0.192749 |  |  |  |  |  |
| Observations | 7 |  |  |  |  |  |
| ANOVA |  |  |  |  |  |  |
|  | *df* | *SS* | *MS* | *F* | *Significance F* |  |
| Regression | 1 | 0.991381 | 0.991381 | 26.68423 | 0.003568 |  |
| Residual | 5 | 0.185762 | 0.037152 |  |  |  |
| Total | 6 | 1.177143 |  |  |  |  |
|  | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* |
| Intercept | 1.981386 | 0.130849 | 15.1425 | 2.28E-05 | 1.645027 | 2.317745 |
| X Variable 1 | 0.038532 | 0.007459 | 5.165678 | 0.003568 | 0.019358 | 0.057707 |

After Regression it is clear that net profit margin and bank credits to gems and jewellery industry are highly related and there is a positive relationship as r square is much larger than 0.7.

**Conclusion:** According to data above we have observed, the decrease in bank credits to Gems and jewellery sector in the recent years. As bank credits plays an important role in starting a new business or expending an established one and not only that it also helps to carry out new innovations and development in any field (in our context Gems and jewellery industry). And due to current decrease in bank credits the industry in moving towards other sources of credits which are not cheap with higher interest rates and short return time which has led to significant decrease in net profit margin of the gems and jewellery industry. The biggest reason for the decrease in bank credits is the increase in NPAs in recent years and because of this reason may banks have lost trust in the industry.

**Non Performing Asset**

Debt is named nonperforming when credit installments have not been made for a period of 90 days. The non-payment of interest or principal can disturb spending plans and decline profit. Banks have four alternatives to recover a few or the greater part of the asset coming about because of nonperforming asset. At the point when organizations are struggling to repay debt, lender may restructure the loan. At the point when defaulted credits are collateralize by resources of borrowers, bank can claim the security, pitch it to cover loses.

Non-performance asset depends on factor such as delay in supply of gems and jewellery. When borrowers don’t use the budget for that particular purpose for which he got the loan, there is high chance for that loan to become non-performance asset. Failure of business may any reason like disputes in management or fraud.

NPA also occurs when company fails to recover its credits. Sometimes, when a company diverts its funds to expand existing projects or set up new projects, then their business fails due to which they are unable to repay the loan. Thus, it comes under NPA. Another reason for NPA is delay in settlement of payments.

**Objectives:**

* + 1. To find out whether Non Performance Asset depends on bank credit in gems and jewellery sector.
    2. To find out whether Non Performance Asset has any impact on Gross Domestic Product in gems and jewellery sector.

**Data Analysis:**

|  |  |  |
| --- | --- | --- |
| Financial Year | NPA (%) | Growth of bank credit(%) |
| 2005 | 4.8 | 19 |
| 2006 | 2.2 | 24 |
| 2007 | 2.4 | 20 |
| 2008 | 1.2 | 15 |
| 2009 | 1.3 | 14 |
| 2010 | 4.4 | 11 |
| 2011 | 5.1 | 25 |
| 2012 | 3.3 | 29 |
| 2013 | 9.8 | 19 |
| 2014 | 10.2 | 14 |
| 2015 | 1.2 | 3 |
| 2016 | 13.5 | 1 |
| 2017 | 12 | 2 |

**Regression:**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| *Regression Statistics* | |  |  |  |  |  |
| Multiple R | 0.440743 |  |  |  |  |  |
| R Square | 0.194254 |  |  |  |  |  |
| Adjusted R Square | 0.121004 |  |  |  |  |  |
| Standard Error | 4.09249 |  |  |  |  |  |
| Observations | 13 |  |  |  |  |  |
| ANOVA |  |  |  |  |  |  |
|  | *df* | *SS* | *MS* | *F* | *Significance F* |  |
| Regression | 1 | 44.41602 | 44.41602 | 2.651945 | 0.1317 |  |
| Residual | 11 | 184.2332 | 16.74847 |  |  |  |
| Total | 12 | 228.6492 |  |  |  |  |
|  | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* |
| Intercept | 8.73375 | 2.291358 | 3.811604 | 0.002885 | 3.690504 | 13.77699 |
| X Variable 1 | -0.21499 | 0.132021 | -1.62848 | 0.1317 | -0.50557 | 0.075583 |

**Correlation:**

|  |  |  |
| --- | --- | --- |
|  | *Column 1* | *Column 2* |
| Column 1 | 1 |  |
| Column 2 | -0.440742533 | 1 |

The correlation between NPA and bank credit in gems and jewellery sector is

-0.440742. Since, the value is not positive. So, there is no positive relation between NPA and bank credit.

**Conclusion:**

From the given Observations, there is a no correlation between the Non-performance asset and bank credit in gems and jewellery sector. And also R2 value shows that there is no relation between NPA and bank credit. So, I conclude that bank credit in gems and jewellery sectors are independent of Non-performance asset.

|  |  |  |
| --- | --- | --- |
| **FINANCIAL YEAR** | **NPA in Gems and Jewellery (%)** | **GDP Growth Rate (in %)** |
|
| 2008 | 1.2 | 6.7 |
| 2009 | 1.3 | 8.9 |
| 2010 | 4.4 | 9.1 |
| 2011 | 5.1 | 7.8 |
| 2012 | 3.3 | 7.8 |

**Correlation:**

|  |  |  |
| --- | --- | --- |
|  | **NPA in Gems and Jewellery (%)** | **GDP Growth Rate (in %)** |
| Column 1 | 1 |  |
| Column 2 | 0.268938485 | 1 |

The correlation between NPA and bank credit in gems and jewellery sector is

0.268938485. Since, the value is less. So, there is no relation between NPA and GDP growth rate.

**Regression:**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Regression Statistics | |  |  |  |  |  |
| Multiple R | 0.268938 |  |  |  |  |  |
| R Square | 0.072328 |  |  |  |  |  |
| Adjusted R Square | -0.2369 |  |  |  |  |  |
| Standard Error | 1.971691 |  |  |  |  |  |
| Observations | 5 |  |  |  |  |  |
|  |  |  |  |  |  |  |
| ANOVA |  |  |  |  |  |  |
|  | df | SS | MS | F | Significance F |  |
| Regression | 1 | 0.909306 | 0.909306 | 0.233901 | 0.661751 |  |
| *Residual* | *3* | *11.66269* | *3.887565* |  |  |  |
| Total | 4 | 12.572 |  |  |  |  |
|  |  |  |  |  |  |  |
|  | Coefficients | Standard Error | t Stat | P-value | Lower 95% | Upper 95% |
| *Intercept* | *-0.89735* | *8.229911* | *-0.10904* | *0.920059* | -27.0886 | 25.2939 |
| X Variable 1 | 0.490986 | 1.015203 | 0.483633 | 0.661751 | -2.73984 | 3.721816 |

**Conclusion:** From the given Observations, there is a no correlation between the Non-performance asset and GDP growth in gems and jewellery sector. And also R square value shows that there is no relation between NPA and GDP growth.

Although Non-performance asset has not much impact on bank credit and GDP in gems and jewellery sector but non-performance asset can lead to great downfall to the country’s economy. It has to be taken care on time and action should be taken accordingly to keep country business smooth. Therefore, banking institutions should be very cautious while providing loan. They must make sure that the properties based on which they are providing loan, worth the loan given to them.

**Interest Rate Analysis**

An interest rate is the amount of interest due per period, as a proportion of the amount lent, deposited or borrowed.

Interest rate is the amount charged, expressed as a percentage of principal, by a lender to a borrower for the use of assets.

Annual interest rate is the rate over a period of one year.

**Objectives:**

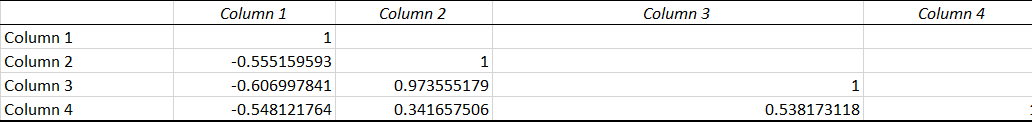
* To Check whether import of Gems and Jewellery has affected the Interest Rate or not.
* To Check whether export of Gems and Jewellery has affected the Interest Rate or not.
* To see whether the Capital Inflow has an impact on the Interest Rate or Not.
* To See whether the Inflation has an impact on the Interest Rate or Not.

**Data Analysis:**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Year** | **Lending Interest Rate (%)** | **Import(millions)** | **Export(millions)** | **CUMULATIVE FDI INFLOW (US $ MILLION)** | **Inflation (in %)** |
|  |  |  |  |  |  |
| 2006 | 11.18 | 14.8 | 16.7 | 121.59 | 9.47 |
| 2007 | 13.02 | 14.5 | 17.2 | 142.86 | 6.49 |
| 2008 | 13.31 | 18.65 | 20.9 | 167.54 | 11.17 |
| 2009 | 12.18 | 23 | 24.9 | 251.04 | 9.13 |
| 2010 | 8.33 | 28.55 | 29.4 | 282 | 5.86 |
| 2011 | 10.167 | 42.45 | 43.1 | 301.9 | 6.32 |
| 2012 | 10.604 | 42.72 | 43.2 | 338.15 | 2.23 |
| 2013 | 10.292 | 37.55 | 39.1 | 390.76 | 5.36 |
| 2014 | 10.25 | 30.87 | 35 | 433.32 | 4.56 |
| 2015 | 10.08 | 31.34 | 36.2 | 696.48 | 6.13 |
| 2016 | 9.67 | 24.31 | 32.6 | 772.05 | 5.57 |

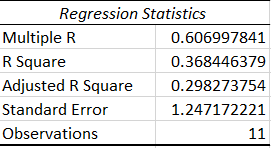
The Interest rate has remained almost stable at average of around 10.5%.

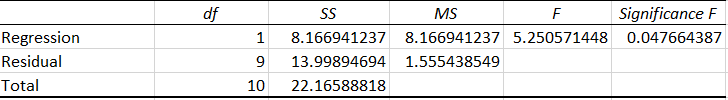
**Correlation:**

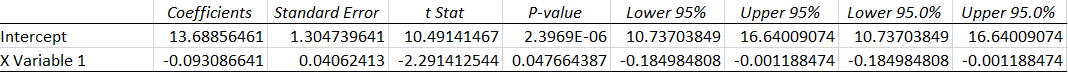


**Regression Analysis:**

1. **Interest Rate vs Export:**

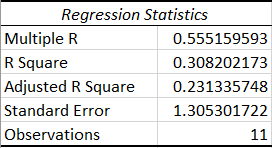


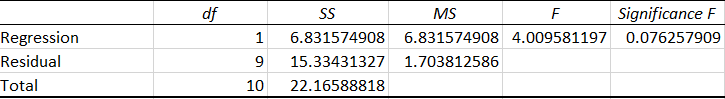


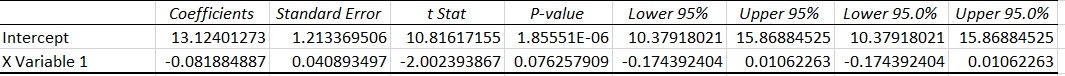


As From the above regression the value of R-square is 0.368 which is less than 0.67 so we can conclude that the export has no impact on the interest rate.

1. **Interest Rate vs Import:**

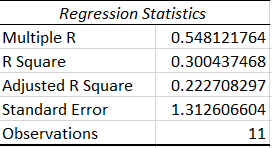


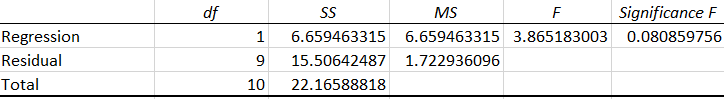


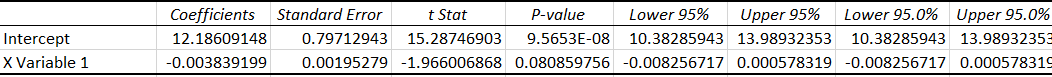


The value of R square is 0.308 so we can conclude that Import has no impact on the Interest rate.

1. **Interest rate and Capital:**

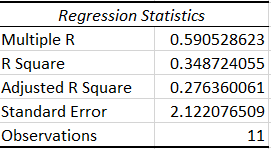


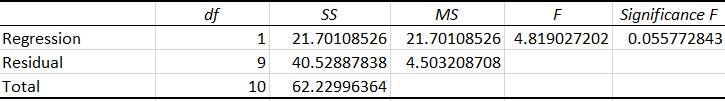


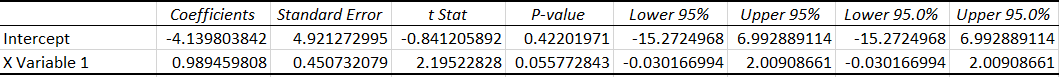


The R-square is 0.3004 which is very less compared to 0.67, so we can say that the Capital Inflow have no impact on the Interest Rate.

1. **Interest rate and Inflation:**

****

****



The R-square is 0.348 which is very less compared to 0.67, so we can say that the Inflation have no impact on the Interest Rate.

**Conclusion:**

From the above data we can conclude that the Import, Export and The Capital Inflow have no Impact on the Interest Rate as far as the gems and Jewellery Industry is concerned.

According to me and the data I have analyzed, lending Interest rate will be around 9.86 at the end of 2018.

**State-wise Analysis**

In this report I have collected data from year 2000 of export of gems of jewellery industry from the selected 6 states which were leading from long time. Here I have compared the data over the year and made a conclusion on the competitiveness among the state regarding the production and the income they had earned.

**Data of Export (values in million dollar):**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| States | Year | | | | | | | | | | | | |
| 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2013 | 2014 | 2015 |
| Gujarat | 46.69 | 119.11 | 115.96 | 233.63 | 231.49 | 282.22 | 225.55 | 378.88 | 529.18 | 689.1 | 4894.65 | 2704.41 | 2655.47 |
| Maharashtra | 6949.07 | 6647.12 | 8069.9 | 9937.79 | 12937.38 | 14168.99 | 13941.78 | 17396.11 | 15304.88 | 15941.61 | 21283.45 | 23586.45 | 18989.48 |
| Rajasthan | 164.94 | 182.8 | 218.1 | 228.85 | 277.63 | 356.76 | 423.9 | 507.92 | 502.95 | 535.17 | 846.16 | 626.7 | 595.87 |
| Delhi | 297.03 | 279.03 | 313.69 | 495.6 | 682.66 | 481.96 | 471.03 | 456.76 | 1522.9 | 2015.77 | 1779.91 | 3347.29 | 2046.56 |
| West Bengal | 53.88 | 61.88 | 75.94 | 89.27 | 130.13 | 220.36 | 417.88 | 651.26 | 910.99 | 1012.05 | 2055.7 | 1162.47 | 789.69 |
| Kerala | 3 | 5.06 | 6.55 | 6.16 | 8.71 | 8.77 | 6.76 | 24.39 | 34.24 | 54.29 | 694.63 | 217.04 | 715.98 |

**PERCENTAGE CONTRIBUTION IN EXPORT:**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| STATE | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2013 | 2014 | 2015 |
| Gujarat | 0.621323 | 1.632762 | 1.317706 | 2.12559 | 1.622442 | 1.818537978 | 1.456392 | 1.951449 | 2.814018 | 3.403301 | 15.51173 | 8.546262 | 10.29529 |
| Maharashtra | 92.47413 | 91.11885 | 91.70195 | 90.41506 | 90.6741 | 91.30056846 | 90.02305 | 89.59991 | 81.38668 | 78.73181 | 67.44981 | 74.53603 | 73.62247 |
| Rajasthan | 2.194924 | 2.505826 | 2.47837 | 2.082101 | 1.945823 | 2.298850575 | 2.737152 | 2.616078 | 2.674535 | 2.643077 | 2.681583 | 1.980448 | 2.310196 |
| Delhi | 3.9527 | 3.824949 | 3.564602 | 4.509021 | 4.784553 | 3.105600468 | 3.041474 | 2.352575 | 8.098318 | 9.955408 | 5.640749 | 10.57784 | 7.934541 |
| West Bengal | 0.717003 | 0.848252 | 0.862941 | 0.812188 | 0.912041 | 1.419931362 | 2.69828 | 3.354361 | 4.844367 | 4.998274 | 6.51476 | 3.673546 | 3.061639 |
| Kerala | 0.039922 | 0.069363 | 0.074431 | 0.056044 | 0.061046 | 0.056511155 | 0.04365 | 0.125622 | 0.182078 | 0.268125 | 2.201366 | 0.685873 | 2.775864 |

**Descriptive statistics:**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Types | Gujarat | Maharashtra | Rajasthan | Delhi | West Bengal | Kerala |
| Mean | 1008.18 | 14242.62 | 420.5962 | 1091.553 | 587.0385 | 137.3523077 |
| Standard Error | 410.4122 | 1482.145 | 56.95493 | 266.6622 | 165.2453 | 71.70182227 |
| Median | 282.22 | 14168.99 | 423.9 | 495.6 | 417.88 | 8.77 |
| Standard Deviation | 1479.762 | 5343.951 | 205.3539 | 961.4642 | 595.8004 | 258.5245967 |
| Sample Variance | 2189696 | 28557808 | 42170.23 | 924413.3 | 354978.1 | 66834.96712 |
| Kurtosis | 3.189913 | -0.77383 | -0.30179 | 0.834955 | 1.7149 | 2.584585781 |
| Skewness | 1.932037 | 0.107022 | 0.514587 | 1.222756 | 1.292195 | 1.986254239 |
| Range | 4847.96 | 16939.33 | 681.22 | 3068.26 | 2001.82 | 712.98 |
| Minimum | 46.69 | 6647.12 | 164.94 | 279.03 | 53.88 | 3 |
| Maximum | 4894.65 | 23586.45 | 846.16 | 3347.29 | 2055.7 | 715.98 |
| Sum | 13106.34 | 185154 | 5467.75 | 14190.19 | 7631.5 | 1785.58 |
| Count | 13 | 13 | 13 | 13 | 13 | 13 |

\*Graph values in Million Dollars.

**Exports and Import:**

According to the above graph the export is increasing yearly in every state since 2002 till 2007 and there was sudden drop in the export. From 2013 export again increased.

Maharashtra is leading in export. The main reason to lead in export is that it is:

* Well connected through ports
* Well infrastructure
* Well maintained SEZs
* Availability, flexibility and mobility of resources

Gujarat is at the 2nd position in export with just 5% of India’s population and 6% of its land mass while Delhi is at 3rd followed by west Bengal and then Kerala.

**GDP (Gross domestic product):**

Y= C + I + G + (EXPORT – IMPORT)

As we know that basically exports in India always exceed the import so the difference between the export and import is always positive. From the above analysis, we can conclude that Maharashtra has significant contribution in nation’s GDP through gems and jewellery industry due to factors such as production, employment, location of the area.

**Production:**

|  |  |
| --- | --- |
| **States** | **Type of production** |
| Maharashtra | Machine made jewellery |
| Gujarat | Diamond processing center |
| Rajasthan | Polishing precious and semi-precious gemstone |
| Delhi | Silver jewellery and articles |
| West Bengal | Light weight plain gold jewellery |
| Kerala | Gold jewellery and Diamond cutting |

Above image shows the various processing and production of Gems and Jewellery in particular states. The specialties of each type of gems and jewellery found in the above states are affected by the skill of the labors and the favorable geographical condition and the technical advanced equipment such as the availability of machineries.

**Conclusion:**

Now, looking at the analysis I can conclude that the leading state in gems and jewellery industry is Maharashtra because of many supporting factors. Other states are comparatively less but have great competition among them to fulfill the demand of the people and increase the level in the market.

**MAJOR TRANSPORT USED**

The gems and jewellery sector has been one of the fastest growing sectors in India in the past few years. So, in order to import or export gems and jewellery we need transportation. So, transportation is very much required in the growth of gems and jewellery industry. The ways I which gems and jewellery is transported are through air, water and land. So, transport sector plays a big role in gems and jewellery industry

There are some points which shows that how Transport department is the biggest factor in import and export of gems and jewellery and it affects other factor also and can also cause in the development of gems and jewellery industry: -

Without transport sector gems and jewellery industry in today’s world cannot survive and thrive.

Ensuring security during transfer of such expensive good is a key task of transportation management authorities.

Ensuring that the finished goods or the intermediate goods reach on time to meet the demand and supply is another factor which comes under the discretion of transportation authorities.

Providing a minimalistic cost-efficient transportation is also dependent on the efficiency of the people involved in this segment.

**Variables Used:**

There are two variables of transport sector which are most effective in gems and jewellery industry:

1. **Travelling and Conveyance:** Conveyance allowance, also called Transport Allowance is a type of allowance offered to employees of a company to compensate for their travel from residence to and from respective workplace location. In general, conveyance allowance is paid by an employer only if the there is no transportation provided by the employer.
2. **Vehicle Maintenance**: A motor vehicle service or tune-up is a series of maintenance procedures carried out at a set time interval or after the vehicle has travelled a certain distance.

**Data Analysis:**

1. **PC Jewellers:**

|  |  |  |
| --- | --- | --- |
| **Year** | **Travelling and conveyance (IN LAKHS)** | **Vehicle running and maintenance (IN LAKHS)** |
| 2012 | 151.98 | 59.76 |
| 2013 | 160.23 | 60.73 |
| 2014 | 333.89 | 84.13 |
| 2015 | 361.64 | 102.01 |
| 2016 | 400.05 | 100.06 |
| 2017 | 300.75 | 90.21 |

**Correlation:**

|  |  |  |
| --- | --- | --- |
|  | *Column 1* | *Column 2* |
| Column 1 | 1 |  |
| Column 2 | 0.9663245 | 1 |

**Regression:**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| *Regression Statistics* | |  |  |  |  |  |
| Multiple R | 0.9663245 |  |  |  |  |  |
| R Square | 0.9337831 |  |  |  |  |  |
| Adjusted R Square | 0.9172289 |  |  |  |  |  |
| Standard Error | 30.176949 |  |  |  |  |  |
| Observations | 6 |  |  |  |  |  |
|  |  |  |  |  |  |  |
| ANOVA | |  |  |  |  |  |
|  | *df* | *SS* | *MS* | *F* | *Significance F* |  |
| Regression | 1 | 51367.412 | 51367.412 | 56.407522 | 0.001682 |  |
| Residual | 4 | 3642.5931 | 910.64826 |  |  |  |
| Total | 5 | 55010.005 |  |  |  |  |
|  |  |  |  |  |  |  |
|  | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* |
| Intercept | -165.0187 | 61.140316 | -2.6990161 | 0.0541495 | -334.77143 | 4.7340312 |
| X Variable 1 | 5.4309765 | 0.7231184 | 7.5104941 | 0.001682 | 3.4232779 | 7.438675 |

1. **Rajesh Exports:**

|  |  |  |
| --- | --- | --- |
| **Year** | **Travelling and conveyance** | **Vehicle running and maintenance** |
| 2012 | 32.399 | 56.76 |
| 2013 | 24.234 | 52.25 |
| 2014 | 95.22 | 68.35 |
| 2015 | 24.156 | 50.23 |
| 2016 | 190.9 | 87.23 |
| 2017 | 109.31 | 78.5 |

**Correlation:**

|  |  |  |
| --- | --- | --- |
|  | *Column 1* | *Column 2* |
| Column 1 | 1 |  |
| Column 2 | 0.9722494 | 1 |

**Regression:**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| *Regression Statistics* | |  |  |  |  |  |
| Multiple R | 0.9722494 |  |  |  |  |  |
| R Square | 0.945269 |  |  |  |  |  |
| Adjusted R Square | 0.9315862 |  |  |  |  |  |
| Standard Error | 17.227478 |  |  |  |  |  |
| Observations | 6 |  |  |  |  |  |
|  |  |  |  |  |  |  |
| ANOVA | |  |  |  |  |  |
|  | *df* | *SS* | *MS* | *F* | *Significance F* |  |
| Regression | 1 | 20503.374 | 20503.374 | 69.084707 | 0.0011445 |  |
| Residual | 4 | 1187.144 | 296.786 |  |  |  |
| Total | 5 | 21690.518 |  |  |  |  |
|  | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* |
| Intercept | -199.50704 | 34.273396 | -5.8210469 | 0.004337 | -294.66524 | -104.34884 |
| X Variable 1 | 4.2528315 | 0.5116668 | 8.311721 | 0.0011445 | 2.8322168 | 5.6734462 |

1. **Tribhovandas Bhimji Zaveri Ltd (TBZ):**

|  |  |  |
| --- | --- | --- |
| **Year** | **Travelling and conveyance** | **Vehicle running and maintenance** |
| 2012 | 180.068 | 27.27 |
| 2013 | 372.98 | 22.94 |
| 2014 | 354.78 | 22.67 |
| 2015 | 263.1 | 24.67 |
| 2016 | 212.98 | 26.39 |
| 2017 | 237.57 | 28.55 |

**Correlation:**

|  |  |  |
| --- | --- | --- |
|  | *Column 1* | *Column 2* |
| Column 1 | 1 |  |
| Column 2 | -0.8699086 | 1 |

**Regression:**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| *Regression Statistics* | |  |  |  |  |  |
| Multiple R | 0.8699086 |  |  |  |  |  |
| R Square | 0.7567409 |  |  |  |  |  |
| Adjusted R Square | 0.6959261 |  |  |  |  |  |
| Standard Error | 42.877296 |  |  |  |  |  |
| Observations | 6 |  |  |  |  |  |
|  |  |  |  |  |  |  |
| ANOVA | |  |  |  |  |  |
|  | *df* | *SS* | *MS* | *F* | *Significance F* |  |
| Regression | 1 | 22876.674 | 22876.674 | 12.443373 | 0.0242849 |  |
| Residual | 4 | 7353.8502 | 1838.4625 |  |  |  |
| Total | 5 | 30230.525 |  |  |  |  |
|  | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* |
| Intercept | 991.11433 | 205.104 | 4.8322526 | 0.0084474 | 421.65434 | 1560.5743 |
| X Variable 1 | -28.363879 | 8.0407503 | -3.5275165 | 0.0242849 | -50.688581 | -6.0391775 |

1. **TARA JEWELS:**

|  |  |  |
| --- | --- | --- |
| **YEAR** | **Travelling and conveyance** | **Vehicle running and maintenance** |
| 2012 | 231.30 | 126.26 |
| 2013 | 226.94 | 110.23 |
| 2014 | 328.90 | 155.88 |
| 2015 | 242.45 | 106.26 |
| 2016 | 170.48 | 277.32 |
| 2017 | 151.85 | 269.42 |

**Correlation:**

|  |  |  |
| --- | --- | --- |
|  | *Column 1* | *Column 2* |
| Column 1 | 1 |  |
| Column 2 | -0.6550605 | 1 |

**Regression:**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| *Regression Statistics* | |  |  |  |  |  |
| Multiple R | 0.6550605 |  |  |  |  |  |
| R Square | 0.4291042 |  |  |  |  |  |
| Adjusted R Square | 0.2863803 |  |  |  |  |  |
| Standard Error | 52.709114 |  |  |  |  |  |
| Observations | 6 |  |  |  |  |  |
| ANOVA |  |  |  |  |  |  |
|  | *df* | *SS* | *MS* | *F* | *Significance F* |  |
| Regression | 1 | 8352.9016 | 8352.9016 | 3.0065327 | 0.1579539 |  |
| Residual | 4 | 11113.003 | 2778.2507 |  |  |  |
| Total | 5 | 19465.905 |  |  |  |  |
|  |  |  |  |  |  |  |
|  | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* |
| Intercept | 315.69732 | 56.389829 | 5.5984799 | 0.0049971 | 159.13406 | 472.26059 |
| X Variable 1 | -0.5187292 | 0.2991629 | -1.7339356 | 0.1579539 | -1.3493386 | 0.3118802 |

1. **GITANJALI GEMS:**

|  |  |  |
| --- | --- | --- |
| YEAR | Travelling and conveyance | Vehicle running and maintenance |
| 2012 | 149.09 | 128.51 |
| 2013 | 164.89 | 107.34 |
| 2014 | 176.41 | 93.12 |
| 2015 | 148.31 | 89.23 |
| 2016 | 151.88 | 88.52 |
| 2017 | 152.98 | 102.18 |

**Correlation:**

|  |  |  |
| --- | --- | --- |
|  | *Column 1* | *Column 2* |
| Column 1 | 1 |  |
| Column 2 | -0.1891769 | 1 |

**Regression:**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| *Regression Statistics* | |  |  |  |  |  |
| Multiple R | 0.1891769 |  |  |  |  |  |
| R Square | 0.0357879 |  |  |  |  |  |
| Adjusted R Square | -0.2052651 |  |  |  |  |  |
| Standard Error | 12.215758 |  |  |  |  |  |
| Observations | 6 |  |  |  |  |  |
|  |  |  |  |  |  |  |
| ANOVA | |  |  |  |  |  |
|  | *df* | *SS* | *MS* | *F* | *Significance F* |  |
| Regression | 1 | 22.154618 | 22.154618 | 0.1484648 | 0.7196198 |  |
| Residual | 4 | 596.89898 | 149.22475 |  |  |  |
| Total | 5 | 619.0536 |  |  |  |  |
|  |  |  |  |  |  |  |
|  | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* |
| Intercept | 171.32513 | 36.842373 | 4.6502196 | 0.0096599 | 69.0343 | 273.61595 |
| X Variable 1 | -0.1385954 | 0.3596973 | -0.3853113 | 0.7196198 | -1.1372753 | 0.8600844 |

**Conclusion:**-

1. **PC Jewellers:** The value of R square for PC Jewellers is 0.933 so it suggests that transportation has the major impact on the company. So, it helps in the better production of gems and jewellery.
2. **Rajesh Exports:** The value of R square for Rajesh Exports is 0.94 so it clearly shows that transportation has major impact on the production of the company which also helps in the growth of the company.
3. **Tribhovandas Bhimji Zaveri:** The value of R square is 0.75 so it shows that transportation has good impact on the production of a company. So it suggests that transportation is very much needed in the progress of the company.
4. **TARA Jewels:** The value of R square is 0.42 so it shows that transportation has not that much impact or minor impact on the production of company. So, need of transportation less.
5. **Gitanjali Gems:** The value of R square is 0.03 it clearly shows that transportation has less or we can say negligible impact on the production of that company. Here transportation part in the progress of company is almost neglected.

So, from the above parameters we can conclude that that transportation is very much needed in gems and jewellery industry. So in coming years by advancement in technology the transport sector will grow bigger and bigger and it will directly have the good impact on gems and jewellery industry.

**IMPORTS AND EXPORTS**

As we all know Imports and Exports will play a crucial role in the economy of the country. India is the 14th largest importer and 19th largest exporter in the world in terms of value of goods. After crude oil Gold bars and Rough diamonds occupy 2nd and 3rd positions respectively in Imports of India

Indians are very fascinated about the jewellery due to this large amount of Trades has been done in India. This is the reason why India is the largest exporter of C&P diamonds and one among the top exporters of gold jewelry. At the same time India is the largest importer of rough diamonds and ranked among top three in gold imports. India exports gems and jewellery to nearly160 countries. Platinum has very less imports when compared to gold and diamonds and the irony is that there are no platinum exports for India. Virtually imports do not consist of hand made jewellery as that is India’s area of expertise.

India is one of the largest exporters of Gold. Gold plays a crucial role in foreign exchange. The value of imports and Exports increases year by year though there are some exceptions. The exports of silver are more when compared to its exports.

The gems and jewellery shipping grew mainly as the economic conditions are becoming better in the major export destinations, including the US, Hong Kong and the Middle East. Gems and jewellery exports of India contribute nearly 20 per cent to country’s total foreign exchange earnings.

Due to Import duty levied on Imports Government earns huge amount of Money every year. Due to large exports of C&P Diamonds, the value of Indian economy increases, as a result, INR equivalent with the currencies of other countries. India imports three things mainly – Crude Oil, Cooking Oil and Gold. The first two are essentials. Gold is considered to be Non-essential. So our Government wants to reduce the import of Gold. There are many shortfalls in this appeal.

In 2001, the total world production of Gold was 3764 tonnes and India imported 462 tonnes, which turns out to be 12.27% of the total production. In 2012, the total production was 4130 tons. India imported 1079 tons which turns to be 26.12%. India has consumed one-fourth of the total gold production. Increase in Gold Imports has been a trend over the past few years and stopping it all of a sudden is not possible. Government should try and create alternatives for Gold in the long run. Otherwise, people are not going to stop buying Gold

The vast majority of the world’s diamonds come from sources that use the revenues generated by diamonds to aid their national development.

More than 80% of the world’s diamonds are polished in India and demonetization is hurting this industry, which deals mostlyin cash. Decision to invalidate Rs500 and Rs1,000 currency notes has forced businesses to stall operations in the diamond hubs of Surat and Saurashtra, both in Gujarat. The industry in Surat is estimated to be worth Rs90,000 crore ($13.2 billion) and employs over two million people.

1. **GOLD:**

|  |  |  |  |
| --- | --- | --- | --- |
| (All values in US million$) | | | |
| Year | Imports | INR equivalent of one US$ | Exports |
| 2007-08 | 2,694 | 40.27 | 5,687 |
| 2008-09 | 4,677 | 46.14 | 8,851 |
| 2009-10 | 7,503 | 47.42 | 9,755 |
| 2010-11 | 8,652 | 45.62 | 12,840 |
| 2011-12 | 10,963 | 46.88 | 17,018 |
| 2012-13 | 11,335 | 54.31 | 18,502 |
| 2013-14 | 5,663 | 60.28 | 18,271 |
| 2014-15 | 5,468 | 61.06 | 12,741 |
| 2015-16 | 4,184 | 65.46 | 13,816 |
| 2016-17 | 4,291 | 67.09 | 14,131 |

From Above Data we can say that Imports and Exports are directly proportional to Each other there is no particular Trend for Imports and Exports i.e., they are not increasing or decreasing constantly.

**Scatter Curves:**

From the scatter curves we can say that R square value for Exports and INR Equivalent for 1USD is good when compared to R square value of Imports and INR Equivalent to 1USD

**Correlation:**

|  |  |  |  |
| --- | --- | --- | --- |
|  | **IMPORTS** | **INR EQUIVALENT TO USD** | **EXPORTS** |
| IMPORTS | 1 |  |  |
| IMNR EQUIVALENT TO USD | -0.223 | 1 |  |
| EXPORTS | 0.608804 | 0.52085 | 1 |

There is weak correlation between Imports and INR equivalent to USD but it is comparatively strong for Exports and INR equivalent to USD also for Exports and Imports.

1. **SILVER:**

|  |  |  |  |
| --- | --- | --- | --- |
| (All values in US million$) | | | |
| Year | Imports | INR equivalent of one US$ | Exports |
| 2007-08 | 21 | 40.27 | 232 |
| 2008-09 | 26 | 46.14 | 241 |
| 2009-10 | 32 | 47.42 | 420 |
| 2010-11 | 87 | 45.62 | 574 |
| 2011-12 | 100 | 46.88 | 774 |
| 2012-13 | 70 | 54.31 | 934 |
| 2013-14 | 39 | 60.28 | 1,475 |
| 2014-15 | 35 | 61.06 | 2,052 |
| 2015-16 | 44 | 65.46 | 2,960 |
| 2016-17 | 51 | 67.09 | 4,021 |

**Scatter Curves:**

From the scatter curves we can say that R square value for Exports and INR Equivalent for 1USD is good when compared to R square value of Imports and INR Equivalent to 1USD In silver sector.

**Correlation:**

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Imports** | **INR Equivalent** | **Exports** |
| Imports | 1 |  |  |
| INR Equivalent | -0.08055 | 1 |  |
| Exports | -0.02951 | 0.919846 | 1 |

In silver sector there is very weak correlation between Imports and Exports where as we have observed good correlation between Exports and Imports in Gold Sector

1. **ROUGH DIAMONDS SECTOR ANALYSIS:-**

|  |  |  |  |
| --- | --- | --- | --- |
| (All values in US million$) | | | |
| Year | Imports | INR equivalent of one US$ | Exports |
| 2007-08 | 9,797 | 40.27 | 567 |
| 2008-09 | 7,960 | 46.14 | 776 |
| 2009-10 | 9,048 | 47.42 | 744 |
| 2010-11 | 11,994 | 45.62 | 1,137 |
| 2011-12 | 15,163 | 46.88 | 1,772 |
| 2012-13 | 14,927 | 54.31 | 1,579 |
| 2013-14 | 16,716 | 60.28 | 1,585 |
| 2014-15 | 16,757 | 61.06 | 1,419 |
| 2015-16 | 14,048 | 65.46 | 1,170 |
| 2016-17 | 17,080 | 67.09 | 1,500 |

India imports more Rough Diamonds and creates value addition by polish it and exports large amount of cut and polish diamonds.

**Scatter Curve:**

From the scatter curves we can say that R square value for Exports and INR Equivalent for 1USD is weak when compared to R square value of Imports and INR Equivalent to 1USD

**Correlation:**

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Imports** | **INR EQUIVALENT** | **Exports** |
| Imports | 1 |  |  |
| INR Equivalent | 0.758312 | 1 |  |
| Exports | 0.89134 | 0.547352 | 1 |

The correlation between Imports and Exports is high .But here we observe something different when compared to silver and gold i.e., the correlation of INR Equivalent is high with Imports compared to Exports.

1. **C&P DIAMONDS:**

|  |  |  |  |
| --- | --- | --- | --- |
| (All values in US million$) | | | |
| Year | Imports | INR equivalent of one US$ | Exports |
| 2007-08 | 5,461 | 40.27 | 14,346 |
| 2008-09 | 8,982 | 46.14 | 15,156 |
| 2009-10 | 11,610 | 47.42 | 19,374 |
| 2010-11 | 20,808 | 45.62 | 30,574 |
| 2011-12 | 14,472 | 46.88 | 26,672 |
| 2012-13 | 5,559 | 54.31 | 21,607 |
| 2013-14 | 6,541 | 60.28 | 24,498 |
| 2014-15 | 6,640 | 61.06 | 23,160 |
| 2015-16 | 2,771 | 65.46 | 20,668 |
| 2016-17 | 2,634 | 67.09 | 22,784 |

India is the largest exporter of C&P Diamonds in the world.80% of C&P diamonds in the world are produced in India. India Exports more C&P diamonds.

**Scattered Curves:**

From the scatter curves we can say that R square value for Exports and INR Equivalent for 1USD is weak when compared to R square value of Imports and INR Equivalent to 1USD

**Correlation:**

|  |  |  |  |
| --- | --- | --- | --- |
|  | *Imports* | *INR Equivalent* | *Exports* |
| Imports | 1 |  |  |
| INR Equivalent | -0.61523 | 1 |  |
| Exports | 0.567405 | 0.213206 | 1 |

The relation between INR Equivalent and Exports is high when compared to relation between Imports and INR Equivalent

**Imports:** (All values in US million$)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Year** | **Gold** | **Silver** | **Rough Diamonds** | **C&P diamonds** |
| 2007-08 | 2,694 | 21 | 9,797 | 5,461 |
| 2008-09 | 4,677 | 26 | 7,960 | 8,982 |
| 2009-10 | 7,503 | 32 | 9,048 | 11,610 |
| 2010-11 | 8,652 | 87 | 11,994 | 20,808 |
| 2011-12 | 10,963 | 100 | 15,163 | 14,472 |
| 2012-13 | 11,335 | 70 | 14,927 | 5,559 |
| 2013-14 | 5,663 | 39 | 16,716 | 6,541 |
| 2014-15 | 5,468 | 35 | 16,757 | 6,640 |
| 2015-16 | 4,184 | 44 | 14,048 | 2,771 |
| 2016-17 | 4,291 | 51 | 17,080 | 2,634 |

By observing from the above table the imports of Gold, Rough Diamonds, C&P Diamonds are considerably large whereas the silver imports meager . India Imports great quantity of Rough Diamonds as India is a largest Exporter of Cut and Polish Diamonds. It Imports Rough Diamonds and does value addition to it.

**Correlation:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | *Gold* | *Silver* | *Rough Diamonds* | *C&P diamonds* |
| Gold | 1 |  |  |  |
| Silver | 0.805987 | 1 |  |  |
| Rough Diamonds | 0.171936 | 0.357788 | 1 |  |
| C&P Diamonds | 0.546452 | 0.583422 | -0.31236 | 1 |

There is a good correlation between Imports of Silver and Gold also the correlation between the C&P Diamonds and Gold, C&P Diamonds and Silver are also considerably strong.

**Exports:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| (All values in US million $) | | | | |
| Year | Gold | Silver | Rough Diamonds | C&P diamonds |
| 2007-08 | 5,687 | 232 | 567 | 14,346 |
| 2008-09 | 8,851 | 241 | 776 | 15,156 |
| 2009-10 | 9,755 | 420 | 744 | 19,374 |
| 2010-11 | 12,840 | 574 | 1,137 | 30,574 |
| 2011-12 | 17,018 | 774 | 1,772 | 26,672 |
| 2012-13 | 18,502 | 934 | 1,579 | 21,607 |
| 2013-14 | 18,271 | 1,475 | 1,585 | 24,498 |
| 2014-15 | 12,741 | 2,052 | 1,419 | 23,160 |
| 2015-16 | 13,816 | 2,960 | 1,170 | 20,668 |
| 2016-17 | 14,131 | 4,021 | 1,500 | 22,784 |

Observing the statistics in above table the exports of C&P diamonds are more than other jewellery whereas Gold takes the 2nd position.Upto 2013-14 silver & Rough Diamonds exports were nominal in early years but they are also playing a active role in last 4,5 years.

**Correlation:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | *Gold* | *Silver* | *Rough Diamonds* | *C&P Diamonds* |
| Gold | 1 |  |  |  |
| Silver | 0.335073 | 1 |  |  |
| Rough Diamonds | 0.931263 | 0.443987 | 1 |  |
| C&P Daimonds | 0.654046 | 0.185837 | 0.678984 | 1 |

Exports of C&P Diamonds and Gold have a good correlation value but C&P Diamonds and silver does not have a good correlation value whereas we observe a good correlation between Imports of these.

**CONCLUSION:**

After analyzing and studying regarding the role of imports and exports in gems and jewellery industry in India we can make some concluding statements as, India Imports large amount of Gold, Rough Diamonds and C&P Diamonds also it Exports large amounts of Gold Jewellery and C&P Diamonds .We can observe a study growth in both Imports and Exports from 2007-11, But there is drastic growth from 2011-13 and it decreased in 2014-15 and a steady raise as it was observed in the beginning is maintained from 2015-17.Digging down the reasons why imports and exports of gems and jewellery increased drastically from 2011-13 we found that in the year 2011-12. The INR equivalent to 1USD increased by 8 rupees from 2011-12 to 2012-13, by 6 rupees from 2012-13 to 2013-14. Thus we can conclude that the abnormal increase in INR Equivalent to 1USD in turn increased the inflation rate and thus we are aware at time of high inflation imports increase due to less rates in other countries and exports increase as other countries can get goods at less price in our country than their respective countries.Also there was an economic crisis in the above years in the Europe as it in 2009 in USA, India imports most of its Raw materials for Gems and Jewellery industry from Switzerland as Switzerland belongs to Europe, I think this may be one reason for fluctuations in Imports from 2011-13.

Thus Indian Imports and Exports play a Crucial Role in Indian Economy as it contributes a major chunk to the total foreign reserves of the country.

**Information and Communication Technology**

The term information and communication technology (ICT) is generally accepted to mean all technologies that, combined, allow people and organizations to interact in the digital world, in our case with the Gems and Jewellery Industry.

**Variables:**

1. **Advertisement Expense:**

Advertisement Expense is a category in financial accounting that refers to the cost associated in promoting their business, like in newspapers, the internet, fliers, magazines, television, billboards and many others.

1. **Communication Expense:**

Communication Expense is a category in financial accounting that refers to the cost associated in using communication and telephony technologies like the mobile phones, landlines and the internet.

**Objectives:**

To see how the Sales is affected after the introduction of Information and Communication Technology in the Gems and Jewellery Industry.

**Data Analysis:**

1. **PC Jewellers:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Year** | **Advertisement Expenses (in INR)** | **Communication Expenses (in INR)** | **Sales (in INR)** |
| 2012 | 264100000 | 10800000 | 30,419,264,512 |
| 2013 | 261800000 | 23800000 | 40,184,193,574 |
| 2014 | 376400000 | 30650000 | 53,248,291,000 |
| 2015 | 464100000 | 41300000 | 63,485,164,000 |
| 2016 | 285000000 | 45100000 | 72,590,700,000 |
| 2017 | 222900000 | 40700000 | 80,994,400,000 |

**Correlation:**

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Advertisement Expenses (in INR)** | **Communication Expenses (in INR)** | **Sales (in INR)** |
| Advertisement Expenses (in INR) | 1 |  |  |
| Communication Expenses (in INR) | 0.275816 | 1 |  |
| Sales (in INR) | 0.034842 | 0.936056 | 1 |

**Regression Analysis:**

1. **Advertisement Expenses vs Sales:**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| *Regression Statistics* | |  |  |  |  |  |
| Multiple R | 0.034842 |  |  |  |  |  |
| R Square | 0.001214 |  |  |  |  |  |
| Adjusted R Square | -0.24848 |  |  |  |  |  |
| Standard Error | 1.01E+08 |  |  |  |  |  |
| Observations | 6 |  |  |  |  |  |
|  |  |  |  |  |  |  |
| ANOVA | |  |  |  |  |  |
|  | *df* | *SS* | *MS* | *F* | *Significance F* | |
| Regression | 1 | 4.95E+13 | 4.95E+13 | 0.004862 | 0.947758 |  |
| Residual | 4 | 4.07E+16 | 1.02E+16 |  |  |  |
| Total | 5 | 4.08E+16 |  |  |  |  |
|  |  |  |  |  |  |  |
|  | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* |
| Intercept | 3.03E+08 | 1.39E+08 | 2.180502 | 0.094691 | -8.3E+07 | 6.89E+08 |
| X Variable 1 | 0.000163 | 0.002337 | 0.069727 | 0.947758 | -0.00632 | 0.006651 |
|  |  |  |  |  |  |  |
| **Conclusion:**  Value of R2 is 0.001214. Therefore, for PC Jewellers, advertisement expenses have negligible effect on sales of the company. As the advertisement expenses of the company increases more and more people would get to know about the offers and discount provided by the company overall increasing the sales of the company. | | | | | | |
| *Regression Statistics* | |  |  |  |  |  |
| Multiple R | 0.936056 |  |  |  |  |  |
| R Square | 0.876202 |  |  |  |  |  |
| Adjusted R Square | 0.845252 |  |  |  |  |  |
| Standard Error | 5135902 |  |  |  |  |  |
| Observations | 6 |  |  |  |  |  |
|  |  |  |  |  |  |  |
| ANOVA | |  |  |  |  |  |
|  | *df* | *SS* | *MS* | *F* | *Significance F* |  |
| Regression | 1 | 7.47E+14 | 7.47E+14 | 28.31058 | 0.006002 |  |
| Residual | 4 | 1.06E+14 | 2.64E+13 |  |  |  |
| Total | 5 | 8.52E+14 |  |  |  |  |
|  |  |  |  |  |  |  |
|  | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* |
| Intercept | -3905544 | 7076889 | -0.55187 | 0.610417 | -2.4E+07 | 15743050 |
| X Variable 1 | 0.000633 | 0.000119 | 5.320769 | 0.006002 | 0.000303 | 0.000963 |

**Conclusion:**

Value of R2 is 0.876202. Therefore, for PC Jewellers, communication expenses increase sales of the company. When most of the complaints and FAQs are sorted online through emails or telephonically, satisfying the customer and overall increasing the sales and making the customers loyal.

1. **Rajesh Exports Limited:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Year** | **Advertisement Expenses (in INR)** | **Communication Expenses (in INR)** | **Sales (in INR)** |
| 2012 | 110,311,021 | 1,527,628 | 2.572E+11 |
| 2013 | 57,945,143 | 1,716,232 | 3.1874E+11 |
| 2014 | 216,584,444 | 1,848,044 | 2.35354E+11 |
| 2015 | 68,557,031 | 2,353,872 | 3.79193E+11 |
| 2016 | 57,481,461 | 2,813,378 | 386,186,200,000.00 |
| 2017 | 40,410,137 | 1,478,403 | 2,421,320,000,000.00 |

**Correlation:**

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Advertisement Expenses (in INR)** | **Communication Expenses (in INR)** | **Sales (in INR)** |
| Advertisement Expenses (in INR) | 1 |  |  |
| Communication Expenses (in INR) | -0.15978 | 1 |  |
| Sales (in INR) | -0.43777 | -0.3928 | 1 |

**Regression Analysis:**

1. **Advertisement Expenses Vs Sales:**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| *Regression Statistics* | |  |  |  |  |  |
| Multiple R | 0.437771 |  |  |  |  |  |
| R Square | 0.191643 |  |  |  |  |  |
| Adjusted R Square | -0.01045 |  |  |  |  |  |
| Standard Error | 65791468 |  |  |  |  |  |
| Observations | 6 |  |  |  |  |  |
|  |  |  |  |  |  |  |
| ANOVA |  |  |  |  |  |  |
|  | *df* | *SS* | *MS* | *F* | *Significance F* |  |
| Regression | 1 | 4.1E+15 | 4.1E+15 | 0.948309 | 0.385292 |  |
| Residual | 4 | 1.73E+16 | 4.33E+15 |  |  |  |
| Total | 5 | 2.14E+16 |  |  |  |  |
|  |  |  |  |  |  |  |
|  | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* |
| Intercept | 1.14E+08 | 35196043 | 3.239882 | 0.031677 | 16311155 | 2.12E+08 |
| X Variable 1 | -3.3E-05 | 3.41E-05 | -0.97381 | 0.385292 | -0.00013 | 6.15E-05 |
| **Conclusion:**  Value of R2 is 0.191643. Therefore, for Rajesh Exports, advertisement expenses have negligible effect on sales of the company. One of reason is that they have a wholesale network in India, where Jewellery are bought in large quantity, and they even don’t try to target the general public. | | | | | | |
| *Regression Statistics* | |  |  |  |  |  |
| Multiple R | 0.392801 |  |  |  |  |  |
| R Square | 0.154293 |  |  |  |  |  |
| Adjusted R Square | -0.05713 |  |  |  |  |  |
| Standard Error | 539009 |  |  |  |  |  |
| Observations | 6 |  |  |  |  |  |
|  |  |  |  |  |  |  |
| ANOVA | |  |  |  |  |  |
|  | *df* | *SS* | *MS* | *F* | *Significance F* |  |
| Regression | 1 | 2.12E+11 | 2.12E+11 | 0.72977 | 0.441101 |  |
| Residual | 4 | 1.16E+12 | 2.91E+11 |  |  |  |
| Total | 5 | 1.37E+12 |  |  |  |  |
|  |  |  |  |  |  |  |
|  | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* |
| Intercept | 2115447 | 288350.2 | 7.33638 | 0.001838 | 1314858 | 2916035 |
| X Variable 1 | -2.4E-07 | 2.8E-07 | -0.85427 | 0.441101 | -1E-06 | 5.38E-07 |

**Conclusion:**

Value of R2 is 0.154293. Therefore, for Rajesh Exports, communication expenses have negligible effect on sales of the company. Because of producing higher quality products, customer never gets a chance to file a complaint or any query.

1. **Tribhovandas Bhimji Zaveri Jewellers:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Year** | **Advertisement Expenses (in INR)** | **Communication Expenses (in INR)** | **Sales (in INR)** |
| 2012 | 356703000 | 14406000 | 13,854,700,000.00 |
| 2013 | 535602000 | 16186000 | 16,494,200,000.00 |
| 2014 | 441806000 | 25929000 | 18,177,400,000.00 |
| 2015 | 633146000 | 27996000 | 19,337,300,000.00 |
| 2016 | 508654000 | 16804000 | 16,543,100,000.00 |
| 2017 | 374147000 | 16821000 | 16,998,200,000.00 |

**Correlation:**

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Advertisement Expenses (in INR)** | **Communication Expenses (in INR)** | **Sales (in INR)** |
| Advertisement Expenses (in INR) | 1 |  |  |
| Communication Expenses (in INR) | 0.568246 | 1 |  |
| Sales (in INR) | 0.675796 | 0.874598308 | 1 |

**Regression Analysis:**

1. **Advertisement Expenses vs Sales**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| *Regression Statistics* | |  |  |  |  |  |
| Multiple R | 0.675796 |  |  |  |  |  |
| R Square | 0.4567 |  |  |  |  |  |
| Adjusted R Square | 0.320875 |  |  |  |  |  |
| Standard Error | 86496275 |  |  |  |  |  |
| Observations | 6 |  |  |  |  |  |
|  |  |  |  |  |  |  |
| ANOVA | |  |  |  |  |  |
|  | *df* | *SS* | *MS* | *F* | *Significance F* |  |
| Regression | 1 | 2.52E+16 | 2.52E+16 | 3.362417 | 0.140624 |  |
| Residual | 4 | 2.99E+16 | 7.48E+15 |  |  |  |
| Total | 5 | 5.51E+16 |  |  |  |  |
|  | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* |
| Intercept | -1.7E+08 | 3.55E+08 | -0.48571 | 0.652577 | -1.2E+09 | 8.13E+08 |
| X Variable 1 | 0.038302 | 0.020888 | 1.833689 | 0.140624 | -0.01969 | 0.096296 |
|  |  |  |  |  |  |  |
| **Conclusion:**  Value of R2 is 0.4567. Therefore, for TBZ Jewellers, advertisement expenses affect the sales of the company to some extent. As TBZ is a well-known brand their sales is better even without the advertisement. | | | | | | |
| *Regression Statistics* | |  |  |  |  |  |
| Multiple R | 0.874598 |  |  |  |  |  |
| R Square | 0.764922 |  |  |  |  |  |
| Adjusted R Square | 0.706153 |  |  |  |  |  |
| Standard Error | 3110912 |  |  |  |  |  |
| Observations | 6 |  |  |  |  |  |
|  |  |  |  |  |  |  |
| ANOVA | |  |  |  |  |  |
|  | *df* | *SS* | *MS* | *F* | *Significance F* |  |
| Regression | 1 | 1.26E+14 | 1.26E+14 | 13.01564 | 0.022602 |  |
| Residual | 4 | 3.87E+13 | 9.68E+12 |  |  |  |
| Total | 5 | 1.65E+14 |  |  |  |  |
|  |  |  |  |  |  |  |
|  | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* |
| Intercept | -2.6E+07 | 12760101 | -2.04669 | 0.110104 | -6.2E+07 | 9311770 |
| X Variable 1 | 0.00271 | 0.000751 | 3.60772 | 0.022602 | 0.000624 | 0.004796 |

**Conclusion:**

Value of R2 is 0.764922. In case of TBZ Jewellers, they recently tied up with Amazon and Snap deal to sell and showcase their Jewellery online, eventually increasing the sales.

1. **Gitanjali Gems:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Year** | **Advertisement Expenses (in INR)** | **Communication Expenses (in INR)** | **Sales (in INR)** |
| 2012 | 709720000 | 8070000 | 77554700000 |
| 2013 | 571990000 | 9440000 | 1.03807E+11 |
| 2014 | 1,401,560,000.00 | 60000000 | 73,430,300,000.00 |
| 2015 | 936350000 | 87170000 | 71579300000 |
| 2016 | 656210000 | 88700000 | 1.07507E+11 |
| 2017 | 1,171,760,000.00 | 110430000 | 1.04648E+11 |

**Correlation:**

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Advertisement Expenses (in INR)** | **Communication Expenses (in INR)** | **Sales (in INR)** |
| Advertisement Expenses (in INR) | 1 |  |  |
| Communication Expenses (in INR) | 0.484886096 | 1 |  |
| Sales (in INR) | -0.407780272 | 0.185372019 | 1 |

**Regression:**

1. **Advertisement Expenses vs Sales:**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| *Regression Statistics* | |  |  |  |  |  |
| Multiple R | 0.40778 |  |  |  |  |  |
| R Square | 0.166285 |  |  |  |  |  |
| Adjusted R Square | -0.04214 |  |  |  |  |  |
| Standard Error | 3.32E+08 |  |  |  |  |  |
| Observations | 6 |  |  |  |  |  |
|  |  |  |  |  |  |  |
| ANOVA | |  |  |  |  |  |
|  | *df* | *SS* | *MS* | *F* | *Significance F* |  |
| Regression | 1 | 8.81E+16 | 8.81E+16 | 0.797801 | 0.422233 |  |
| Residual | 4 | 4.42E+17 | 1.1E+17 |  |  |  |
| Total | 5 | 5.3E+17 |  |  |  |  |
|  | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* |
| Intercept | 1.6E+09 | 7.87E+08 | 2.033659 | 0.111746 | -5.8E+08 | 3.78E+09 |
| X Variable 1 | -0.00771 | 0.008636 | -0.8932 | 0.422233 | -0.03169 | 0.016263 |
| **Conclusion:**  Value of R2 is 0.166285. Therefore, for Gitanjali Gems, advertisement expenses have negligible effect on sales of the company and doesn’t fully depend on advertisement expense. As the market value for Gitanjali is high and people are more loyal towards the company, so the advertisements doesn’t matter much to the middle class people. | | | | | | |
| *Regression Statistics* | |  |  |  |  |  |
| Multiple R | 0.185372 |  |  |  |  |  |
| R Square | 0.034363 |  |  |  |  |  |
| Adjusted R Square | -0.20705 |  |  |  |  |  |
| Standard Error | 47524244 |  |  |  |  |  |
| Observations | 6 |  |  |  |  |  |
|  |  |  |  |  |  |  |
| ANOVA | |  |  |  |  |  |
|  | *df* | *SS* | *MS* | *F* | *Significance F* |  |
| Regression | 1 | 3.21E+14 | 3.21E+14 | 0.142342 | 0.725127 |  |
| Residual | 4 | 9.03E+15 | 2.26E+15 |  |  |  |
| Total | 5 | 9.36E+15 |  |  |  |  |
|  |  |  |  |  |  |  |
|  | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* |
| Intercept | 18804336 | 1.13E+08 | 0.167063 | 0.875426 | -2.9E+08 | 3.31E+08 |
| X Variable 1 | 0.000466 | 0.001235 | 0.377283 | 0.725127 | -0.00296 | 0.003896 |

**Conclusion:**

Value of R2 is 0.034363. Therefore, for Gitanjali Jewellers, communication expenses have negligible effect on sales of the company.

1. **Tara Jewels:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Year** | **Advertisement Expenses (in INR)** | **Communication Expenses (in INR)** | **Sales (in INR)** |
| 2012 | 32,788,286 | 6,327,114 | 12,799,000,000.00 |
| 2013 | 11,520,591 | 5,671,473 | 13,836,000,000.00 |
| 2014 | 33,735,980 | 6,911,602 | 14,171,400,000.00 |
| 2015 | 25,863,176 | 5,594,588 | 14,141,600,000.00 |
| 2016 | 8,266,732 | 4,241,530 | 13,627,800,000.00 |
| 2017 | 394,242 | 3,220,931 | 11,894,800,000.00 |

**Correlation:**

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Advertisement Expenses (in INR)** | **Communication Expenses (in INR)** | **Sales (in INR)** |
| Advertisement Expenses (in INR) | 1 |  |  |
| Communication Expenses (in INR) | 0.917105 | 1 |  |
| Sales (in INR) | 0.488298 | 0.636669 | 1 |

**Regression:**

1. **Advertisement Expenses vs Sales:**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| *Regression Statistics* | |  |  |  |  |  |
| Multiple R | 0.488298 |  |  |  |  |  |
| R Square | 0.238435 |  |  |  |  |  |
| Adjusted R Square | 0.048043 |  |  |  |  |  |
| Standard Error | 13599118 |  |  |  |  |  |
| Observations | 6 |  |  |  |  |  |
|  |  |  |  |  |  |  |
| ANOVA | |  |  |  |  |  |
|  | *df* | *SS* | *MS* | *F* | *Significance F* |  |
| Regression | 1 | 2.32E+14 | 2.32E+14 | 1.25234 | 0.325767 |  |
| Residual | 4 | 7.4E+14 | 1.85E+14 |  |  |  |
| Total | 5 | 9.71E+14 |  |  |  |  |
|  |  |  |  |  |  |  |
|  | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* |
| Intercept | -8.3E+07 | 91215212 | -0.91132 | 0.413679 | -3.4E+08 | 1.7E+08 |
| X Variable 1 | 0.007597 | 0.006789 | 1.11908 | 0.325767 | -0.01125 | 0.026445 |
|  |  |  |  |  |  |  |
| **Conclusion:**  Value of R2 is 0.238435. The sales of Tara Jewels are not much dependent on advertisement expenses but depend on other factors affecting total sales. | | | | | | |
| *Regression Statistics* | |  |  |  |  |  |
| Multiple R | 0.636669 |  |  |  |  |  |
| R Square | 0.405347 |  |  |  |  |  |
| Adjusted R Square | 0.256683 |  |  |  |  |  |
| Standard Error | 1176789 |  |  |  |  |  |
| Observations | 6 |  |  |  |  |  |
|  |  |  |  |  |  |  |
| ANOVA | |  |  |  |  |  |
|  | *df* | *SS* | *MS* | *F* | *Significance F* |  |
| Regression | 1 | 3.78E+12 | 3.78E+12 | 2.72661 | 0.174033 |  |
| Residual | 4 | 5.54E+12 | 1.38E+12 |  |  |  |
| Total | 5 | 9.32E+12 |  |  |  |  |
|  |  |  |  |  |  |  |
|  | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* |
| Intercept | -7681628 | 7893236 | -0.97319 | 0.385565 | -3E+07 | 14233508 |
| X Variable 1 | 0.00097 | 0.000587 | 1.651245 | 0.174033 | -0.00066 | 0.002601 |

**Conclusion:**

Value of R2 is 0.405347. Therefore, for Tara Jewellers, communication expenses affect sales of the company to some extent.

**Overall Conclusion:**

As the Industry try to invest more and more money in the ICT sector the sales of gems and Jewellery increases all over India. In future, in this industry most of sales will be digitized and customer issues may be resolved with the help of AI chat bots. There will be increase in investment on Digital Marketing to expand business of industry.

**Market Leaders**

My role is to analyze the leading jewellers in the Indian gems and jewellery industry. The Gems and Jewellery sector is witnessing changes in consumer preferences due to adoption of western lifestyle. Some of the key investments in this industry are listed below.

* An international diamond exchange will be set up in Surat by October 2020 at a cost of Rs 2,400 crore
* Companies such as PC Jewellers, TBZ, TARA Jewels and Rajesh Exports are planning to introduce a virtual-reality (VR) experience for their customers. The customer will have to wear a VR headset, through which they can select any jewellery, see the jewellery from different angles and zoom on it to view intricate designs.

**Market size:**

India is one of the largest exporters of gems and jewellery and the industry is considered to play a vital role in the Indian economy as it contributes a major chunk to the total foreign reserves of the country. The Goods and Services Tax (GST) and monsoon will steer India’s gold demand going forward.

**LEADING COMPANIES OF GEMS AND JEWELRY:**

Some of the leading companies of the gems and jewellery market are:

1. TBZ**:** It is a noted Indian jeweller and jewellery retail chain based inIndia. Established in 1864 (153 years ago) by Tribhovandas Bhimji Zaveri in Zaveri Bazaar the jewellery district of Mumbai.

**Data Analysis:**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | 2013 | 2014 | 2015 | 2016 | 2017 |
| NET SALES | 16583 | 18243 | 19337 | 16543 | 16998 |
| GROSS PR | 1498 | 1340 | 832 | 370 | 695 |
| PROFIT AF | 845 | 550 | 243 | -276 | 147 |
| AVG WAGE | 290 | 350 | 430 | 445 | 577.3 |
| TOTAL WA | 491.5 | 537.3 | 637.4 | 673.8 | 722.04 |
| NO. OF EM | 1667 | 1496 | 1476 | 1501 | 1376 |

**Correlation:**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | *Column 1* | *Column 2* | *Column 3* | *Column 4* | *Column 5* |
| Column 1 | 1 |  |  |  |  |
| Column 2 | 0.9996756 | 1 |  |  |  |
| Column 3 | 0.9984739 | 0.9994440 | 1 |  |  |
| Column 4 | 0.9958377 | 0.9973866 | 0.9990742 | 1 |  |
| Column 5 | 0.9975199 | 0.9988448 | 0.9998755 | 0.9995282 | 1 |

Regression:

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *Regression Statistics* | |  |  |  |  |  |  |  |
| Multiple R | 0.851906304538557 |  |  |  |  |  |  |  |
| R Square | 0.72574435171254 |  |  |  |  |  |  |  |
| Adjusted R Square | 0.634325802283386 |  |  |  |  |  |  |  |
| Standard Error | 57.9013461502809 |  |  |  |  |  |  |  |
| Observations | 5 |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| ANOVA |  |  |  |  |  |  |  |  |
|  | *df* | *SS* | *MS* | *F* | *Significance F* |  |  |  |
| Regression | 1 | 26615.011621956 | 26615.011621956 | 7.93869905226367 | 0.0668725854555134 |  |  |  |
| Residual | 3 | 10057.697658044 | 3352.56588601465 |  |  |  |  |  |
| Total | 4 | 36672.70928 |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
|  | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* | *Lower 95.0%* | *Upper 95.0%* |
| Intercept | 670.516229521349 | 33.1035211188685 | 20.2551331960625 | 0.000263067808282555 | 565.166051044725 | 775.866407997973 | 565.166051044725 | 775.866407997973 |
| X Variable 1 | -0.192538865213218 | 0.0683350849327886 | -2.81756970672665 | 0.0668725854555134 | -0.410011603778819 | 0.024933873352384 | -0.410011603778819 | 0.024933873352384 |

As the value of R square is 0.72 it clearly shows that market leaders have less impact on Gems and jewellery industry.



1. PC Jeweller: This company started operations in April 2005 with oneshowroom at Karol Bagh, Delhi and 79 showrooms across India. It is a first-generation business promoted by two brothers- Padam Chand Gupta and Balram Garg. The company however, had a vision of expanding its presence in the retail segment. It has accordingly been opening showrooms at regular intervals and today has strength of 68 stores spread over 54 cities.

**Data Analysis:**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | |  |  |  | PCJ | | |  | | |  | | |  | | |  | |
|  | |  |  |  | 2013 | | | 2014 | | | 2015 | | | 2016 | | | 2017 | |
|  | | NET SALES | | | 40184 | | | 53248 | | | 63613 | | | 73032 | | | 84744 | |
|  | | GROSS PR | |  | 4818 | | | 5715 | | | 7232 | | | 7521 | | | 7579 | |
|  | | PROFIT A | |  | 2910 | | | 3563 | | | 3784 | | | 3982 | | | 4210 | |
|  | | AVG WAGE | | | 230 | | | 180 | | | 192 | | | 226 | | | 332.9 | |
|  | | TOTAL WA | | | 226.05 | | | 318.17 | | | 406.31 | | | 489.76 | | | 695.8 | |
|  | | NO. OF EM | | | 1607 | | | 2236 | | | 2444 | | | 2516 | | | 2504 | |
|  |  | |  |  | |  |  | |  |  | |  |  | |  |
|  | |  |  |  | | |  | | |  | | |  | | |  | |
|  | |  |  | *Column 1* | | | *Column 2* | | | *Column 3* | | | *Column 4* | | | *Column 5* | |  |
| Column 1 | | |  |  | 1 | |  |  | |  |  | |  |  | |  |  |  |
| Column 2 | | |  | 0.9999095 | | |  | 1 | |  |  | |  |  | |  |  |  |
| Column 3 | | |  | 0.9999224 | | | 0.9999324 | | |  | 1 | |  |  | |  |  |  |
| Column 4 | | |  | 0.9997945 | | | 0.9999216 | | | 0.9999439 | | |  | 1 | |  |  |  |
| Column 5 | | |  | 0.9994636 | | | 0.9997415 | | | 0.9996973 | | | 0.9999014 | | |  | 1 |  |

**Regression:**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *Regression Statistics* | |  |  |  |  |  |  |  |
| Multiple R | 0.915244455140971 |  |  |  |  |  |  |  |
| R Square | 0.837672412666293 |  |  |  |  |  |  |  |
| Adjusted R Square | 0.783563216888391 |  |  |  |  |  |  |  |
| Standard Error | 231.334288356015 |  |  |  |  |  |  |  |
| Observations | 5 |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| ANOVA |  |  |  |  |  |  |  |  |
|  | *df* | *SS* | *MS* | *F* | *Significance F* |  |  |  |
| Regression | 1 | 828482.141092449 | 828482.141092449 | 15.481146977394 | 0.0292405996492565 |  |  |  |
| Residual | 3 | 160546.658907551 | 53515.5529691837 |  |  |  |  |  |
| Total | 4 | 989028.8 |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
|  | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* | *Lower 95.0%* | *Upper 95.0%* |
| Intercept | 2606.47843612402 | 294.126703411136 | 8.86175381526182 | 0.0030293727222158 | 1670.43599556797 | 3542.52087668006 | 1670.43599556797 | 3542.52087668006 |
| X Variable 1 | 2.53575824023329 | 0.644475301759572 | 3.9346088722253 | 0.0292405996492565 | 0.484750197301936 | 4.58676628316464 | 0.484750197301936 | 4.58676628316464 |

1. RAJESH EXPORTS:Rajesh exports is a gold retailer in India whichrefines, designs, and sells gold and jewellery. The company was founded in 1989 by the current executive chairman, Rajesh Mehta, and his brother, Prashant Mehta is Rajesh Exports MD. The brothers started manufacturing in a ten-person shop located in their garage in Bangalore.

..Data of five years of Rajesh Exports is given in the below excel sheet.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  |  | Rajesh exports | |  |  |
|  | 2013 | 2014 | 2015 | 2016 | 2017 |
| NET SALES | 184114 | 205338 | 256539 | 311970 | 291785 |
| GROSS PR | 1863 | 3484 | 6068 | 7595 | 7650 |
| PROFIT A | 1934 | 2480 | 4124 | 4526 | 3575 |
| AVG WAGE | 180 | 145 | 142 | 154 | 170 |
| TOTAL WA | 64.88 | 53.5 | 50.36 | 50.66 | 59.89 |
| NO. OF EM | 362 | 375 | 358 | 328 | 350 |

Correlation:

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  | | *RAJESH* | |  | |  | |  | |
|  |  | *Column 1* | | *Column 2* | | *Column 3* | | *Column 4* | | *Column 5* | |
|  | Column 1 | 1 | |  | |  | |  | |  | |
|  | Column 2 | 0.9999774 | | 1 | |  | |  | |  | |
|  | Column 3 | 0.9999078 | | 0.9999749 | | 1 | |  | |  | |
|  | Column 4 | 0.9998995 | | 0.9999718 | | 0.9999983 | | 1 | |  | |
|  | Column 5 | 0.9998726 | | 0.9999564 | | 0.9999873 | | 0.9999947 | | 1 | |
| Regression: | | |  | |  | |  | |  | |  | |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | RAJESH |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| *Regression Statistics* | |  |  |  |  |  |  |  |
| Multiple R | 0.727903219051844 |  |  |  |  |  |  |  |
| R Square | 0.529843096306037 |  |  |  |  |  |  |  |
| Adjusted R Square | 0.373124128408049 |  |  |  |  |  |  |  |
| Standard Error | 866.616263595912 |  |  |  |  |  |  |  |
| Observations | 5 |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| ANOVA |  |  |  |  |  |  |  |  |
|  | *df* | *SS* | *MS* | *F* | *Significance F* |  |  |  |
| Regression | 1 | 2539097.55501318 | 2539097.55501318 | 3.3808485559382 | 0.163247596269198 |  |  |  |
| Residual | 3 | 2253071.24498682 | 751023.748328938 |  |  |  |  |  |
| Total | 4 | 4792168.8 |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
|  | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* | *Lower 95.0%* | *Upper 95.0%* |
| Intercept | 10354.3232967437 | 3841.04775889891 | 2.69570282555194 | 0.0740551443403013 | -1869.60495198238 | 22578.2515454698 | -1869.60495198238 | 22578.2515454698 |
| X Variable 1 | -125.792604403017 | 68.4135694680815 | -1.83870839339418 | 0.163247596269198 | -343.515115787983 | 91.9299069819492 | -343.515115787983 | 91.9299069819492 |

As the value of R square is 0.52 it suggests that marketing leader Rajesh expo has less impact on the production of gems and jewellery industry.

1. TARA JEWELS:Tara Jewels Limited is a public listed company since2012 and an integrated player in the jewellery industry with experience ranging from designing to manufacturing and retailing of jewellery with a portfolio of products that includes studded gold, platinum and silver jewellery. The company has three manufacturing facilities spread across approximately 53,000 sq ft and is one of the largest studded jewellery exporters from India since 2001.

..Data of five years of Tara Jewels is given in the below excel sheet.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  | Tara jewels | |  |  |  |
|  | 2013 | 2014 |  | 2015 | 2016 | 2017 |
| NET SALES | 13991 | 16355 |  | 16954 | 17353 | 18013 |
| GROSS PR | 1317 | 1534 |  | 1576 | 1586 | 1244 |
| PROFIT A | 539 | 737 |  | 504 | 437 | 254 |
| AVG WAGE | 190 | 220 |  | 278 | 265 | 250 |
| TOTAL WA | 224.1 | 187.3 |  | 215.8 | 231.8 | 351.44 |
| NO. OF EM | 970 | 1002 |  | 1014 | 1077 | 1213 |

Correlation:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | *Column 1* | *Column 2* | *Column 3* | *Column 4* | *Column 5* |
| Column 1 | 1 |  |  |  |  |
| Column 2 | 0.9999212 | 1 |  |  |  |
| Column 3 | 0.9999283 | 0.9998611 | 1 |  |  |
| Column 4 | 0.9999144 | 0.9997746 | 0.9999831 | 1 |  |
| Column 5 | 0.9994793 | 0.9991266 | 0.9994969 | 0.9996211 | 1 |
|  |  | TARA |  |  |  |

Regression:

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| SUMMARY OUTPUT |  | Tara Jewels |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| *Regression Statistics* | |  |  |  |  |  |  |  |
| Multiple R | 0.904007391695241 |  |  |  |  |  |  |  |
| R Square | 0.817229364239633 |  |  |  |  |  |  |  |
| Adjusted R Square | 0.756305818986178 |  |  |  |  |  |  |  |
| Standard Error | 86.2210042724704 |  |  |  |  |  |  |  |
| Observations | 5 |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| ANOVA |  |  |  |  |  |  |  |  |
|  | *df* | *SS* | *MS* | *F* | *Significance F* |  |  |  |
| Regression | 1 | 99720.6152667399 | 99720.6152667399 | 13.4140152356495 | 0.035183278510677 |  |  |  |
| Residual | 3 | 22302.1847332601 | 7434.06157775335 |  |  |  |  |  |
| Total | 4 | 122022.8 |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
|  | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* | *Lower 95.0%* | *Upper 95.0%* |
| Intercept | 1097.06764134128 | 169.060825116781 | 6.48918896842881 | 0.00742956529085519 | 559.04064308017 | 1635.0946396024 | 559.04064308017 | 1635.0946396024 |
| X Variable 1 | -2.49028304311359 | 0.679938000441632 | -3.66251487855674 | 0.035183278510677 | -4.65414922044106 | -0.326416865786131 | -4.65414922044106 | -0.326416865786131 |

As the value of r squre is 0.81 we can conclude that the marketing leader has a major impact on the jewellery market.

1. RENAISSANCE JEWELS**:** The company was originally incorporatedon December 04, 1989 as Mayur Gem and Jewellery Export Private Limited and were engaged in the business and manufacture of jewellery. Mr. Chandrakant Dhanak and Mrs. Darshana Dhanak were the original promoters of the company. In the year 1995, Mr. Niranjan A. Shah and family acquired the entire shareholding of Mayur Gem and Jewellery Export Private Limited.

.. Data of five years of Renaissance jewellery is given in the below excel sheet

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  |  | Renaissance jewel | |  |  |
|  | 2013 | 2014 | 2015 | 2016 | 2017 |
| NET SALES | 4469 | 9519 | 12222 | 12764 | 13196 |
| GROSS PR | 693 | 431 | 606 | 563 | 786 |
| PROFIT A | 209 | 148 | 295 | 402 | 474 |
| AVG WAGE | 225 | 280 | 290 | 330 | 350 |
| TOTAL WA | 127 | 112 | 150 | 183 | 202 |
| NO. OF EM | 442 | 476 | 512 | 423 | 648 |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  | *Column 1* | *Column 2* | *Column 3* | *Column 4* | *Column 5* |
|  | Column 1 | 1 |  |  |  |  |
|  | Column 2 | 0.9958710 | 1 |  |  |  |
|  | Column 3 | 0.9960707 | 0.9998784 | 1 |  |  |
|  | Column 4 | 0.9950175 | 0.9996446 | 0.9998928 | 1 |  |
|  | Column 5 | 0.9964137 | 0.9997403 | 0.9999566 | 0.9998463 | 1 |
|  |  |  | Renaissance | |  |  |
| Regression: | |  |  |  |  |  |

As the

value of R square is 0.99 it shows that market leaders have no

impact on gems and jewellery industry.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| SUMMARY OUTPUT |  | Renaissance |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| *Regression Statistics* | |  |  |  |  |  |  |  |
| Multiple R | 0.999367487870189 |  |  |  |  |  |  |  |
| R Square | 0.998735375811973 |  |  |  |  |  |  |  |
| Adjusted R Square | 0.998313834415964 |  |  |  |  |  |  |  |
| Standard Error | 5.50661616125472 |  |  |  |  |  |  |  |
| Observations | 5 |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| ANOVA |  |  |  |  |  |  |  |  |
|  | *df* | *SS* | *MS* | *F* | *Significance F* |  |  |  |
| Regression | 1 | 71842.2315353578 | 71842.2315353578 | 2369.24625972142 | 0.0000190939568319606 |  |  |  |
| Residual | 3 | 90.9684646421751 | 30.3228215473917 |  |  |  |  |  |
| Total | 4 | 71933.2 |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
|  | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* | *Lower 95.0%* | *Upper 95.0%* |
| Intercept | -246.357825440645 | 11.6040037592342 | -21.2304158592331 | 0.0002286321789303 | -283.286944330719 | -209.428706550572 | -283.286944330719 | -209.428706550572 |
| X Variable 1 | 3.56561902739435 | 0.0732537457538492 | 48.6749037977623 | 0.0000190939568319606 | 3.33249291487182 | 3.79874513991688 | 3.33249291487182 | 3.79874513991688 |

**Conclusion: -**

From the above parameters we can conclude that these Market leaders still have potential to be lead the market for another few years. By analysing the above data we see that Renaissance and tara jewels have a little more impact on the indian market than the othe marketing leaders.