

Use of Multiple Regression Analysis to Identify Factors that Affect the Unemployment Rate in the Kingdom of Saudi Arabia

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Abstract: This study investigates factors that affected the unemployment rate in the Kingdom of Saudi Arabia from 1999 to 2013. The research was conducted using multiple regression analysis. The factors selected for the study were Domestic Investment, Foreign Investment, Gross Domestic Product (GDP), Saudi Population Growth, Average Individual Income, Number of Industries, Inflation Rate, Bachelor Graduates, Intermediate Diploma Graduates and High Diploma Graduates. The unemployment rate was used as the dependent variable; remaining variables were used as independent variables. The results of the regression analysis indicated significant impact of three variables: GDP, Saudi Population Growth and Inflation Rate. GDP and Inflation Rate were observed to have a negative impact on the unemployment rate, while Saudi Population Growth had a positive relationship with the unemployment rate. [Rami Alamoudi, Mohammed Balubaid, Amir Siddiqui. **Use of Multiple Regression Analysis to Identify Factors that Affect the Unemployment Rate in the Kingdom of Saudi Arabia.** *Life Sci J* 2015;12(7):15-22]. (ISSN:1097-8135). <http://www.lifesciencesite.com>. 3

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1. Introduction

According to (Mincer, 1973; Buss and Redburn, 1988; Jones and Riddell, 1999; Benati, 2001; Brandolini *et al.*, 2006; Johnson *et al.*, 2012; Lloyd and Murray 2014; and Posel, 2014) the definition of unemployment has been long debated, if the definition of the unemployed include only those who engaged in job search or all individuals who are not working.

In this research, the standard definition of unemployment by the International Conference of Labor Statisticians (ICLS) is used. According to Luebker (2008) The standard definition of unemployment by the International Conference of Labor Statisticians (ICLS) is when a person who does not have a job, whether paid or self-employed, is able to take a job if it is accessible and is actively seeking employment. The relaxed definition of unemployment by the (ICLS) is someone satisfies the first two criteria (not having a job and having the ability to pursue a job) but not the third criteria (searching for a job). These people are called "available non-seekers". Unemployment is one of the most important macroeconomic issues that policy makers and economies face (Nakwato, 2012). Unemployment has social and economic implications in all economies; consequently, different countries try to maintain policies that support the rising employment rate. In addition, governments spend time and money researching different factors and phenomena that may affect the growth of unemployment and proposing new ideas and policies to improve the employment rate.

2. Unemployment in the Kingdom of Saudi Arabia

Saudi Arabia, one of the most oil-rich countries in the world, is facing the problem of unemployment.

According to the Central Department of Statistics and Information (CDSI) report (2014), the unemployment rate in Saudi Arabia was 11.8% in 2014. The research conducted by the CDSI in 2014 revealed that the total workforce (Saudis and non-Saudis) above the age of 15 years is 11,739,303 persons, which is approximately 54.1% of the total population of the Saudi Arabia. The total number of employed people in the total workforce is 11,067,673 workers which is 94.3% of the total workforce. The number of unemployed people is 671,630 which is approximately 5.7% of the total workforce (Saudis and non-Saudis). **Figure 1** presents the unemployment rates among Saudis and non-Saudis from 1999 to 2013.

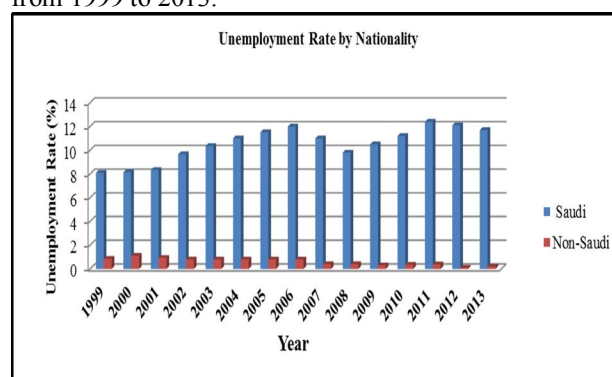


Figure 1: Unemployment Rates for Saudis and Non-Saudis from 1999 to 2013.

In addition, the population of Saudi Arabia is growing rapidly. According to the CDSI the rate of growth of the Saudi population was 2.15% in 2013. This information aids in the prediction of job demand in the future. **Figure 2** presents the growth of the

population in Saudi Arabia (Saudis and Non-Saudis) from 1999 to 2013.

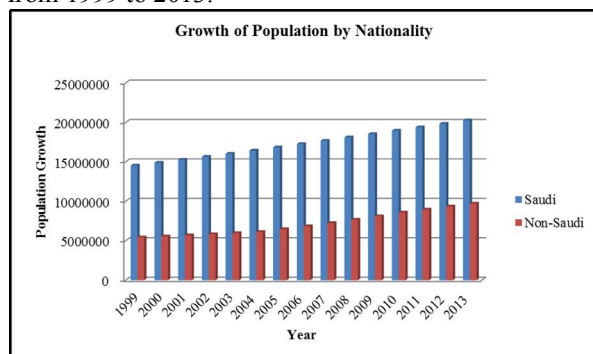


Figure 2: Population Growth for Saudis and Non-Saudis in the Kingdom of Saudi Arabia from year 1999 to 2013.

3. Statement of the Problem

Unemployment not only affects the person who is unemployed, but also adversely affect his/her family and the society in which she/he resides. Unemployment causes hopelessness, distress and sorrow in unemployed people and causes them to live a way they do not want. Unemployment has a negative effect on the life expectancy.

An issue that plays a critical role in the development of different countries is the underutilization of human capital or in other words unemployment. The Kingdom of Saudi Arabia has a young population, with 45% of the populace under the age of 18 years. The number of Saudi workers will double over the coming decade. Unless employment issues faced by this segment are resolved, the problem will likely get worsen as the number of new workers entering the job market grows (Fakeeh, 2009).

Due to the importance of this topic, this research will explore the different factors that affect the unemployment rate in the Kingdom of Saudi Arabia using a multiple regression analysis.

4. Literature Review

4.1 Effects of Unemployment on Mental and Physical Health

The impact of stress on health was examined by Linn (1985) in a study that included 300 men who could not find a job after the study began. These individuals were compared to an equal number of people who continued to work. Statistical techniques, including multivariate analyses of variance and covariance, were used to compare the data regarding the psychological conditions that were collected from the two groups. The data highlighted that symptoms of anxiety and depression were substantially higher in the unemployed subjects than in the employed subjects. A standard deviation analysis of the self-esteem factor indicated that some men handled their unemployment-related stress better than others. Similarly, the analysis showed that individuals with good self-esteem had

more support from their friends and families than those with low self-esteem. Moreover, unemployed men had more doctors' visits, took more medications and spent more time sick compared to the employed persons.

4.2 Effects of Unemployment on Financial Problems

Choudhry et al (2012) conducted research to investigate the effects of financial crises on the youth unemployment rate (YUR). Different types of financial crises (currency crises, systematic banking crises, non-systematic banking crises and debt crises) and countries that were grouped according to their revenues were considered in this research. Experimental estimations the effects of financial crises on young workers were presented by researchers with the help of an empirical and theoretical literature review of the YUR.

The impact of financial crises on the YUR was examined using a fixed effects panel estimation on a large number of countries around the world for a period of 25 years between 1980 and 2005. The impact's persistence over time was also studied. The research concluded that the financial crises had a significant impact on the YUR that went beyond the impact of the GDP changes. Additionally, the impact on the YUR is greater than the impact on general unemployment. The result is not affected by the inclusion of a control variable, such as GDP growth. The findings suggest that the YUR is affected by financial crises for a period of about five years after the inception of the crises, with the most significant effects found in the second and third years after the financial crises (Choudhry et al, 2012).

4.3 Effects of Unemployment on Crime

The relationship between employability and crime in the U.S was investigated by Fallahi et al (2012). This study suggested that not only un-employment but also volatility affect crime. The link between un employment rates and the volatility of crime was explored. The results indicate that joblessness rates only have a major effect on robberies and motor-vehicle thefts in the short term and that the volatility of unemployment rates has a negative effect on motor-vehicle thefts irrespective of the time period. However, there's a positive impact on robberies in the short term and no effect in the long term.

4.4 Regression Analysis

One of the most important techniques managers use today is regression analysis. This tool helps to determine the relationships between different variables. For example, levels of education and personal income, or sales numbers and advertising. There are two goals when using a regression analysis. The first is to understand the correlations between dependent and independent variables. The second goal is to predict "forecast" the independent values based on the dependent values.

4.5 Simple Linear Regression Analysis

In any type of regression analysis, there is an assumption that needs to be tested to determine if, there is a significant relationship between different variables. In this technique there are some random errors that cannot be predicted. The general equation for simple linear regression is:-

$$Y = \beta_0 + \beta_1 X + \text{Error}(1)$$

Where,

Y = Dependent Variable

X = Independent Variable

β_0 = Intercept (value Y when $X=0$)

β_1 = Slope of Regression Line

4.6 Multiple Regression Analysis

The disadvantage of a simple linear regression analysis is that it can only be used for one independent and one variable. Unfortunately, many real life cases are too complicated for a simple linear regression analysis to be suitable. In reality, more than one independent variables is needed to predicate used to predict a dependent variable accurately. Regression models with more than one independent variables are called to be multiple regression model.

4.7 Correlation Coefficient

Another measure related to the coefficient of determination is the coefficient of correlation. This measure also expresses the degree or strength of the linear relationship. It is usually expressed as r and can be any number between and including $+1$ and -1 . Figures 6.1, 6.2, 6.3 and 6.4 illustrate possible scatter diagrams for different values of r .

The value of r is the square root of r^2 . It is negative if the slope is negative, and it is positive if the slope is positive.

4.8 Steps in the Hypothesis Test for a Significant Regression Model

Table 1: ANOVA for Multiple Regression Analysis

ANOVA Table for Multiple Regression Analysis				
Source	Sum of Square	Degree of Freedom	Mean Square	F-Ratio
Regression	SSR	K	MSR=SSR/K	F=MSR/MSE
Residual Error	SSE	N-K-1	MSE=SSE/(N-K-1)	
Total	SST	N-1		

Specify null and alternative hypotheses:

$H_0: \beta_1 = 0$ (no linear relationship between X and Y)

$H_1: \beta_1 \neq 0$ (linear relationship exists between X and Y)

Select the level of significance (α). Common values are 0.01 and 0.05.

Calculate the value of the F test statistic using the formula in **Table 1**.

Make a decision using one of the following methods:

Reject the null hypothesis if the test statistic is

greater than the F value. Otherwise, do not reject the null hypothesis:

Reject if the F calculated $> F_{\alpha, df_1, df_2}$

$df_1 = k$

$df_2 = n - k - 1$

Reject if the null hypothesis if the observed significance level, or p -value, is less than the level of significance (α).

Otherwise, do not reject the null hypothesis:

p - Value = $P(F > \text{calculated test statistic})$

Reject if p -value $< \alpha$

4.9 Selecting the "Best" Regression Equation

The first step in developing a multiple regression equation to forecast variables is to select a complete set of probable predictor variables. Any variable that adds to the accuracy of the forecast can be included. To select the final equation, expert must evaluate the predictor variables using the following steps:

- The expert wants the equation to include as many useful predictor variables as possible.

- Considering that it costs money to track information on a large number of X 's, the equation can include as few predictor variables as possible. The best equation is usually the simplest one.

- Compromise between extremes and judgment are necessary parts of selecting the best regression equation. After completing the potential predictors list, the next step is to eliminate the independent variables that are in-appropriate. An independent variable (1) may not be essential to the problem (there must be some reasonable link between the dependent and independent variables), (2) may be a result of large measurement mistakes, (3) may replicate other independent variables, or (4) may be hard to measure precisely (exact data are unattainable or costly).

The next step is to reduce the list of predictors' to obtain the best selection of independent variables. Methods currently being used are given in the material that follows. No search method can be considered to give the best set of independent variables. Usually, there is no "best" set. The complete process for variable selection is quite subjective. The key in the automatic search process is to concentrate on the essential areas of the problem (Hank and Wichern 2008).

5. Objective of the Study

The objective of this study is to implement comparative research to define the effects of different factors on the unemployment rate in the Kingdom of Saudi Arabia.

6. Data and Methodology

A multiple regression analysis was used to discover the relationship between Domestic Investment, Foreign Investment, Gross Domestic Product (GDP), Saudi Population Growth, Average

Individual Income, Number of Industries, Inflation Rate, Bachelor Graduates, Intermediate Diploma Graduates and High Diploma Graduates. For the purpose of the sample, annual data were collected from the Central Department of Statistics and Information of Saudi Arabia, the Ministry of Labor website, World Bank website for the period of 1999 to 2013 and from some expertise. The unemployment rate is used as a dependent variable, and Domestic Investment, Foreign Investment, Gross Domestic Product (GDP), Saudi Population Growth, Average Individual Income, Number of Industries, Inflation Rate, Bachelor

Graduates, Intermediate Diploma Graduates and High Diploma Graduates are used as independent variables.

7. Data Normalization and Standardization

Due to the large difference in scale between the factors influencing the unemployment rate in the Kingdom of Saudi Arabia, mean normalization was used. This method is applied by obtaining the mean and the standard deviation of the original data. Then, subtracting the original value of the data with the mean. Finally, dividing by the standard deviation. The following **Table 2** shows the normalized data.

Table 2: Normalized Data

Year	Unemployment Rate for the Saudis	Domestic Investment	Foreign Investment	Gross Domestic Product (GDP)	Saudi Population Growth	Average Individual Income	Number of Industries	Inflation Rate	Bachelor Graduates	Higher Diploma Graduates	Intermediate Diploma Graduates
1999	-1.68092	-1.50484	-0.08173	-0.77305	-1.50824	-1.20852	-1.09768	-1.20133	-1.34177	-0.69853	-1.0941
2000	-1.64621	-1.48266	0.93521	-0.73838	-1.31202	-1.01993	-0.97886	-1.13129	-1.00416	-0.62337	-0.7802
2001	-1.51431	-0.97951	0.20838	-0.73122	-1.11093	-1.09862	-0.86120	-1.12737	-0.93439	-0.65798	-1.0767
2002	-0.59795	-0.89189	-0.93022	-0.73061	-0.90485	-1.09063	-0.72374	-0.70549	-0.80085	-0.68666	-0.5230
2003	-0.11894	-0.73229	-0.72434	-0.67328	-0.69365	-0.93123	-0.61889	-0.59344	-0.82572	-0.64760	-0.3154
2004	0.33230	-0.46799	-0.98014	-0.63091	-0.47671	-0.64556	-0.52570	-0.67421	-0.45828	-0.62905	-0.1255
2005	0.69329	2.11941	0.72933	-0.58398	-0.25404	-0.22147	-0.41969	-0.53805	-0.30264	-0.59023	-0.5928
2006	1.02651	0.14460	1.18165	-0.55588	-0.02820	0.03059	-0.30902	-0.08422	-0.16429	-0.57688	-0.5021
2007	0.33230	0.81899	1.94592	-0.52536	0.20043	0.20492	-0.12729	0.53206	0.15153	-0.16152	-1.4959
2008	-0.50076	0.14169	-1.68825	-0.48267	0.43073	0.77773	0.05910	2.32309	-0.19750	-0.56600	0.8428
2009	-0.01481	0.60994	-1.11115	0.42984	0.66291	0.11111	0.28277	0.81420	0.27688	0.06817	1.8684
2010	0.47114	0.62085	0.41426	0.86403	0.89654	0.60635	0.51226	0.90108	0.71028	0.21157	0.9547
2011	1.30419	0.26057	-0.40927	1.49810	1.13110	1.34255	0.67885	1.05205	1.48618	1.73187	0.9126
2012	1.09593	0.45253	-0.22211	1.78448	1.36603	1.59538	1.68186	0.12901	1.60627	1.85129	0.9356
2013	0.81825	0.89061	0.73245	1.84888	1.60088	1.54736	2.44722	0.32391	1.79847	1.97491	0.9918

8. Regression Analysis:

8.1 Multiple Regression model I:

The regression model is obtained as:

Unemployment Rate in Saudi Arabia = - 0.000 - 0.042 Domestic Investment - 0.254 Foreign Investment

- 1.05 Gross Domestic Product (GDP) + 2.71 Saudi Population Growth + 0.623 Average Individual Income - 1.25 Number of Industries - 1.17 Inflation Rate + 0.67 Bachelor Graduates - 0.07 Higher Diploma Graduates - 0.146 Intermediate Diploma Graduates

Table 3: Regression Statistics for Model I

Predictor	Coefficient	Standard Error Coefficient	t	t _{α/2,4}	p
Constant	-0.0000	0.1288	-0.00	2.776	1.000
Domestic Investment	-0.0419	0.2806	-0.15		0.889
Foreign Investment	-0.2538	0.2608	-0.97		0.386
Gross Domestic Product (GDP)	-1.050	1.129	-0.93		0.405
Saudi Population Growth	2.707	2.245	1.21		0.294
Average Individual Income	.6228	0.8055	0.77		0.483
Number of Industries	1.2489	0.6881	-1.82		0.144
Inflation Rate	1.1745	0.5398	-2.18		0.095
Bachelor Graduates	0.669	2.243	0.30		0.780
Higher Diploma Graduates	-0.067	1.259	-0.05		0.960
Intermediate Diploma Graduates	-0.1456	0.5341	-0.27		0.799
S = 0.498739		R-Sq = 92.9%		R-Sq (adj) = 75.1%	

Table 3 shows that all of the factors have P-values greater than 0.05 and $|t| < t_{\alpha/2,5}$, which means the factors are insignificant. Additionally, the “t” test indicates that the sample mean are not different from each other.

The R^2 value is 92.9%, as shown in the same table. The R^2 value indicates that 92.9% of the variability in the response variable “Unemployment Rate” is explained by the model.

Table 4: ANOVA for Regression Model I

Source	Sum of Square	Degree of Freedom	Mean Square	F-Ratio	$F_{0.05,10,4}$	P-Value
Regression	13.0050	10	1.3005	5.23	5.96	0.063
Residual Error	0.9950	4	0.2487			
Total	14.0000	14				

Table 4: Hypothesis Test for a Significance, Regression Model I

H_0 : all $\beta_i = 0$ (no linear relationship)

H_1 : $\beta_i \neq 0$ (linear relationship exists “at least one $\beta_i \neq 0$ ”)

Level of significance = $\alpha = 0.05$

F-Ratio = 5.23

$F_{\alpha, df1, df2} = F_{\alpha, k, n-k-1} = F_{0.05, 10, 4} = 5.96$

Accept the null hypothesis the F_{Critical} is greater than the F_{Ratio} and the P-value is 0.063 which is greater than 0.05. Therefore, the regression model is found to be insignificant. This is because all ten variables were considered for the analysis and the model is under

stress. Consequently, “t” test was repeated after removing the variable which is having the lowest “t” value and highest P-value which is “**Higher Diploma Graduates**” in this model.

8.2 Multiple Regression model II:

The regression model is obtained as:

Unemployment Rate in Saudi Arabia = - 0.000 - 0.042 Domestic Investment- 0.248 Foreign Investment- 1.08 Gross Domestic Product (GDP) +2.78 Saudi Population Growth+ 0.616 Average Individual Income - 1.27 Number of Industries- 1.18 Inflation Rate + 0.59 Bachelor Graduates - 0.138 Intermediate Diploma Graduates.

Table 5: Regression Statistics for Model II

Predictor	Coefficient	Standard Error Coefficient	t	$t_{\alpha/2,5}$	p
Constant	0.0000	0.1152	-0.00	2.571	1.000
Domestic Investment	-0.0418	0.2510	-0.17		0.874
Foreign Investment	-0.2479	0.2113	-1.17		0.294
Gross Domestic Product (GDP)	-1.0844	0.8268	-1.31		0.247
Saudi Population Growth	2.779	1.608	1.73		0.145
Average Individual Income	0.6158	0.7112	0.87		0.426
Number of Industries	-1.2656	0.5480	-2.31		0.069
Inflation Rate	-1.1821	0.4655	-2.58		0.049
Bachelor Graduates	0.591	1.515	0.39		0.712
Intermediate Diploma Graduates	-0.1379	0.4599	-0.30		0.776
S = 0.446243	R-Sq = 92.9%		R-Sq(adj) = 80.1%		

Table 5 shows that Domestic Investment, Foreign Investment, Gross Domestic Product (GDP), Saudi Population Growth, Average Individual Income, Number of Industries, Bachelor Graduates and Intermediate Diploma Graduates are insignificant because their P-values are greater than 0.05 and $|t| < t_{\alpha/2,5}$. The only significant variable is Inflation Rate is which having P-value of 0.049 which is less than 0.05

and $|t| > t_{\alpha/2,5}$. Therefore the model is significant. The contribution of the factors on the variability of the response variable is to be checked with R^2 value. The R^2 value is obtained as 92.9% as shown in the same table. The R^2 value indicates that 92.9% of the variability in the response variable “Unemployment Rate” is explained by the model.

Table 6: ANOVA for Regression Model I

Source	Sum of Square	Degree of Freedom	Mean Square	F-Ratio	F _{.05, 9, 5}	P-Value
Regression	13.0043	9	1.4449	7.26	7.26	.021
Residual Error	0.9957	5	.1991			
Total	14.0000	14				

Table 6: Hypothesis Test for a Significance, Regression Model II

H_0 : all $\beta_i = 0$ (no linear relationship)

H_1 : $\beta_i \neq 0$ (linear relationship exists “at least one $\beta_i \neq 0$ ”)

Level of significance = $\alpha = .05$

F-Ratio = 7.26

$F_{\alpha, df1, df2} = F_{\alpha, k, n-k-1} = F_{.05, 9, 5} = 4.77$

The null hypothesis is rejected because F_{Ratio} is greater than F_{Critical} and the P-value is 0.021 which is less than 0.05. Therefore, at least one β_i is not equal to zero. Consequently, the third regression model was

tried after removing “Domestic Investment” which was the most insignificant and has the lowest “t” = 0.17 and the largest P-value 0.874.

By applying the same method several times, the final regression model, model VII, was obtained.

8.3 Multiple Regression model VII Using “t” test:

The regression model is obtained as:

Unemployment Rate in Saudi Arabia = - 0.000 - 0.649 Gross Product Domestic (GPD) + 3.08 Saudi Population Growth - 1.08 Number of Factories - 0.951 Inflation Rate.

Table 7: Regression Statistics for Model VII

Predictor	Coefficient	Standard Error Coefficient	t	$t_{\alpha/2, 10}$	P
Constant	-0.0000	0.1062	-0.00	2.228	.000
Gross Domestic Product (GDP)	-0.6493	0.3296	-1.97		0.077
Saudi Population Growth	3.0775	0.5284	5.82		0.000
Number of Industries	-1.0768	0.4162	-2.59		0.027
Inflation Rate	-0.9507	0.2318	-4.10		0.002
S = 0.411295		R-Sq = 87.9%		R-Sq(adj) = 83.1%	

The R^2 value is obtained as 87.9% as shown in Table 7. The R^2 value indicates that 87.9% of the variability in the response variable “Unemployment Rate in the Kingdom of Saudi Arabia” is explained by the model.

The P-value indicates that all of the variables in the model except for Gross Domestic Product (GDP)

are highly significant. The P-value of (GDP) is very close to 0.05 if $\alpha = 0.01$ the (GDP) is also will be significant.

Thus, the model factors are significant on the unemployment rate. However, (GDP) does not show significance at $\alpha = 0.05$.

Table 8: ANOVA for Regression Model VII

Source	Sum of Square	Degree of Freedom	Mean Square	F-Ratio	F _{.05, 4, 10}	P-Value
Regression	12.3084	4	3.0771	18.19	3.48	0.000
Residual Error	1.6916	10	0.1692			
Total	14.0000	14				

Table 8: Hypothesis Test for a Significance, Regression Model VII H_0 : all $\beta_i = 0$ (no linear relationship) H_1 : $\beta_i \neq 0$ (linear relationship exists "at least one $\beta_i \neq 0$ ")Level of significance $\alpha = .05$

F-Ratio = 18.19

 $F_{\alpha, df1, df2} = F_{\alpha, k, n-k-1} = F_{.05, 4, 10} = 3.48$

The null hypothesis is rejected because F_{Ratio} is greater than F_{Critical} and the P-value is 0.001 which is less than 0.05. Therefore, there is at least one β_i not equal to zero. The model is highly significant $F = 18.19 > F_{\text{Critical}} = 3.48$ and it has a very low p-value = 0.000.

However, it can be observed that the variable GDP has very low effect since $p = 0.077$. If this variable removed only 3 variables Saudi Population Growth, Number of Industries and Inflation Rate remains in the model which are most significant factors.

Best Subsets Regression Analysis

Best Subsets Regression: Unemployment Rate in the Kingdom of Saudi Arabia versus Domestic Investment, Foreign Investment, Gross Domestic Product (GDP), Saudi Population Growth, Average Individual Income, Number of Industries, Inflation Rate, Bachelor Graduates, Higher Diploma Graduates and Intermediate Diploma Graduates.

Table 9: Shows the Number of Occurrences of the Independent Variables

Variables	R-Sq	R-Sq adjusted	Domestic Investment	Foreign Investment	Gross Domestic Product (GDP)	Saudi Population Growth	Average Individual Income	Number of Industries	Inflation Rate	Bachelor Graduates	Higher Diploma Graduates	Intermediate Diploma Graduates
1	63.8	61.0				X						
1	62.0	59.0								X		
2	76.7	72.8			X					X		
2	74.5	70.2								X	X	
3	83.2	78.7				X		X	X			
3	79.9	74.4							X	X	X	
4	87.9	83.1			X	X		X	X			
4	85.5	79.7				X		X	X			X
5	90.0	84.4			X	X	X	X	X			
5	89.9	84.3			X	X		X	X		X	
6	91.9	85.8		X	X	X	X	X	X			
6	91.5	85.2		X	X	X		X	X	X		
7	92.7	85.4		X	X	X	X	X	X	X		
7	92.6	85.2		X	X	X	X	X	X			X
8	92.8	83.3		X	X	X	X	X	X	X		X
8	92.8	83.1	X	X	X	X	X	X	X	X		
9	92.9	80.1	X	X	X	X	X	X	X	X		X
9	92.9	80.0		X	X	X	X	X	X	X	X	X
10	92.9	75.1	X	X	X	X	X	X	X	X	X	X

Figure 3 represents the number of occurrences of the independent variables in the subsets of this model. It can be clearly observed that Saudi Population Growth occurred (15) times, Inflation Rate occurred (15) times, number of industries occurred (14) times and GDP occurred (13) times. Thus, it can be safely concluded that the best combination of variables is obtained with Model VII.

Conclusion

This research investigates the impact of different variables on the unemployment rate in the Kingdom of Saudi Arabia. To satisfy this research sample data were collected from 1999 to 2013. A multiple regression analysis was used to test the significance of the data.

The selected factors are Domestic Investment, Foreign Investment, Gross Domestic Product (GDP), Saudi Population Growth, Average Individual Income, Number of Industries, Inflation Rate, Bachelor Graduates, Intermediate Diploma Graduates and High Diploma Graduates. The unemployment rate is used as a dependent variable, while remaining variables are used as independent variables. The results of the regression analysis showed a significant impact of four variables Saudi Population Growth, GDP, Number of Industries and Inflation Rate. GDP Number of Industries and Inflation Rate showed a negative impact on the unemployment rate and Saudi Population Growth revealed as a positive relationship with the unemployment rate.

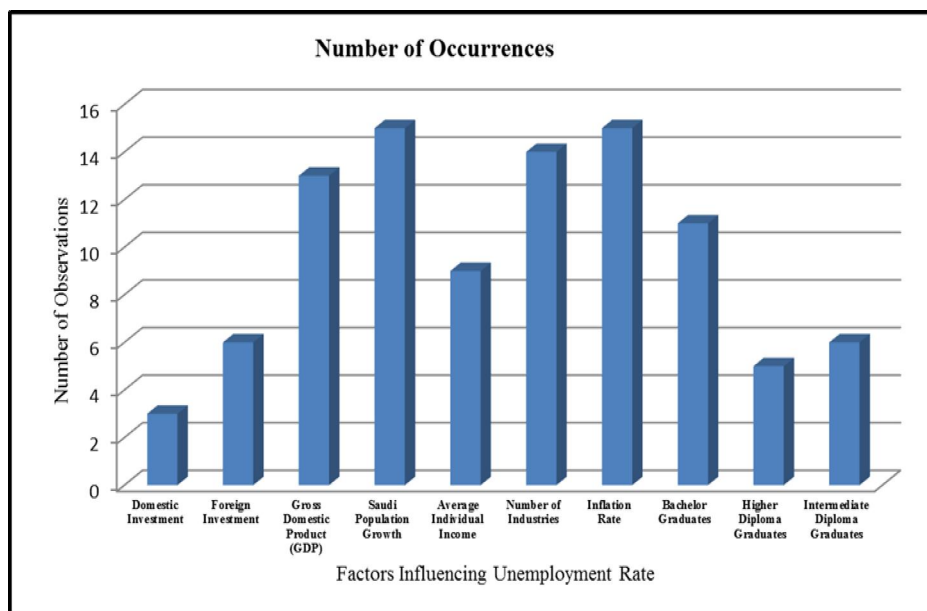


Figure 3: Number of Occurrences of the Independent Variables in the Subsets

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