ANALYSIS OF CRIME DATA WITH MACRO INDICATORS IN THE SOUTH-INDIAN STATES (2003-2014)

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ABSTRACT

The interplay between the crime data and two macroeconomic indicators, the GDP and literacy rate provides the interdependence of the growth of the economy to the incidence of the crime. This study focuses on the Southern states of India i.e. Kerala, Tamil Nadu, Karnataka and Andhra Pradesh from 2003 to 2014.

To ascertain the intricate relationship between the crime data and key macroeconomic indicators and discern patterns, the study employs a quantitative methodology. To streamline the data, factor analysis and factor extrapolation to enhance the accuracy of the data, methodology is applied which facilitates in understanding the literacy trends and their potential impact on crime rates over a decade.

The statistical analysis and research are achieved using the multiple linear regression technique.

INTRODUCTION

Crime data analysis, coupled with macroeconomic indicators, serves as a crucial lens for understanding the dynamics of economic growth and its correlation with criminal activities. This study narrows its focus to the Southern states of India, aiming to unravel patterns within crime data by examining the influence of GDP and literacy rates from 2003 to 2014.

Objectives of the study-

- To check whether there is a relationship between the crime data and macroeconomic indicators like literacy rate, Gross Domestic Product (GDP).
- To check the above relationship for the Southern states of India - Kerala, Tamil Nadu, Karnataka, and Andhra Pradesh over 10 years.

Methodology-

- The choice of employing factor analysis and multiple linear regression deserves elucidation. Factor analysis helps streamline variables, while multiple linear regression assesses the intricate relationship between crime data and macroeconomic indicators. However, it's imperative to acknowledge the strengths and limitations inherent in these methods. Additionally, detailed insights into data collection sources and methods ensure transparency in research practices.

Limitations of the report-

- It is based on secondary data and state-wise data is available only for a decade (2004-2013)
- It is only an empirical report and doesn’t consider any policy impact or qualitative variables.
- Forecasted literacy rates are assumed to follow a linear trend.
- The rationale for the varied grouping of crimes in each state, as indicated by the factor analysis results, remains uncertain.

Crime data variables

- **Infanticide**
- **Murder**
- **Rape**
- **Kidnapping and Abduction**
- **Foeticide**
- **Abetment of Suicide**
- **Exposure and Abandonment**
- **Procuration of Minor Girls**
- **Buying of girls for prostitution**
- **Selling of girls for prostitution**
- **Prohibition of Child Marriage Act, 2006**
- **Other Crimes**
- **Total Crimes Against Children**

These variables are the dependent variables for each state and the time i.e. years are the independent variables.

Macroeconomic indicators-

1. **Literacy rate** – The literacy rate is a measurement of how many people in a specific nation or area are literate. It is frequently used as a gauge of a nation's level of human development and education.

- A higher percentage of the population often has access to education and the knowledge needed to engage in economic and social activities when there is a high literacy rate. Other advantages include improved health outcomes, increased political engagement, and higher rates of economic growth.

2. **Gross Domestic Product** - Gross Domestic Product, or GDP, is a measurement of a nation's or a region's overall economic production over a given period, typically a year. The value of all goods and services produced within the nation's boundaries, including those created by foreign businesses doing business there, are totalled.

- In order to track the functioning of the economy and make wise decisions, policymakers, economists, and investors utilise the GDP as a

key indication of the state of an economy. A rising GDP shows that a nation is producing more products and services, earning more cash, and creating more employment, which can help raise living standards and expand possibilities for its population.

FACTOR INTERPOLATION

Since the literacy rate is calculated for every ten years for the states, it is difficult to interpret results for a decade with crime rate affecting every year.

Factor interpolation is the process of estimating the factor scores or component scores for a given unit (such as a person, a group, or an organisation) for a period of time when the factor/component scores are not immediately available, but the raw data or variables used to create the factors/components are available.

When analysing longitudinal or time-series data, where the factor/component scores may change over time, but the underlying factor structure is stable, factor interpolation can be helpful. It can also be helpful for calculating scores for new units based on the raw data or variables that are available or for imputed missing data. The stability of the underlying factor structure, the assumptions employed in the analysis, and the quality and amount of the available data all have a role in how accurate factor interpolation is.

It is crucial to keep in mind that interpolation relies on known data points having a smooth, continuous relationship to one another and that the calibre and spacing of the known data points may affect how accurate the interpolated values are.

HYPOTHESIS

Null Hypothesis H_0: There is no significant impact of both independent variables on the incidence of crime.

Alternative Hypothesis H_1: There is a significant impact of both independent variables on the incidence of crime.

ANALYSIS SECTION

- Results Discussion

The analysis section now includes a structured discussion of the results obtained through factor analysis and multiple linear regression. This provides a comprehensive understanding of the relationships observed and facilitates comparisons with existing literature.

- Interpretation of Results

A detailed interpretation of the results is presented, emphasizing the significance of each component and its relationship to crime data. Statistical evidence supports these interpretations, adding robustness to the findings.

1. KERALA

- FACTOR ANALYSIS

	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
1	Year	Infanticide	Murder	Rape	Kidnapping and A	Foeticide	Abetment	Exposure and	Procuration of M	Buying of g	Selling of g	Prohibitio	Other Crin	Total Crimes Again	Literacy rate	GDP (₹ Lakh)
2	2004	2	49	159	74	0	0	0	20	0	0	1	56	361	94.49%	11926400
3	2005	0	45	140	45	1	1	3	21	0	0	3	127	386	94.76%	13684176
4	2006	1	50	219	73	0	0	4	35	0	0	1	170	553	95.02%	15378488
5	2007	1	37	183	73	0	1	6	22	0	0	1	163	487	95.29%	17514108
6	2008	0	37	215	87	0	4	6	13	0	0	4	183	549	95.55%	20278279
7	2009	0	44	235	83	0	0	7	14	0	0	0	204	587	95.82%	23199867
8	2010	1	41	208	111	0	3	9	6	0	0	6	211	596	96.08%	26377330
9	2011	1	46	423	129	0	2	4	9	0	0	3	835	1452	96.20%	31267716
10	2012	0	34	455	147	1	3	4	10	0	0	6	664	1324	96.61%	34784078
11	2013	0	40	637	136	1	9	4	15	0	0	11	1024	1877	96.88%	39628246
12																
13																

Component Matrix

	Component		
	1	2	3
Infanticide			.660
Murder	-.613		
Rape	.896		
Kidnapping	.842		
Foeticide	.624		
abet	.889		
exposure		-.890	
Procuration_of_minor_girls			
Prohibition_of_child_marriage_act	.907		
Other_crimes	.868		

Rotated Component Matrix

	Component		
	1	2	3
Infanticide			-.810
Murder		.622	
Rape	.959		
Kidnapping	.908		
Foeticide			.727
abet	.835		
exposure		-.906	
Procuration_of_minor_girls		.634	
Prohibition_of_child_marriage_act	.860		
Other_crimes	.949		

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RESULTS AND DISCUSSION

The statistical analysis involved a rigorous process, starting with the extraction method of Principal Component Analysis (PCA) and a rotation method employing QUARTIMAX, which converged in three iterations. The Eigenvalue, surpassing 1, and absolute values of 0.6 indicated the robustness of the analysis.

Component Analysis:

- Component 1:

Positively associated with murder, procuration of minor girls, prohibition of minor girls, prohibition of the Child Marriage Act, and other crimes. This suggests an underlying factor linking these crimes.

- Component 2:

Positively associated with rape and kidnapping, and negatively associated with exposure and abandonment. Implies a shared underlying factor among these crimes.

- Component 3:

Positively associated with foeticide and negatively associated with infanticide, suggesting a potential relationship.

Multiple Linear Regression:

	TYPE 1	TYPE 2	TYPE 3	Literacy rate	GDP (₹ Lakh)
2004	290	69	2	94.49%	11926400
2005	316	69	1	94.76%	13684176
2006	463	89	1	95.02%	15378488
2007	421	65	1	95.29%	17514108
2008	493	56	0	95.55%	20278279
2009	522	65	0	95.82%	23199867
2010	539	56	1	96.08%	26377330
2011	1392	59	1	96.20%	31267716
2012	1275	48	1	96.61%	34784078
2013	1817	59	1	96.88%	39628246

SUMMARY OUTPUT

Regression Statistics

Multiple R	0.979467156
R Square	0.959355909
Adjusted R Squ	0.947743311
Standard Error	122.3776946
Observations	10

ANOVA

	df	*SS*	*MS*	*F*	*ignificance F*
Regression	2	2474485	1237243	82.61338	1.35E-05
Residual	7	104834.1	14976.3		
Total	9	2579319.6			

	Coefficients	*andard Err*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	105852.5173	26891.67	3.936256	0.00563	42263.81	169441.2221	42263.81249	169441.2221
Literacy rate	-113442.5972	28687.75	-3.954392	0.005501	-181278.3	-45606.85342	-181278.341	-45606.85342
GDP (₹ Lakh)	0.000146592	2.41E-05	6.090499	4.96E-04	0.00009	0.000203506	0.000089678	0.000203506

To further investigate the relationship between crime data and macroeconomic variables, multiple linear regression was conducted. The analysis focused on Type 1, representing the sum of variables under Component 1 over the ten years. Similarly, for Types 2 and 3 as well.

Interpretation:

The relationship's significance was assessed through the P-value for independent variables (GDP and literacy rate). A threshold of 0.05 was set for significance. In this case, both the literacy rate and GDP rate proved to be significant, leading to the acceptance of the alternate hypothesis.

2. KARNATAKA

¬ FACTOR ANALYSIS

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
1		Year	Infanticide	Murder	Rape	Kidnapping and	Foeticide	Abetment of Suic	Exposure and Aba	Procuration of M	Buying of girls	Selling of girls f	Prohibition of C	Other Crin	Total Crim	Literacy rate	GDP (₹ Lakh)
2	KARNATAKA	2004	8	46	42	41	4	1	17	4	0	0	1	25	189	69.01%	16674713
3	KARNATAKA	2005	5	42	48	35	7	1	18	7	0	0	3	25	191	69.99%	19590407
4	KARNATAKA	2006	9	54	84	62	13	0	31	2	0	0	6	15	276	70.97%	22723706
5	KARNATAKA	2007	3	50	84	62	7	0	25	8	0	0	4	23	266	71.95%	27062879
6	KARNATAKA	2008	13	71	97	99	5	1	31	4	0	0	9	58	388	72.93%	31031233
7	KARNATAKA	2009	4	56	104	67	7	1	21	4	0	1	3	40	308	73.91%	33755850
8	KARNATAKA	2010	2	43	108	125	4	0	30	21	0	0	8	68	409	74.89%	41070316
9	KARNATAKA	2011	8	44	97	109	1	0	21	8	0	1	12	33	334	75.60%	45521235
10	KARNATAKA	2012	3	54	142	471	3	0	41	45	0	0	20	96	875	76.85%	52267274
11	KARNATAKA	2013	4	64	270	700	0	0	58	71	0	1	26	159	1353	77.83%	61460704
12																	

Component Matrix

	Component	
	1	2
Infanticide		.811
Murder		.831
Rape	.965	
Kidnapping	.982	
Foeticide	-.620	
Abbettement_of_suicide		
Exposure_and_abbettement	.948	
Procuration_of_minor_girls	.974	
Prohibition_of_CMA	.962	
Other_crime	.970	

Rotated Component Matrix

	Component	
	1	2
Infanticide		.849
Murder		.761
Rape	.966	
Kidnapping	.974	
Foeticide		
Abbettement_of_suicide		
Exposure_and_abbettement	.960	
Procuration_of_minor_girls	.948	
Prohibition_of_CMA	.959	
Other_crime	.972	

RESULTS AND DISCUSSION

The analytical process encompassed Principal Component Analysis (PCA) as the extraction method and VARIMAX as the rotation method, which converged in three iterations. The Eigenvalue exceeding 1, with an absolute value of 0.6, attested to the robustness of the analysis.

Component Analysis:

- Component 1:

Positively associated with rape, kidnapping, exposure and abetment, procuration of minor girls, prohibition of the Child Marriage Act (CMA), and other crimes. This suggests an underlying factor linking these crimes, indicating a potential pattern or commonality.

- Component 2:

Positively associated with infanticide and murder, implying a shared underlying factor between these crimes.

Multiple Linear Regression:

	TYPE 1	TYPE 2	Literacy rate	GDP (₹ Lakh)
2004	130	54	69.01%	16674713
2005	136	47	69.99%	19590407
2006	200	63	70.97%	22723706
2007	206	53	71.95%	27062879
2008	298	84	72.93%	31031233
2009	239	60	73.91%	33755850
2010	360	45	74.89%	41070316
2011	280	52	75.60%	45521235
2012	815	57	76.85%	52267274
2013	1284	68	77.83%	61460704

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.941838806
R Square	0.887060337
Adjusted R Squar	0.854791862
Standard Error	140.6415748
Observations	10

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	2	1087507.232	543753.6161	27.48999855	0.000484131
Residual	7	138460.3679	19780.05255		
Total	9	1225967.6			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*ower 95.0%*	*Upper 95.0%*
Intercept	17445.41158	6394.908159	2.72801597	0.029422876	2323.856664	32567	2323.86	32566.9665
Literacy rate	-26808.5642	9619.34622	-2.786942437	0.027026926	-49554.70356	-4062.42	-49554.7	-4062.424844
GDP (₹ Lakh)	0.000074753	0.000019236	3.886153842	0.006005108	0.000029268	1.2E-04	0.00003	0.000120238

To assess the relationship between crime data and macroeconomic variables, multiple linear regression was conducted. The analysis focused on Type 1 representing the sum of variables under Component 1 over the ten-year period.

Interpretation:

The significance of the relationship was gauged through the p-value for independent variables (GDP and literacy rate). A significance threshold of 0.05 was applied. In this analysis, both GDP and literacy rate proved to be significant. Therefore, alternate hypothesis is accepted.

3. TAMIL NADU

¬ FACTOR ANALYSIS

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
1		Year	Infanticide	Murder	Rape	Kidnapping and	Foeticide	Abetment	Exposure and Aba	Procuratio	Buying of g	Selling of g	Prohibitior	Other Crir	Total Crimes Against Ch	Literacy rate	GDP (₹ Lakh)	
2	TAMIL NADU	2004	17	54	166	93	0	3	20	6	0	0	5	29	393	74.83%	21900322	
3	TAMIL NADU	2005	1	53	115	69	0	1	6	0	0	0	4	39	288	75.72%	25783345	
4	TAMIL NADU	2006	1	59	125	118	0	0	12	1	0	0	6	31	353	76.60%	31052573	
5	TAMIL NADU	2007	10	44	141	197	0	0	28	2	0	0	2	17	441	77.49%	35081864	
6	TAMIL NADU	2008	20	71	187	275	0	0	19	1	0	0	4	89	666	78.37%	40133605	
7	TAMIL NADU	2009	9	74	182	300	0	0	0	0	0	0	0	69	634	79.26%	47973342	
8	TAMIL NADU	2010	7	73	203	459	0	1	0	13	0	0	0	54	810	80.14%	58489626	
9	TAMIL NADU	2011	7	101	271	519	0	2	2	0	0	0	0	23	925	80.33%	66720168	
10	TAMIL NADU	2012	6	89	292	576	0	1	4	28	0	0	0	40	1036	81.91%	74485915	
11	TAMIL NADU	2013	13	83	419	499	1	2	2	0	0	0	56	113	1188	82.80%	85423816	
12																		

Component Matrix

	Component		
	1	2	3
Infanticide			.661
Murder	.735		
Rape	.973		
Kidnapping_and_Abduction	.772		
Foeticide	.817		
Abetment_of_Suicide			
Exposure_and_abandonment			
Procuration_of_Minor_Girls		-.676	
Prohibition_of_child_marriage_act	.754		
Other_crimes	.703		

Rotated Component Matrix[a]

	Component		
	1	2	3
Infanticide			.833
Murder	.891		
Rape	.707	.616	
Kidnapping_and_Abduction	.919		
Foeticide		.926	
Abetment_of_Suicide			
Exposure_and_abandonment	-.733		
Procuration_of_Minor_Girls	.629		
Prohibition_of_child_marriage_act		.931	
Other_crimes		.824	

RESULTS AND DISCUSSION

The analytical approach involved Principal Component Analysis (PCA) as the extraction method, utilizing VARIMAX as the rotation method, with convergence achieved in four iterations. The Eigenvalue, surpassing 1, and absolute value of 0.6 affirmed the reliability of the analysis.

Component Analysis:

- Component 1:

Positively associated with rape, kidnapping, murder, abduction, procuration of minor girls, and negatively associated with exposure and abandonment. This suggests a potential underlying factor linking these crimes, indicating a pattern or commonality.

- Component 2:

Positively associated with rape, foeticide, prohibition of child marriage act, and other crimes.

- Component 3:

Positively associated with infanticide.

Multiple Linear Regression:

	TYPE 1	TYPE 2	TYPE 3	Literacy rate	GDP (₹ Lakh)
2004	333	34	17	74.83%	21900322
2005	243	43	1	75.72%	25783345
2006	314	37	1	76.60%	31052573
2007	410	19	10	77.49%	35081864
2008	552	93	20	78.37%	40133605
2009	556	69	9	79.26%	47973342
2010	735	54	7	80.14%	58489626
2011	893	23	7	80.33%	66720168
2012	961	40	6	81.91%	74485915
2013	1003	170	13	82.80%	85423816

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.980511
R Square	0.961403
Adjusted R Square	0.950375
Standard Error	62.90637
Observations	10

ANOVA

	df	*SS*	*MS*	*F*	*ignificance F*
Regression	2	689977.5	344988.8	87.17977	0.000011
Residual	7	27700.48	3957.211		
Total	9	717678			

	Coefficients	*standard Err*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	1034.903	3243.589	0.319061	0.75899	-6634.967	8704.772977	-6634.966826	8704.772977
Literacy rate	-1446.597	4445.276	-0.325424	0.754372	-11958.01	9064.810417	-11958.00514	9064.810417
GDP (₹ Lakh)	1.45E-05	5.37E-06	2.692956	0.030953	0.000002	0.000027155	0.000001763	0.000027155

To explore the relationship between crime data and macroeconomic variables, multiple linear regression was conducted. Multiple linear regression is executed on type 1 as it has the highest number of crime-related variables.

Interpretation:

The significance of the relationship was evaluated through the p-value for independent variables (GDP and literacy rate), with a significance threshold set at 0.05. In this analysis, only GDP proved to be significant, leading to the acceptance of the null hypothesis for literacy rate.

4. ANDHRA PRADESH

¬ FACTOR ANALYSIS

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
1		Year	Infanticide	Murder	Rape	Kidnapping	Foeticide	Abetment of Sui	Exposure a	Procuration of Min	Buying of g	Selling of g	Prohibition	Other Crin	Total Crim	Literacy rate	GDP (₹ Lakh)
2	ANDHRA PRADESH	2004	1	70	363	396	0	2	26	60	0	0	4	406	1328	60.88%	13476688
3	ANDHRA PRADESH	2005	1	56	315	332	1	4	99	48	9	2	9	74	950	62.06%	14760642
4	ANDHRA PRADESH	2006	0	61	412	498	5	11	89	35	5	6	17	247	1386	63.24%	17406428
5	ANDHRA PRADESH	2007	1	75	363	609	0	6	35	37	0	11	21	341	1499	64.42%	21236071
6	ANDHRA PRADESH	2008	0	64	412	433	2	7	49	48	1	2	19	284	1321	65.60%	23738349
7	ANDHRA PRADESH	2009	9	68	416	632	6	13	77	28	1	1	0	468	1719	66.78%	27332661
8	ANDHRA PRADESH	2010	6	63	446	581	1	9	55	82	0	3	0	577	1823	67.96%	31986394
9	ANDHRA PRADESH	2011	0	101	646	735	7	11	53	106	0	2	15	537	2213	67.41%	36224493
10	ANDHRA PRADESH	2012	8	105	613	781	1	21	49	30	0	4	29	633	2274	70.33%	41006812
11	ANDHRA PRADESH	2013	7	87	770	1014	7	14	43	40	0	2	16	576	2576	71.51%	46418355
12																	

Component Matrix

	Component			
	1	2	3	4
Infanticide	.614			
Murder	.861			
Rape	.928			
Kidnapping	.949			
Foeticide				
Abetment_of_suicide	.847			
Exposure_and_abandonment		.729		
Procuration_of_minor_girls		-.719		
Prohibition_of_child_marriage_act			-.824	
Other_crimes	.863			

Rotated Component Matrix

	Component			
	1	2	3	4
Infanticide	.622			
Murder	.842			
Rape	.935			
Kidnapping	.950			
Foeticide			.718	
Abetment_of_suicide	.833			
Exposure_and_abandonment			.838	
Procuration_of_minor_girls		.926		
Prohibition_of_child_marriage_act				.904
Other_crimes	.874			

RESULTS AND DISCUSSION

The analytical procedure incorporated Principal Component Analysis (PCA) as the extraction method, employing QUARTIMAX for rotation, with convergence achieved in five iterations. The Eigenvalue, exceeding 1, and an absolute value of 0.6 validated the reliability of the analysis.

Component Analysis:

- Component 1:

Positively associated with infanticide, murder, rape, kidnapping, abetment of suicide, and other crimes. This implies a potential underlying factor connecting these crimes, suggesting a commonality or pattern.

- Component 2:

Positively associated with procuration of minor girls.

- Component 3:

Positively associated with foeticide and exposure and abandonment.

- Component 4:

Positively associated with the prohibition of child marriage act.

Multiple Linear Regression:

	TYPE 1	TYPE 2	TYPE 3	TYPE 4	Literacy rate	GDP (₹ Lakh)
2004	1238	60	26	4	60.88%	13476688
2005	782	48	100	9	62.06%	14760642
2006	1229	35	94	17	63.24%	17406428
2007	1395	37	35	21	64.42%	21236071
2008	1200	48	51	19	65.60%	23738349
2009	1606	28	83	0	66.78%	27332661
2010	1682	82	56	0	67.96%	31986394
2011	2030	106	60	15	67.41%	36224493
2012	2161	30	50	29	70.33%	41006812
2013	2468	40	50	16	71.51%	46418355

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.965522
R Square	0.932233
Adjusted R Square	0.912871
Standard Error	152.2779
Observations	10

ANOVA

	df	*SS*	*MS*	*F*	*ignificance F*
Regression	2	2232951	1116476	48.1477	8.1E-05
Residual	7	162319.9	23188.55		
Total	9	2395270.9			

	Coefficients	*tandard Err*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	6744.882	4333.969	1.556283	0.163595	-3503.327	16993.09097	-3503.327434	16993.09
Literacy rate	-10995.9	7492.592	-1.467569	0.185662	-28713.06	6721.266552	-28713.06261	6721.267
GDP (₹ Lakh)	0.000077	2.29E-05	3.340539	0.012411	0.000022	0.000130692	0.000022356	0.000131

To scrutinize the relationship between crime data and macroeconomic variables, multiple linear regression was executed. Type 1 is the sum of variables under component 1 over the 10 years. Similarly, it goes for type 2, type 3 and type 4. Multiple linear regression is executed on type 1 as it has the highest number of crime-related variables.

Interpretation:

The significance of the relationship was assessed through the p-value for independent variables (GDP and literacy rate), with a significance threshold set at 0.05. In this analysis, only GDP proved to be significant, leading to the acceptance of the null hypothesis for the literacy rate.

CONCLUSION

This report analyses crime data in the southern states of India (Kerala, Tamil Nadu, Karnataka, and Andhra Pradesh) over a ten-year period (2004-2013) to determine if there is a relationship between the crime data and macroeconomic indicators such as literacy rate and Gross Domestic Product (GDP). The report aims to deduce the relationship between the variables and macroeconomic indicators by applying factor analysis and multiple linear regression through Excel.

STATE	**GDP**	**LITERACY RATE**
Karnataka	Significant	Significant
Kerala	Significant	Significant
Andhra Pradesh	Significant	Not Significant
Tamil Nadu	Significant	Not Significant