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Statistical analysis of exchange rate of Australian Dollar

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ABSTRACT

The Research Paper contains the data of the Exchange Rate of Australian Dollar from the year 2000 to 2019. The analysis has been done to understand the trend in the Exchange Rate of Australian Dollar using 3 yearly moving average and least square method. It also helps in understanding the future trends in the Exchange Rate of Australian Dollar.

Keywords— Exchange rate, Australian Dollar, Moving Average, Future trends

1. OBJECTIVE

The Research Paper contains a Statistical Analysis of the Exchange Rate of Australian Dollar using 3 yearly moving average and least square method to understand the trend. It also helps in understanding the future trends in the Exchange Rate of Australian Dollar.

2. INTRODUCTION

An exchange rate is the rate at which one currency will be exchanged for another. It is also regarded as the value of one country's currency in relation to another currency. The government has the authority to change exchange rate when needed. Exchange rates are determined in the foreign exchange market, which is open to a wide range of different types of buyers and sellers, and where currency trading is continuous. Aside from factors such as interest rates and inflation, the currency exchange rate is one of the most important determinants of a country's relative level of economic health. Exchange rates play a vital role in a country's level of trade, which is critical to most every free market economy in the world.

The Australian dollar is the currency of Australia, including its external territories: Christmas Island, Cocos (Keeling) Islands, and Norfolk Island. It is officially used as currency by three independent Pacific Island states: Kiribati, Nauru, and Tuvalu. It is legal tender in Australia. Within Australia, it is almost always abbreviated with the dollar sign (\$), with A\$ or AU\$ sometimes used to distinguish it from other dollar-denominated currencies. The \$ symbol precedes the amount. It is subdivided into 100 cents. the Australian dollar was the fifth most traded currency in world foreign exchange markets, accounting for 6.9% of the world's daily share.

Data of Australian Dollar Exchange Rate from 2000 to 2019. The data shows the Exchange Rate of Australian Dollar in different years. An extract of the data is given below.

	A	B
1	Time Serie	AUSTRALIA - AUSTRALIAN DOLLAR/US\$
2	03-01-2000	1.5172
3	04-01-2000	1.5239
4	05-01-2000	1.5267
5	06-01-2000	1.5291
6	07-01-2000	1.5272
7	10-01-2000	1.5242
8	11-01-2000	1.5209
9	12-01-2000	1.5202
10	13-01-2000	1.4954
11	14-01-2000	1.5004
12	17-01-2000	1.867
13	18-01-2000	1.506

14	19-01-2000	1.5074
15	20-01-2000	1.5002
16	21-01-2000	1.5103
17	24-01-2000	1.5281
18	25-01-2000	1.5286
19	26-01-2000	1.5373
20	27-01-2000	1.5267
21	28-01-2000	1.5962
22	31-01-2000	1.5669
23	01-02-2000	1.5835
24	02-02-2000	1.5723
25	03-02-2000	1.5657
26	04-02-2000	1.5835
27	07-02-2000	1.5775
28	08-02-2000	1.5741

3. ANALYSIS

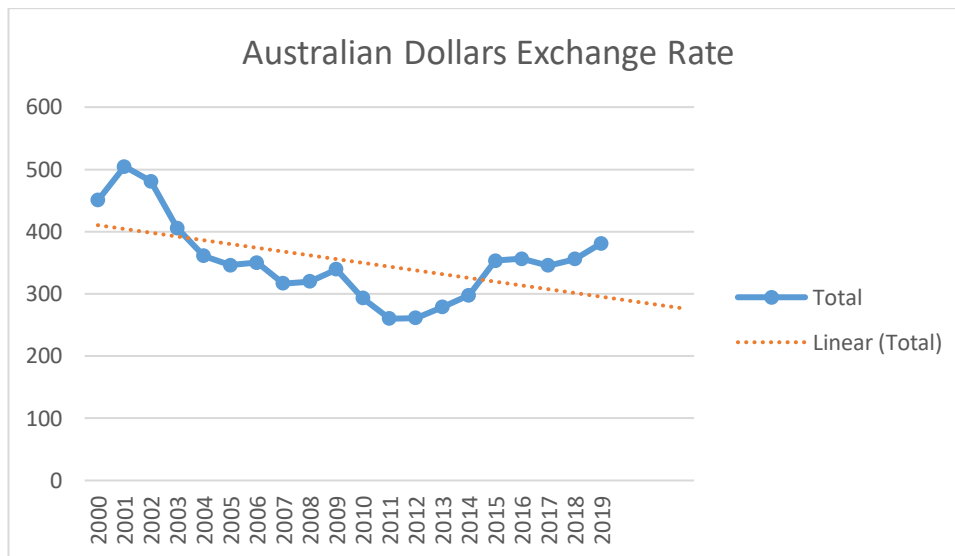
Using Least Square Method:

	A	B	D
1	Row Labels	Sum of AUSTRALIA - AUSTRALIAN DOLLAR/US	X
2	2000	450.1718	-9.5
3	2001	504.6503	-8.5
4	2002	480.8018	-7.5
5	2003	405.4288	-6.5
6	2004	360.9443	-5.5
7	2005	346.0492	-4.5
8	2006	350.102	-3.5
9	2007	316.4729	-2.5
10	2008	319.7099	-1.5
11	2009	339.368	-0.5
12	2010	293.0031	0.5
13	2011	259.9692	1.5
14	2012	261.1001	2.5
15	2013	278.7485	3.5
16	2014	297.693	4.5
17	2015	353.0072	5.5
18	2016	356.1095	6.5
19	2017	345.3316	7.5
20	2018	355.6825	8.5
21	2019	380.7078	9.5

Middle Year 2010

SUMMARY OUTPUT								
<i>Regression Statistics</i>								
Multiple R	0.537302211							
R Square	0.288693666							
Adjusted R	0.249176647							
Standard Error	57.74624736							
Observations	20							
<i>ANOVA</i>								
	df	SS	MS	F	Significance F			
Regression	1	24361.31	24361.31	7.305553	0.014562			
Residual	18	60023.32	3334.629					
Total	19	84384.63						
	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95%	Upper 95%
Intercept	352.752575	12.91245	27.31879	4.18E-16	325.6245	379.8806	325.6245	379.8806
X Variable	-6.05256534	2.239303	-2.70288	0.014562	-10.7572	-1.34796	-10.7572	-1.34796
Y = a + bX								
Y = 352.7526 - 6.05257X								

	A	B	E
1	Row Labels	Sum of AUSTRALIA - AUSTRALIAN DOLLAR/US	Trendline
2	2000	450.1718	410.2519457
3	2001	504.6503	404.1993804
4	2002	480.8018	398.146815
5	2003	405.4288	392.0942497
6	2004	360.9443	386.0416844
7	2005	346.0492	379.989119
8	2006	350.102	373.9365537
9	2007	316.4729	367.8839883
10	2008	319.7099	361.831423
11	2009	339.368	355.7788577
12	2010	293.0031	349.7262923
13	2011	259.9692	343.673727
14	2012	261.1001	337.6211617
15	2013	278.7485	331.5685963
16	2014	297.693	325.516031
17	2015	353.0072	319.4634656
18	2016	356.1095	313.4109003
19	2017	345.3316	307.358335
20	2018	355.6825	301.3057696
21	2019	380.7078	295.2532043
22	2020	Forecasted	289.2006389
23	2021		283.1480736
24	2022		277.0955083



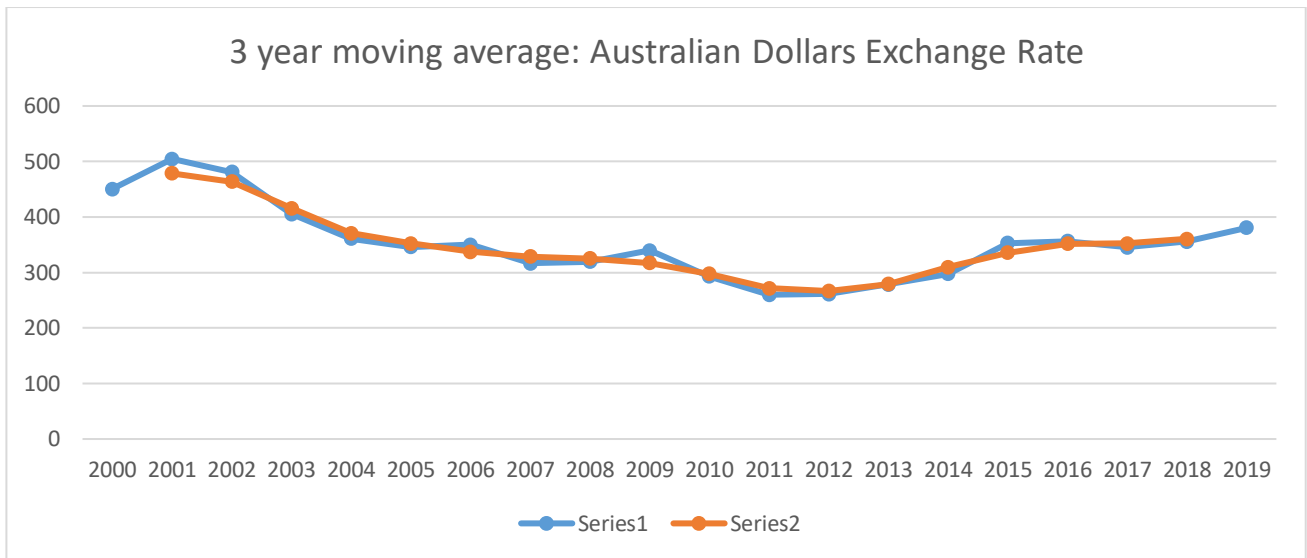
There is a falling trend in the exchange rate of Australian Dollar.

Moving Averages

Moving Averages are used to identify the current trend in health expenditure as compared to the forecast.

3-Yearly Moving Average:

	A	B	C
1	Row Labels	Sum of AUSTRALIA - AUSTRALIAN DOLLAR/US	3 year moving average
2	2000	450.1718	
3	2001	504.6503	478.5413
4	2002	480.8018	463.6269667
5	2003	405.4288	415.7249667
6	2004	360.9443	370.8074333
7	2005	346.0492	352.3651667
8	2006	350.102	337.5413667
9	2007	316.4729	328.7616
10	2008	319.7099	325.1836
11	2009	339.368	317.3603333
12	2010	293.0031	297.4467667
13	2011	259.9692	271.3574667
14	2012	261.1001	266.6059333
15	2013	278.7485	279.1805333
16	2014	297.693	309.8162333
17	2015	353.0072	335.6032333
18	2016	356.1095	351.4827667
19	2017	345.3316	352.3745333
20	2018	355.6825	360.5739667
21	2019	380.7078	



4. CONCLUSION

The analysis shows that the Exchange Rate of Australian Dollar keeps fluctuating between the years 2000 and 2019. It rises and falls through the subsequent years. However, the data depicts that there is an overall downward trend in the Exchange Rate of Australian Dollar.

5. REFERENCES

[1] <https://www.kaggle.com/brunotly/foreign-exchange-rates-per-dollar-20002019>