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Statistical analysis of exchange rate of New Zealand Dollar

Sagar Abrol

sagarabrol08@gmail.com

NMIMS Anil Surendra Modi School of Commerce, Mumbai, Maharashtra

ABSTRACT

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

Keywords— Exchange Rate, New Zealand Dollar, Regression, Moving Averages, Future Trend

1. OBJECTIVE

The Research Paper contains a Statistical Analysis of the Exchange Rate of New Zealand 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 New Zealand Dollar.

2. INTRODUCTION

An exchange rate is the price of one currency expressed in terms of another currency, or against a basket of other currencies. In a floating exchange rate regime rates are determined by the forces of demand and supply in the foreign exchange market. However, exchange rates may be pegged against another currency, or fixed to the value of gold. In which case the rate will be predetermined for a period of time, rather than constantly fluctuating over time.

The New Zealand dollar is the official currency and legal tender of New Zealand, the Cook Islands, Niue, the Ross Dependency, Tokleau, and a British territory, the Pitcairn Islands. Within New Zealand, it is almost always abbreviated with the dollar sign, with "NZ\$" sometimes used to distinguish it from other dollar-denominated currencies. In the context of currency trading, it is often informally called the "Kiwi" or "Kiwi dollar", since New Zealand is commonly associated with the kiwi and the one-dollar coin depicts the indigenous bird on its reverse.

3. DATA OF NEW ZEALAND 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.

Time Serie	NEW ZEALAND - NEW ZELAND DOLLAR/US\$
03-01-2000	1.9033
04-01-2000	1.9238
05-01-2000	1.9339
06-01-2000	1.9436
07-01-2000	1.938
10-01-2000	1.935
11-01-2000	1.9365
12-01-2000	1.9286
13-01-2000	1.9084
14-01-2000	1.9186
18-01-2000	1.9342
19-01-2000	1.9399
20-01-2000	1.9486
21-01-2000	1.9592
24-01-2000	1.9759
25-01-2000	1.9732
26-01-2000	1.9763
27-01-2000	1.9716
28-01-2000	2.0534
31-01-2000	2.019

3. ANALYSIS

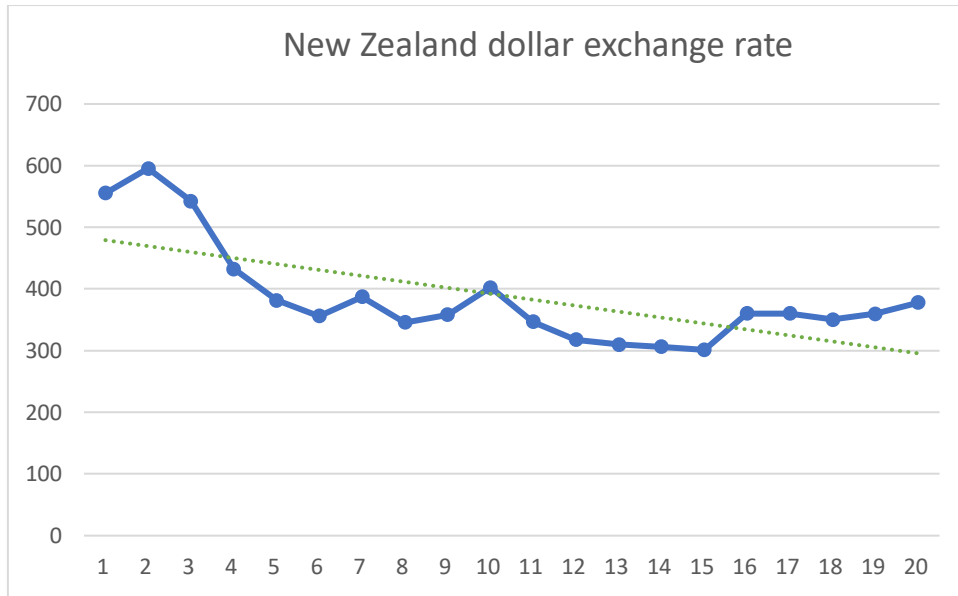
3.1 Using Least square method

B	C	D	E
year	sum of new zealand dollar	X	Y=387.387-9.66198x
2000	555.4666	-9.5	479.1761357
2001	595.4823	-8.5	469.5141562
2002	542.4747	-7.5	459.8521766
2003	432.3245	-6.5	450.1901971
2004	381.645	-5.5	440.5282175
2005	356.2649	-4.5	430.866238
2006	387.3044	-3.5	421.2042584
2007	345.5278	-2.5	411.5422789
2008	358.3996	-1.5	401.8802993
2009	402.4786	-0.5	392.2183198
2010	346.9008	0.5	382.5563402
2011	317.4921	1.5	372.8943607
2012	309.9051	2.5	363.2323811
2013	306.1644	3.5	353.5704016
2014	301.215	4.5	343.908422
2015	360.0586	5.5	334.2464425
2016	360.2542	6.5	324.5844629
2017	350.3906	7.5	314.9224834
2018	359.9251	8.5	305.2605038
2019	378.0723	9.5	295.5985243

Middle year 2009.5

SUMMARY OUTPUT									
Regression Statistics									
Multiple R	0.68659								
R Square	0.47141								
Adjusted R Square	0.44204								
Standard Error	62.1873								
Observations	20								
ANOVA									
	df	SS	MS	F	gnificance F				
Regression	1	62080.3	62080.3	16.0528	0.00083				
Residual	18	69610.7	3867.26						
Total	19	131691							
		Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept		387.387	13.9055	27.8586	3E-16	358.173	416.602	358.173	416.602
X Variable 1		-9.66198	2.41152	-4.00659	0.00083	-14.7284	-4.59556	-14.7284	-4.59556
Y=a+bx									
Y=387.387-9.66198x									

year	sum of new zealand dolla	Trendline
2000	555.4666	479.1761357
2001	595.4823	469.5141562
2002	542.4747	459.8521766
2003	432.3245	450.1901971
2004	381.645	440.5282175
2005	356.2649	430.866238
2006	387.3044	421.2042584
2007	345.5278	411.5422789
2008	358.3996	401.8802993
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2015	360.0586	334.2464425
2016	360.2542	324.5844629
2017	350.3906	314.9224834
2018	359.9251	305.2605038
2019	378.0723	295.5985243
2020	Forecasted	285.9365447
2021		276.2745652
2022		266.6125856



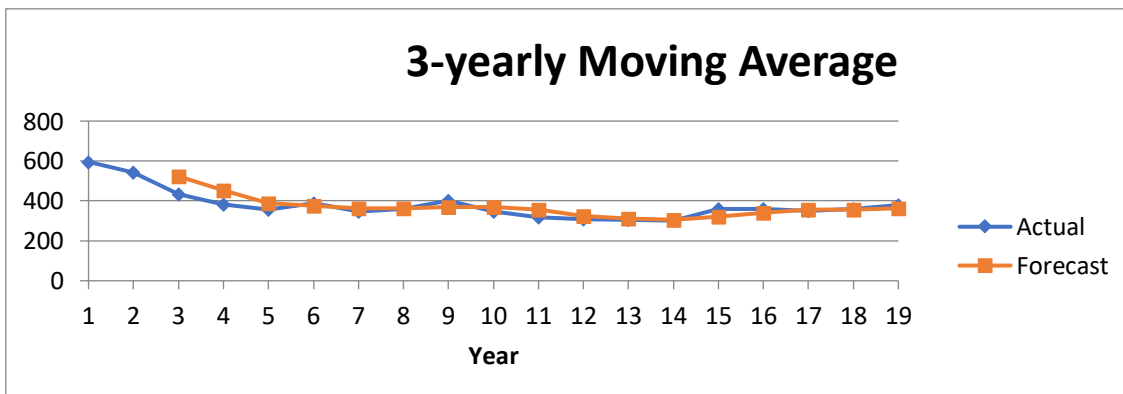
New Zealand dollar is showing a falling trend.

3.2 Moving averages

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

3-Yearly Moving Average:

Year	sum of New Zealand dollar	3-yearly Moving average
2000	555.4666	
2001	595.4823	
2002	542.4747	523.4271667
2003	432.3245	452.1480667
2004	381.645	390.0781333
2005	356.2649	375.0714333
2006	387.3044	363.0323667
2007	345.5278	363.7439333
2008	358.3996	368.802
2009	402.4786	369.2596667
2010	346.9008	355.6238333
2011	317.4921	324.766
2012	309.9051	311.1872
2013	306.1644	305.7615
2014	301.215	322.4793333
2015	360.0586	340.5092667
2016	360.2542	356.9011333
2017	350.3906	356.8566333
2018	359.9251	362.796
2019	378.0723	



4. CONCLUSION

The analysis of the Exchange Rate of New Zealand Dollar keeps fluctuating between the years 2000 and 2019. It is not stable. It rises and falls through the subsequent years. However, the data depicts that there is an overall downward trend in the Exchange Rate of New Zealand Dollar.

5. REFERENCES

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