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"Does pricing inefficiency exist among ETFs?"

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Abstract

With many developments taking place in Indian economy, stock market has also resulted in sound growth by giving better return. Some contributions of this developments are from innovative investment options such as Exchange Traded Funds (ETFs). ETFs offer two prices for investments i.e. market based price and NAV based price. Generally, market price and NAV needs to be uniform, but they are not. Hence, this paper measures the pricing efficiency of selected Exchange Traded Funds (ETFs) in India. The main objective of this paper is to analyse the whether ETFs are fairly priced or not. Pricing inefficiency exist when there is some deviation in two prices. Therefore, the study furtherinvestigates the persistence of such deviations among ETFs. The study finds that Nifty ETFs average closing prices were very close to average NAVs and the mean difference of the two series is numerically very small.For gold ETFs, the price difference is little higher than Nifty ETFs. However, this difference is not more than 0.8% of the price.For all 18 ETFs, β coefficients are closer to 1 indicating close relationship between ETF's closing price and NAV. The result also shows that on average, ETFs in India are traded at discount to its NAVs as 15 ETFs out of 18 ETFs were traded at a discount for more than 60% of trading days.

Keywords: Mutual Fund, Exchange, Exchange Traded Fund, NAV, Pricing Efficiency

The paper is divided into six sections. Section I deals with introduction & literature review, Section IIdeals with research methodology, Section III includes analysis and interpretation, Section IV covers the findings and Section V deals with the conclusion.

Section I: Introduction& Literature Review

ETF is one of the investment alternatives which have been gaining increasing popularity in India. An ETF holds assets such as stocks, commodities or bonds and it trades at a price on an exchange and also it has NAV price for investment at the end of the day. ETFs market price is influenced by the buying and selling behaviour of the investors and NAV is determined at the end of day by dividing net current market value (i.e. current value less any liability) by number of share outstanding. As ETFs market price and NAVs are affected by different set of factors, both value may deviate from each other. A positive deviation means ETF is traded at a premium and a negative deviation means ETF is traded at a discount. An economically significant and persistent deviation suggests an inefficient ETF market and provides market participant an opportunity to earn arbitrage profit. Few studies also support this statement. ETF's NAV and closing price has bi-directional relationship (Dharani et al 2016). International studies also shows that there exists small price deviation between NAV and market price (Richard et al 2011; Narat & Peter, 2013; Yvonne & Johannes, 2018). There is premium in the price deviation of US ETF (Antti 2017). There exist small price deviation and disappear within 3 days (Jiang & Feng, 2010). Indian studies also support this, there exists price deviation in the ETF and average persistence is for more than 3 days (Harsh & Nidhi, 2015; Vanita & Swati 2016). Market efficiency of gold ETF is weak form (Rupel & Anuradha, 2017). Study also show that gold ETFs are overpriced (Aravind 2015).

Section II: Research Methodology

The study is based on secondary data covering 18 ETFs listed on stock exchange. This includes 10 Gold ETFs and 8 Nifty ETFs. The information about market prices of Nifty ETF and Gold ETF are derived from NSE website. NAV prices of each ETF are taken from AMFI

website. Nifty Spot prices are collected from NSE website and Gold spot prices are collected from bullion rates website.An ETF's pricing efficiency is examined by

i. finding out rupee premium/ discount
ii. analyzing the persistence of such deviations

Rupee Deviation & Percentage Deviation: Rupee deviation and percentage (%) deviation has been calculated to further examine the pricing efficiency of ETFs. The rupee deviation, also called mispricing, is simply the difference of ETF's daily closing price and ETF's daily NAV. Rupee deviation and percentage (%) deviation has been calculated as follow:

$$RP_{diff} = P_{etf} - NAV_{etf}$$

$$\%_{diff} = \frac{P_{etf} - NAV_{etf}}{P_{etf}}$$

A simple autoregressive model can be used to analysis the persistency in ETF's deviation. The persistency in ETF's deviation can be capture by regressing deviation on day (t) against the deviation of previous day (t-1). The autoregressive model has been expressed as follows:

$$D_t = \alpha + \beta 1 D_{t-1} + \varepsilon t$$

Where, D_t = ETF's deviation on day (t),
D_{t-1} = ETF's deviation on previous day (t-1),
α = intercept,
$\beta 1$ = slop of the regression line
εt = error term

The premium/ discount series obtained is regressed against its one day lagged value to observe the persistence of such premium/ discount (Harsh & Nidhi, 2015). ADF test has been used to test the unit root or non-stationarity in the time series data, first at level, assuming intercept, trend & intercept and no trend & no intercept. The Schwarz Information Criteria (SIC) has been chosen for selecting the optimal lag length. The null hypothesis is that the series has unit-root (non-stationary).

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Section III: Analysis and Interpretation

Prior to measuring pricing Efficiency, the study first requires the analysis of relationship between ETFs closing price and NAV. Descriptive statistics and a simple linear regression have been used to analyse and capture the strength of relationship between closing price and NAV.

Table No. 1 exhibits the descriptive statistics of ETFs closing price and NAV from the date of inception to Dec 2020. The result shows that Nifty ETFs average closing prices are very close to average NAVs and the means (i.e. average closing price and average NAV) difference of the two series is numerically very small. To illustrate, Birla Nifty recorded an average closing price of Rs 90.93, average NAV Rs 90.79 and the difference is Rs 0.14. For Nippon Nifty, average closing price is Rs 540.905, average NAV is Rs 541 and mean difference is just Rs (-0.905). Other ETFs also follow the same pattern i.e. the two values are very close to each other and mean difference is numerically very small. For gold ETFs, the price difference is little higher than Nifty ETFs. However, this difference is not more than 0.8% of the price. For eg: Kotak gold average closing price is Rs 1322.38, NAV price is Rs 1322.47 and the difference is Rs (-0.09). For Axis gold average closing price is Rs 2631.09, NAV price is Rs 2648.74 and mean difference is Rs (-17.65). Thus, the analysis suggests a very close relationship between ETF's closing price and NAV for Nifty ETFs and little variation for some of the gold ETFs.

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Table No. 4.3.1 (a) Descriptive Statistics, two sample t-test for ETF's Closing Price and Net Asset Value)

Sl No	*ETFs*	*Variable*	*Obs*	*Mean*	*SD*	*Min*	*Max*	*Range*	*t-stat (p value)*
	Gold ETFs								
1	Axis Gold	Mkt Price	2491	2631.0997	681.12515	42.19	4617.45	4575.26	-0.91 (0.36)
		NAV Price	2491	2648.7494	681.31962	41.79	4353.56	4311.78	
2	Birla Gold	Mkt Price	2332	2975.7495	554.06419	2187.4	5129.05	2941.65	-1.93 (0.05)
		NAV Price	2332	3006.9187	544.87271	2194.7	5114.96	2920.26	
3	HDFC Gold	Mkt Price	2553	2865.312	562.07794	1853.9	5044.85	3190.95	0.08 (0.93)
		NAV Price	2553	2864.0225	562.86248	1863.04	4986.77	3123.73	
4	IDBI Gold	Mkt Price	2191	2997.4192	567.25359	2335	5332.15	2997.15	-2.45 (0.01)
		NAV Price	2191	3039.2365	560.11108	2384.33	5159.65	2775.33	
5	IPru Gold	Mkt Price	2505	1531.6100	1236.7842	27.5	3152.85	3125.35	-0.3 (0.75)
		NAV Price	2505	1542.3523	1243.89013	27.6	3347.93	3320.33	
6	Kotak Gold	Mkt Price	3232	1322.3819	1016.18310	222.3	3081.4	2859.1	-0.004 (0.99)
		NAV Price	3232	1322.4725	1010.71934	227.74	3246.02	3018.28	
7	Quantum	Mkt Price	3150	1266.8950	358.0347	564.55	2446.05	1881.5	-0.22 (0.82)
		NAV Price	3150	1268.9455	359.74741	542.88	2423.52	1880.64	
8	Religare Gold	Mkt Price	2563	2814.5885	616.7412	1629.06	5178.45	3549.39	-1.89 (0.05)
		NAV Price	2563	2846.8881	604.92247	1646.04	5047.09	3401.05	
9	SBI	Mkt Price	2810	2724.5568	652.14047	1459.19	5027.25	3568.06	-0.99 (0.31)
		NAV Price	2810	2741.9407	651.61015	1457.08	4992.47	3535.39	
10	UTI Gold	Mkt Price	3369	2437.3672	817.74364	862.69	5158.85	4296.16	-0.81 (0.41)
		NAV Price	3369	2453.4249	807.90281	859.55	4912.24	4052.7	
	Nifty ETFs								
11	Birla Nifty	Mkt Price	2127	90.9333	27.14336	45.44	153.82	108.38	0.16 (0.86)
		NAV Price	2127	90.7952	26.62603	45.57	153.54	107.97	
12	ICICI Nifty	Mkt Price	1849	96.0893	20.31092	52.27	148.25	95.98	0.46 (0.64)
		NAV Price	1849	95.7766	20.45629	53.47	148.42	94.96	
13	Kotak Nifty	Mkt Price	2683	503.3789	290.32865	82.09	1011.8	929.71	-0.05 (0.95)
		NAV Price	2683	504.1539	290.64045	78.92	1011.35	932.43	
14	Motilal Nifty	Mkt Price	2567	88.6263	15.83937	60.15	136.42	76.27	-1.6 (0.11)
		NAV Price	2567	89.3287	15.55755	60.44	137.36	76.92	
15	Quantum Nifty	Mkt Price	2483	759.7733	272.57241	249.66	1441	1191.34	-0.23 (0.82)
		NAV Price	2483	761.5446	272.93454	253.85	1446.54	1192.69	
16	SBI Nifty	Mkt Price	1336	102.3088	16.01817	70.01	145	74.99	0.31 (0.75)
		NAV Price	1336	102.1131	16.12777	69.94	144.97	75.03	
17	UTI Nifty	Mkt Price	1275	1049.4926	174.53632	703.25	1490	786.75	0.22 (0.82)
		NAV Price	1275	1047.9692	174.05051	701.64	1491.27	789.63	
18	Nippon Nifty	Mkt Price	4682	540.9055	329.30546	83.52	1303.4	1219.88	0.03 (0.97)
		NAV Price	4682	541.1395	329.20475	80.72	1300.31	1219.58	

Source:

Calculated by scholar using secondary data
Note: two samples t-test value and p- values are given, p-values are written in bracket.

Table No. 2 depicts the result descriptive statistics of ETFs deviation (PETF - NAVETF), which is calculated on daily basis from the date of inception to Dec 2020. Further, descriptive statistics have been calculated separately for total deviation, premium and discount. To

summarise, the descriptive statistics shows that on average, ETFs in India are traded at discount to its NAVs as 15 ETFs out of 18 ETFs were traded at a discount for more than 60% of trading days. This is similar to the findings of the earlier studies conducted in India. Earlier (Garg, 2014) observed that of the twelve ETFs, nine ETFs recorded a discount. Vanita & Swati (2016) also found that of the selected ETFs, all were traded at a discount. Furthermore, the average daily deviation between ETFs closing price & ETFs NAV varies from rupee 1.2895 to rupee –41.8173 for gold ETFs. Among them, HDFC gold shows largest average deviation (Premium) M = 1.2895 and IDBI gold shows lowest average deviation (Discount) M = -41.8173. The average daily deviation between ETFs closing price & NAV varies from rupee 1.5234 to rupee -1.7713 for Nifty ETFs. Among the, UTI Nifty shows largest average deviation (premium) M= 1.5234 and Quantum Nifty shows lowest average deviation (Discount) M= -1.7713.

Table No. 4.3.2(a) Descriptive Statisticsfor ETF's Total Deviation, Premium and Discount

Sl No	*Gold ETF*	*Deviations*	*Obs*	*% Deviation*	*Mean*	*SD*	*Min*	*Max*	*Range*
1	Axis Gold	Total	2491	100	-17.6498	68.32525	-297.35	480.51	777.86
		Premium	789	31.67	44.0496	69.0204	0.01	480.51	480.5
		Discount	1702	68.33	-46.2519	45.19429	-297.35	0.00	297.35
		Par							
2	Birla Gold	Total	2332	100	-31.1691	59.3573	-384.73	741.72	1126.45
		Premium	496	21.27	38.6514	56.85338	0.03	741.72	741.7
		Discount	1836	78.73	-50.0313	43.37835	-384.73	-0.04	384.68
		Par							
3	HDFC Gold	Total	2553	100	1.2895	61.72359	-241.87	359.44	601.31
		Premium	954	37.37	50.0941	70.45829	0.04	359.44	359.4
		Discount	1599	62.63	-27.8284	29.21086	-241.87	-0.04	241.82
		Par							
4	IDBI Gold	Total	2191	100	-41.8173	83.23169	-355.02	818.09	1173.11
		Premium	378	17.25	82.3679	98.34267	0.13	818.09	817.96
		Discount	1813	82.75	-67.7092	49.72479	-355.02	-0.07	354.95
		Par							
5	IPru Gold	Total	2505	100	-10.7423	51.48746	-302.78	287.87	590.65
		Premium	519	20.72	43.4235	68.06796	0.00	287.87	287.86
		Discount	1986	79.28	-24.8974	34.16758	-302.78	0.00	302.78
		Par							
6	Kotak Gold	Total	3232	100	-0.0906	41.11835	-223.42	307.4	530.82
		Premium	1049	32.46	27.5422	58.21526	0.00	307.4	307.39
		Discount	2183	67.54	-13.369	18.2298	-223.42	0.00	223.42
		Par							
7	Quantum	Total	3150	100	-2.0505	26.956	-128.86	161.16	290.02

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	Gold	Premium	1229	39.02	15.9694	29.22277	0.00	161.16	161.16
		Discount	1921	60.98	-13.5792	17.45636	-128.86	0.00	128.86
		Par							
8	Religare Gold	Total	2563	100	-32.2996	75.06425	-499.66	284.89	784.55
		Premium	559	21.81	44.7227	52.73627	0.06	284.89	284.83
		Discount	2004	78.19	-53.7844	65.6882	-499.66	-0.05	499.61
		Par							
9	SBI Gold	Total	2810	100	-17.3839	63.22121	-232.83	603.29	836.12
		Premium	803	28.58	42.2286	74.73476	0.02	603.29	603.27
		Discount	2007	71.42	-41.2349	37.04337	-232.83	-0.02	232.8
		Par							
10	UTI Gold	Total	3369	100	-16.0577	55.50032	-266.2	246.61	512.81
		Premium	1063	31.55	37.371	52.48226	0.02	246.61	246.59
		Discount	2306	68.45	-40.6869	36.17242	-266.2	-0.01	266.19
		Par							
	Nifty ETFs								
11	Birla Nifty	Total	2127	100	0.1381	5.61693	-13.04	21.95	34.99
		Premium	870	40.9	5.1413	5.05928	0.00	21.95	21.95
		Discount	1257	59.1	-3.3248	2.5206	-13.04	0.00	13..04
		Par							
12	ICICI Nifty	Total	1849	100	0.3128	1.5357	-3.26	18.9	22.17
		Premium	955	51.65	1.0232	1.79914	0.00	18.9	18.9
		Discount	894	48.35	-0.4461	0.55331	-3.26	0.00	3.26
		Par							
13	Kotak Nifty	Total	2683	100	-0.4356	3.1976	-20.73	31.73	52.45
		Premium	1129	42.08	1.89837	2.54398	0.00	31.73	31.73
		Discount	1554	57.92	-2.1278	2.47940	-20.73	0.00	20.73
		Par							
14	Motilal Nifty	Total	2567	100	-0.7024	1.31932	-32.98	10.62	43.6
		Premium	540	21.04	0.6559	0.91888	0.00	10.62	10.62
		Discount	2026	78.93	-1.0651	1.16445	-32.98	0.00	32.98
		Par	1	0.03					
15	Quantum Nifty	Total	2483	100	-1.7713	6.01444	-84.13	56.49	140.62
		Premium	813	32.74	3.7145	5.25622	0.00	56.49	56.49
		Discount	1670	67.25	-4.442	4.30775	-84.13	0.00	84.13
		Par	1	0.01					
16	SBI Nifty	Total	1336	100	0.1958	0.62285	-1.07	10.1	11.17
		Premium	896	67.06	0.3846	0.67843	0.00	10.1	10.1
		Discount	440	32.94	-0.1889	0.14239	-1.07	0.00	1.07
		Par							
17	UTI Nifty	Total	1275	100	1.5234	8.8592	-28.82	143.37	172.19
		Premium	732	57.41	5.2746	9.84663	0.00	143.37	143.37
		Discount	543	42.59	-3.5335	3.01566	-28.82	-0.01	28.81
		Par							
18	Nippon Nifty	Total	4682	100	-0.234	2.05124	-11.22	19.51	30.73
		Premium	1986	42.41	1.5272	1.46853	0.00	19.51	19.51
		Discount	2667	56.96	-1.5480	1.32044	-11.22	0.00	11.22
		Par	29	0.63					

Source: Calculated by scholar using secondary data

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Table No. 3 exhibits the result regression analysis. The α coefficient (intercept) represents an (approximate) average difference between ETF closing price and NAV. The analysis shows that, of the 18 ETFs, α coefficient (intercept) of 13 ETFs are negative. A negative α coefficient suggests that on average ETFs are traded at discount. However, α value of only 5 ETFs out of the 18 ETFs, found to be statistically significant. Further the persistence analysis shows that the deviations (Premium/discount) do not disappear in a single day. On average the deviations persisted for 3 days, with minimum persistence of 2 days and maximum persistence of 6 days. For only one ETF (SBI Nifty), the β (slope) coefficient was insignificant at second lag, implying that deviation takes two days to disappear. For four gold ETFs (Axis, Quantum, Religare, SBI) and two Nifty ETFs (Birla, ICICI) the β (slope) coefficient was insignificant at third lag, implying that deviation takes three days to disappear. For three gold ETFs (IDBI, Kotak & UTI) and two Nifty ETFs (Motilal & UTI), the β (slope) coefficient was insignificant at fourth lag, implying that deviation four days to disappear. For three gold ETFs (Birla, HDFC and IPru) and for two Nifty ETFs (Kotak & Quantum) the β (slope) coefficient was insignificant at fifth lag, implying that deviation five days to disappear. The β (slope) coefficient of Nippon Nifty was insignificant at sixth lag, implying that premium or discount was persistent for maximum number of six days.

Table No. 3 Persistency in ETF's Price Deviation

Sl No	*ETFs*	*Variable*	*α*	*Dt-1*	*Dt-2*	*Dt-3*	*Dt-4*	*Dt-5*	*Dt-6*	*R2*	*DW statastics*
	Gold ETFs										
1	Axis Gold	Co-efficient	-0.5591	0.71147	0.1178	0.0058	0.0491	0.0161	-0.0037	0.8952	1.99982
		p-value	0.2259	0.0000	0.0000	0.8153	0.0475	0.5157	0.8798		
2	Birla Gold	Co-efficient	-3.1154	0.4878	0.1855	0.0634	0.104	0.0198	1.06	0.6672	2.0004
		p-value	0.0002	0.0000	0.0000	0.0068	0.0000	0.3979	1.000		
3	HDFC Gold	Co-efficient	0.0533	0.6886	0.0891	0.0495	0.1178	0.0474	-0.0183	0.9034	2.0012
		p-value	0.8889	0.0000	0.0002	0.0405	0.0000	0.0500	0.4480		
4	IDBI Gold	Co-efficient	-2.1769	0.6029	0.1787	0.0822	0.0248	0.0303	0.0085	0.8350	1.9979
		p-value	0.0085	0.0000	0.0000	0.0012	0.3276	0.2322	0.7365		
5	IPru Gold	Co-efficient	-0.3466	0.6124	0.1397	0.1198	0.1184	0.0065	0.0472	0.9041	1.9979

		p-value	0.2901	0.0000	0.0000	0.0000	0.0000	0.7858	0.0457		
6	Kotak Gold	Co-efficient	-0.0014	0.7066	0.1109	0.1288	0.0412	0.0262	0.0137	0.9263	2.0014
		p-value	0.9943	0.0000	0.0000	0.0000	0.0584	0.229	0.5259		
7	Quantum	Co-efficient	-0.0596	0.6656	0.1742	0.0409	0.0825	0.0176	0.0195	0.9195	1.9993
		p-value	0.6641	0.0000	0.0000	0.0592	0.0001	0.4177	0.3691		
8	Religare Gold	Co-efficient	-1.435	0.4796	0.2441	0.0406	0.0865	0.0622	0.0214	0.8261	1.9999
		p-value	0.0363	0.0000	0.0000	0.071	0.0001	0.0058	0.3427		
9	SBI	Co-efficient	-0.6461	0.7259	0.1532	0.0049	0.1046	0.0774	-0.1745	0.9024	1.9989
		p-value	0.0974	0.0000	0.0000	0.8305	0.0000	0.0009	0.0000		
10	UTI Gold	Co-efficient	-0.5009	0.7619	0.0841	0.0445	0.0381	0.0194	-0.0079	0.8933	1.9977
		p-value	0.1274	0.0000	0.0001	0.0413	0.0809	0.3734	0.7159		
	Nifty ETFs										
11	Birla Nifty	Co-efficient	0.0018	0.5860	0.1481	0.0432	0.0925	0.0023	0.0196	0.8631	2.0031
		p-value	0.9686	0.0000	0.0000	0.0889	0.0003	0.9266	0.4402		
12	ICICI Nifty	Co-efficient	0.0536	0.4548	0.2389	-0.0100	0.0538	0.1127	0.0391	0.5330	1.9994
		p-value	0.0340	0.0000	0.0000	0.7020	0.0385	0.0000	0.1302		
13	Kotak Nifty	Co-efficient	-0.0853	0.3390	0.1168	0.1031	0.0622	0.0231	0.0446	0.3724	2.0046
		p-value	0.0880	0.0000	0.0000	0.0000	0.0025	0.2617	0.0292		
14	Motilal Nifty	Co-efficient	-0.1987	0.5236	-0.1464	0.1464	-0.0022	0.074	0.0399	0.3203	2.0049
		p-value	0.0000	0.0000	0.0000	0.0000	0.9241	0.0011	0.0759		
15	Quantum Nifty	Co-efficient	-0.6789	0.1261	0.1018	0.1847	0.0672	-0.0147	0.0395	0.1356	2.0009
		p-value	0.0000	0.0000	0.0000	0.0000	0.0012	0.4751	0.0526		
16	SBI Nifty	Co-efficient	0.0461	0.3293	0.0551	0.0004	0.0905	0.1678	0.1397	0.3138	1.9984
		p-value	0.0031	0.0000	0.0566	0.9894	0.0014	0.0000	0.0000		
17	UTI Nifty	Co-efficient	0.4821	0.2547	0.1991	0.0759	-0.0033	0.2534	0.0707	0.2993	2.0061
		p-value	0.0263	0.0000	0.0000	0.0097	0.9066	0.0000	0.0160		
18	Nippon Nifty	Co-efficient	-0.0499	0.3287	0.1696	0.0586	0.0499	0.0402	0.0284	0.3483	2.0046
		p-value	0.0425	0.0000	0.0000	0.0002	0.0013	0.0099	0.0677		

Source: Calculated by scholar using secondary data

Section IV: Findings

- The result shows that Quantum (under-priced) and UTI Nifty(overpriced) variation is Rs 1.5 and in all other Nifty ETFs variation is Rs 0.2 to Rs 1. Four Nifty ETFs are under priced and four Nifty ETFs are overpriced with very small differences. For gold ETFs,

the price difference is little higher than Nifty ETFs.Further, for gold ETFs the negative (discount) mean differences range from Rs (-0.09) to Rs (-41.82) and positive (premium) mean differences is Rs 1.29.The two-sample t-test result shows that of the 18 ETFs, t-values of 17 ETFs are statistically non-significant at the 5 percent level ($p > .05$) and t-value of only 1 ETFs (IDBI Gold) are statistically significant at 5 percent level ($p < .05$). Thus, with given information the study fails to reject the null hypothesis, "ETF's market price is not statistically significantly different from ETF's NAV," and ETFs market price and NAV are close to each other.

- The result shows that on average, ETFs in India are traded at discount to its NAVs as 15 ETFs out of 18 ETFs were traded at a discount for more than 60% of trading days.Furthermore, the average daily deviation between ETF's market price and ETF's NAV varies from rupee 1.2895 to rupee – 41.8173 for gold ETFs.The average daily deviation between ETF's market price and NAV varies from rupee 1.5234 to rupee -1.7713 for Nifty ETFs.
- The average premium on gold ETFs varies from Rs 15 to Rs 82. The average premium on Nifty ETFs varies from Rs 0.38 to Rs 5.1. The average discount on gold ETFs varies from Rs -13 to Rs -67. The average discount on Nifty ETFs varies from Rs -0.1889 to Rs -4.442.
- The deviations in Indian ETF market are not only significantly large but also persistence for several days. That is, on average the deviations persisted for 3 days, with minimum persistence of 2 days and maximum persistence of 6 days.

Section V: Conclusion

ETFs are innovative investment option and it has gained lot popularity amongst investors in the recent past. As the ETFs prices are available in two different markets i.e. NSE based market price and fund based NAV, the prices may not be same. So there exist price deviation among these two prices. Compare to international ETFs, price deviation is high for Indian ETFs and even it persists for a greater number of days. So, an investor while buying ETF can consider

either NAV based or price-based ETF. Because both have some variation that will reduce the cost of investment.

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