A Principal Component Approach for Measuring Investor Sentiment

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***Abstract*— Main objective of this study is to understand the sentiment effect in Sri Lankan market while developing an aggregate investor sentiment index. Even with a rich literature on the subject matter, it was understood that empirical findings relevant to Sri Lankan market are minimum. Given this context, current study attempts to test the sentiment effect over a sample period of 96 months, based on all the listed entities at Colombo Stock Exchange. The results suggest existence of sentiment at a marginal level. Upon a comprehensive analysis of number of different sentiment indicators, the study suggests four measures based on extant literature and expert advice. This paper develops a comprehensive index to measure the sentiment of the Colombo stock exchange. The index is a linear combination of four sentiment proxies whose weights are obtained via the principal component method. The study promotes sentiment-based trading rules, which are known to be profitable. The results in this paper provide useful information for investors, business-cycle researchers and academics.**

Keywords*— *Investor sentiment, Principal Component Analysis, Asset pricing

I. INTRODUCTION

Traditional asset pricing theories stand upon two basic assumptions; all investors are rational investors and the financial markets are informationally efficient [1][2]. Thereby, according to the traditional theory, in a market with a set of rational investors, the asset price demonstrates fair value of all expected future earnings [3]. It is long been understood that, the traditional asset pricing model has performed poor in predicting asset prices [4][5][6]. Especially, during the periods of market bubbles and crashes conventional theory has found less convincing. As a result, a new avenue of asset pricing emerged based on behavioral finance theories. Under behavioral finance theories scholars attempted to understand how human psychology, emotions and behavioral biasness induce investor decision making process. These studies are led with the intention of filling existing loopholes in the conventional finance theories. The notion of behavioral finance is grounded by two alternative assumptions namely; existence of irrational investors and limits to arbitrage [7]. Market mispricing is a result of speculative demand driven by varying levels of investor confidence and emotion. On the other hand, arbitrage will be costly and limited in a market with noise traders (irrational investors), because noise traders will act in accordance to their sentiment (cognitive and affection biases) which is difficult to rationalize. This will ultimately result asset prices to move away from their fundamentals.

Delong et al. [7]formally established the role of investor sentiment in financial markets based on the Noise trader risk theory. The mainstream theory argues that rational investors seek mispriced assets continuously to take advantage of arbitrage opportunities. Consequently, removing asset mispricing from the market, resulting the market prices to be equal to the present value of expected future cash flows of the asset. In contrary, sentiment-based models claim that while several investors play rationally, several other investors may not act rationally due to their inherent behavioral biasness. These noise traders are driven by their own biased expectations about the market. Given the situation, even rational investor now will not be able to take advantage of arbitrage opportunities and the asset prices will continue to deviate from their intrinsic values. According to Delong et al. [7] noise traders base their decisions on their individual sentiment.

Investor sentiment is defined as the "propensity to speculate" [8]. Brown and Cliff [9] in a different note elaborated investor sentiment as the speculator's bias. He further described sentiment as excessive optimism or pessimism. By laying the ground for sentiment studies Lee et al. [10], Finter

et al. [11], Carhart [12], Fisher and Statman [13] has contributed to the literature immensely. Even though investor sentiment is considered as one of the hot and upcoming topics in the area of behavioral finance, there is a serious gap in the existing body of knowledge due to lack of studies. Most of the sentiment studies were done specially based on US stock market [8], [9], [14]. This may be due to the vibrant nature of the market. There are less studies on frontier or South Asian markets. Most importantly, as per the authors knowledge none based on the Sri Lankan market. CSE, well known as a frontier market functions at a different dimension than those of developed markets. In addition, CSE once rated as one of the promising markets in the world by Financial Times and Bloomberg, which further proves the increasing importance of CSE as a stock market. Therefore, this study focuses at the Sri Lankan stock market with the purpose of adding to the limited number of studies on investor sentiment.

As mentioned above, sentiment studies on these small markets are limited and the existing knowledge is mainly based on the studies of developed markets. These markets are different to each other in terms of the size, activities, risk exposure and behavior. Hence, some of the variables used in developed markets may be impractical in emerging markets [15]. For example, closed end fund discount, first day IPO return and number of IPOs [8], [14] put/call ratio, change in margin borrowing position [9] dividend premium [10] will not be applicable to Sri Lankan stock market due to its inactive nature. Accordingly, this study will be significant in terms of investigating the applicability of existing sentiment proxies to the selected market. Furthermore, it attempts to introduce several new proxies to measure investor sentiment. Thirdly, current study seeks to reconfirm the pertinence of CAPM for Sri Lankan market incorporating the sentiment impact. Finally, this paper will be addressing the existing literature gap in sentiment studies with regard to Sri Lankan market as well as frontier markets.

The rest of the paper is organized as follows; section two gives an overview about the existing literature and section 3 elaborates the data and methodology adopted for the study. Section 4 and 5 are devoted to the discussion of results and conclusion respectively.

II. LITERATURE REVIEW

As stated by Baker and Wurgler [8] starting from the Great Crash (1929), Tronic boom (1960s), Nifty fifty bubble (1970s), Internet bubble (2000), Sub-prime crisis (2007) till the most recent Global financial crisis (2008-2009), markets have experienced number of market anomalies, that have challenged the classical finance theory. De Long et al. [7] through his alternative asset pricing model, investigated the behavior of not-fully-rational investors, well-known as noise traders. There are number of studies carried out to test the existence of sentiment effect in financial markets. For instance, Fisher and Statman [13] tested the Wall street for sentiment effect based on three different investor groups and reported a statistically significant sentiment effect. Lee et al. [16] by employing a GARCH model suggested that sentiment is a significant factor in explaining equity excess returns and conditional volatility in New York stock exchange. Subsequent studies by Lee, et al. [17], Cook et al. [18], Chang et al. [19] reported findings in favor of the existence of investor sentiment in most developed markets.

An extensive study carried out by Chang et al. [19] based on 38 developed and developing equity markets concluded the predictive power of sentiment proxies on stock market returns. Moreover, it stated that this predictability tends to last for at least 2 years. Findings of Chuang, Ouyang and Lo [20] provided further evidence not only about the existence of sentiment, but also about it's significant impact on the market price formation. Moreover, they say that investors tend to adjust their opinions based on the latest market information and make decisions based on their current information, while extrapolating their past experience to predict the future. Finter et al. [11] explicated a market sentiment index which explained the return spread between stocks subject to sentiment and the stocks which are not. Adding to the same, it is understood, stocks that are difficult to arbitrate and value are more sensitive to market sentiment [11].

In an eagle's view point the empirical findings provide a general concession about the investor sentiment effect on stock market returns; i.e. prevalence of sentiment in the market, and the importance of considering the same in asset pricing. Yet, an in-depth study would highlight the fact that, even though there is a sentiment effect in most markets, the perspective needs to be different specially based on the nature of the market under study. A recent study on G7 countries postulated a

significant and non-linear sentiment effect on stock returns, which changed with the different market conditions [21]. Somewhat, similar results were revealed based on Corredor et al.[22], where it concluded that sentiment effect was not uniform across countries and confirmed the role of country-specific factors in the impact of investor sentiment on stock prices.

A. Investor Sentiment in Emerging and Frontier markets

Aitken [23] suggested that institutional investors' sentiment for emerging markets plays an important role in overshooting asset prices. He discovered the fact that the total return autocorrelation of emerging stock markets increases sharply as institutional investors began to invest heavily in these markets. Contrary, Greece, a market recently downgraded from been a developed market to an emerging market, signposted negative results for the existence of sentiment in the market. Doukas and Milonas [24] reported investor sentiment as not a source of systematic risk and their findings were valid across portfolios of various sizes and mutual funds. Istanbul stock exchange was only successful in the turnover ratio as a sentiment proxy and all other proxies failed to capture the sentiment effectively [25]. Grigaliuniene and Cibulskiene [26]investigated the impact of Scandinavian market sentiment and reported a negative correlation between market sentiment and stock returns. Chuang et al. [20] tested the same hypothesis as Lee and Swaminathan [27], i.e. higher the trading volume, more optimistic is the investors (bullish sentiment) and lower the trading volume, more pessimistic is the investors (bearish sentiment) using change in trading volume as the sentiment proxy. Findings concluded that, change in trading volume can reflect the investor expectations to a certain degree in Taiwan stock market and thereby can be used as a sentiment proxy. Finally concluded the notion of sentiment of Taiwan stock market has a significant effect in determining stock prices [20].

A different study focusing on the Taiwan market consider the direct and indirect effects of sensitive factors on Taiwan stock market returns. Their findings suggested that extreme sentiment indicators play an important role in determining changes in market returns [20]. Dash and Mahakud [28] evaluates the pricing implication of aggregate market sentiment risk and investigated the impact of investor sentiment on the cross section of stock returns of Indian non-financial companies. Findings suggested that stocks are difficult to value, and arbitrage and their characteristics are significantly affected by sentiment risks. Anusakumar et al. [29] conducted a sentiment study based on 13 Asian markets, with the purpose of understanding whether local and global sentiment affected the stock price of these selected countries. Their findings show that there is a sentiment effect in the market. The results are vigorous for the company size, transaction volume, sample period, alternative proxies. Evidence found the presence of sentiment, specially within individual investors in Karachi stock exchange [30]. Liston et al. [31] investigated the Dow Jones Islamic stock index and discovered that the current bullish change in emotion is decreasing the conditional future volatility.

Jiang and Li [32] based on a sample of 293 IPOs, examined the pre-market and after-market sentiment in Hong Kong. The finding was, institutional investors play an important role in reallocating stocks in the secondary market and underwriters consider investors' sentiment when pricing IPOs before and during the after-market period. Dash [33] re-visited the issue investor sentiment as a conditioning information variable and tested a new asset pricing model. Study revealed favorable results towards the new five factor asset pricing model suggested by Dash [33]. The Indian stock market shows a significant impact of investor sentiment on stock market volatility. Further research shows that the pessimism of noise traders makes the market volatile [34]. Malaysian capital market gives a significant role for the investor sentiment [15]. Motivated by Baker and Wurglur [8], Gunathilaka et al. [15] constructed a sentiment index which consist of six proxy variables, tested the pricing implication of size, liquidity and BM ranked portfolios and concluded that small and illiquid stocks are exposed more to sentiment risk.

B. Measuring Investor Sentiment

Investor sentiment measure is two forms; bottom-up/explicit and top-down/implicit approach. Both these approaches are tested and validated extensively throughout the empirical

studies and have identified their own pros and cons. Bottom-up approach is about the mass psychology of the investors over time, using cognitive biases of individual investor psychology such as; overconfidence, representativeness, conservatism, frame dependence and mental accounting [14][35]. Diversely, top-down approach focuses on aggregate sentiment and traces its effect to market returns and individual stocks [14] while measuring investor sentiment implicitly. It believes that the true investor characteristics are too complex to describe through some realized biases [14] and overall market variables can better define changes in investor sentiment.

Baker and Wurgler [8] constructed a sentiment index based on six implied sentiment proxies; Closed-End Fund Discount (CEFD), Turnover (TURN), Number of IPOs (NIPO), First-day IPO return (RIPO), Premium for dividend paying stocks (PDPD) and Equity share in new issues (S). Following Baker and Wurgler [8], [14], Dash [33] built an index with 12 market related implied sentiment proxies ; turnover volatility ratio (TVR), share turnover velocity (STV), advance decline ratio (ADR), change in margin borrowing (CMB), the put- call ratio (PCR), fund flow (FF), cash to total assets (CTA), buy-sell imbalance ratio (BSIR), price earnings high-low difference (PEhld) and three of the existing measures proposed by Baker and Wurglur [14]. Relative Strength Index (RSI), Phycological Line Index (PLI) are few other proxies used in the existing literature [36][37]. Gunathilaka et al. [15] attempted to study the sentiment of the Malaysian market based on a sentiment index constructed with six sentiment proxies namely; advance decline ratio (ADR), turnover (TR), dividend premium (DivP), first day return on initial public offering (RIPO), change in margin finance position (CMF) and change in open interest (COI).

III. METHODOLOGY

A. Data

The study spans from January 2010 till December 2017 for 96 months. Current study employs a top-down approach to analyze the sentiment effect as bottom-up approach is much appropriate for markets dominated by individual and retail investors [34]. Hence, Sri Lanka is mostly dominated by institutional investors, top-down approach is chosen for the study. Top-down approach, also known as implicit approach, uses implied sentiment proxies for the measurement of investor sentiment and tends to generalize the finding based on the overall market data. Therein, this study will take the entire market (population) as the sample of study. Accordingly, the study sample is all the companies listed in Colombo Stock Exchange. There are 296 companies listed under 20 business sectors as of 31st December 2017. However, the sample size may slightly vary throughout the 96 months, due to new listings and de-listings of companies. Research is mainly based on secondary market data and all the data series are obtained on a monthly basis, as of the last trading day of each month. Market related information for implicit sentiment proxies are extracted mainly from the data libraries of Colombo Stock Exchange, Securities and Exchange Commission of Sri Lanka and Bloomberg. Macroeconomic data series are obtained via the official websites and data repositories of Central Bank of Sri Lanka. Secondly, the asset pricing study is also undertaken for the same time span, on a monthly basis for the information extracted from Colombo Stock Exchange.

B. Variable Description

The existing studies have established several different measures of investor sentiment. However, literature does not provide evidence regarding the exact number of sentiment proxies needed to construct an index [34] or for that matter, the specify proxies to be used for an index [8]. Given this background, current study has selected three sentiment proxies based on the literature and one possible measure based on the expert advice. Each of these will be measuring four different aspects of the market namely; market liquidity, market trend and momentum, investor confidence over the market and foreign investor sentiment. Each of these variables are further elaborated in Table I.

As CAPM suggests, excess stock returns primarily depend on the market excess return component [1]. Certain portion of the remaining unexplained excess return can be explained via several other factors, such as firm size [38], book to market value [38], liquidity premium [39] or market sentiment [15]. Hence as shown in figure 1. an aggregate sentiment index is constructed based

on the implied sentiment proxies, upon which excess returns are determined. Alternative hypothesis for each of the identified implied sentiment proxies are as follows;

H1: Turnover ratio is positively associated with investors' sentiment

H2: Advance to Decline ratio is positively associated with investors' sentiment

H3: New accounts opened is positively associated with investors' sentiment

H4: Foreign Investor sentiment is negatively associated with local investors' sentiment

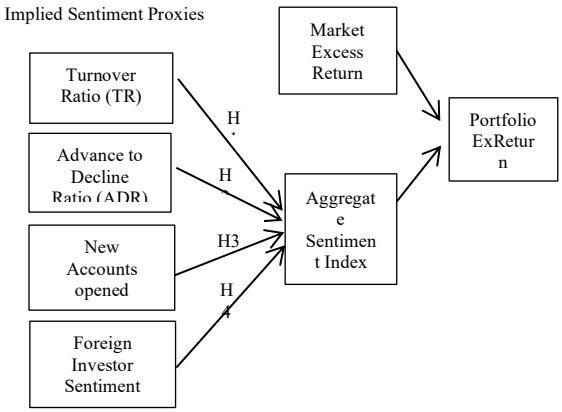

Figure I Conceptual Framework

TABLE I. VARIABLE DESCRIPTION

Variable	**Description**
Turnover Ratio (TR)	Measure the level of market liquidity $TR = \frac{Value\ of\ shares\ traded\ (Rs.)}{Market\ Capitalization\ (Rs.)}$
Advance to Decline Ratio (ADR)	Measures the depth and breadth of the market $ADR = \frac{Number\ of\ Advancing\ stocks_t}{Number\ of\ Declining\ stocks_t}$
New Accounts Opened (NACC)	Measures the investors' confidence on the market's current situation $\frac{New\ Accounts\ opened\ (No.)_t}{Moving\ Average\ Number\ of\ New\ Accounts\ for\ previous\ 5\ months}$
Foreign Investor Sentiment (FIS)	Foreign investors' trading bahaviour compared to the domestic investors $FIS = \frac{Foreign\ Equity\ Trade\ Count}{Domestic\ Equity\ Trade\ Count}$
Market Excess Return	Difference between return of the market portfolio and the risk-free interest rate.
Portfolio Excess Return	Difference between portfolio returns and risk-free interest rate.

C. Model Specifications

Construction of the investor sentiment index closely follows the index construction approach of Baker and Wurgler [8], [14], Finter et al. [11], Dash and Mahakud [28], Dash [33], Sadaqat and Butt [40]. Current study uses principal component analysis (PCA) and develop an alternative sentiment index to isolate the common component of the selected proxy measures. Sentiment indicators are partially driven by economic fundamentals [14]. Accordingly, a sentiment proxy contains two main components; rational component, which is driven by the rationally developed economic reflection and the irrational component, i.e. the remaining total sentiment which is not explained via the economic conditions [14]. Accordingly, each sentiment proxy will be regressed separately with a set of macroeconomic variables following the below model;

$$SP_{jt} = \beta_j + \beta_1 EXR_t + \beta_2 AWPLR_t + \beta_4 FIP_t + \beta_5 TS_t + e_t$$

Where, SP_{jt} is the *j*th sentiment proxy at time *t*, regressed against exchange rate (EXR), average weighted prime lending rate (AWPLR), growth in factory industrial production index (FIPG) and term spread (TS). The residual, e_t is accounted for the cleaned / orthogonalized proxy measure.

However, even after adjusting for business cycle fluctuations these proxies may still contain an idiosyncratic/ non-sentiment-related components [8]. Therefore, principal component analysis is used to isolate the common sentiment component. As per the extant literature and expert advice expected relationship between investor sentiment and the proxy measures can be formulated as follows;

$$SI_t = TR_t + ADR_t + NACC_t - FIS_t$$

The sentiment index is tested by incorporating the SI to an asset pricing model. Where, $R_{it} - R_{ft}$, is the difference between the return of the *i* th asset at time t and the risk-free rate (Excess portfolio return). R_{mt} is the return of the market portfolio at time *t* where $R_{mt} - R_{ft}$ is the excess market return. SI_t refers to the developed aggregate sentiment index at time *t*. $\propto_i$ is the intercept β_i and γ_i are the coefficients of excess market return and *SI*. e_{it} is the error term for asset *i* at time *t*.

$$R_{it} - R_{ft} = \propto_i + \beta_i(R_{mt} - R_{ft}) + \gamma_i SI_t + e_{it}$$

As the next step three equally weighted portfolios are constructed based on the illiquidity factor [41], where Portfolio 3 represents the least liquid shares (most illiquid), whereas Portfolio 1 consist of shares with highest liquidity [15]. All the stocks are ranked based on the illiquidity ratio where, ILQ_{it} refer to the illiquidity ratio of firm *i* at month *t*. R_{idt} is the return of firm *i* on day *d* in month *t*. Vol_{idt} refers to the rupee trading volume of firm *i* on day *d* in month *t*. D_{it} denotes, number of days traded by firm *i* on month *t*. The monthly portfolio returns are then calculated for each of the portfolios.

$$ILQ_{it} = \frac{1}{D_{it}} \sum_{d=1}^{idt} \frac{|R_{idt}|}{Vol_{idt}}$$

$$R_{idt} = \frac{P_d - P_{d-1}}{P_{d-1}}$$

IV. ANALYSIS AND DISCUSSION

A. Descriptive Statistics

Table II summarizes the descriptive statistics of the adjusted sentiment proxy measures and three asset portfolios. The macro adjusted sentiment proxies depict a zero mean as the residual series are normally distributed. Asset portfolios are namely; P1, P2 and P3. Where P1 consists of most liquid companies and P3 consists of least liquid companies. Within the sample period there are 241 to 296 listed companies in the Colombo Stock Exchange. Hence, one portfolio consists of approximately 95 companies on average. As per the analysis of portfolios it is understood that, the mean portfolio returns differ among the three portfolios noticeably. Whereby highest liquid portfolio showing a much larger return compared to the least liquid portfolio.

B. Aggregate Sentiment Index

It should be noted that the specified model is suggested considering the cross-correlation among variables (Refer Table III), while ensuring that the final index captures market liquidity, momentum effect, investors' confidence and foreign investor trading bahaviour. Orthogonalized series demonstrate somewhat lessened correlation between and among the other variables. Hence, it is evident that for the major part, the macroeconomic impact on these measures are removed via the orthogonalized process.

TABLE II. DESCRIPTIVE STATISTICS

	ADR$^{\perp}$	**TR$^{\perp}$**	**NACC$^{\perp}$**	**FIS$^{\perp}$**
Mean	0.000	0.000	0.000	0.000
Median	-0.519	-0.001	-0.033	-0.001
Maximum	6.262	0.013	1.135	0.021
Minimum	-2.885	-0.010	-0.645	-0.021
Std. Dev.	1.792	0.005	0.372	0.009
	P1	**P2**	**P3**	**MEXRT**
Mean	1.193	-0.468	0.218	0.001
Median	0.260	-0.750	-1.170	-0.610
Maximum	31.520	19.500	24.020	23.080
Minimum	-17.740	-18.280	-20.280	-11.860
Std. Dev.	8.040	6.991	8.172	5.277

TABLE III. CORRELATION MATRIX

Panel A	**ADR**	**TR**	**NACC**	**FIS**
ADR	1.000			
TR	0.176	1.000		
NACC	-0.004	0.307	1.000	
FIS	-0.169	-0.481	-0.192	1.000
Panel B	**ADR$^{\perp}$**	**TR$^{\perp}$**	**NACC$^{\perp}$**	**FIS$^{\perp}$**
ADR$^{\perp}$	1.000			
TR $^{\perp}$	0.246	1.000		
NACC$^{\perp}$	0.059	0.214	1.000	
FIS $^{\perp}$	-0.173	0.014	-0.131	1.000

According to Table IV, first principal component with an Eigenvalue of 1.4 explains 35% of the total variation in macro adjusted sentiment proxies. On the other hand, the first principal component results the expected relationship of all four sentiment proxies. However, the second principal component is observed with an inversion of the expected relationship in ADR and FIS. Hence, the sentiment index is defined restricted to

the factor loading of first principal component as follows;

$$SI_{1_t} = 0.566TR_t + 0.557ADR_t + 0.486NACC^{\perp}{}_t - 0.365FSI^{\perp}{}_t$$

C. Test of Sentiment Index

As per the Tabel V, CAPM is satisfactorily working for the current sample, where almost 83% to 68% of the portfolio excess returns are explained by the market excess return factor. Secondly, the sentiment index is incorporated to the CAPM framework. It is expected to have a higher explanatory power with the sentiment index. The asset pricing is conducted as an Ordinary Least Square regression, with a non-zero intercept. CAPM validity is checked with reference to the significance of the explanatory variable (Excess market return), the adjusted R^2 and the overall model fit (F statistic). Based on the findings, predictor variable (portfolio excess return) is explained via the excess market returns at a significant level under all the assets portfolios.

Asset pricing based on the proposed sentiment index has been able to explain the portfolio excess returns more than the CAPM model individually, however at a marginal level. Both the proposed index is significant at all portfolios at 1% and 10% significance levels. The resulting adjusted R^2 is marginally greater than the model excluding the sentiment index. The F statistic does not provide enough evidence towards the overall model fit. In addition, the regression is conducted with a non-zero intercept. The intercept is significant at neither including or excluding the sentiment index.

D. Findings and Discussion

Principal component analysis resulted the expected relationships between the sentiment proxy measures and the sentiment effect of the Sri Lankan market. Therein, the theoretical background can be validated. Besides, the new proxy introduced via this study seams to operate with the expected direction. Secondly, the pricing implication of the proposed model is evaluated to further validate the findings. To evaluate the validity of the results, this study compares significance of the beta coefficient, intercept and adjusted R^2. Beta factor is statistically significant for all three portfolios and depicts a positive correlation between market risk and average returns. The intercept found to be significant only in P1. In overall, intercepts are not statistically significant.

TABLE IV. PRINCIPLE COMPONENT ANALYSIS

Variable	PC 1	PC 2	PC 3	PC 4
TR⊥	0.566	0.544	0.113	-0.608
ADR⊥	0.556	-0.113	0.626	0.533
NACC⊥	0.485	0.114	-0.761	0.413
FIS⊥	-0.365	0.823	0.118	0.418
EigenV	1.416	1.015	0.939	0.628
Propotion	0.354	0.253	0.235	0.157

These results disagree with the results of Samarakoon [42], who concluded a strong negative relation between beta and market return and partially in line with the findings of Abeysekara and Nimal [43]. However, the current study employs a liquidity as the portfolio construction factor, whereas Abeysekara and Nimal [43] used size-BM and size-momentum portfolios with Carhart four factor model. As per the findings, CAPM is explaining approximately 68% to 83% of the average returns via market risk.

An important second finding is the increasing explanatory power of the traditional asset pricing model, at portfolios with higher degree of liquidity. As it is clearly signifying that the adjusted R^2 is least with P3, comparatively a lesser figure compared to that of least liquid portfolio. The results conclude that, when the portfolio is illiquid explanatory power of the traditional model is less compared to when the portfolio is liquid. These findings comply with the empirical literature [15]. As per the results all four sentiment proxies generated the expected relationship via the principal component analysis. Newly introduced proxy measure based on the foreign trading bahaviour (FIS) found to be effective in capturing the sentiment effect in Sri Lanka.

V. CONCLUSION

The proposed index provide evidence on the existence of sentiment effect. However, the model suggests a marginal effect of sentiment. In addition,

the model is not strong enough to capture the sentiment in full scale or to quantify the amount of the sentiment effect in our market. This may be due to the large role played by the institutional investor in our market, where sentiment is prone to play a

TABLE I. SUMMARY RESULTS

	Highest Liquid		Lowest Liquid
Portfolio	**1**	**2**	**3**
$R_{it} - R_{ft} = \alpha_i + \beta_i(R_{mt} - R_{ft}) + e_{it}$			
α_i	1.192	-0.469	0.217
p value	0.001*	0.149	0.649
β_i	1.395	1.185	1.280
p value	0.000*	0.000*	0.000*
Adjusted R^2	0.837	0.798	0.680
F-Statistic	483.866	372.165	200.393
p value	0.000	0.000	0.000
$R_{it} - R_{ft} = \alpha_i + \beta_i(R_{mt} - R_{ft}) + \gamma_i SI_1$			
α_i	1.188	-0.473	0.213
p value	0.000*	0.132	0.650
β_i	1.224	1.045	1.139
p value	0.000*	0.000*	0.000*
γ_i	1.181	0.965	0.966
p value	0.001*	0.006*	0.063***
Adjusted R^2	0.854	0.812	0.688
F-Statistic	275.491	204.104	104.706
p value	0.000	0.000	0.000

Significance level 1%, 5% and 10% are denoted with *, **, *** respectively.

role with mostly retail investors.

Another possibility would be the setting-off of sentiment effect of retail investors against the institutional investors trading bahaviour, provided institutions are not driven by their sentiments. In overall, since the study incorporates sentiment proxies at an aggregate level, it is justifiable to conclude lessen effect due to possible set-offs among and between the variables used.

Findings of the study are found to be consistent with prevailing literature. In a nutshell, Sri Lankan market has a sentiment effect, where major part of the asset prices can be read by CAPM fundamentals. However, if incorporated with the proposed sentiment index, excess returns can be read at a higher proportion than only with fundamentals. Investors can use these findings to decide their investment strategies. Moreover, investors can be cautious when investing in liquid stock, because the statistics suggests that sentiment effect is present within the liquid region.

Furthermore, these findings are suggestive that Sri Lanka, known as a frontier market works in a similar pattern to emerging markets. Hence, policymakers can take the emerging markets as a model when developing policies and structures for frontier markets. Finally, this study will address the empirical gap in sentiment studies relevant to Sri Lanka, and in overall a frontier market. Henceforth, the study will provide directional guide for further sentiment related studies in Sri Lanka. One major limitation is nonexistence of proven sentiment measures for a frontier market, and on the other hand data unavailability restrain the possibility to come up with new sentiment measures.

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