EXAMINING ASSET PRICING MODELS IN EMERGING MARKETS: EVIDENCE FROM EGYPT

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Abstract

The study aims at executing five tantamount asset pricing models in Egypt, in particular: 1) "the CAPM", 2) "the Fama-French three-factor model (1993)", 3) "the Carhart model (1997)", 4) "the four-factor model of Chan and Faff (2005)", and 5) "the five-factor model (Liquidity and Momentum-Augmented Fama-French three-factor model)". This research effort pursues Fama-French arranging approach in view of the size and Book-to-Market proportion (B-M ratio) for 55 securities out of the most 100 stocks in the Egyptian Stock Exchange (EGX) over a five years' time period. We utilized "the time series regression of Black, Jensen and Scholes (1972)". The findings of the study revealed that in terms of predictability, FF three-factor model prompts a significant improvement over the CAPM, while alternate models do not demonstrate a noteworthy increment over the FF three-factor model.

Keywords: Asset Pricing Models, CAPM, Fama-French Three-Factor Model, Carhart Four-Factor Model, Emerging Markets, Egypt, EGX

1. INTRODUCTION

Assessing and measuring risk and determining the required rates of return are the hub of modern finance theory (Abdeldayem & Darwish, 2018). Sharpe (1964) described the risk-return relationship through the capital asset pricing model (CAPM) that is an unreliable model and a consensus on an alternative has not been reached yet (Brown & Walter, 2013). In addition, the CAPM is unable to sufficiently describe the cross-section variations in stock returns (Ray, Savin, & Tiwari, 2009; Abdeldayem, 2015). Fama-French three-factor Model is also criticized in the literature due to its lack of the underlying theoretical foundation. Beltratti and Tria (2002), Daniel and Titman (1997) point out that the high returns associated with small and high book-to-market ratio cannot be attributed to factor loadings. Hence, the expected returns relate to characteristics and do not relate to factor loadings.

The asset pricing in emerging markets, and consequently in the Egyptian context remains a puzzle because of their unfamiliar risk-return patterns, for instance, many emerging markets show higher variability, higher serial correlation and informational inefficiency (Buckberg, 1995; Abdeldayem, 2015). As a result, the search for a superb asset pricing model is by far inconclusive issue. In order to tackle this issue, this study compares five asset pricing models using R^2 to specify which one can describe and explain the variations in stock returns in the Egyptian stock market.

The Egyptian stock exchange was originated in 1883 as one of the first stock markets worldwide and attracts many investors over the past few years. In 2005, it was acting as good as the peak stock markets in the world (Bassiouny & Ragab, 2014). It is also deemed as one of the best stock exchanges in Africa and in the MENA region (Omran, 2007; Abdeldayem & Assran, 2013; Abdeldayem & Mahmoud, 2013; Shaker & Elgizery, 2014 (A & B), Abdeldayem & Sedeek, 2018). Nevertheless, the academic focus on the Egyptian stock exchange is questionable in finance in general and in asset pricing theory in particular.

This study has some contributions. First, to the authors' knowledge, this is one of the inaugural studies that attempts to address the Fama-French three-factor model and its extensions in the Egyptian setting. Also, as far as we know, this is the first to implement the five-factor model (Fama-French three-factor Model plus liquidity and momentum) in an

emerging market. Finally, this is the first to compare these models in either mature or emerging markets.

The rest of the paper is organized as follows. In section 2, we provide a theoretical framework and literature review. Section 3 provides the methodology of the study. Section 4 focuses on the discussion and analysis. Section 5 presents the results and empirical findings, while section 6 reports the concluding comments.

2. THEORETICAL FRAMEWORK AND LITERATURE REVIEW

Over the last five decades, a stream of research has been conducted to provide a reliable asset pricing model for estimating expected returns to evaluate managed portfolios, estimate the cost of capital and calibrate abnormal returns.

Fama and French (1996) compare the Merton's (1973) Intertemporal CAPM and the Fama-French three-factor model during the period 1963-1993. The findings indicate that an inclusion of size and B-M ratio in the models helps significantly in explaining the variations in portfolio's average returns and the market anomalies vanished accordingly. Beltratti and Di Tria (2002) test the applicability of CAPM, Momentum-augmented Fama-French three-factor model and short-term interest rates augmented Fama-French three-factor model. The result confirms the momentum-Fama-French three-factor model is the best of all. Gaunt (2004) relies on a sample of 6814 firms listed on the Australian stock market to examine either the CAPM or the Fama-French three-factor model can better predict the expected returns. His result demonstrates the superiority of the Fama-French model and the remarkable presence of B-M ratio during the period 1991-2000. Hsiou Hung, Shackleton and Xu (2004) use monthly English data to analyze the cross-sectional determinants of the CAPM and the Fama-French model, they argue that CAPM cannot do as good as Fama-French model. Iqbal and Brooks (2007) apply four alternative estimation methods to compare trading volume-augmented CAPM with trading volume-augmented Fama-French model. More precisely, they estimate the target coefficients using OLS, the Dimson thin trading estimator, a trade to trade estimator and a sample selectivity estimator using daily, weekly and monthly data in the Karachi stock market. They reach unexpected and inconsistent results with those in developed markets concerning weekly and monthly data. Schrimpf, Schroder and Stehle (2007) conclude that unconditional models outperform conditional models and conditional CAPM outperforms Fama-French model in terms of the Hansen-Jagannathan distance in the German stock market. In light of GDP-augmented Fama-French model, Nguyen, Faff, and Gharghori (2009) affirm that it does not add any incremental predictability to the traditional Fama-French model using monthly data on the Australian stock market from 1990 to 2005. Li, Liu, and Roca (2011) also work on the Australian stock market using quarterly data during the period 1974-2006. They provide evidence that Unconditional multifactor models outplay unconditional one-factor model, the Fama-French three-factor model outplays the conditional models and conditional CAPM outplays the unconditional CAPM. Brailsford, Gaunt and O'Brien (2011) continue investigating the Australian context. Their study is in favour of Fama-French in time-series and in cross-section.

Misirli and Alper (2009) investigate 318 stocks in the Istanbul stock market. They use the multivariate GRS F-static (1989) to differentiate between coskewness-augmented CAPM and coskewness-augmented Fama-French model. The coskewness factor works better to CAPM while it does not show any better to Fama-French model. In other emerging stock market, namely Hong Kong, Lam and Tam (2011) run time series regression to tests the performance of several asset pricing models. Baek and Bilson (2014) address the capability of the Fama-French model and APT to predict the variations in stock returns for U.S financial firms. The findings are consistent with the literature in supporting Fama-French.

3. METHODOLOGY

Monthly data for all companies listed on the EGX 100, the index of the 100 most active securities in the Egyptian stock exchange, has been collected. However, the net sample amounts to 55 shares in consequence of excluding 45 shares because of insufficient available data. Furthermore, following Shaker and Elgiziry (2014b) "a monthly closing price, 91-days treasury bills rates, monthly values for the key market index (EGX 30), number of shares outstanding, trading volume, market value of equity and Book-to-Market ratio are collected from EGID (Egypt for information dissemination) which is the sole authorized data provider of the Egyptian stock exchange". A time span of five years from January 2003 to December 2007 is analyzed. Due to the strong negative effect of global financial crisis in 2008 on the Egyptian stock market, resulting in more than 70% falls in the aggregate market capitalization, we drop out of two years 2008 and 2009 but the later years are set aside owing to the harmful economic consequences of the Egyptians revolution in January 2011.

We use the monthly return of the main market index (EGX 30) as a proxy for market return, Size is proxied by market capitalization of the company, B-M ratio is calculated by dividing the total book value by the total market capitalization of the firm. Momentum is defined as one-year prior return behavior and Turnover that is calibrated by dividing the annual trading volume of shares outstanding as a proxy for liquidity.

4. ANALYSIS AND DISCUSSION

4.1. Construction of size – B/M sorted portfolios

This research effort follows the conventional Fama-French (1993) technique to construct the dependent variable portfolios. First, two portfolios based on size are constructed and three portfolios based on the B-M ratio are also constructed. Then from the intersection of two size portfolios and three B-M ratio portfolios, we form six mimicking portfolios (B/L, B/M, B/H, S/L, S/M, S/H). Each is defined as follows in Table 1:

Table 1. Size – B/M sorted portfolios

Size	B-M Ratio	Name
Big (B)	Low (L)	B/L
	Medium (M)	B/M
	High (H)	B/H
Small (S)	Low (L)	S/L
	Medium (M)	S/M
	High (H)	S/H

where:

    – B/L: Stands for big size and low B-M ratio;

    – B/M: Stands for big size and medium B-M ratio;

    – B/H: Stands for big size and high B-M ratio;

    – S/L: Stands for small size and low B-M ratio;

    – S/M: Stands for small size and medium B-M ratio;

    – S/H: Stands for small size and high B-M ratio.

The excess return of each portfolio equals the difference between the average monthly return of a portfolio and the risk-free rate.

4.2. Factor portfolios

The explanatory variables $R_m - R_f$, SMB, HML, WML and IMV are created according to Fama-French (1993) who employ returns on zero-cost portfolios as explanatory factors. Accordingly, the first factor is the market factor ($R_m - R_f$) = excess return on the market portfolio. The second factor is the size factor SMB (small minus big) = the difference between the average return on mimicking portfolios of small size stocks (S/L, S/M, S/H) and the average return on mimicking portfolios of big size stocks (B/L, B/M, B/H). The third factor is the B-M factor HML (high minus low) = the difference between the average return on the mimicking portfolios of high B-M ratio portfolios (B/H, S/H) and the average return on portfolio of low B-M ratio stocks (B/L, S/L). The fourth factor is the momentum factor WML (winners minus losers) = the difference between the average return on winners' portfolios (B/W, S/W) and the average return on losers' portfolios (B/Losers, S/Losers). The fifth factor is the liquidity factor IMV (illiquid minus very liquid) = the difference between the average return on portfolios of illiquid stocks (B/I, S/I) and the average return on portfolios of very liquid stocks (B/V, S/V).

The study runs the time series regressions of Black, Jensen and Scholes (1972) for the models below:

    – The Basic CAPM (Sharpe, 1964; Lintner, 1965)

    – The Basic Fama-French three-factor model (1993)

    – The Carhart model (1997): Fama-French three-factor model plus the momentum factor

    – The Chan and Faff model (2005): Fama-French three-factor model plus the liquidity factor

    – The Five-factor model: Fama-French three-factor model plus the momentum and liquidity factors.

The step technique is followed through increasing one independent factor or more at a time and the ordinary least square "OLS" of estimation is run as a result of testing for homoscedasticity, normality and no serial correlations of residuals.

5. RESULTS AND EMPIRICAL FINDINGS

5.1. The basic features of portfolios

Table 2 Panel (A) clarifies the number of securities in the sample each year. It seems that the number is small in comparison with developed countries. For instance, Beltratti and Tria (2002) start with 170 firms in 1990 and reaches 270 in 2000. Malin and Veeraraghavan (2004) use a sample ranged from 174 to 398 securities each year. Gaunt (2004) uses a sample of around 150 companies. Chan and Faff (2005) use a sample of 1179 on average. Nguyen, Faff and Gharghori (2009) depend on an average of 900 securities per year.

Table 2. Summary statistics for the six intersection mimicking portfolios (size and B-M ratio)

Portfolios / Year	B/H	B/M	B/L	S/H	S/M	S/L	Total
Panel A: the number of stocks in each portfolio by year (on average)							
2003	2	14	11	15	8	5	55
2004	4	10	13	13	12	3	55
2005	3	11	13	14	11	3	55
2006	5	13	10	13	8	6	55
2007	4	13	10	13	9	6	55
Average	3.6	12.2	11.4	13.6	9.6	4.6	55
Panel B: the market capitalization ME (in millions) on average							
2003	653.5	29432.2	24715.2	960.9	480.7	487.8	56730.3
2004	1331.5	17546.3	61834.5	1305.1	1259.2	191.5	83468.1
2005	2931	92630.7	175994.4	3438.2	2895.5	605.3	278795.1
2006	11012.9	51559	14918.9	3379.7	2683.8	2098.1	85652.4
2007	60114	66574.4	148195	4966	3601.7	2651.1	286102.2
Average	15208.58	51608.52	85131.6	2809.98	2184.18	1206.76	158149.6

Note: This table demonstrates the market capitalization at the end of the year for all companies in the sample.

Panel B shows the market value of each portfolio. It is noticed that it plays around 56.7 billion in 2003 and 286.1 billion in 2007.

5.2. Estimates of asset pricing models

5.2.1. Correlation coefficients of the explanatory variables

The correlations in Table 3 reveal that the correlation coefficients are relatively small in most cases, which is consistent with the way explanatory factors are constructed. The highest negative correlations are between market risk premium and liquidity premium and between market risk premium and value premium with a coefficient of -0.59, -0.45 respectively. On the other hand, the highest positive correlations are 0.57 and 0.172 for value factor and liquidity factor and for market factor and momentum factor.

Table 3 below reports correlations between the variables used in the study. $R_m - R_f$ is a market risk premium. SMB is the size factor "small minus big". HML is the value factor "high minus low". WML is the momentum factor "winners minus losers". IMV is the liquidity factor "illiquidity minus very liquidity".

Table 3. Correlations matrix

Factors	R_u-R_c	SMB	HML	WML	IMV
R_u-R_c	1.00	-0.226	-0.45	0.172	-0.59
SMB		1.00	-0.38	0.124	-0.123
HML			1.00	-0.25	0.57
IMV				1.00	-0.14

5.2.2. The CAPM model

Table 4 shows the excess return of six portfolios, B/H, B/M, B/L, S/H, S/M and S/L which are the dependent variables. All the market betas are statistically significant with high t-values except that related to S/L. There is a negative relationship between beta coefficients and B-M ratio, but the relationship between size and beta coefficients is unstable. Table 4 shows the regression outputs from the CAPM:

$$R_i - R_f = a + b(R_m - R_f) + e(t) \qquad (1)$$

Where, R_i is the return on portfolio i, R_f is the risk-free rate of return and R_m is the return on the market portfolio (Shaker & Elgiziry, 2014b).

According to R^2 values vary considerably between 3.6% and 55%. The CAPM has more predictive power for the biggest size portfolios (38.9% on average) than the smallest size portfolios (21% on average) and has more predictive power for the lowest B/M portfolios (25.25% on average) than the highest B/M portfolios (21.2% on average).

Table 4. The CAPM

Portfolios	B/H	B/M	B/L	S/H	S/M	S/L
b	0.515	0.92	3.98	0.66	0.86	1.43
t(b)	2.97	8.04	6.84	4.47	5	1.41
R^2	14.8	55	46.9	27.4	32	3.6
S(e)	9.32	6.31	32	8.1	9.43	55.8

Note: The parameters are estimated using the OLS method. Statistical significance at the 5% level

5.2.3. The Fama-French three factor model

Table 5 explains that the addition of size factor (SMB) and value factor (HML) leads to a perceptible effect on R^2 in the majority of dependent variables. The average value of R^2 increases from 30% to 57.15%.

Table 5 reports the regression outputs from the FF three-factor model:

$$R_i - R_f = a + b(R_m - R_f) + s(SMB) + h(HML) + e(t) \qquad (2)$$

Where, R_i is the return on portfolio i, R_f is the risk-free rate of return and R_m is the return on the market portfolio. SMB is the size factor (small minus big). HML is the value factor (high minus low) (Shaker & Elgiziry, 2014b).

It can be seen from the Table 5 that according to exposures, the market factor has statistically significant exposures for all six dependent variables; the SMB and HML have only two statistically significant exposures. The "s" coefficient is positive for the smallest size portfolios and negative for two out of the three biggest size portfolios, confirming the existence of the size effect.

Table 5. The Fama-French three-factor model

Portfolios	B/H	B/M	B/L	S/H	S/M	S/L
b	0.76	0.77	0.76	0.70	0.78	0.60
t(b)	3.46	5.26	3.37	3.77	3.72	2.86
s	0.09	-0.06	-1.32	0.075	0.076	1.40
t(s)	1.15	1.32	-20	1.39	1.25	23
h	0.08	-0.051	-1.02	-0.004	-0.06	-0.87
t(h)	1.61	-1.59	-20.5	-0.10	-1.36	-18.75
R^2	20.2	57.3	95.3	31.5	41	97.6
S(e)	9.2	6.27	9.71	8.014	8.96	8.98

Note: The parameters are estimated using the OLS method. Statistical significance at the 1% level

5.2.4. The Carhart four-factor model

Jegadeesh and Titman (1993) show the past short-term return behavior "momentum" is crucial to stock returns and they found that the momentum strategy can earn 1 % per month. Four years later, Carhart (1997) construct momentum risk factor in the Fama-French three-factor model context in order to develop his four-factor model.

The Table 6 reports the regression outputs from the Carhart four-factor model:

$$R_i - R_f = a + b(R_m - R_f) + s(SMB) + h(HML) + w(WML) + e(t) \qquad (3)$$

Where, R_i is the return on portfolio i, R_f is the risk-free rate of return and R_m is the return on the market portfolio. SMB is the size factor (small minus big). HML is the value factor (high minus low). WML is the momentum factor (winners minus losers) (Shaker & Elgiziry, 2014b).

Table 6 manifests that the Carhart four-factor model has not achieved much concerning the predictability. The average value of R^2 is 57.73% for the cohort model in comparison with 57.15% for FF model. Furthermore, Momentum factor has no statistical significance at all. It means that the addition of the momentum factor is dispensable.

Table 6. The Carhart four-factor model

Portfolios	B/H	B/M	B/L	S/H	S/M	S/L
b	0.757	0.756	0.752	0.69	0.75	0.59
t(b)	3.39	5.15	3.28	3.68	3.62	2.79
S	0.09	-0.06	-1.32	0.073	0.07	1.40
t(s)	1.13	-1.38	-19.87	1.34	-0.05	22.75
h	0.083	-0.047	-1.02	-0.0008	-1.16	-0.86
t(h)	1.6	-1.44	-20	-0.02	-1.16	-18.37
w	0.027	0.121	0.112	0.093	0.25	0.07
t(w)	0.14	0.97	0.57	0.58	1.42	0.41
R^2	20.2	58.1	95.3	31.9	43.3	97.6
S(e)	9.29	6.27	9.77	8.07	8.87	9.05

Note: The parameters are estimated using the OLS method. Statistical significance at the 5% level

5.2.5. The Chan and Faff (2005) four-factor model

Many research in the developed and liquid markets reports the centrality of liquidity in asset pricing theory such as Brennan and Subrahmanyam (1996), Pastor and Stanbaugh (2003), while the literature does not shed much light on emerging markets where the liquidity has more influential effect as well as it considers an obvious hindrance to attract foreign investments, thus the liquidity of emerging capital markets would be of interest for the current and future state of the art (Bekaert, Harvey, & Lundblad, 2007).

Table 7 reports the regression outputs from Chan and Faff four-factor model:

$$R_i - R_f = a + b(R_m - R_f) + s(SMB) + \quad (4)$$
$$+ h(HML) + L(IMV) + e(t)$$

Where R_i is the return on portfolio i, R_f is the risk-free rate of return and R_m is the return on the market portfolio. SMB is the size factor (small minus big). HML is the value factor (high minus low). IMV is the liquidity factor (illiquidity minus very liquidity) (Shaker and Elgiziry, 2014b).

Table 7 reveals that the average R^2 of liquidity augmented Fama-French model is 63.63%. It is noted that liquidity factor works well in S/H portfolio and its R^2 is increased by 22.5%. Therefore the liquidity augmented Fama-French model outperforms the momentum augmented Fama-French model, but does not add noticeable value to the predictability of Fama-French three-factor model in spite of "L" that is statistically significant with high t-values for the B/M, B/L, S/H and S/M portfolios.

Table 7. The Chan and Faff four-factor model

Portfolios	B/H	B/M	B/L	S/H	S/M	S/L
b	0.82	0.56	0.31	0.31	0.49	0.74
t(b)	3.32	3.64	1.44	1.76	2.23	3.17
s	0.09	-0.07	-1.35	0.047	0.056	1.41
t(s)	1.17	-1.77	-23.9	1.04	0.96	23.17
h	0.076	-0.02	-0.96	0.05	-0.025	-0.88
t(h)	1.42	-0.75	-21.65	1.35	-0.55	-18.4
L	0.07	-0.24	-0.53	-0.46	-0.33	0.167
t(L)	0.53	-2.96	-4.51	-4.94	-2.8	1.32
R^2	20.7	63.7	96.7	54	49	97.7
S(e)	9.27	5.84	8.27	6.63	8.42	8.9

Note: The parameters are estimated using the OLS method. Statistical significance at the 1% level

5.2.6. The five-factor model

The rationale behind developing the five-factor model is that many previous studies, for example, Cho, Elton, and Gruber (1984), Chamberlain and Rothschild (1983) stated that the most suitable number of variables in the framework of Arbitrage Pricing Theory is five.

Table 8 does not provide any valuable insight different from liquidity augmented Fama-French model, confirming the meaninglessness of momentum factor:

$$R_i - R_f = a + b(R_m - R_f) + s(SMB) + h(HML) + \quad (5)$$
$$+ L(IMV) + w(WML) + e(t)$$

Where, R_i is the return on portfolio i, R_f is the risk-free rate of return and R_m is the return on the market portfolio. SMB is the size factor (small minus big). HML is the value factor "high minus low". IMV is the liquidity factor (illiquidity minus very liquidity). WML is the momentum factor (winners minus losers)" (Shaker & Elgiziry, 2014b).

Table 8 below reports the regression outputs from the five-factor model.

Table 8. The five-factor model

Portfolios	B/H	B/M	B/L	S/H	S/M	S/L
b	0.81	0.54	0.29	0.29	0.46	0.73
t(b)	3.25	3.52	1.33	1.65	2.09	3.09
S	0.09	-0.07	-1.36	0.044	0.048	1.41
t(s)	1.15	-1.86	-23.8	0.97	0.86	22.9
h	0.076	-0.02	-0.96	0.53	-0.014	-0.88
t(h)	1.41	-0.57	-21.26	1.47	-0.31	-18.03
L	0.07	-0.25	-0.53	-0.47	-0.34	0.16
t(L)	0.52	-3.03	-4.54	-4.98	-2.92	1.29
w	0.024	0.14	0.15	0.126	0.277	0.06
t(w)	0.12	1.20	0.91	0.95	1.68*	0.34
R^2	20.7	64.7	96.7	54.8	51.7	97.7
S(e)	9.36	5.81	8.28	6.64	8.27	8.99

Note: The parameters are estimated using the OLS method. Statistical significance at the 5% level

5.2.7. Cross –section of average return

The average return tests focus mainly on the intercepts in the time-series regressions. If something other than factor sensitivities is accountable for the stock return, the intercept terms will be significantly different from zero (Black, Jensen, & Scholes, 1972).

Table 9 reports all models that generate at least four negative alphas, which means these portfolios do not earn returns conform to their risk exposures. In addition, all the models have significant intercepts at the 1% or 5 % significance levels.

CAPM is the capital asset pricing model, Fama-French is the Fama-French three-factor model, Carhart is the momentum augmented Fama-French three-factor model, Chan & Faff is the liquidity augmented Fama-French three-factor model and Five-factor model is the momentum and liquidity augmented Fama-French three-factor model (Shaker & Elgiziry, 2014b). B/H, B/M, B/L, S/H,

S/M and S/L are size-B/M sorted portfolios:
- The CAPM: all the portfolios produce large abnormal returns with an absolute average of 5.7% and four out of six portfolios are statistically significant.
- The Fama-French: all the portfolios produce large abnormal returns with an absolute average of 3.5%. Two out of six portfolios are statistically significant.
- The Carhart model: all the portfolios produce large abnormal returns with an absolute average of 3.6%. Five out of six portfolios are statistically significant.
- The Chan & Faff model: all the portfolios produce large abnormal returns with an absolute average of 3.3%. Four out of six portfolios are statistically significant.
- The five-factor model: all the portfolios produce large abnormal returns with an absolute average of 3.4%. Four out of six portfolios are statistically significant.

Table 9. Intercept analysis presents comparison and analysis for each individual intercept

Models \ Portfolios	Intercept	B/H	B/M	B/L	S/H	S/M	S/L
CAPM	a	-3.41	-2.95	13	-4.33	-2.67	8.05
	t(a)	-2.24**	-2.97**	2.59**	-3.40**	-1.80**	0.92**
Fama-French	a	-2.08	-3.8	-3.7	-4.30	-3.50	-3.50
	t(a)	-1.24*	-3.40*	-2.16*	-3.03*	-2.22*	-2.21*
Carhart	a	-2.11	-3.87	-3.80	-4.38	-3.73	-3.58
	t(a)	-1.23**	-3.47**	-2.19**	-3.05**	-2.36**	-2.22**
Chan & Faff	a	-1.70	-5.17	-6.70	-6.95	-5.40	-2.57
	t(a)	-0.93*	-4.55*	-4.17*	-5.38*	-3.31*	-1.48*
Five-factor model	a	-1.74	-5.31	-6.87	-7.08	-5.70	-2.63
	t(a)	-0.93**	-4.66**	-4.24**	-5.54**	-3.52**	-1.50**

Note: *Statistical significance at the 1% level
**Statistical significance at the 5% level

6. CONCLUSION

In this paper, five versions of Asset Pricing Models are applied to the Egyptian stock market that are CAPM, Fama-French three-factor model, Carhart (1997) four-factor models, Chan and Faff (2005) Fama-French three-factor model plus liquidity and Five-factor model (Fama-French three-factor model plus momentum and liquidity). The time series regressions tests reinforce the prevailing understanding in the theory regarding the outperformance of Fama-French three-factor model over CAPM. The Fama-French three-factor model proves higher predictability in the all six intersection portfolios (B/L. B/M, B/H, S/L, S/M, S/H) But in different magnitudes. The insignificance of the momentum factor comes inconsistent with the literature in explaining the cores-section and time series variations in stock returns. In addition, the

predictability power of the momentum factor too slight to include it in the model.

Moreover, the results confirm that augmenting Fama-French three-factor model with liquidity proxied by turnover, does not lead to superior explanatory power except S/H portfolio, which cannot be considered a sufficient statistical approval. In addition, the five-factor does not succeed in contributing to Fama-French three-factor models in any way except S/H portfolio.

In conclusion, we would recommend resorting to Fama-French three-factor model with plenty of practical implications, including determining the cost of capital and assessing the portfolio performance in the Egyptian stock market. Comparison between the conditional and unconditional multifactor models as well as extending the Fama-French three-factor model with profitability, investment and sales to price ratio is left for future research.

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