

CAPM vs Fama-French Three Factor Model

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Abstract : The Capital Asset Pricing Model, or CAPM, independently made by Sharpe et al during the 1960s, has been a for the most part recognized gadget to choose the theoretical rate of return of a preferred position (from the budgetary pro's point of view) and the speculative cost of significant worth (from the association's viewpoint). Regardless, disregarding its reputation and intuitively fulfilling appearance the CAPM's authenticity has been tended to by observational data. The Fama-French Three Factor Model (later on insinuated as TFM) was made by Eugene Fama and Kenneth French as an enlargement to the CAPM. In this paper we will try to take a gander to the detriment of significant worth as foreseen by CAPM with that foreseen by the more accurate TFM and check whether there is a basic refinement between the figures of the two.

I. RESEARCH PROBLEM

Is the CAPM no longer of any use to the money related specialist? Is the TFM for each situation more exact than the CAPM? Despite when the portfolio isn't different, yet contains only couple of tremendous top blue chip stocks (yet across over different undertakings)? Likewise, when these models are being used to find the costs of significant worth (from the association's point of view) in light of credible data?

II. Review OF LITERATURE

The CAPM finds out the cost of significant worth just dependent on the danger return parts of a stock and on its precariousness versus the market. Perold (2004) referenced distinctive exceedingly confident assumptions of the CAPM, for instance, the business parts being faultless and theorists being danger - reluctant. These suppositions make the CAPM less strong than various models.

Fama and French battled that little top stocks give higher returns than enormous top stocks, and stocks with a higher B/M (book to promote) extent (for instance 'improvement' stocks) also have higher returns than low B/M extent stocks ('regard' stocks).

Idolor (n.d.) drew a connection between's Consumption Oriented Capital Asset Pricing Model and Capital Asset Pricing Model the Nigerian Capital Market. It was circulated in The Journal of Commerce Vol.6, No.3 pp.1-22. The essential inspiration driving this examination was to apply the assessment between the CCAPM and CAPM and understand which model is better for theory portfolio. The variable for Capital Asset Pricing Model CAPM is Market Premium. If the market premium extends, it will provoke a development in the portfolio returns and from this time forward will be helpful for a budgetary master to place assets into a stock. The variable for CCAPM is Consumption per head. If C/P extends the portfolio returns augmentations and therefore will be helpful for the budgetary master to place assets into a stock.

- 1) Data Analytics Technique like CAPM Regression Model was used for research theory reason. There was no scaling which was sought after. While discussing the substances it was basic to put certain suppositions before starting. Under CAPM, there were 2 suppositions: Given market clearing asset costs, budgetary authorities use joint dispersal of advantage returns.
- 2) Borrowing and crediting is in threat free rate which is self-governing of the entirety obtained or lent and is same for all of the budgetary authorities.

Research opening in CAPM was about the entirety that the theorist spends will be sketchy in light of the way that his or her wealth is questionable due to decision to place assets into risk assets. Under CCAPM were Goods and organizations need not be exhausted in a comparative period that they are purchased and usage data is nothing however hard to dropped by, issue of assessing the use prompts misstep of unadulterated reviewing of data.

Landing at the goals, that CCAPM is better than logically ordinary CAPM. Both the models can be used for asset evaluating, we turned out to be progressively familiar with that CCAPM isn't statically preferable when dissected over CAPM just in explaining about the assortments in portfolio returns.

Shapiro, N. G. (n.d.) drew an assessment between Consumption Beta and Market Beta. The essential inspiration driving this examination was to check beta with respect to monetary trade list than to the beta assessed in regards to use advancement. Two request were tended to - first, do stocks with high usage betas increase higher returns?

- Second, is the use beta a predominant explanation of benefits than the standard beta? The variables in market rate and peril free rate are Return on the advantages, Risk free rate and market rate. Market premium which is the differentiation between the market rate of return and the risk free rate is even more then it favored for the examiner to contribute and if the market premium is low, by then it isn't favored for the money related expert to contribute. The variable in use beta is Relation between an advantage's typical return and its covariance with usage is drawn. In case the covariance is restricted, the money related authority can place assets into stocks and if the covariance isn't constrained, by then it isn't had any desire to place assets into that stocks.

The assessment system was finished by taking a gander at Capital Asset Pricing Model (CAPM) and Consumption Capital Asset Pricing Model (CCAPM) using Variance-Covariance Matrix and Measurement of Risk. Scaling was not required. A part of the facts discussed are high systematic peril secure high typical return. This occurs in perspective on market beta is always far greater and certainly more tremendous than is the coefficient on the usage beta.

Result shows that there is no assistance for CCAPM. A protections trade's beta contains considerably a greater number of information on its entry than does its usage beta. The usage CAPM may perform insufficiently in light of the fact that paralyzes to tendencies are a critical determinant of buyer spending. A segment of the assessment gaps are Consumers don't adequately take part in the protections trade in light of trade costs, deadness, general uncertainty of organizations, or liquidity goals various individuals hold no stock in any way shape or form.

Nel (2011) examination in this paper about the capital asset assessing model (CAPM), with a specific emphasis on two of its rule portions, to be explicit the danger free rate and beta. The objective of research is to decide if there is a gap between what is tended to in the academic world and what is associated before long. If such an opening exists, it may have proposals for the academic network and adventure experts. Using the scale was 35 contracted clerks who work in the insightful network. Results revealed that there is a basic opening among theory and practice, the insightful network and hypothesis experts seem to agree with respect to the use of the CAPM and the calculation of beta. The insightful network and adventure experts agree that the CAPM is the most ideal approach to manage register the cost of significant worth. As to estimation of beta, they agree that beta should be resolved from chronicled figures. The results show that, disregarding the way that insightful world and hypothesis experts agree on the usage of the CAPM and certain pro communities, they contrast basically on the use of APT, the choice of an appropriate R_f and changing the R_f for cost purposes.

Taneja (2010) reviewed the judicious power of the Capital Asset Pricing Model and Fama French Three Factor Model in explaining the cross-sectional protections trade returns in India. The elements included size, impact, past returns, benefit yield, getting worth extent and book to exhibit esteem Summary estimations, relationship and distinctive backslide procedures were used to draw the reasonings. The end was that the Fama French Three Factor Model to make certain better gets ordinary assortments in returns than CAPM. It explains 91.9 percent of the total proficient danger with accurately critical betas.

Anwar (2018) chose the instructive power of the bit of leeway esteeming models for different territories in Indian Capital Market. The objective was to explore the market chance premium, size premium and worth premium on return of the favorable position as indicated by the advantage assessing models for different portions in Indian Capital Market. , the assessment incorporates the consistently records open in the NSE site, return of the rest as poor variable. 71 associations found their world in Nifty 50 for the model time span.

The end was that in NIFTY Auto the Fama and French three factor model is more useful than the standard CAPM and the two factor models. In NIFTY Bank, the CAPM model is vivacious anyway not progressively valuable to the three-factor model.

Gokgoz (2007) pondered the appropriateness of the CAPM and the Fama-French Three Factor Model on the principal records (land, insurances, industrials) of the Istanbul Stock Exchange (ISE). Time plan backslide and cross-sectional backslide was associated for the 2001-2006 stock data on both the CAPM and the Three Factor Model. The GRS F-test was moreover associated on the two models. The Three Factor Model was seen to be superior to anything the CAPM since the evaluating bumble estimations of the backslide Three Factor Model were converging to zero.

Sreenu (2016) analyzed the precision of evaluated comes back from CAPM and the Three Factor Model contrasted with the genuine returns earned by putting resources into values on the France Stock Exchange (FSE) for the period 2004-2014. This paper unmistakably illustrated the criteria for choosing organizations for stock information. Cross sectional relapse and relapse examination test to compute beta qualities was directed on the information. A SML test and a non-linearity test were additionally directed on the information. The event of a huge distinction between anticipated return in CAPM and that in Fama-French's model was affirmed.

Varghese (2009) in this paper tests the CAPM in Indian capital market. The information utilized for the investigation comprised of month to month value information of 108 basic stocks which are incorporated into 8 diverse BSE sectoral files. It was discovered that capital resource evaluating model holds positive connection between resources' efficient hazard and their normal return. Resources with high degrees of efficient hazard must be evaluated to yield high rates of return so as to prompt financial specialists to acknowledge high degrees of hazard that can't be broadened inside the market.

Weston (n.d.) in this paper encourages us to comprehend its hypothetical structure, ideas and strategies in capital planning choices by the utilization of speculation obstacle rates to acknowledge or dismiss four theoretical tasks and beta in deciding the normal rate of return for a security. The hazard free return is determined as a normal of the hazard free returns over the past ten-year time frame on 9-to year U.S. government security issues. Hypothetically, the utilization of shorter developments would limit the impact of value level ascents. Show 8 presents calculations of a market return of 8.2%, a change of around 1% and an expected hazard free rate of 4.3%.

As these organizations produce buyer durables with moderately high-salary flexibilities of interest, their beta qualities are high. As the estimation of the betas for individual activities or for individual divisions in an organization's value information are not accessible it is treated by Rubinstein. capital resource evaluating model is that it broadens the utilization of neoclassical monetary hypothesis to a wide scope of budgetary choices. At least, it gives a general system to explaining the suppositions of elective criteria that have been utilized. An incredible down to earth bit of leeway of the new money related hypothesis is use of the bounty of up to this time moderately disregarded however promptly accessible budgetary data.

Bajpai and Sharma (2015) examination about the connection between the hazard and return of a benefit by utilizing Logarithmic returns of stock costs. The information ranges from January 2004 to December 2013, which incorporates the time of subprime emergency and sovereign obligation emergency, so the information contains auxiliary break to evacuate the impact of basic break. The timespan for before the emergency time frame ranges from January 2004 to July 2008 and after the emergency time frame ranges from August 2008 to December 2013. The focal point of this investigation was on industry impact on CAPM, and we can finish up with the assistance of results that industry impact is there and it impacts the arrival producing procedure of stocks. The outcomes demonstrate that there is an intelligent impact of beta and industry in the market. This clarifies returns of stocks are not decided with the beta of stocks just, yet the business to which it has a place has additionally a noteworthy job in the estimating of the benefit. Further, these two factors mutually significantly affect the profits of the stocks. In Indian value showcase, the industry impact is plainly noticeable. Subsequently it very well may be said that notwithstanding the efficient hazard, the industry to which a benefit has a place additionally assumes an import job in the estimating of the advantage.

III. RESEARCH OBJECTIVE

To figure the expenses of value utilizing the CAPM and the TFM for similar stocks over a similar timeframe (for example have a similar example) and factually decide whether there is a noteworthy distinction between the consequences of the two. We think such an examination is vital on the grounds that there is an absence of writing which investigations past information utilizing the formulae of every one of these models, utilizing the information gave in Agarwalla, S. J. (2013).

The stocks are as follows:

Reliance Industries Ltd.
Tata Consultancy Services Ltd.
HDFC Bank Ltd.
Hindustan Unilever Ltd.
ITC Ltd.
Housing Development Finance Corp Ltd.
Infosys Ltd.
State Bank of India
ICICI Bank Ltd.
Kotak Mahindra Bank Ltd.

The top ten were chosen because they are large cap blue chip stocks which are less likely to have anomalous deviations and are not highly volatile.

VII. RESEARCH DESIGN

The month to month return esteems for every individual stock were determined utilizing the month to month shutting esteems [(closing val of this current month/(shutting val of one month from now 1))]. The overabundance return was determined by subtracting the hazard free rate (r_f) from the month to month return. Next, the coefficients for market premium, SMB and HML were determined utilizing relapse by accepting the abundance returns as Y and the month to month $r_m - r_f$, SMB and HML information from Agarwalla, S. J. (2013) as X. The qualities in this manner got were connected to the TFM and CAPM formulae which are given as follows:

$$\bar{r}_a = r_f + \beta_a (\bar{r}_m - r_f)$$

Where:

r_f = Risk free rate

β_a = Beta of the security

\bar{r}_m = Expected market return

(CAPM)

$$r = r_f + \beta_1 (r_m - r_f) + \beta_2 (SMB) + \beta_3 (HML) + \varepsilon$$

(TFM)

Where r or r_a is the cost of equity, β_1 , β_2 , β_3 are the coefficients calculated through regression (described above) and $r_m - r_f$, SMB, HML are the averages of the ten years' monthly data of these three parameters. This is how cost of equity from each of the models was obtained. Detailed working on excel sheets has been attached at the end of the paper.

VIII. DATA ANALYSIS:

The following values for cost of equity from the two different models were found:

NAME	ANNUAL RETURNS BY CAPM:	ANNUAL RETURNS BY TFM:
Reliance Industries Ltd.	6.89%	7.64%
Tata Consultancy Services Ltd.	16.45%	18.74%
HDFC Bank Ltd.	6.75%	4.59%
Hindustan Unilever Ltd.	7.01%	6.22%
ITC Ltd.	6.98%	7.32%
Housing Development Finance Corp Ltd.	3.45%	5.33%
Infosys Ltd.	8.13%	7.14%
State Bank of India	8.51%	10.42%
ICICI Bank Ltd.	8.05%	6.24%
Kotak Mahindra Bank Ltd.	8.25%	7.06%

Hypothesis Testing:

To determine whether the differences in the figures given by two different models on the same sample were significantly different, a two tailed T test was used.

	ANNUAL RETURNS BY CAPM:	ANNUAL RETURNS BY FAMA FRENCH THREE FACTOR MODEL:
Mean	0.08047	0.08069654
Variance	0.001080445	0.001648847
Observations	10	10
Pearson Correlation	0.922287487	
Hypothesized Mean Difference	0	
df	9	
t Stat	-0.04381777	
P(T<=t) one-tail	0.483003219	
t Critical one-tail	1.833112933	
P(T<=t) two-tail	0.966006438	
t Critical two-tail	2.262157163	

Since the P value given by the T test is greater than the confidence level of 0.05, we fail to reject null hypothesis, i.e. for the given sample there is no significant difference between the costs of equity values predicted by CAPM and TFM.

IX. INTERPRETATION AND CONCLUSION

The reason behind the CAPM and TFM not giving any significant difference in results is probably the nature of the sample, i.e. differences in B/M ratio and size by market capitalization are not apparent when the sample consists of the stocks of the ten biggest companies on the stock exchange. Since difference in market cap and B/m ratio are the two additional factors that the TFM extends on to the CAPM (and since the differences in those two factors are negligible in our sample) the results produced by these two models are nearly the same. A larger and more diverse portfolio could result in significant differences between the two sets of figures (i.e. rejection of the null hypothesis). Thus, the limited and narrow sample used is a limitation of our study.

X. REFERENCES

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