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Portfolio construction and performance evaluation: Evidence from India and Iran

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Abstract. *This paper comparatively examines asset management practices among practitioners in India and Iran as examples of emerging economies, in order to understand to what extent they apply sophisticated models presented in financial literature in constructing portfolios under their management, as well as in portfolio evaluation process. The sophistication of a particular technique is those given by Amenc et al. (2011). The results show that companies in Inia and Iran use less sophisticated models in portfolio selection stage. Regarding the performance evaluation, respondents in both countries seems to be well-aware of market models and risk-adjusted ratios are widely used by practitioners.*

Keywords: portfolio management, performance evaluation, portfolio construction, risk, portfolio practitioners.

JEL Classification: C52, G11.

1. Introduction

Markowitz (1952) Portfolio Selection Theory is a normative theory for a rational investor to identify the "Efficient frontier". A positive theory on the other hand, describes and predict the investment behaviour of individuals under certainty. Therefore, understanding the actual behaviour of financial practitioners in constructing portfolios under their management and managing the relevant risk is of outmost importance.

Although numerous studies devoted to introduce and enhance techniques for asset allocation ad risk management, the question remains is that to what extent such advanced academic theories are applied in real scenarios by practitioners.

According to Schröder (2013, pp. 25-26), although wealth advisors are aware of the limitations of traditional investment concepts, such as the statistic mean-variance analysis, they do not use new dynamics asset allocation models. He attributes this to the inherent complexity of dynamic models. Engle (2004) argues that financial practitioners fail to use dynamic models introduced in financial literature.

There are several studies compared modern portfolio theory with its application in practice and found a significant gap between theory and practice. Fabozzi et al. (2007, pp. 16-17) states that despite the high influence of mean-variance analysis in investment management, it is mostly utilized only by quantitative firms, where process for automated forecast generation and risk control are already in place. Therefore, portfolio management remains a purely judgmental process at many firms based on qualitative, not quantitative assessments. Michaud (1989, pp. 33-36) explains the reasons for not using MV optimizers by portfolio managers and terms this fact as "Markowitz Optimization Enigma".

A close look at the available literature on Asset Allocation theories and practices reveals that: (i) Most of the previous studies conducted to survey and examine the impact of academic research on financial industry are in areas such as product innovation, corporate finance, capital budgeting, etc. (Amenc et al., 2011, pp. 40-41), and not much studies were carried out in Portfolio Construction and Performance Measurements (ii) Although there are evidences of such surveys in developed countries, there has not been much empirical work to test asset allocation practices in emerging economies. Hence, it is felt this study is considered essential by taking into account these observations and the present study intends to fill that gap.

This paper is divided into five sections, including the introduction. In Section 2, we give an overview of relevant literature in portfolio construction and risk management. Section 3 explains the methodology applied to get the results. Section 4 presents the results. Section provides the final remark and conclusion.

2. Literature review

Risk measures

Mean-Variance was pioneered by Markowitz in the 1950s.Variance is defined as dispersion around the mean which considers both positive and negative deviations from the mean as undesirable outcome and weighs both in the same manner while, in reality only left side of

return distribution is undesirable. Rom and Ferguson (1994, p. 351) argued that while in Mean-Variance framework the volatility is a symmetric measure of risk that treat all uncertainty the same, in the real world is just the opposite; only in bear market should volatility avoided, and in a bull market we should seek as much as volatility as possible. Roman and Mitra (2009, pp. 25-27) reviewed alternative risk measures in detail and concluded that although they provide good theoretical and practical properties, the mean-variance model is still the most used by practitioners.

Roy (1952) first introduced the concept of "safety first" to the investment literature in order to develop a practical framework which assumes that the first and foremost objective of an investor would be the safety of their principal by setting a minimum acceptable return that preserve the principal. Therefore, an investor prefers a portfolio with lower probability of going below the minimum accepted return called "disaster level" or "target return".

Mean-Absolute Deviation (MAD) introduced by Konno in 1988. In this approach, the risk of a portfolio is measured by the absolute deviation of the return from the mean instead of the variance. Konno and Yamazaki (1991) used MAD portfolio optimization model to Tokyo Stock Market to show its advantages on solving portfolio optimization problem in a real time compared to Markowitz mean-variance model. Since MAD framework is that it converts the portfolio optimization problem from quadratic programming problem into a scalar parametric linear programming problem, making the implementation procedures more efficient and simpler compared to Mean-Variance model.

Markowitz (1959) introduced "semi-variance" concept which considers only the downside of return distribution as a measure of risk. Bawa (1975) and Fishburn (1977) introduced Lower Partial Moments as a generalization of semi-variance. Lower partial moment (LPM) is the risk associated with losses and considers the moments of asset returns that fall below a certain minimum acceptable level of return τ which is referred to as 'benchmark market level' or 'disaster level'.

Value at Risk (VaR) is a regulatory measure of risk that entered the financial lexicon in the

early 1990s (see GA Holton (2002)). First, the US security and Exchange Commission (SEC), based on the market historical data, calculated a 0.95 quintile of the amount of money a firm might lose over a one-month period which later referred to as VaR. This new risk metric imposed by regulations, such as the UK Securities and Futures Authority 1992 "portfolio" value-at-risk measure, Europe's 1993 Capital Adequacy Directive (CAD) "building-block" value-at-risk measure and the Basel Committee's 1996 value-at-risk measure based largely upon the CAD building-block measure, to banks and financial institutions in order to track and report the market risk exposure of their portfolios.

There is voluminous literature analyzed the mean-VaR model for portfolio selection in comparison to classical Mean-Variance model and derived some advantages and drawbacks. For instance, Alexander and Baptista (2002) examined the economic implications of using mean-VaR in compared to mean-Variance and found out that the higher variance portfolio might have less VaR. Thus, an efficient portfolio that globally minimizes VaR may not exist. They showed that it is possible for some risk-averse agents to end up choosing portfolios with greater standard deviations if they switch from using

variance to VaR as a measure of risk and concluded that regulators should be aware that VaR is not a unique improvement over variance as a measure of risk. In a subsequent study (Alexander and Baptista (2004), imposed Value-at-Risk (VAR) and Conditional Value-at-Risk (CVaR) constraints to the mean-Variance portfolio selection and compared them for both highly risk-averse and slightly risk-averse agents and obtained similar results.

Kaplanski and Kroll (2002) analyzed the validity of VaR in comparison to the traditional measures of risk and found out that the VaR family is at least as good as other measures of risk for decision making purposes. However, they showed some drawbacks of imposing VaR constraint. For instance, the congruence of Mean-VaR criterion with the expected utility theory is only observed in the presence of normality (or log-normality) assumption, which makes it applicable only in the case of irrational utility functions. For all non-normal distributions, Mean-VaR criterion may screen out alternatives which consider superior by risk-averse individuals. Furthermore, they suggested that Accumulative-Value-at-Risk (A VaR) is superior to both regular VaR and the traditional risk measures.

Roman and Mitra (2009) discussed alternative models for portfolio selection by incorporating those risk metrics that penalize only the downside (adverse) part and not the upside (potential) of the return distribution, such as Lower Partial Moments (LPMs), Value-at-Risk (VaR) and Conditional Value-at-Risk (CVaR).

Covariance matrix estimation

In the portfolio optimization practices, expected returns and covariance matrix need to be estimated using quantitative methods. Calculating the sample analogues from historical data is the most common used approach for estimation of security expected returns and covariances. It implies that past provides good estimate of future. However, the returns are time variant (nonstationary) in most cases. Therefore, historical returns are not an indication of future returns. Moreover, economic and political environments, monetary and fiscal policies, customer perspectives and business cycles are all subject to change over the time, making historical data a poor estimator (Fabozzi et al., 2007, pp. 146-152). Therefore, alternative methods such as models with explicit factors (single factor and multi-factor models), models with implicit factors (statistical/hypothetical models) and Optimal Shrinkage techniques are suggested by academia to estimate covariance matrix.

Factor models are based on Sharpe's (1964) Capital Asset Pricing Model (CAPM), Ross's (1976) Arbitrage Pricing Theory (APT) and Fama and French works (Lee and Junior, 2018, p. 348). They are called factor models because they try to each exposure to risk as a separate factor. In these models' risk is also referred to as risk factor. Single factor model know as market model is a regressive model considering the market performance.

Engle et al. (1990), showed the advantages of applying FACTOR-ARCH model to examine the dynamic relationship between the return risk premia and volatilities in a multivariate system and concluded that it works better than other models due to its property of being stable over time.

Implicit factor models aim to explain returns with factors that are linear return combinations. Although the number of factors is relatively lesser than other factor models,

they are less attractive to be used due to the fact that they are based on hypothetical model and difficult to interpret (Fabbozi et al., 2007, p. 168). Robust statistical techniques such as Shrinkage and Bayesian estimators are other advance models which improve the estimation process.

Estimation error

A crucial part of the problem of the Markowitz model of portfolio optimisation lies on the estimation error of the necessary inputs. Typically, expected returns, risks and correlations are measured from historical data and fed into an optimizer as if they were known perfectly, where these data sometimes are measured with substantial errors (Jorion, 1992).

The unintuitive character of many optimized portfolios can be traced to the fact that MV optimizers are, in a fundamental sense, "estimation-error maximizers" (Michaud, 1989, pp. 33-34). According to Phillip Jorion (1992), part of this problem is due to measurement of necessary inputs.

There are several techniques introduced in financial literature to address this issue, such as putting constraints on portfolio weights, constructing Global Minimum Risk Portfolio, Black-Litterman and Bayesian techniques, and portfolio resampling.

Shrinkage and Bayesian methods allow incorporation of uncertainty of expected return and risk in the portfolio optimization process, therefore provide more realistic models. For example, Black and Litterman (1990) combined investor views with market equilibrium. In this model, if the confidence in the view considered to be zero, they end up holding market portfolio as given by CAPM model. However, by putting the investor view into account, the resulting expected returns will deviate from the market equilibrium and imply the investor views.

Jorion (1991) compared the historical sample mean, Bayesian estimator and a CAPM-based estimator, found that historical sample covariance leads to the worst forecast and out-of-sample performance and is outperformed by shrinkage estimators. Also, an active portfolio based on the CAPM produces the best results among others. Grauer and Hakansson (1995) also confirmed earlier studies showed estimators outperformed the historical sample estimator. Another study by Nathaphan and Chunhachinda (2010), where they employed six different estimating strategies to examine the ex-post portfolio performance, showed that shrinkage estimators incorporating the single index model outperform other traditional methods of portfolio selection.

3. Methodology

This study is a survey about portfolio construction and performance evaluation techniques adopted by practitioners in investment management institutes in India and Iran. A questionnaire base on Amenc et al. (2011) survey was disseminated among participants in both countries and generated responses from institutions based in India and Iran representing 47% and 53% of the respondents respectively. Later, descriptive statistics was extracted and analysed.

The population of the survey is companies listed in Association of Mutual fund India (AMFI) and Financial Information Processing Center of Iran (FIPIRAN) in case of India and Iran respectively. At the time of survey, 44 companies were listed in AMFI and 70 companies were listed in FIPIRAN offering asset management services. Since data in FIPIRAN is sorted based on mutual funds schemes instead of list of institutions, initially the list of funds was extracted and clustered as per companies managed them. It reached 196 mutual fund schemes managed by 70 companies at the time of data collection.

The respondents are asked about their practices in risk management and performance evaluation and are given different options which almost cover most of the available methods in the portfolio management field from the least sophisticated ones to the most sophisticated ones. Tables 1 and 2 gives unsophisticated options available to choose for each question. Therefore, it is assumed that participants adopt non-sophisticated techniques for a particular category if they select any of the given options in Tables 1 and 2. Later, based on their responses, we conclude that to what extent they apply sophisticated/non-sophisticated techniques in their practices.

Table 1. *Non-sophisticated risk measures/techniques in the process of portfolio construction*

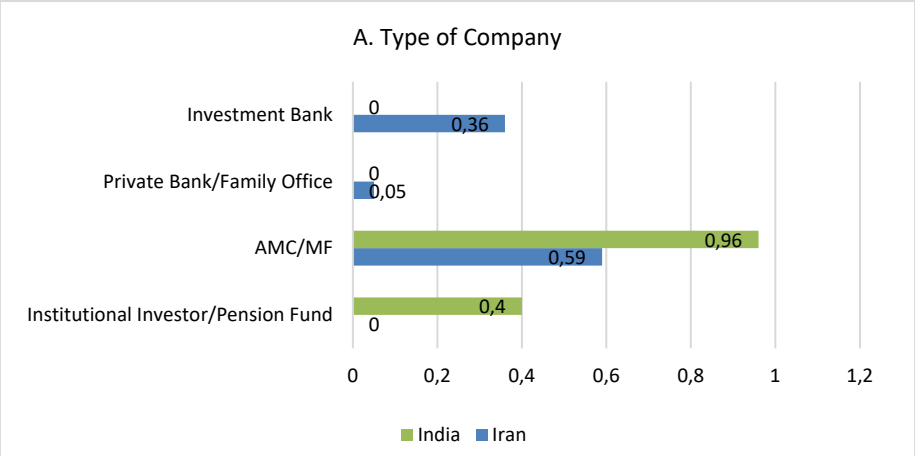
Portfolio Construction	
Measures and techniques	Non-sophisticated answers
Absolute risk measures	No No/Average risk
Relative risk measures	No No/Tracking error
Covariance matrix estimation	Sample Covariance
Extreme risk calculation	Not account for it Not account for it/Normal distribution VaR
Estimation risk	Weight constraints

Table 2. *Non-sophisticated measures/techniques in the process of portfolio performance evaluation*

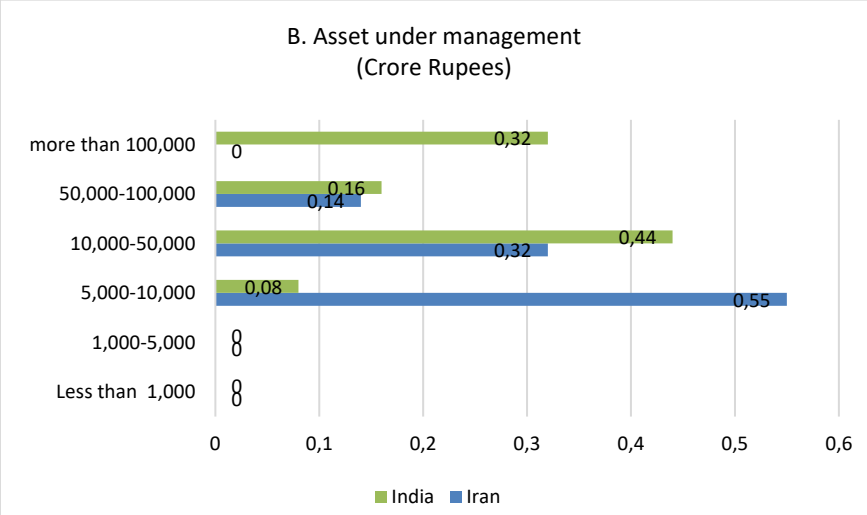
Performance Evaluation	
Measures and techniques	Non-sophisticated answers
Absolute performance evaluation	Sharpe ratio Average excess return Sharpe ratio/Average excess return
Relative performance evaluation	Average excess return Information ratio Average excess return/information ratio
Manager's alpha	Peer group

4. Analysis and discussion of results

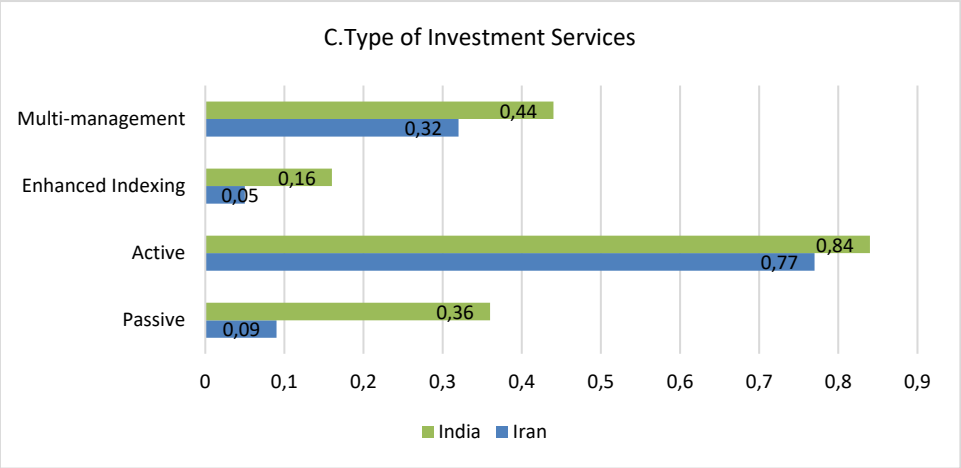
As shown in the Chart A, majority of respondents are Asset Management Companies (AMCs) in both India and Iran with a share of 96% and 59% respectively. Investment Banks constitute 36% of the participants in Iran.



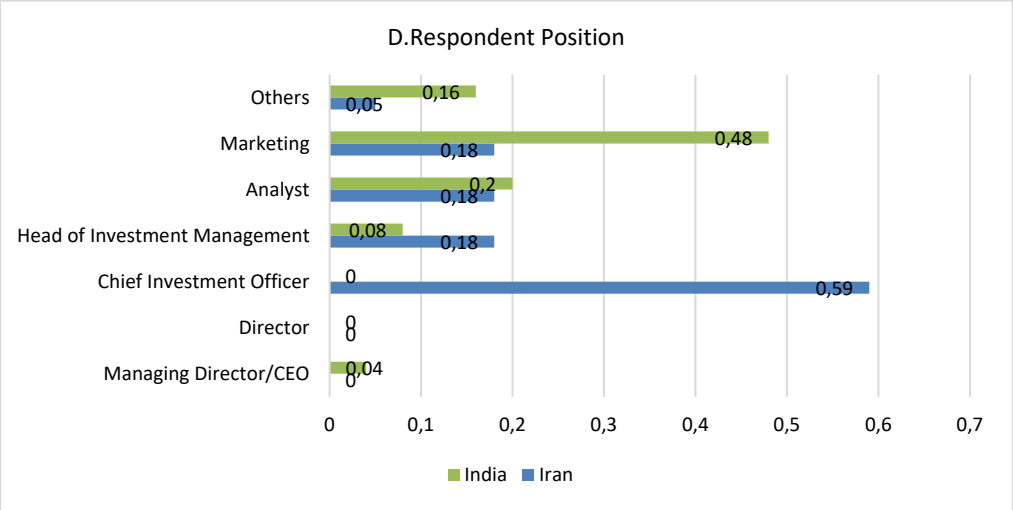
As it is indicative in Chart B, the size of asset under management in India is significantly higher compared to Iran. 55% of companies in Iran manage assets between Rs. Cr. 5,000 to 10,000 and no respondents in Iran has asset more than Rs. Cr. 100,000 under their management. In India, on the other hand, only 8% of respondents' portfolios are between Rs. Cr. 5,000-10,000 and about one-third of respondents have portfolios more than Rs. Cr. 100,000 under their management.



We also asked our respondents about the type of services their companies offer. The options cover the whole range of investment strategies including passive strategies, actively-managed strategies, multi-management (active and passive management), and enhanced indexing strategies. Evidently, majority of respondents (more than third-fourth) in both countries offer actively managed investment services as shown in Chart C. On the other hand, enhanced indexing strategies seem not to be popular among practitioners in both countries.



The role of respondents in their respective companies are questioned and presented in the Chart D. As it shows, most of the senior executive such as Managing Director/CEO, Chief Investment Officer, Head of investment management provided most of responses we received from Iranian companies. In India, on the other hand, Marketing positions account for nearly half of the responses. The responses from analysts account for less than one-fifth of responses received from Iran and one-tenth in case of India.



Portfolio construction and risk management

Modern portfolio theory emphasizes on considering both risk and return while constructing a portfolio. Although several risk measures have been introduced from the inception of the portfolio theory, the question is that to what extend the concept of risk is incorporated in the process of portfolio construction by investment management practitioners. Therefore, the respondents are questioned whether they set absolute risk measures when implementing portfolio optimization and which measures of risk they use.

As Table 3 shows, 14% and 4% of respondents from Iran and India do not count for risk measures in the process of portfolio construction. While variance/volatility is the most common used measure among both respondents from Iran and India, other risk measures such as tail risks and downside measure of risk seem to be less-common measures in both countries. Semi-deviation/LPMs are the second most popular risk measure among Indian mutual funds accounting for 40% of responses. In contrast, tail risk measures such as VaR/CVaR get lesser consideration of only 4% among Indian respondents.

Table 3. *Do you set absolute risk objectives in portfolio construction?*

Absolute Risk Measures	Iran	India
No	0.14	0.04
Variance/Volatility	0.64	0.52
VaR/CVaR	0.18	0.04
Semi-deviation/LPMs	0.09	0.4
Others	0.05	0

Regarding the relative risk measure to a benchmark as it is shown in the Table 4, the statistics are corresponding to those of absolute risk objective. 50% of respondents from Iran and 44% in India consider tracking error volatility in their portfolio construction process. Indian companies consider downside risk relative to a benchmark as twice as respondents from Iran. Tail risk relative to a benchmark is less common comparatively by respondents from both countries.

It may imply that practitioners are judged relative to some benchmark so that they have to consider the risk measures compared to some broad market index.

Table 4. *Do you set relative risk objectives in portfolio construction?*

Relative Risk Measures	Iran	India
No	0.14	0.04
Tracking Error relative to a benchmark	0.5	0.44
Tail risk relative to a benchmark	0.18	0.12
downside risk relative to a benchmark	0.18	0.36
Others	0.05	0.04

Regarding the estimation of covariance matrix, the respondents are given a variety of options including the use of sample covariance matrix, specifying a model with explicit factors such as single-factor model, constant correlation approach, or multi-factor forecast, specifying implicit factor models such as use of Principal Component Analysis (PCA), and use of optimal shrinkage techniques. Also, they are given option “other” in case they use other methods for the estimation of covariance matrix other than the given options. The responses indicate that using models with explicit factors seems to be the dominated method amongst others. The second most common option is using the traditional sample covariance matrix in both countries. Therefore, majority of respondents in India and Iran apply either sample covariance matrix or models with explicit factors jointly or individually. On the other hand, implicit factor models and optimal shrinkage techniques seem to be less familiar to the respondents, especially in case of Iran. Also, somehow surprisingly, 27% of respondents in Iran declared that they do not account for covariance matrix estimation in the process of portfolio construction which may imply that corresponded respondents adopt naive approach towards construction of portfolio under their management.

Table 5. *When implementing portfolio optimization, how do you estimate covariance matrix?*

Estimation of Covariance Matrix	Iran	India
Sample Covariance Matrix	0.27	0.36
Explicit factors models	0.45	0.52
Implicit factors Models	0.05	0.12
Optimal Shrinkage techniques	0.05	0.16
No/Others	0.27	0.04

There are at least four standard methods for calculation of VaR which are the most commonly used for calculation of VaR. Each method has its own strengths and weaknesses. Parametric approach assumes normal distribution for returns whereas non-parametric approach doesn't assume any particular return distribution.

The respondents are asked how they calculate extreme risks. As shown in Table 6, majority of respondents use simple VaR based on normal distribution technique to calculate extreme risks of their portfolios. Taking all together, more than half of the respondents in both countries either do not account for extreme risk measures or use VaR based on normal distribution method for calculation of extreme risks. One might imply that respondents' approach towards extreme risk is non-sophisticated. However, the results show that almost a quarter of respondents calculate VaR based on models that take higher moments of return distribution into account, sophisticated methods such as Cornish-Fischer semi-parametric approach, thus estimate more negative outcomes by considering the fat tails of return distributions.

Other less commonly used methods are VaR based on extreme value theory and CVaR respectively. The extreme value theory (EVT) is an advanced technique and refers to those events with an extremely rare probability of occurrence and a catastrophic impact, such as financial market turmoil. The results show that over 10% of respondents in both countries are aware of EVT and calculate VaR base on it. Conditional Value at Risk (CVaR), also referred to as expected shortfall, calculates the probability of portfolio losses beyond the VaR is applied by less respondents in both countries and participants from Iran seem to be either less aware of such measures or not adopting CVaR (tail VaR) in their practices.

Table 6. *When implementing portfolio optimization, how do you calculate extreme risk measures?*

Extreme Risk Calculation	Iran	India
No	0.09	0.08
VaR based on Normal Distribution	0.5	0.44
VaR based on Higher Moments	0.23	0.24
VaR based on Extreme Value Theory	0.14	0.12
CVaR	0.05	0.12

Next, the respondents are asked how they deal with the estimation error i.e., uncertainty about the estimated parameters that are used as inputs in portfolio optimization. As Table 7 indicates, imposing constraints on the portfolio weights is the most common used method. It counts for nearly 70% of respondents from Iran and above 30% of respondents from India. Other techniques such as Global Minimum Risk Portfolio or Black-Litterman/Bayesian Techniques seem not to be known or applied by respondents in Iran and only 5% of respondents use portfolio resampling to deal with estimation error. In India, on the other hand, about one-fourth of respondents use Global Minimum Risk Portfolio and the same proportion use portfolio resampling to deal with estimation error. The results show

that not only Indian institutions take error estimation into account more than Iranian companies, but they also use more sophisticated techniques than simply impose constraints on portfolio weights.

Table 7. *How do you deal with the estimation error?*

Estimation Error	Iran	India
Constraints on portfolio weights	0.68	0.32
Global Minimum Risk Portfolio	0.05	0.28
Black-Litterman/Bayesian Techniques	0	0.08
Portfolio Resampling	0.05	0.25
Other	0.23	0.08

Performance evaluation

The risk-adjusted performance measures, which evaluate the average excess return obtained in the managed portfolio considering the risk taken by the portfolio manager, are used to evaluate the ex-post performance of the portfolio.

Initially respondents are asked which absolute risk-adjusted ratios they use. As indicated in Table 8, Sharpe ratio and Treynor ratio are the most widely common measure in both countries. This result is corresponding to the fact that volatility and factor models are widely used in the process of portfolio construction. The other commonly used performance measure is average return in excess of risk-free rate which does not count for the risk taken.

As it is indicated in Table 8, applying Sharpe ratio and/or average return in excess of risk-free rate confirms that respondents use non-sophisticated methods. It is used by 56% of respondents in India and 23% of respondents in Iran. Surprisingly, Sortino ratio which considers semi-variance as risk adjustment is used by 27% of respondents from Iran which indicates the awareness of the respondents of the post-modern financial theories. This ratio is used by only 4% of respondents in case of India. Measures based on VaR are used by 9% of respondents in Iran and 28% of respondents in India, which implies the emphasize on tail risks by Indian institutions.

Table 8. *What do you use to measure the absolute performance?*

Absolute Performance	Iran	India
Sharpe Ratio	0.59	0.64
Treynor Ratio	0.59	0.28
Sortino Ratio	0.27	0.04
Measures based on VaR	0.09	0.28
Average return in excess of risk-free rate	0.23	0.56
Other	0.14	0.04

Assuming that the performance of a fund manager would be evaluated against a benchmark, the respondents are asked about the relative performance measures. Jenson's alpha extracted from CAPM is among the most widely used methods in both countries follows by using the naïve average return difference with a broad market index, which does not consider about the risk taken. Next most widely measure is the information ratio which considers the standard deviation of tracking error as the risk measure. It is used by 36% of respondents in India and 18% of respondents from Iran.

Table 9. *What do you use to measure the relative performance?*

Relative Performance	Iran	India
M-squared (Modigliani&Modigliani)	0.14	0.04
Graham-Harvey Measures	0.05	0
Jenson's alpha	0.59	0.52
The Information Ratio	0.18	0.36
Adapted information Ratio/VaR-based measure	0.05	0
Tail risk of tracking error	0.05	0
Average Return difference with a broad market index	0.5	0.44

Finally, the respondents are asked how they analyse manager's alpha which is the return in excess of a "normal" return on a reference portfolio. Alpha is, in other words, the "abnormal" return. As Table 10 shows, 72% of respondents in India consider absolute performance in a peer group to analyse the manager's alpha. This might not be the best approach as peer groups sometimes are not good proxies because risk exposures can vary greatly from one managed portfolio to another (Amenc et al., 2011). Comparatively peer group analysis is less commonly used by respondents from Iran (only 23%). Single-factor model which is based on CAPM are widely used by the institutions in both countries. However, alpha from multifactor models is not a common approach among respondents of both countries. According to Amenc et al. (2011) this indicate that practitioners are reluctant to use other multifactor models, probably because the ongoing debate in the asset-pricing literature about the right risk factors. In contrast, return-based style analysis which is a specific case of multi-factor models and facilitate the decomposition of the excess return into various risk factors, is among the widely used methods in calculating the manager's alpha with 32% and 24% of respondents from Iran and India respectively.

Table 10. *How do you analyze manager's alpha?*

Manager's alpha	Iran	India
multifactor models	0.05	0.12
single-factor models, such as CAPM	0.36	0.64
return-based style analysis	0.32	0.24
Absolute performance in a peer group	0.23	0.72
Other	0.09	0.04

In the table below, we summarized the outcomes of the survey and commented whether practices in India and Iran are sophisticated or non-sophisticated accordingly:

Table 11. *Summary of findings*

Methods	Comments	Sophistication/non-sophistication
Absolute risk	Variance/volatility dominates in both countries, participants from India are well aware of downside risk measures in the process of portfolio optimization	Mostly adoption of non-sophisticated measures. India seems to be more sophisticated than Iran setting downside measures in the process of portfolio optimization.
Relative risk	Tracking error dominates in both countries, however respondents from India are relatively more aware of downside risk measures relative to a benchmark than participants from Iran	Mostly adoption of non-sophisticated measures. India seems to be more sophisticated than Iran.
Covariance matrix	Explicit factors models seem to be the dominated method in both countries. Participants from India seem to adopt Implicit factor models and Shrinkage techniques more than participants from Iran.	Mostly adoption of sophisticated measures. India seems to be more sophisticated than Iran
Extreme risk	Either do not account for extreme risk measures or use VaR based on normal distribution	Non-sophisticated techniques are adopted by majority of respondent in both countries. However, some respondents in both countries adopt sophisticated techniques.

Methods	Comments	Sophistication/non-sophistication
Estimation error	Imposing constraints on the portfolio weights is the most common used method (nearly 70% of respondents from Iran and above 30% of respondents from India).	Overall, **non-sophisticated** techniques dominated. India adopts more sophisticated techniques than Iran.
Absolute performance	Sharpe ratio and Treynor ratio are the most widely common measure	**Non-sophisticated** methods dominated in both countries.
Relative performance	Jenson's alpha the most widely used methods in both countries follows by using the naïve average return difference with a broad market index	**Relatively sophisticated** Well aware of market model.
Managers' alpha	Single factor model, return based analysis and absolute performance in a peer group dominate in both countries.	**Non-sophisticated** methods are mostly applied by participants in both Iran and India. India seems to be less sophisticated.

5. Conclusion

The sophistication of adoption of a particular technique in both portfolio construction and performance Relative performance evaluation are those given by Amenc et al. (2011). This paper used the same criteria to find out the extent of sophistication of techniques adopted by asset management practitioners in India and Iran as examples of emerging economies. As resulted data in boldface in the above tables show, companies in both India and Iran use less sophisticated techniques and models in construction of their portfolios. However, it seems that practitioners in both countries are well aware of factor models. Regarding the performance evaluation, it seems ratios based on factor models such as Sharpe ratio, Treynor ratio, and Jenson's alpha are popular and widely used by practitioners in both countries. However, results show a slightly different approach between the two countries; Indian respondents seem to adopt various sophisticated measures in addition to the non-sophisticated ones in the process of portfolio optimization. On the other hand, it seems that respondents from Iran use more sophisticated measures to evaluate the ex-post performance than respondents from India.

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