The concept of portfolio management process finance essay

Introduction

A portfolio manager compiles appropriate investment opportunities and combinations (portfolio) for its customers or clients, to reduce financial risks through diversification. It carries out the necessary transactions on the stock exchange. Here the portfolio manager analyses the financial markets, monitors investment strategies and maintains also broker contacts. The basic idea of the portfolio management models of the strategic investment planning can be lead back to portfolio selection developed by Markowitz (1952). Since Markowitz's " Portfolio Selection Theory" many further studies and theories has expanded the classical optimal and complete portfolio management strategy. This report is going to construct for a client different portfolio management models: Markowitz equal- and value-weighted portfolio and the Treynor-Black model. We use data from DATASTREAM for the period between 31. 12. 2001 and 31. 12. 2011

1. 0 Portfolio Management Process

1. 1 The concept of portfolio management process

The portfolio management process includes three main elements, planning, execution and feedback. PlanningExecutionFeedbackSource: own sourceIt is on behalf of the portfolio manager to find an optimal investment strategy for each of his individual clients, therefore planning is an important component for the further portfolio management process. It includes the investment objectives, where risk and return are worked out and constraints. Constraints consists of two parts, the internal part, where a client's time horizon and liquidity needs are stated ad the external part which includes important

information such as regulatory requirements and tax issues. All the above mentioned parts of the planning step build the " Investment Policy Statement" (IPS). The execution step includes the portfolio selection, where the portfolio manager may use a very of techniques to build an optimal portfolio cut to the clients objective. It is important that the manager respects the client's objective and do not select securities which are not in line with the clients risk and return expectations. The feedback step includes important tasks such as monitoring and rebalancing. This includes the regularly feedback as well as the clients circumstances and market and economic input factors. The portfolio manager needs to be up to date about the client's circumstances such as changes in client's income or tax concerns. Also regularly monitoring of the created portfolio is important, as security valued today might not be in the line with the client's risks and return expectations in six month time.

1. 2 Investment Policy Statement

The basis for the strategic asset allocation builds the " Investment Policy Statement" (IPS), which includes client's objective, constraints and circumstances and builds is an important link for the relationship between investor and portfolio manager (adviser). Our client, German in nationality and resident in Germany, is a 43 years old lawyer and co-owner of a good running law firms. He is married has three children and his income (£150, 000 base salary per annum) builds the only income for his family. The investor has £300, 000 of savings from prior years. He is a moderate investor, A= 4, with above average ability of and below average willingness risk taking. The client's objective is to provide for his children a head start in

life, support for current lifestyle and construct of second home. The client's constraints are long-term and multi-stage investments with and his tax and regulations are the same in Germany (Income Tax: 42. 0%, Gains Tax: 50. 0% and Wealth Transfer Tax: 50. 0%). Overall we suggest that the client with the above stated investment policy allocation between British T-Bills and in the United Kingdom listed stocks.

2. 0 Markowitz methodology for portfolio construction

2. 1 Stock Selection using portfolio diversification

Professor Harry M. Markowitz (1952) established over a half century ago the mean-variance analysis which states that investors are risk-averse and also investors know variance, expected returns and covariance's of all securities. Markowitz's " Portfolio Selection Theory" (1952) is the main concept for portfolio managers to minimizing unsystematic risk. Risk can be divided into two parts, the systematic and unsystematic risk. Unsystematic risk, which is in fact the company risk, can be reduced by a diversified portfolio. Systematic risk are not controllable for a portfolio manager, it includes changes such as interest rate and inflation risk. A Diversification cannot eliminate the systematic risk. Total Risk

Number of shares

Unsystematic

Risk

Systematic

Risk

Source: Bodie, Z., Kane, A. and Marcus, A. J. (2011)The famous rule " Don´t put all eggs into one basket" can be lead back on this portfolio selection theory. The reduction of the unsystematic risk will be realised due to not correlated or negative correlated returns of two securities. The correlation coefficient (r) lies between -1 and +1 and can be calculated as follow: (1)Covariance, between the returns on two securities are given by:(2)where r is the return and E(r) is the expected return of securities A and B. Fratzscher and Imbs (2009) and Bera and Park (2008) has given empirical evidence that negative correlations can be used to build a zero-variance portfolio. Therefore we pick 25 stocks, firstly by the criteria of negative correlated or less correlated stocks with the Benchmark (indices), in our case the FTSE All Share index, followed by the diversification between different industries. We create a matrix correlation of the all the listed stocks in the FTSE ALL Shares and choose the two most negative correlated stocks as our first portfolio. We than run again a correlation of all the stocks listed in the FTSE ALL Shares and choose again the stock which shows the lowest correlation to our two stock portfolio. This will create our second portfolio and we run again a correlation against our three stock portfolio. We continue until we reached our 25 stocks.

Risk

r= 1

r=-1

Security A

Security B

r= 0. 5

C´

A´

B´

B A

C

Source: Bodie, Z., Kane, A. and Marcus, A. J. (2011)When determine our stocks, we also pay attention about the industry in which the company operates. The graph below shows our final 25 stock portfolio divided in weights of industry given in percent. The correlation matrix (Appendix) indicates the correlation of each of the chosen stock and also with the FTSE All Share Index. The portfolio picked regarding the correlation matrix is an equally-weighted portfolio, which is given by:(3)(4)The descriptive statistic about our 25 stocks gives us a quick overview about performance and behavior of the last decade.

Industry

Companies

Mean

Standard Deviation

Kurtosis

Skewness

Healthcare

DECHRA PHARMACEUTICALS

0, 00086

0, 07122193

1, 10342181

-0, 3782311

PRIMARY HEALTH PROPS.

0, 008485

0, 070575041

1, 34416722

0, 4329419

GENUS

0, 019151

0, 081153444

1, 8466591

0, 2692987

GLAXOSMITHKLINE

-0, 000537

0, 049531758

0, 95457652

-0, 1423956

SMITH & NEPHEW

0, 001807

0, 073244629

-0, 01408066

-0, 0009046

ASTRAZENECA

-0, 000125

0, 065563935

1, 22282928

-0, 0171535

Industrial Engineering

GOODWIN

-0, 001753

0, 063731099

1, 387766

-0, 0111156

Mining

RANDGOLD RESOURCES

0, 028303

0, 117465149

0, 85433359

0, 4889429

CENTAMIN

0, 016761

0, 136370774

0, 74043101

0, 1509619

Industrial Transport

UK MAIL GROUP

-0, 002453

0, 099259729

2, 69624618

-0, 9784011

Automobiles & Parts

TOROTRAK

-0, 011636

0, 218988691

5, 84490858

0, 0704421

Oil & Gas

SOCO INTERNATIONAL

0, 013429

0, 114581751

1, 2255746

-0, 0490887

SEVERN TRENT

0, 007574

0, 053922678

1, 29595222

-0, 7963218

FORTUNE OIL

0, 012342

0, 153563632

4, 31919078

1, 2858852

Food Producer

TATE & LYLE

0, 007386

0, 083635828

3, 01297197

-1, 1393368

CRANSWICK

0, 004633

0, 086109373

3, 42880486

-0, 6592947

DEVRO

0, 01334

0, 083623519

-0, 321439

0, 3385955

General Retailers

ASHLEY(LAURA) HOLDINGS

-0, 001598

0, 13995178

1, 42312694

0, 0785833

MCBRIDE

0, 008956

0, 10705162

2, 2230589

-0, 2618515

Software & Computer Service &Media

RM

-0, 011523

0, 142791774

33, 0710935

-4, 359697

BLOOMSBURY PBL.

-0, 006771

0, 081292414

2, 73558771

-0, 8282866

TELECOM PLUS

0, 018216

0, 102838277

0, 51842641

-0, 3388966

Insurance and Finance

JARDINE LLOYD THOMPSON0, 0019220, 0684031631, 44363605-0, 7160704

LONRHO-0, 0026370, 2017546495, 94846882-0, 3677583

Leissure

RANK GROUP-0, 0046590, 0948195253, 89174698-0, 7946632We can see that most of the companies had a positive return during the decade, while the mining sector outperformed all other industries for the analyzed time

period. The highest kurtosis can be seen for the software, computer and media industry; it has a stronger peak, heavier tails and more rapid decay. The autocorrelation and correlation analysis (Table 1; appendix) shows that our time series indicate lack of divergence.

2. 2 Construct of optimal and complete passive managed portfolio

We now optimize the portfolio on behalf of our clients which includes the risky and risk-free assets. First we construct the optimal risky portfolio using H. M. Markowitz efficient frontier and move further to construct the optimal complete portfolio which depends on the features of our clients risk tolerant. The efficient frontier is a graph for all possible minimum-variance portfolios of the expected return-variance. The construction of an optimal portfolio is a complicated process, with many different steps. Estimation step: We use covariance matrix and geometric returns to estimate the expected return for our 25 stock portfolios.(4)The second step includes a calculation step, the optimal risky portfolio P, and the creation of the efficient frontier graph, a plot of expected return versus standard deviation, which gives us the Capital Market Line (CAL). The efficient frontier is portfolios which in fact fulfill two criteria's of the client: Maximum expected return for all portfolios with the same risk. Minimum risk of all portfolios with the same expected return E(r). The y-intercept of the capital market line is the risk-free rate and the slope the Sharpe ratio. The optimal portfolio is given by a low variance among all portfolios. The optimal risky portfolio can be seen on the graph below, where our client achieves 0. 47% given a volatility of 2. 34%. Optimization step. We solve now for the weights that minimize the portfolio variance matter to the

two constraints and allocate funds among risk-free and risky assets. We review our client's investment policy statement and determine four the investor the following allocations; 205% of investment in optimal risky portfolio offering the leverage of 105% from T-Bills. In this case, the portfolio means increases to 3% along with the volatility of 8. 4%.

2. 3 Construct of market value-weighted Portfolio (MWP)

A market capitalization-weighted index or short value-weighted is estimated by summing the total market value of all the stocks in the indices. We use for the clients portfolio construction ten years of annual data for the same 25 stocks we picked regarding the correlation matrix and industry the firm operates. With a value-weighted portfolio the investor holds exactly the same weight of each company to its relative weight in the index.(5)where is the ending prices for stocks on day t, is the number of outstanding shares on day t, is the ending prices for stocks on base day and is the number of outstanding shares on base day. The geometric mean of the optimal portfolio is only 0. 07% with 5. 1% standard deviation implying that because market could not perform well, as a consequence of financial crisis, MWP does not offer high return. Moreover, the complete portfolio suggests 107% investment on T-Bills by shorting in the optimal portfolio. This investment opportunity improves portfolio mean to 0. 2% by decreasing the standard deviation to 1. 7%. Optimal and Complete Portfolios

Markowitz ModelMWP

Optimal Portfolio

Portfilio Return

SD

Complete Portoflioy

1-y

Portfilio Return

SD

2. 4 Treynor-Black methodology

The construction using Markowitz optimal portfolio selection theory assumes that market are efficient and in equilibrium. Treynor-Black (1973) propose a model to construct an optimal portfolio when markets are not efficient and in equilibrium. If markets are not fully efficient than an active portfolio management approach is used. In theory, markets would reach equilibrium when investors frequently seek out profit opportunities arising from over- or undervalued security pricings. In other words for active portfolio management mispricing is the required end result. The following table shows the chosen stocks which are significant over- or undervalued using the Tryenor-Black method. The efficiency of the Treynor-Black (TB) model hangs on critically on the capability to predict abnormal returns and depend on forecast of expected returns, variances and covariance's.

Name

5%

10%

BRITISH AMERICAN TOBACCO

OVERVALUED

OVERVALUED

BG GROUP

OVERVALUED

OVERVALUED

LLOYDS BANKING GROUP

UNDERVALUED

UNDERVALUED

ROYAL BANK OF SCTL. GP.

UNDERVALUED

UNDERVALUED

IMPERIAL TOBACCO GP.

OVERVALUED

OVERVALUED

RANDGOLD RESOURCES

OVERVALUED

OVERVALUED

SPIRAX-SARCO

OVERVALUED

OVERVALUED

CAPITAL GEARING TST.

OVERVALUED

OVERVALUED

ROTORK

OVERVALUED

OVERVALUED

RENTOKIL INITIAL

CORRECT

UNDERVALUED

DIXONS RETAIL

UNDERVALUED

UNDERVALUED

BARR (AG)

OVERVALUED

OVERVALUED

DOMINO'S PIZZA GROUP

OVERVALUED

OVERVALUED

CARR'S MILLING INDS.

OVERVALUED

OVERVALUED

GOODWIN

OVERVALUED

OVERVALUED

Again we look to out summery descriptive statistic to get a quick overview about past performance and volatility, skewness and kurtosis.

Name

Mean

Median

Standard Deviation

Kurtosis

Skewness

BRITISH AMERICAN TOBACCO0, 01502180, 02509990, 051861, 26051-0, 88821BG GROUP0, 01149260, 01622860, 057660, 72754-0, 56537LLOYDS BANKING GROUP-0, 0203948-0, 0089650, 119843, 138930, 005053ROYAL BANK OF SCTL. GP.-0, 0264611-0, 0096290, 1594415, 3543-2, 50171IMPERIAL TOBACCO GP. 0, 01134870, 00834750, 056180, 975150, 350214RANDGOLD RESOURCES0, 02830330, 02824840, 117470, 854330, 488943SPIRAX-SARCO0, 01357880, 01515450, 062830, 56856-0, 49184CAPITAL GEARING TST. 0, 00598550, 00724580, 029251, 41744-0, 5178ROTORK0, 01508260, 015410, 073280, 93041-0, 44421RENTOKIL INITIAL-0, 0126219-0, 0107450, 104494, 31068-0, 60749DIXONS RETAIL-0, 0235102-0, 0114440, 1682212, 4738-1, 03771BARR (AG)0, 01406380, 01549240, 06090, 705270, 042168DOMINO'S PIZZA GROUP0, 02470710,

02548150, 089610, 222360, 066526CARR'S MILLING INDS. 0, 01574410, 00709060, 074941, 984750, 27265GOODWIN0, 02237930, 01996690, 084040, 79567-0, 18359The table above shows that the most stock has shown a positive average return during the past ten years. The stock with negative average returns show higher volatility than those with positive average returns. The autocorrelation and correlation analysis (Table 2, appendix) shows that our time series indicate lack of divergence.

2. 5 Construct an optimal and complete active managed portfolio

We now optimize the portfolio on behalf of our clients which includes again the risky and risk-free assets. The optimal portfolio using the Treynor-Black model includes the following steps four main steps: Calculate expected return and standard deviation for passively managed market index. Identify mispriced stocks regarding highly negative or positive predictive alphas by running regressions.,(6)Where is our predictive alpha, is the analyst forecast return and is the Capital Asset Pricing Model (CAPM). The table below shows the alpha for our 15 stocks.

Ticker

RiskPremium

alpha

t-value

SD

beta

BATS. L

0, 0150

0, 0139

3, 11

0, 0519

0

BG

0, 0115

0, 0090

2, 10

0, 0577

0

LYG

-0, 0204

-0, 0297

-2, 31

0, 1198

0, 4164

RBS

-0, 0265

-0, 0403

-2, 13

0, 1594

0, 6172

IMT. L

0, 0113

0, 0095

2, 13

0, 0562

0, 0846

GOLD

0, 0283

0, 0260

2, 71

0, 1175

0, 1047

SPX

0, 0136

0, 0092

2, 28

0, 0628

0, 1973

COF

0, 0060

0, 0049

2, 16

0, 0293

0, 0490

RTOXV. L

0, 0151

0, 0120

2, 17

0, 0733

0, 1388

RTOKY

-0, 0126

-0, 0197

-1, 70

0, 1045

0, 3160

ROICU

-0, 0235

-0, 0250

-2, 00

0, 1682

0, 0644

BARR (AG)

0, 0141

0, 0109

2, 48

0, 0609

0, 1436

PZZI

0, 0247

0, 0249

2, 95

0, 0896

-0, 0092

CRM

0, 0157

0, 0115

2, 21

0, 0749

0, 1875

GDWN

0, 0224

0, 0000

2, 89

0, 0749

1

We now move to determine the weightings across our 15 mispriced stocks. Where the weight for a stock equals to:(7)We conduct the optimal portfolio by determine weightings of the actively managed portfolio and passively managed market index (FTSE ALL Shares). The combination of both will have than the highest possible Sharpe Ratio.(8)Going back to the clients IPS we allocate the fund between the optimal portfolio and risk-free rate and conduct our complete portfolio using the Tyrenor-Black model.

E(R)σActivePassive (Index)OptimalClient IndifferenceCurveCALSource: Maginn, L., Tuttle, D. McLeavey, D. and Pinto, J. " Managing Investment Portfolios – A Dynamic Process"

2. 6 Compare equal and value-weighted passive portfolio management

We compare the performance of equal and value-weighted portfolios and conclude, the advantage of the market value-weighted portfolio is that it makes the fundamental analysis more visible. Companies with higher market capitalization can be weighted by price-earnings ratio and compared with

companies with similar market capitalization and price-earnings ratio. The equal-weighted portfolio shows compare to the value-weighted portfolio a higher volatility and kurtosis. DeMinguel et al (2009) and Jacobs et al (2010) conclude in there research papers that equal-weighted portfolio outperform a value-weighted portfolio over time.

2. 7 Compare passive and active portfolio management

The question whether active or passive portfolio management is the better choice is inconclusive. A variety of studies has shown that passive portfolio management outperforms active portfolio management when investing in Blue Chips. However in times of financial crisis and recessions we recommend active portfolio management. In other words in times where markets are not efficient active portfolio management protect a portfolio from losses. For active investment strategy the client has to pay 2-3% a front end fee however for the passive investment strategy portfolio manager charge about 1% management fees. Both active and passive approaches have their benefits and can create value for the client. The investor must decide on the basis of his needs and risk tolerance which approach for which product and moment for him can make the best contribution to its portfolio

Conclusion

One very relevance saying for the financial market " Don't put all your eggs in one basket" builds the framework for the portfolio diversification theory. The price of different shares listed on the same index such as the FTSE 250, do not move together. This is the reason why portfolio diversification works. High negatively correlated shares are a good choice for portfolio

diversification, as the case of umbrella business and ice cream. When one business does badly, the other does well.