**Business Analytics Final Project**

The data envelopment analysis is used to analyze firms financial statements and determine a relative financial strength indicator. The DEA approach is studied relating to the 230 US firms to determine optimized RFSI indicators for stock selection. The fundamental analysis about the Investment worthiness by looking at its business or financial level. RFSI[Relative financial strength indicator] is based on studying the correlation between the DEA based score of financial strength and stock market performance. Fundamental analysis is the process of evaluating a public firm for the investment worthiness at the basic or fundamental level.

Fundamental analysis includes analyzing stresses the underlying factors of supply and demand.

The main goal is to predict the future security price and then predict to design equity portfolios.

The traditional programming models are ineffective for portfolio selection. In such cases, data envelopment analysis is used. The important aspect of management is that best set of projects are selected from competing proposals. The Data envelopment analysis is used to evaluate large sets of competing projects. The data envelopment analysis has become the popular area in the operations research. DEA measures the efficiency of the decision making units which can represent the organizations. DEA allows to rank projects from most to least efficient. When two or more projects enter the portfolio we have to compare the respective inputs and outputs with every other possible portfolio. Data envelopment analysis is used for the analysis of entities called Decision making units. DEA provides a measure to compare the firms performance with the other firms. DEA is also used to compare its efficiency overtime.

When the inputs and outputs are more, the PCA is applied for data reduction. DEA measures the relative efficiency of decision making units in organizations such as banks and dental services. DEA and factor analysis has a strong correlation and is used to evaluate efficiency.

DEA is an useful technique for measuring the efficiency of funds and is further developed in operations research. The decision making problems are solved by the Data envelopment analysis. The choice of output variables is important which uses DEA on portfolio analysis.

The undesirable outcomes have been included in the set of input variables. Input variables are checked for volatility risk. The return measures are used as output variables and risk measures are used as input variables. The hedge funds returns are expressed net of such costs. The efficient portfolios are similar to the production frontier. It is a delicate task to measure the risk, return or other performance indicators. The relation between the input and output variables is the first criterion. The framework under which portfolios are studied should be handled with care. The second criterion becomes useless since the first criterion has been successfully applied. The explanatory power of the input and output measures in assets scores relates to the third criterion. The input and output variables should be selected based on the technology. It assumes a relationship of the production kind between risk and return. The levelof risk is always to be minimized. An intent to propose an approach should get rid of monotonicity approach. The minimization of risks and their assimilation to inputs is studied.

The maximization of benefit is done. The risk seeking behaviors should neither be a prior and should not prevent taking them into consideration. The idea of benchmarking is to evaluate investment strategies relative to each other. The factors depend on the decision makers on how to measure financial performance. We have to take the viewpoint of the investor based on theoretical decision making frameworks. Due to the absence of the production process, under the DEA benchmark process the notions of inputs and outputs don’t really matter. Risk measures have always been minimized, studying the financial assets. The unique distribution of returns is characterized by the second order risk. Mean return and risk measure can be derived from the distribution of return. The return is itself the initial amount in the portfolio of finances. The skewness and kurtosis which are the higher moments of distribution are considered as outputs. The time series of returns or prices which are the measures are considered as outputs. The argument is put forward to support our choice of treating risk measures as output variables. The initial amount could generate no return but the initial requirements are met. The shadow prices of input and output would then reveal the investors preferences. The differentiation is made between the bad outputs and good outputs. Shadow prices are negative for undesirable ones positive for desirable outputs. The undesirable byproducts are considered as outputs. Both negative and positive shadow prices are applied on the byproducts. In the production theory the bad outputs are referred by the joint outputs.

All the byproducts in agricultural productions are the unintended outputs. The byproducts could be recycled and used as inputs. The investors will consider the potential impact on the final return. Risk and return are counted and considered as costs or benefits. All DMU’s operate in a similar environments, since environment impacts their performance.

When organizations do not have well defined goals, mixed integer programming models are used for portfolio selection. In such cases Data envelopment analysis is used to build project portfolios. The new DEA-MIP model is used to meet the organizational goals. The second stage DEA is used for calculating the most efficient portfolio. A best set of projects are selected from the competing ones. To evaluate large sets of projects the Data envelopment analysis is used. The DEA has become a popular area in the operations research. The relative efficiency of the decision making units is measured by the DEA. All DMU’s need not have the same set of units of measurement. DEA is capable of discriminating among the inefficient units. The project efficiency scores are not used in the selection of the most useful portfolios. The inputs and outputs of one portfolio should be compared with the inputs and outputs of other portfolios.

Then we can determine the most efficient portfolio. We seek for the solution which places a low burden on stakeholders. These approaches need to have value judgments to create optimal portfolios.