TITLE: METHOD AND DATA PROCESS SYSTEM FOR ANALYSING AND TIMING BUY/SELL TIPS AS AN AID TO INVESTMENT DECISION MAKING ON A TRADEABLE ASSET OR SECURITY

This invention relates to a system and method for processing data on tradeable assets or securities. The system and method is particularly suited to the stock market, options market, futures market, exchange/currency market, commodities market, bond market and other markets where assets or securities like shares, options, futures contracts, bonds, real estate or any type of asset are traded.

In any market, the price of an asset or security is generally subject to daily fluctuations. However, it is the extraordinary movements in the tradeable price of an asset or security which are the most difficult to identify but also represent the best opportunities to buy and sell the asset or security.

Accordingly, it is the object of the present invention to provide a method of analysing the data that is available on tradeable assets or securities and manipulating that data in order to better identify opportunities to purchase and sell those assets or securities.

Accordingly, the invention provides a method for analysing and determining the timing of buy/sell tips as an aid to decision making on a tradeable asset or security including the steps of: receiving data on a number of specified assets or securities; determining the technical strength of each asset or security; ranking the technical strength of each asset or security; selecting tradeable assets or securities having a ranking above a predetermined ranking; determining the fundamental strength of those selected assets or securities based on one or more of a group of variables and ranking those selected assets or securities; and, from the selected group of assets or securities, selecting assets or securities which are suitable for buying and/or assets or securities which are suitable for selling.

The technical strength of a tradeable asset or security is a function of variables that are calculated from the recorded market characteristics of a tradeable asset or security. These characteristics include the volume traded of the tradeable asset or security and the price at which the trade took place.

Hence the technical strength of a tradeable asset or security provides a strong indication of the demand for the asset or security and price movement of the asset or security. A predetermined level for the ranking is chosen based on experience and the fundamental strength of the selected group analysed based on one or more selected variables.

To determine the technical strength of a tradeable asset or security, it is preferable that the first variable which is calculated for each asset or security is the volume index which is defined as:

$$\text{Volume Index} = \frac{\text{Actual volume over a length of time}}{\text{Average volume over the same length of time based on an } x\text{-period}}$$

This variable gives an indication of whether the asset or security is trading higher or lower than average. For example, if the actual volume over a 3-hour period was 50,000 shares, and the average volume for 3 hours in the previous 1-month was 20,000 shares, then the Volume Index is 2.5. The volume index is combined with the price movement of the asset or security. Figures 1, 6, 6A, 6B, 7 and 8 are tables of shares in which the Volume Index of shares for particular market sectors and market capitalisations have been ranked in descending order.

It is preferable that a table of volume index be created by listing the volume index of each tradeable asset or security in a selected group of tradeable assets or securities in descending order over a period of time which may be, for example, the previous hour, previous trading day, previous trading week etc. That period of time may be one of a number of commonly used selectable periods of time or it may be nominated by the user or operator of the method. This variable is used to identify tradeable assets or securities which are subject to higher than usual volume trades over the given period of time. Together with the table, a note may be presented stating how Volume Index was computed and over which period of time.

The group of tradeable assets or securities under consideration may be reduced by setting a predetermined limit on the ranking or actual level/limit on the

volume index and then only further considering those assets or securities above this preset limit.

The second variable which may be used to determine the technical strength of an asset or security is the price movement which may be also listed and tabulated in descending order of price increases (in percentages) and price falls (in percentages) in the same selected group. The combination of the ranking of the tradeable asset or security in the volume index and the ranking on the price movement gives a measure of the upward technical strength of an asset or security. in the case where the price is increasing and the downward technical strength or weakness. in the case where the price is falling.

When an asset or security undergoes higher than average volume of sales with a corresponding increase in price then this indicates that the asset or security may be considered as a potential opportunity to buy. Conversely, when an asset or security undergoes a larger than average volume of sales with a corresponding decrease in price then this indicates that the asset or security should be considered as a sell opportunity.

It is preferable that tradeable assets or securities are selected from the list of ranked assets/securities. The assets or securities may be selected on the basis of a threshold ranking level as per one or several criteria which have been predetermined and may be based on past experience or on the actual combination of volume index and price movement. As well, they may be affected by recent company announcements, media coverage, comments/rumours, relevant economic events, etc.

It is preferable that for this selected number of tradeable assets or securities, the fundamental strength of the asset or security is determined and used as a filter mechanism to identify opportunities to buy or sell.

Alternatively, the fundamental strength of a group of tradeable assets or securities may be determined and ranked based on one or more criteria from a large number of possible criteria and the technical strength preferably as determined above is used to select from the higher ranked securities, on a fundamental strength basis which assets or securities represent opportunities to buy/sell.

In accordance with another aspect, the invention provides a data processing system which receives market data on tradeable assets or securities on a regular or real-time continuous basis (with or without a time lag) and performs the analysis method outlined above. The data processing system further includes a means such as a remote connectible terminal to output results of the analysis.

The output means may be capable of interacting with the data processing means to direct selection and display criteria.

The invention also relates to a computer program which carries out the method or is included in the data processing system above.

The invention may also provide a computer program and a computer programming element for performing the above described method of analysis.

The invention may also be used to enable an asset and/or securities portfolio manager to regularly or continuously monitor the relative performance of their portfolio. The manager may then make decisions on the buying or selling of assets or securities in the portfolio based on the relative performance and any recommendations made.

Accordingly another aspect of the invention provides a method of reviewing a portfolio of tradeable assets or securities including the steps of: -

(a) receiving data on a number of specified assets or securities,

(b) determining the technical strength of each asset or security from recorded market characteristics of the security or asset as a function of the volume traded of the security or asset, the price at which the trade took place, and the direction of movement of the price, and ranking the technical strength of each asset or security in ascending or descending order,

c) selecting a tradeable asset or security having a ranking or volume of technical strength above a predetermined ranking,

d) determining the fundamental strength of those selected assets or securities based on one or more of a group of selected variables and ranking those selected assets or securities based on their fundamental strength.

e) selecting or facilitating the selection of assets or securities which are suitable for purchasing and/or assets or securities which are suitable for selling based on the

combination of the technical strength and fundamental strength and establishing buying and selling benchmarks based on these selections,

f) receiving data on each tradeable asset or security in said portfolio of assets or securities,

g) determining the technical strength and fundamental strength of each portfolio asset or security,

h) comparing the technical and fundamental strength of each portfolio asset or security with the buying and selling benchmarks established in step (e), and,

i) processing, computing and/or displaying pros and cons of individual stocks as per various criteria

It is preferable that the steps of establishing benchmarks for buying and selling and proving recommendations be performed on a continuous or regular basis. This enables recommendations to be made on assets or securities in particular sectors of the market almost independently of the overall trend in the market.

The technical strength of an asset or security may be conducted by calculating the volume index as previously defined and using the volume index in conjunction with the magnitude and direction of the price movement of the asset or security as the measure of technical strength.

The fundamental strength of an asset may be determined by selecting at least one fundamental strength characteristic from the later described list of fundamental strength characteristics depending on the market sector, and the assets or securities under consideration are marked according to the one or more selected fundamental strength characteristics.

Other aspects of the invention may also provide a computer program and a computer programming element for performing the above described method of reviewing a portfolio.

The computer program or computer programming element may be loaded on to form part of a data processing means in a data processing system which is

operatively connectible to a remote terminal by such means as an internal network on the Internet to enable interactive operation of the data processing means.

The foregoing and other features, objects and advantages of the present will become more apparent from the following description of the preferred embodiment and accompanying drawings, in which:-

Fig. 1 is a table of high volume index shares listed in descending order of volume index on the Australian stock exchange for the trading week ending May 11 1987 in which the shares are separated into market sectors and grouped according to market capitalisation (in this example the Top 15 stocks by Volume Index in each category are selected and identified).

Fig. 2 is a table of shares traded on the Australian stock exchange as on May 11 1987 grouped according to market sectors and capitalisation and ranked in descending order according to NTA/price (this is the reciprocal of the Price-to-Book Value), (in this example the Top 15 stocks in each category as per NTA/Price are selected and identified).

Fig. 3 is a table of shares traded on the Australian stock exchange as on May 11 1987 grouped according to market sectors and capitalisation and ranked in ascending order of P/E ratio, (in this example the lowest 15 stocks in each category as per P/E are selected and identified).

Fig. 4 is a table of shares traded on the Australian stock exchange as on May 11 1987 grouped according to market sectors and market capitalisation and ranked in descending order according to dividend yield, (in this example the Top 15 stocks in each category as per dividend yield are selected and identified).

Fig. 5A is a table of shares traded on the Australian stock exchange for the week ending May 11 1987 grouped according to market sector and market capitalisation and are the best performing stocks ranked in descending order of the percentage rise in share price over the previous week.

Fig. 5B is a table of shares traded on the Australian stock exchange for the week ending May 11 1987 grouped according to market sector and market capitalisation and are the worst performing stocks ranked in descending order of the percentage fall in share price over the previous week.

Fig. 6 is a table of shares traded on the Australian stock exchange for the week ending July 17 1987 for shares grouped according to their market capitalisation and market sector and ranked in descending order of their volume index over the previous week.

Fig. 6A is a table of shares traded on the Australian stock exchange for the week ending July 10 1987 for shares grouped according to their market capitalisation and market sector and ranked in descending order of their volume index over the previous week.

Fig. 6B is a table of shares traded on the Australian stock exchange for the week ending June 19 1987 for shares grouped according to their market capitalisation and market sector and ranked in descending order of their volume index over the previous week.

Fig. 7 is a table of shares traded on the Australian stock exchange for the five weeks ending July 17 1987 for shares grouped according to their market sector and market capitalisation and ranked in descending order of the volume index over the previous five weeks.

Fig. 8 is a table of shares traded on the Australian stock exchange for the thirteen weeks ending July 17 1987 for shares grouped according to their market sector and market capitalisation and ranked in descending order of the volume index over the previous thirteen weeks.

Fig. 9 is a table of shares traded on the Australian stock exchange for the week ending July 17 1987 for shares grouped according to their market sector and market capitalisation and ranked in descending order of the change of ownership index (change of ownership is defined by the volume of shares traded as a percent of the issued capital).

Fig. 10 is a table of shares traded on the Australian stock exchange for the five weeks ending July 17 1987 for shares grouped according to their market sector and market capitalisation and ranked in descending order of the change of ownership index over the previous five weeks.

Fig. 11 is a table of shares traded on the Australian stock exchange for the thirteen weeks ending July 17 1987 for shares grouped according to their market

sector and market capitalisation and ranked in descending order of the change of ownership index over the previous thirteen weeks.

Fig. 12 is a table of shares traded on the Australian stock exchange for the thirteen weeks ending July 17 1987 for shares grouped according to their market sector and market capitalisation and ranked in descending order of the volume index over the previous thirteen weeks. This exhibit is titled Takeover Watch and is prepared after the computer scans through the previous two groups of Exhibits on Volume Indices and change of ownership to identify those stocks with a high correlation.

Fig. 13 is a table of shares traded on the Australian stock exchange as on July 17 1987 for shares grouped according to their market sector and market capitalisation and ranked in descending order of the NTA/price ratio.

Fig. 14 is a table of shares traded on the Australian stock exchange as on July 17 1987 for shares grouped according to their market sector and market capitalisation and ranked in ascending order of P/E ratio.

Fig. 15 is a table of shares traded on the Australian stock exchange as on July 17 1987 for shares grouped according to their market sector and market capitalisation and ranked in descending order of the P/E ratio.

Fig. 16 is a table of shares traded on the Australian stock exchange as on July 17 1987 for shares grouped according to their market sector and market capitalisation and ranked in descending order of dividend yield.

Fig. 17 is a table of shares traded on the Australian stock exchange as on July 17 1987 for shares grouped according to their market sector and market capitalisation and ranked in ascending order of yield.

Fig. 18 is a table of shares traded on the Australian stock exchange as on July 17 1987 for shares grouped according to their market sector and market capitalisation and ranked in descending order of yield and listing the dividend for each. The computer identifies those stocks which have had at least a 2-year history of producing good dividends as well as producing an annual capital appreciation of at least the bank deposit rate.

Fig. 19A is a listing in descending order of premium to recommended selling price together with the name of the broker recommending the selling opportunity.

Fig. 19B is a listing in descending order of discount to recommended buying price together with the name of the broker(s) recommending the buying opportunity.

Fig. 20 is a table of shares traded on the Australian stock exchange as on July 17 1987 for shares grouped according to their market sector and market capitalisation and ranked in descending order of the percentage increase in share price over the previous week.

Fig. 21 is a table of shares traded on the Australian stock exchange as on July 17 1987 for shares grouped according to their market sector and market capitalisation and ranked in descending order of the percentage increase in share price over the previous five weeks.

Fig. 22 is a table of shares traded on the Australian stock exchange as on July 17 1987 for shares grouped according to their market sector and market capitalisation and ranked in descending order of percentage price rise over the previous thirteen weeks.

Fig. 23 is a table of shares traded on the Australian stock exchange as on July 17 1987 for shares grouped according to their market sector and market capitalisation and ranked in descending order of the percentage price rise in the share price over the previous fifty-two weeks.

Fig. 24 is a table of shares traded on the Australian stock exchange as on July 17 1987 for shares grouped according to their market sector and market capitalisation and ranked in descending order of the percentage price fall in the share price over the previous week.

Fig. 25 is a table of shares traded on the Australian stock exchange as on July 17 1987 for shares grouped according to their market sector and market capitalisation and ranked in descending order of the percentage price fall in the share price over the previous five weeks.

Fig. 26 is a table of shares traded on the Australian stock exchange as on July 17 1987 for shares grouped according to their market sector and market

capitalisation and ranked in descending order of the percentage price fall in the share price over the previous thirteen weeks.

Fig. 27 is a table of shares traded on the Australian stock exchange as on July 17 1987 for shares grouped according to their market sector and market capitalisation and ranked in descending order of the percentage price fall in the share price over the previous 52 weeks.

Fig. 28 is a table of the commodity share prices and exchange rates as on July 17 1987 together with percent change from one week ago, five weeks ago, thirteen weeks ago and fifty-two weeks ago.

Fig. 29 is a takeover watch of shares traded on the Australian stock exchange for the thirteen weeks ending June 19 1987 for shares grouped according to their market sector and market capitalisation and ranked in descending order of the volume index over the previous thirteen weeks. (Refer description on Figure 12, Page 9).

Fig. 30 is a takeover watch of shares traded on the Australian stock exchange for the thirteen weeks ending July 10 1987 for shares grouped according to their market sector and market capitalisation and ranked in descending order of the volume index over the previous thirteen weeks. (Refer description on Figure 12, Page 9).

While the invention will now be described in regard to the buying and selling of shares, it would be readily understood by persons skilled in the art that the invention may be used in relation to any asset or security like options, futures contracts, bonds, real estate where the asset or security is traded and the results of those trades reported in accessible form.

The method of the invention involves receiving, on a regular or continuous real time basis (with or without a time lag), data on the trading of tradeable assets or securities such as stocks and shares, options, futures, currency, bonds, commodities etc. and analysing this data to identify which of the assets or securities represent good opportunities to buy or sell. It is to be noted that definitions of earnings per share, book value per share (NTA per share), dividend per share, etc are as per commonly accepted industry practice. A good opportunity or tip to "buy" is

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considered to be an asset or security where the potential and likelihood for capital growth is high and a good opportunity or tip to "sell" is considered to be a tradeable asset or security where the likelihood that the asset or security will undergo a devaluation or diminution of value is high. The time period over which calculations are made may vary depending on the use or the program.

The group of tradeable asset or securities may be selected on the basis of one or several common criteria such as:

1. A common industry sector.
2. A market capitalisation above a preselected amount, lower than a preselected amount or between two preset limits.
3. Inter market comparisons.
4. Any other criterion (refer to points 1-39, pages 13-21) like credit rating, currency in which the security is traded, sales turnover, profit margins, earning growth etc.

Depending on the selection process of the operator as well as the nature of members of the group of tradeable assets or securities, the filter mechanisms that are used to identify the buying and selling opportunities may be varied. When selecting a buying opportunity, the operator may establish preset limits within or above which the tradeable asset or security must be ranked in the variable in order for the variable to be selected.

For example, the operator may specify that in order to be representative of a buying opportunity the tradeable asset or security must be in the Top 1% (or Top 5%, 10%) of the higher volume index and in the Top 5% (or Top 2%, Top 10%, Top 25%) of price rises over a certain time frame in order to categorise a particular tradeable asset or security as having an upward technical strength and he may set a separate filter mechanism or selection criterion for identifying an upward fundamental strength hence signalling this tradeable asset or security is a buying opportunity.

A further consideration of the assets or securities on the list above the preset limit may be carried out by considering the fundamental strength of each asset or security. Figures 2, 3, 4, 13, 14 and 16 are tables of shares grouped according to

market sector and capitalisation. ranking the criteria chosen as the indicator of the fundamental strength.

Since the variable which is used to identify the fundamental strength of a tradeable asset or security can be varied and selected depending on the particular industry and market capitalisation, the combination of variables used to calculate the fundamental strength of the group of tradeable asset or securities can be varied with various combinations of the variables selected.

The following are examples of a list of other possible criteria (some of which are fundamental factors) which could generate BUY or SELL signals or tips and therefore act as additional filter mechanisms for BUY, if other criteria of high volume index and price rise are met or SELL, if other criteria of high volume index and price fall are met. The system uses a method of stock exchange relativities, benchmarks and/or comparisons on some or all of these criteria. Different sectors/industry groups may be selected for purposes of classification and comparison.

1. Dividend yield

The dividend yield is defined by the historic dividend divided by the last traded price of the asset or security. For the purposes of selecting buy opportunities/signals/tips, the dividend yield is arranged in descending order and the higher ranked dividend yield tradeable assets or securities are selected based on this variable. Conversely, for identifying sell opportunities/signals/tips low or zero dividend yield tradeable assets or securities are selected.

2. NTA/Price

NTA/Price (reciprocal of Price-to-Book ratio) is defined as the net tangible asset (NTA) backing of a tradeable asset or security divided by the last traded price. This variable is calculated for each tradeable asset or security and arranged in descending order for those tradeable assets or securities which are of an average or benchmark level. A high NTA/Price ratio

indicates buy opportunities/signals/tips when this variable is used. The bottom of the NTA/Price list may be used for identifying sell opportunities/signals/tips. The NTA or book value may be adjusted for inflation and substituted by the replacement cost of the assets and liabilities. A third alternative is an adjustment to make it closer to the market value of assets less liabilities.

3. P/E

P/E is defined as the last traded price of the tradeable asset or security divided by the earnings per asset or security. The P/E ratio can be ranked in descending order with low ranked P/E tradeable assets or securities indicating buy opportunities/signals/tips and high P/E ratios indicating sell opportunities/signals/tips.

4. P/EBITDAPS

The P/EBITDAPS is an abbreviation where P is the last price of the tradeable asset or security and EBITDAPS is the earnings before interest, tax, depreciation and amortisation per share. Low P/EBITDAPS tradeable assets or securities are identified as assets or securities which have the lowest multiple of price to earnings before interest, tax, depreciation and amortisation per share. A low ratio is indicative of buy opportunities/signals/tips whilst a high ratio indicates sell opportunities/signals/tips.

5. P/EVAPS

Identifying assets or securities that had the lowest (for buying) and highest or negative (for selling) P/EVAPS (defined as the price to economic value added per share) would be ranked in ascending order with the lowest ranking indicating buy opportunities/signals/tips. The P/EVAPS would also be ranked in descending order with the highest ranking indicating sell opportunities/signals/tips.

6. Discount to Historical High or Premium to Historical Low

The discount at which the asset or security price is currently trading relative to its historical high price may be listed in descending order with a higher ranking used to identify buy opportunities/signals/tips and a lower ranking indicating of sell opportunities/signals/tips. (The historical high price may be based on a pre-determined period eg. 1 week, 1 month. 1 quarter, 1 year, 3 years, 5 years, etc). For a certain stock identify the discount to its historical high to indicate buy opportunities/signals/tips.

7. Gearing level

Other filtering mechanism for assessing buy opportunities/signals/tips may be gearing levels lower than the industry average or benchmark, interest cover above a benchmark etc.

Conversely, for asset sell opportunities/signals/tips, high gearing levels (higher than or worse than the industry practice or benchmark) or thin interest cover may be chosen. These latter criteria may be chosen for selecting and identifying buy and sell opportunities/signals/tips from the group of tradeable assets or securities.

8. Discount/Premium to Brokers' Recommended Buy/Sell Price.

Buy and sell recommendations of various brokers may be recorded. Price differential between current price and the brokers' buy or sell recommendation price may be computed, compared and/or processed on a regular or continuous basis. An option may be added for the program to track these in ascending or descending or order of discount to broker's buy recommendation and ascending or descending order of premium to broker's sell recommendation.

9. Price to sales per asset or security

For certain stocks like technology stocks, filter mechanisms may be incorporated such as low price to sales per share and/or a high growth rate in sales per share, indicating buy opportunities/signals/tips. Conversely, a high price to sales per share and/or a low/negative growth in sales per share may indicate sell opportunities/signals/tips.

10. Market capitalisation

Market capitalisation, which may or may not be adjusted for debt levels, of a certain key commodity/output or a certain key commodity/resource may be considered. For commodity stocks, filter mechanisms may include market capitalisation per quantity of commodity produced or market capitalisation per quantity of commodity reserves. Again, for stocks such as like technology and internet stocks, etc., filter mechanisms may be incorporated viz market capitalisation per "unique user", market capitalisation per annual sales revenue per user, growth rate in sales per share, growth rate in sales, momentum, average number of hits per month, average number of unique users per month, etc. A low ranking for some or all of these variables may indicate buy opportunities/signals/tips while a high ranking may indicate sell opportunities/signals/tips.

11. Unusually high change of ownership index

The change of ownership index (c/o index) is calculated as

$$\frac{\text{Actual volume of shares traded over a given time period}}{\text{Total Shares on Issue}} \times 100$$

12. Identify stocks which are market leaders or have a position of market dominance or high market share in their respective industry/principal market. As a variation, one may identify stocks in descending order of market share in their respective industry/principal market.

13. Identify stocks which had return on shareholders' equity greater than say 15% per annum or 25% per annum in last/*X* financial year or financial quarter etc. As a variation, identify stocks in descending order of return on shareholder's equity or return on total assets.

14. Identify stocks which have high quality credit rating from rating agencies such as Standard & Poor's, Moody's, other rating agencies etc. Alternatively, identify stocks as per pre-selected categories of credit ratings, industry sectors, countries, stock exchanges, etc.

15. Identify stocks which have a low or high (on a relative basis) P/CFPS where CFPS is per share free cash flow defined by earnings plus depreciation minus capital spending minus dividends.

16. Identify stocks which have low/high volatility.

17. Identify stocks where top executives have significant shareholding in the company. As a variation, identify stocks where the Top 20 (or Top 40 or Top *X*) shareholders have a shareholding that exceeds a certain limit as a percent of issued capital. Or for example, identifying stocks in a certain industry where the combined holding of the Top 20 shareholders exceeds 70% of the issued capital (this may be construed to be a buy opportunity/signal/tip as it may reflect a closely held company).

18. Identify stocks in descending order or ascending order which are at a premium/discount to industry group or overall market based on various criteria outlined in this document.

19. Identify stocks which have high/low gross margins as per various benchmarks to be identified. As a variation, identify these in descending order or ascending order.

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20. Identify stocks which have debt level less/more than industry benchmark or S&P 500 or any other appropriate benchmarks.

21. Identify stocks which have a good/erratic track record of profitability. For example:

Buy Signals/Tips

(i) current quarterly earnings per share are up more than say 20% over the same quarter last year, or the most recent quarter reported.

(ii) annual compound growth rate of earnings exceeds say 20%.

Sell Signals/Tips

(i) last two quarters earnings have shown consecutive declines.

(ii) there has been an annual fall in earnings exceeding say 20%.

(iii) identify worst performance in terms of one of several indicators like declining profits, declining earnings per share, declining sales.

22. Identify stocks where inventories are declining/increasing. As a variation, identify these in descending/ascending order in each industry grouping.

23. Identify stocks where major new products/services have been launched. Identify companies where new management is in place.

24. Identify stocks where insiders are buying/selling more than average. Identify stocks where institutional sponsors are increasing/decreasing.

25. Identify stocks where there is growth/decline in physical volumes of sales or production or inventories.

26. Identify stocks where profit margins are rising indicating buy opportunities/signals/tips or falling indicating sell opportunities/signals/tips. Identify stocks where return on capital employed is higher/lower than a

benchmark. Identify stocks where earnings/revenue are higher/lower than a benchmark.

27. Identify stocks which have a higher/lower than benchmark/average growth in sales/profits/physical volumes/inventories etc.

28. Identify stock exchanges of countries where economic conditions are better or worse than before. For inter-stock exchange comparisons, a volume indicator in value or dollar terms may be used for computation, comparison and ranking of volume index. Also, identify what sectors and industries of the market are more promising and thus present better opportunities.

29. (i) Identify stocks which have a high/low cost structure defined by operating cost per unit produced or by other criteria.

(ii) For certain businesses identify and rank People Effectiveness Index defined by net sales billed in value terms divided by total payroll in value terms for buy/sell opportunities/signals/tips.

30. (i) Identify stocks which have higher than average growth rate in earnings per share (EPS), net tangible asset backing per share (NTA), gross cash flow per share (GCF). dividends per share (DPS), etc.

(ii) Identify "growth industries" for buy opportunities/signals/tips and "decline industries" or "recessing industries" for sell opportunities/signals/tips as per growth or decline in comparison with benchmarks.

31. Identify stocks which have a P/E ratio less than the earnings growth rate for buy opportunities/signals/tips. Also identify stocks which have a P/E ratio greater than the earnings growth rate for sell opportunities/signals/tips.

32. Among certain sectors like bank stocks, certain specific criteria may be created eg. Total Income/Average Assets, Operating Costs/Average Assets, Bad Debt Charge/Average Assets. These criteria may be stated as higher or lower relative to a benchmark. As a variation, they may be compared and listed in ascending/descending order.

33. Identify stocks of distressed firms with negative earnings or negative book values.

34. Identify High Income and capital gain stocks. For example, Figure 18 identifies those stocks in various sectors as at July 17 1987 which had Dividend Yield greater than 5% for that year AND had Dividend Yield greater than 5% one year ago AND had Dividend Yield greater than 5% two years ago AND had a capital gain in share price exceeding 72.8% when compared with the price three years ago (this represents an average annual compound growth rate in share price of 20% per annum). The exact numbers used for Dividend Yield and Capital gain may vary.

35. A "Takeover Watch" Exhibit is created (refer Figure 12) to identify stocks to watch for takeover possibilities. This includes stocks which had Unusually High Volumes Traded (or Volume Index) AND Unusually High Change of Ownership (defined by actual volume divided by shares on issue) and by whom, over 1 week, 5 weeks and/or 13 weeks. As a variation to this, the Takeover Watch might include only Unusually High Change of Ownership or a price increase accompanied by high change of ownership. Also refer to the definition of "momentum up" on page 21.

36. Identify stocks which have return (or earnings) on assets exceeding the indicator lending rate for buy opportunities/signals/tips or below the indicator lending rate for sell opportunities/signals/tips.

37. Identify and rank stocks for buy opportunities/signals/tips which are below their long term average (regression to the mean long-term average price). Conversely, identify and rank stocks for sell opportunities/signals/tips which are above their long term average (regression to the mean long-term average price).

38. Alternatively, the user/operator may pre-specify what, in their opinion, is an appropriate filter mechanism. This filter mechanism may go beyond conventional ideas. For example, they may wish to buy a comparatively high P/E stock because they believe that the bubble effect will mean that the price will continue to rise in the short-term even though they believe that in the long-term it is a sell opportunity.

39. Other criteria for value selection include some or all of Benjamin Graham's criteria, the 200-day moving average comparisons, or any other criteria of selection, may all be introduced in the program.

Typically the considerations for buying and selling tips in accordance with embodiments of the invention are as follows:-

SIGNALS FOR IDENTIFYING BUY OPPORTUNITIES/TIPS

Note: "AND" represents the Logic AND function. "OR" represents the Logic OR function.

1A. Upward technical strength (also termed "momentum up" or "momentum ↑") stocks is defined by selecting those assets/securities that have:

Noticeable price rise as identified by price movements in descending order of the percentage value of rises. (Mention needs to be made of the fact that price rises may reflect an opportunity to buy an overvalued asset/security. However, if volume index is high, there is a certain probability that the price may rise further

before it stabilises to a level when it generates a sell signal/tip based on value considerations.)

AND

High Volume Index above benchmark/average

AND we may also add as an optional factor a condition that

Market is not technically weak (meaning high Market Volume and falling Index)

1B. Upward strength in fundamental terms is defined by some of the criteria outlined earlier (refer above criteria 1-39, pages 13-21) and would include logic OR function of one of several or all of those criteria. The program may pick and identify which of the criteria 1-39 are met.

High Dividend Yield

OR

High NTA/Price

OR

Low P/E

OR

Low P/EBITDAPS

OR

Low P/EVAPS

OR

High discount to its own high

OR

Low gearing level

OR

High Discount to Brokers' Buy Recommendations

OR

Low Price to Sales Per Share (for selected technology and other stocks)

OR

Low Market Capitalisation (which may or may not be adjusted for debt levels) to quantity produced (for selected commodity producers)
OR
Low Market Capitalisation (which may or may not be adjusted for debt levels) to quantity reserves (for selected commodity stocks)

1C. Upward strength in technical and fundamental terms is defined by

Stocks which have technical strength as per 1A above.
AND
Stocks which have fundamental strength in one or more criteria as per 1B above.

Note: The factors of fundamental strength may be individually listed together with their percentile ranking in sector or relativity versus a chosen sector. Only a few of the 39 criteria are listed in Example 1 and Example 2.

SIGNALS FOR IDENTIFYING SELL OPPORTUNITIES/TIPS

2A. Downward technical strength and "momentum down" or ("momentum ↓") stocks is defined by selecting those assets/securities that have:

Noticeable price fall as identified by price movements in descending order of the percentage value of falls. (Mention needs to be made of the fact that price falls may reflect an opportunity to buy an undervalued asset/security. However, if volume index is high, there is a certain probability that the price may fall further before it stabilises to a level when it generate a buy signal/tip based on value considerations.)
AND
High Volume Index above benchmark/average
AND we may also add as an optional factor a condition that

Market is not technically strong (meaning high Market Volume and rising Index)

2B. Downward strength in fundamental terms is defined by some of the criteria outlined earlier (refer above criteria 1-39, pages 13-21), and would include logic OR function of several or all of those criteria. The program may pick and identify which of the criteria 1-39 are met:

Low Dividend Yield

OR

Low NTA/Price

OR

High P/E

OR

High P/EBITPS

OR

High P/EVAPS

OR

High premium to its own low

OR

High gearing level

OR

High Premium to Brokers' Sell Recommendations

OR

High Price to Sales Per Share (for selected technology and other stocks)

OR

High Market Capitalisation (which may or may not be adjusted for debt levels) to quantity produced (for selected commodity producers)

OR

High Market Capitalisation (which may or may not be adjusted for debt levels) to quantity reserves (for selected commodity stocks)

2C. Downward strength in technical and fundamental terms is defined by Stocks which have downward technical strength as per 2A above.
AND
Stocks which have downward fundamental strength in one or more criteria as per 2B above.

The buy and sell opportunities/signals/tips will outline the filtering or selection mechanisms used to provide more useful information to the user. Whether one wishes to buy or sell, the decision-maker may accordingly select the order as descending or ascending order.

The method of the invention and the data processing system computer program and computer program element using the method of the invention is suitable for use by individual and institutional investors, day traders, short-term traders, professional traders and brokers who maintain a list of tradeable assets or securities which are buying and selling opportunities.

A mechanism may be used for comparing a portfolio with a benchmark. This comparison may establish deviation from the benchmark together with suggested buy and sell signals/tips. A further mechanism may exist where the pros and cons of buy and sell decisions are automatically available on a real-time basis (with or without a time delay). Signals for identifying Buy and Sell Opportunities as described earlier would be used to identify BUY signals/tips as pros and SELL signals/tips as cons.

The software may be designed to make the filtering and selection available on a real-time basis in parallel with trading activity in the concerned market. The objective may be to let the system work as a personal interactive broker which provides processed information on stock market relativities/comparisons etc. based on which the user may make a decision on whether to buy, sell or hold a security/asset.

When the invention is embodied in a computer program element on a data processing system, then it may be possible for the client or investor to log onto his or her portfolio of investments and download contra information from the stock

exchange or other relevant source. This information would then be manipulated and analysed in accordance with the method or system of the invention to maintain a customised library of relevant information for that client or investor. The client or operator of the program accesses a data processing means having a computer program element embodying the invention from a terminal which is connectible to the data processing means via an internal network (intranet) on the Internet. The client or operator may interact with the data processing means by specifying such variables as selection criteria, display options or other operating variables. The results of the data processing may then be displayed on the terminal or recorded in hard copy or electronic form.

Alternatively, this may be an added consideration in the BUY/SELL decisions of the investor/user.

The library of relevant information may include information on price movements, volumes, sectoral exposure, recent press clippings, stock market announcements, relative position of various variables, buy and sell signals/tips in accordance with certain selection criteria of the program (together with assumptions and disclaimer and disclosure notices), user's target buy and sell targets, benchmark portfolio guidelines etc.

This historical information can be used to compare the various variables used in the invention including benchmarks to test the validity of buy and sell signals/tips and identify modifications, optional weighting factors or further criteria which could be considered in the future.

Comparisons of various variables including benchmarks may be made on a historical basis and/or on an inter-market basis to identify relativities, arbitrage opportunities etc.

Figures 5A, 5B and 27 are tables calculated to identify the best and worst performing shares over various periods of time. The information in these tables is an example of the historical information which may be gathered and used to test the hypotheses on buy and sell signals/tips and other variables related to the buy/sell decision.

Figure 28 is a table of the commodity prices and exchange rates captured for a particular date to provide a reference for their effect on share prices.

It may be preferable for a benchmark or set point on any one or more variables at any point of time to be computed and/or communicated. The benchmark may exist for any sector or for the market as a whole. It is likely that the benchmark will change with the passage of time.

New indicators may be created to compute the value of a variable relative to a certain benchmark ie. relative P/E, relative P/NTA, relative price rise or fall with respect to a section. (This may be termed over-performance/under-performance with respect to a sector benchmark).

Each stock may be given a percentile ranking as per a selected criterion. This percentile ranking would indicate what percent of the selected group were worse off than that stock for that criterion. For example, if there were 15 companies in the selected group and if the criteria was P/E and the stock had the fifth lowest P/E its percentile ranking (for potential BUY opportunity) would be 66.67. Likewise, if the second criteria were current quarterly earnings growth and the stock was third in its selected group of 15 its percentile rank (for potential BUY opportunity/tip) on current quarterly earnings growth would be 80.

To illustrate the present invention, the following examples are provided based on the data of the accompanying figures.

EXAMPLE 1A

Stocks in which there was both a significant price rise (refer Figure 5A) and a significant volume index (refer Figure 1) in the week ended 11 May 1987. This is an example of Momentum Up or Momentum ↑ stocks. They are separated into three capitalisation levels; over $200 million, between $50 million and $200 million, and under $50 million. They are in descending order from the highest rise of the week down to the lowest rise of the Top 15. Their volume index is also stated with the rank of their volume index in the Top 15. For example, Exhibit 1A processes the commonality/correlation (which may also be referred to as the AND logic function) to identify stocks in the Top 15 of price rises in certain categories that also had a volume index ranking in the Top 15 of that category.

EXHIBIT 1A

Rank of Stock by % Rise	% Price Rise Over Week	Volume Index (Rank)
Capitalisation > $200m (Mining & Oil)		
1. Pelsart Resources N.L.	36.84	2.86 (12)
2. Hartogen Energy Limited	32.31	8.48 (3)
3. Aust. Oil and Gas Corporation Limited	25.58	2.63 (14)
6. M.I.M. Holdings Limited	17.38	2.53 (15)
8. Crusader Limited	16.07	3.99 (9)
14. Bell Resources Limited	11.94	6.19 (6)
15. Metals Exploration Limited	11.76	7.51 (4)
Capitalisation > $200m (Industrials)		
2. Airship Industries	72.41	24.64 (1)
12. Borg-Warner (Australia) Ltd	6.38	8.75 (3)
14. Boral Limited	6.00	1.99 (12)
Capitalisation $50m - $200m		
1. Bruce Resources N.L.	177.78	212.47 (1)
3. Consolidated Petroleum Aust. N.L.	64.71	11.71 (6)
4. Greenbushes Tin Limited	52.94	7.85 (12)
5. Phoenix Oil & Gas N.L.	47.83	10.16 (7)
7. Aztec Exploration Limited	45.83	8.46 (9)
10. Petro Energy Limited	33.33	8.17 (11)
11. Winton Oil N.L.	33.33	14.22 (3)
13. Genoa Oil N.L.	31.43	12.72 (5)
15. Barcoo Petroleum N.L.	26.67	68.01 (2)
Capitalisation < $50m		
5. Zapopan N.L.	66.67	12.06 (7)
12. Central Murchison Gold Limited	46.15	13.23 (7)

EXAMPLE 1B

Stocks in which there was both a significant price decline (refer Figure 5B) and a significant volume index (refer Figure 1) in the week ended 11th May, 1987. This is an example of Momentum Down or Momentum ↓ stocks. They are separated into three capitalisation levels; over $200 million, between $50 million and $200 million, and under $50 million. They are in descending order from the highest decline of the week down to the lowest of the Top 15. Their volume index is also stated with the rank of their volume index in the Top 15.

For example, Exhibit 1B processes the commonality/correlation (which may also be referred to as the AND logic function) to identify stocks in the worst (top) 15 of Price falls in certain categories that also had a volume index ranking in the Top 15 of that category.

EXHIBIT 1B

Rank of Stock by % Fall	% Price Fall Over Week	Volume Index (Rank)
Capitalisation > $200m		
2. Anglo American Pacific Limited	6.15	19.13 (1)
3. Hill 50 Gold Mine N.L.	5.56	3.60 (10)
7. Ampol Exploration Limited	3.57	3.23 (11)
8. Oil Search Limited	3.33	9.99 (2)
11. BHP Gold Mines Limited	2.78	6.33 (5)
Capitalisation < $50m		
9. Kalbara Mining N.L.	17.33	27.54 (5)

EXAMPLE 2

From the list of stocks in Exhibits 1A and 1B we follow certain stocks over each day of the previous week during which they either rose or fell significantly. This establishes the relevance of Momentum Up ↑ or Momentum Down ↓ to buy and sell tips during the period in which momentum was up or down. By doing so, we

can follow their daily movements and see the volumes traded with these fluctuations. By solely using the correlation between price movement and high volume index we can determine good (albeit rough) estimates of when to buy and sell the stock according to the procedures described in the patent. Note that only price and volume index have been taken into account here and not the additional criteria as recommended.

ACTUAL PRICE & VOLUME ON THE DATE

	Vol (00's)		Vol (00's)		Vol (00's)		Vol (00's)		Vol (00's)		Vol (00's)		Vol (00's)	
1/5/87	⇒	4/5/87	⇒	5/5/87	⇒	6/5/87	⇒	7/5/87	⇒	8/5/87	⇒	11/5/87	⇒	15/5/87

STOCK NAME & BUY/SELL TIPS BASED ON TECHNICAL CONSIDERATIONS OF PRICE & VOLUME

AIRSHIP INDUSTRIES LIMITED (Refer Exhibit 1A)

	3640		3195		198		2965		8905		4705			
62	⇒	53	⇒	55	⇒	55	⇒	70	⇒	100	⇒	110	⇒	95
				BUY										

AMPOL EXPLORATION LIMITED (Refer Exhibit 1B)

	232		125		94		1318		6906		2119			
560	⇒	530	⇒	500	⇒	530	⇒	530	⇒	540	⇒	534	⇒	600
										BUY				

ANGLO AMERICAN PACIFIC LIMITED (Refer Exhibit 1B)

	5367		1051		4338		11907		5423		524		143	
325	⇒	320	⇒	300	⇒	300	⇒	305	⇒	300	⇒	295	⇒	295
		SELL												

AZTEC EXPLORATION LIMITED (Refer Exhibit 1A)

	2855		775		2775		5498		9316		1866		2679	
72	⇒	72	⇒	72	⇒	75	⇒	105	⇒	110	⇒	104	⇒	110
						BUY								

BHP GOLD MINES LIMITED (Refer Exhibit 1B)

	2458		1338		1504		1153		4185		1201		2025	
173	⇒	172	⇒	175	⇒	172	⇒	172	⇒	175	⇒	170	⇒	162
		SELL												

BORAL LIMITED (Refer Exhibit 1A)

452 $\overset{199}{\Longrightarrow}$ 450 $\overset{2762}{\Longrightarrow}$ 450 $\overset{1316}{\Longrightarrow}$ 470 $\overset{4957}{\Longrightarrow}$ 478 $\overset{4694}{\Longrightarrow}$ 480 $\overset{2105}{\Longrightarrow}$ 480 $\overset{1199}{\Longrightarrow}$ 495

BUY

BRUCE RESOURCES N.L. (Refer Exhibit 1A)

47 $\overset{2634}{\Longrightarrow}$ 55 $\overset{265}{\Longrightarrow}$ 78 $\overset{552}{\Longrightarrow}$ 80 $\overset{825}{\Longrightarrow}$ 100 $\overset{260}{\Longrightarrow}$ 130 $\overset{550}{\Longrightarrow}$ 110 $\overset{175}{\Longrightarrow}$ 105

BUY

CRUSADER LIMITED (Refer Exhibit 1A)

280 $\overset{334}{\Longrightarrow}$ 300 $\overset{169}{\Longrightarrow}$ 310 $\overset{5451}{\Longrightarrow}$ 315 $\overset{940}{\Longrightarrow}$ 315 $\overset{727}{\Longrightarrow}$ 320 $\overset{660}{\Longrightarrow}$ 325 $\Longrightarrow$ 320

BUY

GENOA OIL N.L. (Refer Exhibit 1A)

445 $\overset{150}{\Longrightarrow}$ 450 $\overset{285}{\Longrightarrow}$ 430 $\overset{505}{\Longrightarrow}$ 455 $\overset{438}{\Longrightarrow}$ 440 $\overset{116}{\Longrightarrow}$ 455 $\overset{40}{\Longrightarrow}$ 500 $\Longrightarrow$ 580

BUY

KALBARA MINING N.L. (Refer Exhibit 1B)

78 $\overset{4040}{\Longrightarrow}$ 72 $\overset{5655}{\Longrightarrow}$ 70 $\overset{2270}{\Longrightarrow}$ 55 $\overset{5103}{\Longrightarrow}$ 64 $\overset{5470}{\Longrightarrow}$ 62 $\overset{1882}{\Longrightarrow}$ 62 $\overset{1790}{\Longrightarrow}$ 63

SELL BUY

METALS EXPLORATION LIMITED (Refer Exhibit 1A)

170 $\overset{174}{\Longrightarrow}$ 160 $\overset{205}{\Longrightarrow}$ 165 $\overset{168}{\Longrightarrow}$ 172 $\overset{4856}{\Longrightarrow}$ 175 $\overset{2145}{\Longrightarrow}$ 190 $\overset{1057}{\Longrightarrow}$ 195 $\overset{2795}{\Longrightarrow}$ 195

BUY

M.I.M HOLDINGS LIMITED (Refer Exhibit 1A)

330 $\overset{15969}{\Longrightarrow}$ 338 $\overset{4615}{\Longrightarrow}$ 362 $\overset{12958}{\Longrightarrow}$ 370 $\overset{7812}{\Longrightarrow}$ 385 $\overset{9365}{\Longrightarrow}$ 380 $\overset{2714}{\Longrightarrow}$ 375 $\Longrightarrow$

BUY

PELSART RESOURCES N.L. (Refer Exhibit 1A)

100 $\overset{1521}{\Longrightarrow}$ 100 $\overset{3609}{\Longrightarrow}$ 105 $\overset{5336}{\Longrightarrow}$ 115 $\overset{884}{\Longrightarrow}$ 135 $\overset{2727}{\Longrightarrow}$ 130 $\overset{1325}{\Longrightarrow}$ 120 $\Longrightarrow$ 119

BUY

PHOENIX OIL & GAS N.L. (Refer Exhibit 1A)

115 $\overset{4958}{\Longrightarrow}$ 125 $\overset{1115}{\Longrightarrow}$ 130 $\overset{1107}{\Longrightarrow}$ 130 $\overset{1093}{\Longrightarrow}$ 145 $\overset{8226}{\Longrightarrow}$ 170 $\overset{1609}{\Longrightarrow}$ 140 $\Longrightarrow$ 160

BUY

WINTON OIL N.L. (Refer Exhibit 1A)

21		24		25		26		27		28		29	
	49750 ⇒	BUY	22325 ⇒		15870 ⇒		18230 ⇒		20530 ⇒		10405 ⇒		⇒

EXAMPLE 3 **(This is an example of a combination of fundamental and technical factors)**

Examples of High Dividend Yield and High Volume Index

This Exhibit lists those stocks that were in the Top 15 of the High Dividend Yield in their category of market capitalisation as at 11/5/87 (Figure 4) AND were also in the Top 15 of High Volume Index subsequently. This suggests technical considerations of High Volume Index and corresponding price rise combined with fundamentals represent a sound BUY opportunity. Daily volume data would have been helpful in making a BUY decision.

Westpac Banking Corporation

4.98 May (11/5/87)

⇩ High 1-Week Volume at 17/7/87 (#10 in Top 15, Figure 6)

5.46 July (17/7/87)

Bell Resources Limited

6.00 May (11/5/87)

⇩ High 1 week Volume at 17/7/87 (Figure 6), High NTA/P at 11/5/87 (Figure 2)

4.35 July (3/7/87)

⇩ High 1-Week Volume Index at 10/7/87 (#2 in Top 15, Figure 6A)

4.78 July (10/7/87)

⇩

6.00 July (17/7/87)

Consolidated Rutile Limited

7.00 May (11/5/87)

⇩ 6.70 with High 1-Week Volume at 10/7/87 BUY (#6 in Top 15, Figure 6A)

7.00 July (17/7/87)

Queensland Coal Trust

1.45 May (11/5/87) – High Dividend Yield Stock

⇩ High Dividend Yield and High Volume Stock
(5 weeks, #10 in Top 15 at 17/7/87, Figure 7)

1.56 July (17/7/87)

CSR

3.83 May (11/5/87) - High Dividend Yield

⇩

4.05 (19/6/87) (#4 in Top 15, Figure 6B)

⇩

3.95 July (17/7/87) - High 5 Week Volume Index
(#9 in Top 15, Figure 7)

CRA

11.30 May (11/5/87) - High Dividend Yield

⇩

10.45 May (10/7/87) - High Dividend Yield

⇩ (10/7/87, Figure 6A High Volume)

10.50 July (17/7/87) - High 5 Week Volume Index
(#12, Figure 7)

Examples of NTA/P and High Volume Index

Bell Resources Limited

6.00 May (11/5/87)

⇩ High Volume at 17/7/87,
(#1 in Top 15, Figure 6)
High NTA/P at 11/5/87

4.35 July (3/7/87)

⇩ High 1-Week Volume Index
(#2 in Top 15, Figure 6A)

4.78 July (10/7/87)

⇩

6.00 July (17/7/87)

Bridge Oil	1.55	High NTA/P at 11/5/87 (#1 in Top 15, Figure 2)
	1.90	High 1-Week Volume at 17/7/87 (#14 in Top 15)
Westpac Banking Corporation	4.98	High NTA/P at 11/5/87 (#5, Figure 2)
	5.46	High 1-Week Volume Index at 17/7/87 (#10, Figure 6)
Tooth & Co.	6.20	May (11/5/87) - High NTA/P (#8, Figure 2)
	7.90	July (17/7/87) - High 5-Week Volume Index (#4, Figure 7)
Sunshine Australia	2.45	May (11/5/87) (#7 in NTA/P, Figure 2)
	2.65	July (17/7/87) - High 5-Week Volume Index (#10, Figure 7)
Austore Property Trust	0.75	May (11/5/87) (#4 in NTA/P, Figure 2)
	0.80	July (17/7/87) - High 5-Week Volume Index (#7, Figure 7)

Similar analysis may be performed using other criteria mentioned in the earlier list of criteria.

Figures 9-11 are illustrative of a table of shares selected on the basis of criteria 11, i.e. change of ownership index and is used as a measure of a buy opportunity/signal/tip.

Figures 12, 29, 30 are a takeover watch and are illustrative of the volume index and the change of ownership index being used as a measure of a buy opportunity/signal/tip.

Figure 13 is illustrative of a table of shares in which criteria 2 is used as a measure of the fundamental strength.

Figures 14 and 15 are illustrative of a table of shares in which criteria 3 is used as a measure of the fundamental strength/weakness.

Figures 16 and 17 are illustrative of a table of shares in which criteria 1 is used as a measure of the fundamental strength.

Figure 18 is illustrative of a table of shares in which criteria 34 is used as the measure of the fundamental strength.

Figures 19A and 19B are illustrative of a table of shares in which criteria 8 is used for determining a buying or selling tip.

Figures 20-27 are illustrative of technical criteria of price rises or price falls.

As can be seen from the above, the method of analysing in accordance with the invention can be used as a basis for buying and selling tips of any type of tradeable asset by a combination of the technical strength as an indicator of the volume turned over and the fundamental strength which is based on a criteria indicative of the particular market under consideration.

The computer program may also make available other information and other opportunities as follows:-

- Comments made on a stock by brokers, media etc, as well as company announcements may be made available to a user based on the buy and sell signals/tips generated, user's interest (as may be determined through mass customisation).
- Networking opportunities or loose alliances may be formed to discuss certain issues related to a stock or financial instrument. This may be in the form of talkback or chatting on the internet created for groups interested in sharing comments/analysis/research on a certain security.

- It may be possible to present a prospectus or Initial Public Offering (IPO) on the internet . Also, the program may be set up for creating comparisons vs current benchmarks in the stock exchange. As a result, investors may either buy or underwrite or sub-underwrite or bid for stock using real-time trading, internet, etc.
- The program may be used for identifying opportunities among closed end funds by comparing with other funds, stocks sectors, their Net Asset Value (NAV), Market Price (MP), NAV/MP, Yield, Fees charged, Total Returns etc. Ranking of NAV/MP and other criteria may be done to identify relativities, value, etc.
- For Futures Markets, a third indicator besides Price and Volume may be used viz. open positions. This will also be compared with its own average or benchmark to create an Open Positions Index. The Open Positions Index may also be listed in descending order. For example, if Prices increase AND Volume Index is unusually high AND Open Positions Index is unusually high this will be a strong buy signal. Seasonal adjustments may include adjustments for double witching and triple witching.
- Adjustments may be made for taxation purposes to suit investors as per their own circumstances and/or the tax regimes under which they operate.
- Opportunities for international portfolio investing, global investing etc. may be highlighted.

Sensitivity Analysis of a stock may be carried out by setting norms of change of earnings per share with critical variables like prices of key commodities, exchange rates, interest rates etc. By using the current P/E multiple and/or other variables, arbitrage opportunities of buy or sell may be identified by generating appropriate signals/tips.

It may be possible to do a sensitivity analysis of price to key variables like interest rates, inflation, employment data, current account deficit, prices of key commodities, etc. to identify arbitrage opportunities. For example, if interest rates have gone up and bank stocks have gone down, identify relative value within the

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banking sector ie. identify those banking stocks which have fallen the most as a result of interest rate falls (these might offer switch opportunities within the banking sector). Likewise, if gold prices go up, identify relative value within gold stocks.

While the invention has been described with reference to tradeable shares and other securities, the invention is equally applicable to any tradeable asset in which volume is recorded and reported such as real estate. Also, embodiments of this document may be combined with relevant factors of the following markets to make it more applicable to each of them:

1. PROPERTY APPLICATION

There is a major difference in Property Valuations when compared with Share Valuations. Whereas Share Valuations are transaction based, Property Valuations are appraisal based.

The first step in Property Valuations is to correctly determine the net income after deducting all outgoings. The second step is to arrive at a decision to use a certain capitalisation rate. It must be remembered small changes in the capitalisation rate can cause significant changes in the resulting capital value. Individual owners of property with a given net income would like to know the capitalization rate applicable to the property.

The capitalisation rate is dependent on the following factors (research on some or all of these factors may be carried out regularly prior to assuming a certain capitalisation rate for the purpose of valuing a property):

- special characteristics like high returns, low risk, indivisibility, illiquidity, high costs of transfer, long-term nature etc.
- Location
- Building type
- Economic Situation
- Quality of cash flow and security of income
- Tenants and Tenant strength and its impact on security and regularity of income.

- Duration of Tenancy contracts
- Alternative investments including alternative property investments
- State of the property market, vacancy levels etc.
- Risks and insurance against fire, earthquake, cyclone, flood, third
- Party liabilities etc.
- Legal environment viz. Title, easements, encroachments, leases etc.
- Growth potential
- Sentiment. This is an important factor in determining capitalization rate and is a function of momentum. A discussion on momentum in estimating capitalization rates for property valuations is given in the following two paragraphs.

The capitalization rate for a given property may be estimated as a result of benchmarking and comparison with similar properties. The value of a property may be fixed on the basis of the estimated capitalization rate. This value may then be translated into certain norms like $ per square meter or $ per square foot. Those values may be regularly updated based on recent transactions.

Additionally, the number and value of transactions may be recorded. Once the data on price (or value in $ per unit of area etc) and volumes of transactions (in number and value) is updated, that information may be communicated to the relevant user. If there is a price rise and if the volumes of transactions are unusually high (mainly in value terms), it would be stated that the momentum is up in that particular geographical area for that category of properties. This would be deemed to be a buy opportunity/signal/tip for that particular category of property.

On the other hand, if there is a price fall and volumes of transactions are unusually high (again mainly in value terms), it would be stated that momentum is down and this would be deemed to be a sell opportunity/signal/tip.

2. CURRENCY APPLICATION

The currency markets can be similarly based on the aforementioned factors (namely criteria 1-39, pages 13-21) as well as political and financial stability, interest rates,

inflation, economic news and data, sentiment, and government actions, particularly the issue or retirement of debt securities.

Certain cross rates may have unusually high volatility and volumes on certain dates. For example, if the Australian Dollar has risen during a 10-hour time period against the US Dollar whilst volumes traded has been higher than average, it would be deduced and stated that the 10-hour momentum of the Australian Dollar is up or high against the US Dollar.

3. COMMODITIES APPLICATION

Similarly the buy/sell tips for investment decision making on commodities will depend on many of the aforementioned criteria as well as any others the operator may wish to take into account as many deal with raw materials that are influenced by outside factors such as seasonality, production levels, political problems, and general supply and demand factors.

For example, if copper price is down over a three-month period and volume is more than average, it may be stated the 3-month momentum of copper prices is down.

4. FUTURES APPLICATION

The price of futures is determined in the trading on the exchange where again many different factors are taken into account. This system can help assist the decision making process, and be adapted to incorporate the different risk spreads needed or desired by each individual customer.

Hedgers may use this system to help better protect themselves against price changes. Speculators can use this system to better determine which way the prices will move on the futures market. For both kinds of users, they can use which criteria they believe are most influential in the determination of price and its movement and thus create their own variation system for better decision-making.

5. OPTIONS APPLICATION

Those in the options markets can also use the system as they would stocks as previously described (particularly as volume plays a significant part). The system can assist hedgers in protecting their investments as well as speculators who need to be able to identify changes in the market to ensure profits for themselves.

The decision process for considering buying or selling put and/or call options on stocks and stock indexes can be made easier with this system of buy/sell tips.

Options on interest rates can also be covered by this system by taking into account the more relevant factors that influence it, as well as evaluating the interest rate caps.

The options on currencies can be adapted in a similar manner as described above under the currency market.

6. BONDS APPLICATION

Prices and volumes of bonds traded would also be analysed in a similar manner and processed information would be provided on momentum and other fundamental as well as miscellaneous factors such as credit ratings, prevailing interest rate environment, perception of risk, inflation, etc.

Claims:-

1. A method for analysing data and determining the timing of buy/sell tips as an aid to making an investment decision tradeable assets or securities including the steps of

(a) receiving data on a number of specified assets or securities,

(b) determining the technical strength of each asset or security from recorded market characteristics of the security as a function of the volume trade of the security, the price at which the trade took place, and the direction of movement of the price, and ranking the technical strength of each asset or security,

(c) selecting tradeable asset or securities having a ranking or value of technical strength above a predetermined ranking or value,

(d) determining the fundamental strength of those selected assets or securities based on one or more of a group of selected variables and ranking those selected assets or securities, based on the fundamental strength, and

(e) selecting or facilitating the selection of securities which are suitable for purchasing and/or securities which are suitable for selling based on the combination of the technical strength and fundamental strength of the security.

2. The method of claim 1 wherein a volume index is calculated as

$$\text{Volume Index} = \frac{\text{Actual volume over a length of time}}{\text{average volume/over the same length of time}}$$

3. The method according to claim 2 wherein a table is created listing the volume index of each tradeable asset or security in a selected group of tradeable assets or securities in ascending or descending order over a predetermined period of time and wherein the technical strength of an asset or security is a combination of the price movement of the asset or security and the volume index.

4. The method of claim 3 wherein an asset or security having a combination of a high volume index and an upward relative price movement is defined as having an upward technical strength or momentum up and wherein an asset or security having

a high volume index and a downward relative price movement relative to the table of volume indices is defined as having a downward technical strength or momentum down.

5. The method according to claim 1, wherein at least one fundamental strength characteristic is selected depending on the market sector and possible market capitalisation and the asset or securities selected on the basis of technical strength are marked according to said fundamental strength characteristic.

6. The method according to claim 5 wherein the fundamental strength is a function of the volume index and at least one of the criteria selected from the group including:

(i) Dividend yield.
(ii) NTA/Price.
(iii) P/E .
(iv) P/EBITDAPS.
(v) P/EVAPS.
(vi) Discount to Historical High or Premium to Historical Low.
(vii) Gearing level.
(viii) Discount/Premium to Brokers' Recommended Buy/Sell Price.
(ix) Price to sales per asset or security.
(x) Market capitalisation.
(xi) Stocks which are market leaders or have a position of market dominance or high market share in their respective industry/principal market.
(xii) Stocks which had return on shareholders' equity greater than amount say 15% per annum or 25% per annum in last/X financial year or financial quarter.
(xiii) Stocks which have high quality credit rating from rating agencies such as Standard & Poor's, Moody's, other rating agencies etc.
(xiv) Identify stocks as per pre-selected categories of credit ratings.

(xv) Stocks which have low or high (on a relative basis) P/CFPS where CFPS is per share free cash flow defined by earnings plus depreciation minus capital spending minus dividends.

(xvi) Stocks which have low volatility/high volatility.

(xvii) Stocks where top executives or top 20 shareholders have significant shareholding in the company.

(xviii) Stocks which are at a premium/discount to industry group or an overall market based on various criteria.

(xix) Stocks which have high/low gross margins.

(xx) Stocks which have a debt level less/more than industry benchmark or S&P 500 or any other appropriate benchmarks.

(xxi) Stocks which have a good/erratic track record of profitability.

(xxii) Stocks where inventories are declining/increasing.

(xxiii) Stocks where major new products/services have been launched or where new management is in place.

(xxiv) Stocks where insiders are selling more than average or where insiders are buying more than average. Identify stocks where institutional sponsors are increasing/decreasing.

(xxv) Stocks where there is growth/decline in physical volumes of sales or production or inventories.

(xxvi) Stocks where profit margins are rising (buy opportunity/signal/tip) or falling (sell opportunity/signal/tip), stocks where return on capital employed is higher/lower than an industry benchmark and stocks where earnings/revenue is higher/lower than an industry benchmark.

(xxvii) Stocks which have a higher/lower than benchmark/average growth in sales/profits/physical volumes/inventories.

(xxviii) Stockmarkets of countries where economic conditions are better or worse than before. For inter-stockmarket comparisons volume indicator in value or dollar terms may be used for computation of volume index.

(xxix) Stocks which have a low cost structure defined by operating cost per unit produced or by other criteria.

(xxx) Stocks which have higher than average growth rate in earnings per share (EPS), net tangible asset backing per share (NTA), gross cash flow per share (GCF), dividends per share (DPS).

(xxxi) Among certain sectors like bank stocks certain specific criteria may be created eg. Total Income/Average Assets, Operating Costs/Average Assets, Bad Debt Charge/Average Assets. These criteria may be stated as higher or lower relative to a benchmark.

(xxxii) Stocks of distressed firms with negative earnings or negative book values.

(xxxiii)Make international comparisons of relativities as per various criteria spelt out and as per criteria which may be added/introduced later.

(xxxiv)Other criteria for value selection like Benjamin Graham's criteria or 200-day moving average comparisons or any other criteria of selection may be introduced in the program.

7. A data processing system including a means to receive data on a number of specified assets or securities,

a data processing means programmable to use at least one of plurality of filter criteria to analyse said data in accordance with the method of claims 1-4, and

a means to output the results of the analysis.

8. A computer program for carrying out the method in accordance with claim 1.

9. A method of reviewing a portfolio of tradeable assets or securities including the steps of

(a) receiving data on a number of specified assets or securities,

(b) determining the technical strength of each asset or security from recorded market characteristics of the security or asset as a function of the volume traded of the security or asset, the price at which the trade took place, and the direction of movement of the price, and ranking the technical strength of each asset or security in ascending or descending order,

c) selecting a tradeable asset or security having a ranking or volume of technical strength above a predetermined ranking,

d) determining the fundamental strength of those selected assets or securities based on one or more of a group of selected variables and ranking those selected assets or securities based on their fundamental strength.

e) selecting or facilitating the selection of assets or securities which are suitable for purchasing and/or assets or securities which are suitable for selling based on the combination of the technical strength and fundamental strength and establishing buying and selling benchmarks based on these selections,

f) receiving data on each tradeable asset or security in said portfolio of assets or securities,

g) determining the technical strength and fundamental strength of each portfolio asset or security, and

h) comparing the technical and fundamental strength of each portfolio asset or security with the buying and selling benchmarks established in step (e).

10. A computer program for carrying out the method in accordance with claim 9.