

TECHNIQUES FOR INVESTING IN PROXY ASSETS

Reference to Related Application

This application is a continuation-in-part of U.S. Patent Application Serial No. 09/408,103 entitled PROXY ASSET DATA PROCESSOR filed on September 29, 1999, which is a continuation of U.S. Patent Application Serial No. 08/961,121 entitled PROXY ASSET DATA PROCESSOR filed October 30, 1997, which issued as U.S. Patent 5,987,435 on November 16, 1999.

Field of Invention

The present invention generally relates to techniques for managing a novel proxy asset investment vehicle and the institutions necessary to implement the proxy assets. More particularly, the present invention defines the proxy assets set, distributes, manages, and maintains a plurality of proxy assets shares, linked to account activity in accordance with pre-determined criteria. Some embodiments also execute trade, issuance and redemption of such proxy assets.

Description of Related Art

Investors take positions in many kinds of investments ranging from real estate, stocks, stock portfolios, equity interests in particular market players and broad markets, among others. As those of ordinary skill in the art of investing know, a long position with respect to a particular asset increases in value as the asset increases in value, while a short position increases in value as the asset decreases in value. Principles of risk management dictate that some of these investments be hedged by offsetting investments. Yet, offsetting investments with the proper response are often unavailable. In addition, some investments are in illiquid assets which are hard to sell or trade on short notice, and which usually impose the burdens of property management in order to assume a long position.

Making otherwise illiquid assets liquid is extremely important. With illiquid markets, investors may be stuck with an inordinately risky exposure to some illiquid assets and at the same time unable to diversify their portfolio. For example, in the market for single family homes, people may be excessively exposed to single family home price risk in their own city, unable to hedge this risk by shorting their city, and unable to invest in single family homes in other cities.

Laws and regulations regarding securities trading are designed to make a clear distinction between securities and derivatives (such as futures and options), and between

securities and short sales. Institutions that hold securities as part of their portfolios may be restricted by charter, pronouncement or regulation from dealing freely in derivatives or from making short sales. These restrictions are designed to guarantee against certain abuses, such as taking excessively speculative positions. Individual investors, fearful of getting into an unexpectedly leveraged position or of exposure to large or unlimited losses in certain circumstances, such as margin calls, may have simple personal rules of thumb so that they will not buy unusual investment instruments.

Over time, there have been many different types of investment vehicles. Investment trusts (REITs), which were designed by an act of the U.S. Congress in 1960 to allow large numbers of investors in real estate, are no more than tax-exempt portfolios of existing readily-made real estate investments. The real estate that they cover is limited to already readily investable classes, excluding for example owner-occupied homes. REITs are not flexible and thus cannot meet current hedging and investment needs.

There are a number of mortgage, reverse mortgage, or sale-of-remainder methods that individual homeowners can use to reduce risk to them due to price fluctuations in their home. Shared appreciation mortgages have a long (though limited) history. A variation on this is the housing limited partnership. Reverse mortgages are contracts in which a homeowner is able to obtain a lifetime annuity from the value of his or her home. These reverse mortgages may pass some of the price risk to the mortgage lender. Sale of remainder refers to a contract in which the homeowner may sell a share in the house to another party with a contract to remain living in the house.

Home equity insurance, discussed in Robert J. Shiller and Allan N. Weiss, "Home Equity Insurance," National Bureau of Economic Research Working Paper 1994, forthcoming, *Journal of Real Estate Finance and Economics* is an insurance contract on an individual home that pays out if the price index for the region should fall sufficiently.

In 1994, Barclays de Zoete Wedd (BZW) started Property Index Certificates (PICs). These are bonds, with maturities of two, three, four, and five years, whose principal at maturity is tied to a commercial real estate price index. BZW owns companies like Canary Wharf and Imry as a result of bad property loans, and has issued the PICs as a way to insulate itself from further moves in commercial real estate prices. In November 1996, BZW also created what are essentially UK commercial real estate index settled futures, although there is no clearing house and BZW is always one side of the contract. An industry-wide group led by AMP Asset Management (the fund management component of Australia

Mutual Provident), has been scheduled to start true index-settled UK commercial real estate futures markets in 1997.

There have been for some time ordinary puts and calls that are settled on indices, such as the Standard and Poor's Index Options. There have been certain swap arrangements that investment banks make between themselves and counter parties. Banks may make many such swap arrangements in such a way that the swaps cancel out, and the bank itself bears no risk.

Index participations (IP) created at the American Stock Exchange (AMEX) in 1989 actually traded there for a few months before the contract was shut down due to regulatory difficulties. (A similar instrument was also created at the Philadelphia Stock Exchange the same year.) The IP were designed to create an alternative to stock index futures that could be traded on a stock exchange rather than a futures exchange. The investors in the long position received a regular dividend proportional to the dividend paid by the Standard and Poor Composite Stock Price Index. In this sense, the IP investors in the long positions could be considered effectively to be holding the stocks in the index itself. The investors in the short position put up 150% margin, and promised to pay the dividend to the investors in the long position. The shorts were subject to the usual margin calls should the price fall, and were not in any sense holding a security. The contracts involved no actual ownership of stocks; the dividends the investors in the long position received came from the investors in the short positions, rather than from the companies in the S&P 500. The investors in the short positions faced unlimited losses if they continued to meet margin calls. Moreover, there was a cash-out option. The investors in the long positions could at any time demand delivery from the holders of the short positions of the index value. The IPs did not allow the price of the IPs to differ from the S&P Index; they did not seek any price discovery by letting a market determine a price for shares in the IP.

The Standard and Poor Depositary Receipts (SPDRs, or, commonly, spiders) were created at the American Stock Exchange in 1993. Each SPDR is like a security, which is traded on the stock exchange, and behind it is an underlying basket of assets, representing the stocks used to compute the Standard and Poor Composite stock price average. Redemption and issuance rules enforce market price correspondence with the market price of the underlying portfolio. The assets held are the actual stocks themselves. Still, the SPDRs are used to create an asset that is like a stock and to insure that the market price corresponds at all times to the value of the basket of stocks. The "superunits" and the "supershares"

created at the AMEX somewhat earlier also shared this property.

Certain computerized trading systems, such as that used at the Iowa Experimental Markets at the University of Iowa have been used in the past. For example, in their presidential election trading system, a security is created for every presidential candidate, and it pays \$1 if that person is elected president. Since only one person can be elected president, the trading system can automatically create new securities whenever buy orders for all presidential candidates come in with combined offer prices equal to \$1.

See also, "A Goal-Directed Financial Asset Management System" invented by Robert R. Champion and Basil R. Twist Jr., awarded patent number 5,126,936 on June 30, 1992, and a System for the Operation of a Financial Account invented by Charles A. Atkins and Amelia Island, and awarded patent number 4,953,085 on August 28, 1990.

In spite of the variety of investment instruments, investments having a particular response are often unavailable. Accordingly, none of the prior art allows hedging the risk of an arbitrary investment. What is needed is an investment instrument that can be constructed to allow an investor to hedge any reasonable economic position the investor may assume, but that also will allow a market to set a price.

Summary of the Invention

A proxy asset according to the present invention is a new kind of security that is designed to make effectively tradable broad categories of assets or claims on income flows, or economic indicators that are individually difficult or impossible to buy, hold, or sell directly. The proxy asset is designed to have a traded market price that reflects the true liquid-market value of the assets or claims or economic indicator. For example, proxy assets can be created that allow people to make investments in local real estate in a given city, but also allow owners of local real estate to hedge their exposure to real estate risk in that city. The proxy asset must also allow the purchasers to see, in the proxy asset share price, an indicator of real estate prices in the city. For another example, proxy assets can be created to allow people to invest in claims today on shares of the flow of national income over future years of some country or to allow people to hedge their own income risk, and also to see a market price of such a claim as never before. Thus, as used herein, the term proxy asset pertains to investments related to indexes, such as measures of assets and claims on income sources and economic indicators. Such measures of assets and claims on income sources include those related to human labor or human capital. Examples of illiquid assets that may be the basis of proxy assets include privately held or infrequently traded corporate stocks,

infrequently traded bonds, ships and aircraft, rare coins, precious gemstones, masterpiece paintings, livestock, and thoroughbreds. These assets, like real estate, are highly illiquid, and are difficult or impossible to hedge using traditional hedging mechanisms. In most circumstances, an index is appropriate for a set of proxy assets if its value is not controlled or affected by those investing in that set of proxy assets.

An advantage of the proxy asset for the investment provider is that the payout and redemption value for a set of proxy assets defined together is fully funded by a resources pool under the control of the investment provider. Thus even small organizations can effectively define, offer and manage proxy assets. This is one way that proxy assets differ from derivatives offered by large investment houses.

A proxy asset data processor is employed as part of a proxy asset management system in one embodiment, and is designed for creating, distributing, managing, and maintaining the proxy assets. The new data processor defines and manages the value of accounts for these proxy assets, guaranteeing payment of a defined distribution by management of underlying cash-value accounts, and also facilitating trade, issuance and redemption of such proxy assets. These attributes thereby assure certain adding-up constraints for account values.

The proxy assets are configured to simplify their use and understanding by investors, to parallel familiar existing assets in appearance and in terms of the kinds of contingencies and activities that the investors become involved with, and to offer the same feeling of financial soundness. The proxy asset data processor is designed to reinforce and confirm these impressions among investors, by facilitating the basic functions necessary for the proxy asset's essential equivalence with other assets.

Proxy assets are designed to resemble existing well-known types of securities, like ordinary stocks, so that regulatory restrictions may have their intended effect. Thus, in embodiments of this invention, proxy asset shares are purchased outright and no position is leveraged or subject to a margin call. That proxy assets resemble familiar securities may also have certain psychological benefits. First, people are somewhat afraid of investing in exotic derivatives because they have the feeling that the structure of the contract is too complicated and abstract, unlike the common law concept of property that has been fundamental to human society since prehistoric times. People tend to feel insecure about an investment whose payoff is determined by a complex contract or mathematical formula in contrast to a traded market price. Second, there are familiar institutions and practices associated with

ownership of securities that are not duplicated with most derivatives. Examples of such institutions and practices are the simple notion that an asset has both an enduring capital value and also generates an income over time, and that some investors may consume the income but not the capital value itself. Third, many derivatives can involve margin calls to which investors can react very negatively because such margin calls force investors to focus on their losses from individual portions of their portfolio, even when their overall portfolio is doing well. For example, investors who hedge against losses in holdings of an asset by taking a short position in the futures markets can be very upset by the repeated margin calls that would be the consequence of such hedging should prices increase. Investors tend to feel upset by margin calls, even though their losses in the futures market are compensated (since the value of the portfolio of other assets is increasing). The reason for this is that the margin call is made more psychologically salient by the need to take action. An individual who hedges risk by taking a position in a proxy asset whose price moves opposite that of the asset hedged will not be confronted by margin calls, can just forget about the portfolio, and thus may be psychologically in a frame of mind that better promotes hedging.

It is, therefore, an object of the present invention to provide techniques for creating, distributing, and managing proxy assets.

It is another object of the present invention to provide a data processing system that operates to define distributions to their holders based on the proxy assets in accordance with stored programmed criteria. The defined criteria characterize the proxy asset's value so that changes in a proxy asset's market price will approximately reflect the expected change in the value of the intended underlying index.

Investors become holders of claims (herein termed "shares") in one or more proxy assets that have an underlying value by virtue of the proxy assets' linkage to a resources pool. The proxy asset account balance is adjusted over time in accord with changes in the value of the associated index and the pooled resources balances managed by an investment manager or bank. The system uses indices of the asset value or of income or economic indicators at set intervals or events, and employs these indices as a vehicle for determining the balances in the accounts, which in turn will affect the price and payouts (herein termed "dividends") on the proxy asset. The database includes detailed account information and stores the updated account balances at set times or events as controlled by the processing logic. In preferred embodiments, upon the occurrence of set events, the system adjusts the account balances corresponding to each investor in each proxy asset by transfers between

accounts in accordance with a formula associated with each proxy asset. The new balance controls the scale of the dividend or distribution paid on the proxy asset, rewarding through time those proxy assets tied to formulas that increase as determined by the indices. The proxy assets are exchanged in a market either via conventional brokerage services or directly through a trading system defined here, allowing a broad spectrum of investors access to this investment and risk management vehicle.

In accordance with some embodiments of the present invention, the proxy asset system further includes processing logic to permit selective bundling of proxy assets into proxy asset portfolios or proxy asset bundles. These proxy asset bundles are configured to permit enhanced distribution in response to changing investment and hedging demands for the underlying indices. Account features include the subsequent dispersion of the pools into their individual proxy assets. Accounts are linked to traditional markets to permit trading and exchanging of proxy assets by means akin to those techniques now employed to trade stocks and bonds.

According to one aspect of the invention, techniques provide a proxy asset set of two or more proxy assets that respond to a set of one or more indices. Each proxy asset of the proxy assets set has a proxy asset account value and a number of proxy asset shares representing equal claims on the proxy asset account value. The proxy assets set has a total number of shares equal to a sum over the proxy assets set of the number of proxy asset shares, and has a proxy assets set account value equal to a sum over the proxy assets set of the proxy asset account value. A proxy asset account value is defined with a predetermined account formula responsive to at least one corresponding index of the set of one or more indices. The proxy assets set account value is constrained by a value of a resources pool. The proxy asset account value is reevaluated according to the account formula upon occurrence of each event of a plurality of predetermined events.

In another aspect of the invention, techniques for investing in a proxy asset include maintaining a database having information indicative of a value for a resources pool, and information indicative of a particular investor account. The investor account information includes a particular investor of a set of investors, a particular proxy asset of the proxy assets set, and an investor account number of proxy asset shares. A signal indicative of the value of the resources pool is sent over a communications link. A proxy asset account value per share responsive to an index of the set of one or more indices is received over the communications link for each proxy asset of the proxy assets set.

In another aspect of the invention, techniques are provided for trading on an exchange shares of a proxy assets set of two or more proxy assets that respond to a set of one or more indices. Each proxy asset of the proxy assets set has a proxy asset account value and a number of proxy asset shares. A sum over the proxy asset set of the proxy asset account value substantially equals a value of a resources pool. A complete set of shares of the proxy assets set among one or more offers to trade shares of the proxy assets set is presented to a trader. A complete set satisfies a certain condition among shares of the proxy assets set.

In another aspect of the invention, techniques are provided for managing a proxy asset set of two or more proxy assets that respond to a set of one or more indices. A value of a resources pool and a value of an index of the set of indices are received. A proxy asset account value is evaluated according to an account formula responsive to the value of the index and a constraint. The constraint is on the proxy assets set account value imposed by the value of a resources pool. The evaluation is performed upon occurrence of each event of a plurality of predetermined events.

In another aspect of the invention, a system provides a proxy asset set of two or more proxy assets that respond to a set of one or more indices. A network is connected to a computer readable medium. The computer readable medium includes a value of a resources pool and a number of shares of each proxy asset for each investor of a set of investors. One or more bank processors connected to the network are configured to compute the value of the resources pool. One or more proxy assets set processors are configured to evaluate a proxy asset account value as a function of at least one corresponding index of the set of one or more indices. The one or more proxy assets set processors are also configured for constraining the proxy assets set account value by the value of the resources pool.

Brief Description of the Figures

The foregoing features are best understood by review of the following detailed description of an illustrative data processing system constructed in accordance with the present invention, including drawings of the illustrative embodiment of which:

Figure 1 is a block diagram illustrating examples of closed paths the data processor of the present invention may identify;

Figure 2 is a relational block diagram depicting the proxy asset account manager;

Figure 3A is a block diagram of the computer hardware available to practice the

invention;

Figure 3B is a block diagram of a computer system including a network;

Figure 4 provides a logic flow diagram for a proxy asset generator, according to one embodiment of the present invention;

Figure 5 provides a logic flow diagram for an account manager, according to one embodiment of the present invention;

Figure 6 provides a logic flow diagram for a dividend generator, according to one embodiment of the present invention;

Figure 7 is a logic flow chart depicting the proxy asset order processor, according to one embodiment of the present invention;

Figure 8 is a logic flow chart illustrating an embodiment of the proxy asset trading, issuance and redemption system, according to one embodiment of the present invention; and

Figure 9 is a relational block diagram depicting a proxy asset bundle manager, according to one embodiment of the present invention.

Detailed Description of the Preferred Embodiments

The present invention is directed to a novel proxy asset system operated by a system proprietor responsible for implementing and managing a group or set of proxy assets. The system proprietor is linked to various ancillary information sources and outlets, via communications links, such as dedicated server lines or telephone connections to the internet. Thus, the system is accessible to brokers or outside investors, in a limited and pre-defined way. One connection of this embodiment is used to monitor the value of one or more indices.

The proxy asset system, in one embodiment, is implemented by a proxy asset data processor and a programmed controlled criterion for operation, with this criterion well understood by participants. The proxy asset data processor includes a proxy asset account manager and a proxy asset dividend generator. In addition, the proxy asset system preferably includes a trading, issuance and redemption system that receives and stores customer orders to buy and sell, including market orders, limit orders and possibly other varieties of order. It also executes these orders by trading existing proxy asset shares or issuing or redeeming proxy asset shares in complete sets, later defined, as needed.

In this example, the stored programming implements an account formula or an account-shifting function that defines the balances in the accounts and a distribution payout

formula for each proxy asset, to be discussed here below. The pooled resources for all accounts within the system are invested in some assets, such as money market instruments, by an investment manager, or separate firm external to the system, characterized herein as the bank. The bank reports to the system proprietor the value of the pooled resources, and the system proprietor tracks the separate accounts for the proxy assets, which are claims on the pooled funds in the bank. The underlying criteria for account processing are publicly distributed to insure complete knowledge by participants. Transfers are made among cash accounts within the proxy asset system. The illustrative examples here each present a single proxy asset system, recognizing that there could be more than one such system, each operating at different institutions run by different system proprietors.

Another exemplary proxy asset system embodiment implements, at a minimum, two proxy assets for real estate in a given city for a given base year. These two proxy assets are referred to as an up proxy asset and a down proxy asset, one share of each forming what will be called a complete set (*see below*). The first proxy asset, the up proxy asset, has an account balance per share that is adjusted by the system proprietor according to an account formula that specifies that it contains, at regular intervals (*e.g.*, quarterly), a balance proportional to the real estate price index for the given base year for that city. In addition, investors ("shareholders") in that proxy asset receive a regular dividend or distribution according to a distribution payout formula that specifies a payout equal to a constant, predetermined, payout rate times the balance in the account corresponding to that share, and subject to an upper limit. The second proxy asset, the down proxy asset, has account balance per share that is set, according to its account formula, to equal the combined balances in the cash accounts for both up and down proxy asset per share minus the balance in the up proxy asset cash account per share. Its distribution payout formula defines a dividend equal to the payout rate times the balance in that account, so long as that balance is positive, and not exceeding an upper bound. The system is defined so that all dividends payouts are always feasible. By construction, the sum of the distribution payout formulas for an up share and a down share is always less than the combined increases in balances per share in the two accounts in the bank.

Accordingly, buying shares in the up proxy asset corresponds to investing in the illiquid real estate itself; the proxy asset is, however, liquid. Moreover, shares in the up proxy asset have the look and feel of an ordinary investment, since they confer on the investor a claim on the account which "backs" the proxy asset, thereby encouraging a

receptive market psychology for these assets. Investments in the down proxy asset are less clearly analogous to existing investments. One might call a share in one of them analogous to a portfolio consisting of a short position in real estate and also to the margin account balance for that short position. By this interpretation, if the assets are created when the index is at 100, we may say that the margin account has an initial margin of 200%, rather than the 150% required by the Federal Reserve regulations for conventional short positions, the higher initial margin allowing for a reasonably well-functioning hedging vehicle without margin calls. If the index drifts far from a starting value of 100, then the proxy asset system creates new up and down proxy assets with an index that is 100 in a newer base year, issuing both up and down proxy assets at 100. Investors may then redeem their original proxy assets shares and purchase shares for the newer base year.

Since the down proxy asset does not involve margin calls at all and resembles an asset, it is better to regard it as a fundamentally new investment vehicle that makes it much easier for participants to hedge their risks.

In accordance with pre-defined logic and controlling system instructions, the system proprietor has two primary functions. The first is to create the proxy assets and distribute shares in these assets, like the up-down proxy assets described in the example above, in a way that allows free commercial access and payment of a market price for the proxy assets and redemption of shares. The second aspect involves, as seen in the example above, the management of an account of pooled resources for each proxy asset that is linked to the accounts of other proxy assets in the system, such that the changes in the value of an index are translated into changes in account balances and ultimately into distributions to the owners of the proxy asset shares. A third function, a trading, issuance and redemption system, is optionally integrated as a feature of the system.

The first primary function is to create the proxy assets. In some embodiments, the system provides tools for a human to identify the index to be used and the predefined account-shifting relationship among the proxy assets in a set.

In an alternative embodiment, the system includes computer logic to develop a proxy assets set that is optimal for the proprietor. In this embodiment, input is received via a graphical user interface that lets investors select indexes from a list of choices. Each potential investor is allowed to select from options indicating (1) an index in which the investor desires to take a position, (2) the side of the index they want to take, (3) the amount of leverage on the index, (4) the amount of money they want to invest, (5) the price range

they would be willing to pay, (6) the length of time they want to hold such an investment, (7) the frequency of evaluation and exchange of assets, and (8) conditions for terminating the assets set. This alternative system then processes all such investor inputs and builds an account formula based on a set of selected indices for which a balance can be found among investments from interested investors. Some selection options, such as similarity and compatibility of the indexes, receive more weight than other selection options, such as amount of leverage. These other options themselves receive more weight than yet other selection options, such as frequency of evaluation.

As in the example above, each proxy asset within the proxy asset system has a pre-specified account formula that defines how much is in its account per share at each point of time. Those proxy assets whose account formulas sum identically to the combined values per share in the accounts corresponding to all the proxy assets in the set will be called a complete set of proxy assets. As long as all proxy assets are part of complete sets of proxy assets, then it is always possible for all proxy assets to be created such that the proxy asset data processor can always adhere to the account formulas defining the proxy assets' balances without running out of resources in the resources pool. (There may also be restrictions on the kinds of complete sets for which share redemptions or new share issues will be generated.) Proxy assets will be issued and redeemed by the proxy asset data processor only in complete sets, so that the account balances defined by the account formula and the distributions can always be paid in accordance with the account formula.

We can clarify what we have said above about account reevaluation, issuance and redemption in mathematical terms. Let us call V_t the proxy assets set account value, or total value of all pooled resources accounts for a given base year in the bank at time t . Call S_t the number of shares of all proxy assets in the system. Thus, the value per share, averaging over the entire system with that base year is V_t/S_t , though individual proxy assets within the system will have different share values. The proxy asset data processor allows free issuance of new shares and redemption of existing shares at any time t at values so as not to disturb V_t/S_t . Thus, when a packet of new shares is issued at time t , if there are s_t shares in the packet, the total value of the packet must be $V_t s_t / S_t$, so that after issuance there will be $S_t + s_t$ shares and the total value after the issuance will be $V_t + V_t s_t / S_t$. It follows that the value per share after issuance will be $(V_t + V_t s_t / S_t) / (S_t + s_t)$ which equals V_t / S_t , the same as it was before the issuance. Note that, in general, the individual shares will not be issued or redeemed at price V_t / S_t , nor will the underlying cash value accounts for each share contain that amount.

The account formula for each proxy asset specifies how much its account contains per share, upon the occurrence of predetermined events, e.g. at regular intervals such as quarterly. The value of the account per share is given in terms of some measure of value of asset or income or indicator underlying the proxy assets, as well as in terms of V_t/S_t .

A complete set is a set of n shares of proxy assets, such that the sum of account formulas for the accounts per share equals nV_t/S_t . Thus, so long as the shares comprise a complete set according to the formula definitions, they can be issued or redeemed together without affecting V_t/S_t . In one embodiment, issuance is automatic when a complete set is identified in a set of bids. In another embodiment, a human may intervene before a complete set is issued to satisfy the bids. In alternative embodiments, upon identification of a complete set, redemption is automatic or both are automatic or neither is automatic, in any combination.

The distribution payout formula for each proxy asset specifies how much is paid out per share each time period to owners of that proxy asset as a function of the balance in that proxy asset's cash account per share, and possibly as a function of other data, such as interest rates and the rate of inflation, or as a function of the balances in accounts that belong to the same complete set. The distribution payout formula must be specified so that dividend payments are always feasible given the balances in the cash accounts.

There is an important reason for issuing and redeeming shares only in such a way that the value per share, averaging over the entire system, is unaffected. The reason is that the account balances of individuals will thus be protected from influence by the decisions of other investors to issue or redeem.

The account for each proxy asset has several purposes. First, all proxy asset holders receive distributions proportional to the amounts in their asset value account at the predefined evaluation events or times, by a payout factor defined by the distribution payout formula. In the preferred embodiment, the same payout factor is applied to all proxy assets managed by a single proxy asset system. Second, the account balance is used by the system to determine whether offers to buy or sell can be settled by issuance of new proxy assets or redemption of old proxy assets. Third, the account balance is provided to customers as information relevant to their evaluation of the proxy assets. The account balance may be referred to as the cash value of the investment based on the value of the pool resources.

Two illustrative techniques depict the issuance and redemption of proxy assets. The first technique involves issuing complete sets of proxy assets to brokers by conventional

underwriting methods, just as new shares in corporations are issued today. Brokers who buy the complete sets will then have the burden of selling off the elements of the complete sets to clients as best they can, leaving the problem of finding customers for the elements of the complete sets to the brokers. Moreover, brokers can redeem the complete sets of proxy assets by purchasing on the market the complete sets, and submitting these back to the system proprietor.

The second technique provides for an integrated trading, issuance, and redemption system implemented by the system proprietor, (possibly with the participation of an existing electronic trading system) that solves the problem of finding complete sets for the brokers, and also allows trading of existing shares. If the proxy asset shares are traded on the trading system described here, participants in the system (e.g., brokers and possibly individuals) can place orders to buy or sell proxy assets in the form of either a market order (to buy or sell at any price) or a limit order (to buy at a price at or below a given price or to sell at a price at or above a given price), and possibly other kinds of orders. They manage the buy or sell orders partly as do other existing trading systems today. In the case of limit orders, it will search for matches, sell limit orders that are at or below buy limit orders for single proxy assets, and clear them. It will also execute buy or sell orders in another way. Whenever a set of unmatched buy orders can be found that constitutes a complete set of proxy assets, at combined prices equal to or above the combined values of the accounts of the proxy assets, then the orders will be executed by creating a new complete set of proxy assets and crediting the proceeds of the sale (minus some commission) into the accounts in amounts corresponding to the balances currently in the accounts. Whenever a set of sell orders can be found that constitutes a complete set of proxy assets, at combined prices at or below the combined values of the cash accounts of the proxy assets, then the orders will be executed by redeeming a complete set of proxy assets and transferring the balances (minus some commission) in the cash accounts in amounts corresponding to the balances currently in the accounts to the sellers. When such complete sets are discovered among buy or sell orders, it means that it is feasible to execute the order by issuance and/or redemption without having any effect on the system proprietor's ability to keep asset balances at their values specified by the cash account formula, and the execution will then be done automatically. The trading, issuance, and redemption system is preferably fully automated and electronic, though it is possible that elements of the system may need to be done manually, given possible regulatory or other issues. Please *see* U.S. Patent No. 4,674,044 to Kalmus, et al., relating to

automated trading techniques, the contents of which are incorporated in their entirety by reference.

There is likely to be more than one way to fill buy and sell orders placed on this exchange, including various combinations of trades, issuance or redemption. In such embodiments, a rule selects the transaction set that maximizes or minimizes the price for one side of the proxy asset set, prioritizes transactions by the size of orders, clusters the orders if people are willing to wait, or alternates among these selection criteria or uses some combination of them. Any other method for prioritizing transactions known in the art may be used.

In some implementations of the trading, issuance, and redemption system, the system proprietor is not the only exchange, or even the primary exchange, on which the existing proxy assets are traded. Trades on the system may be limited to issuance and redemption, or limited to certain times, such as once a month. Additional system constraints are imposed to reflect federal and state regulations, taxation issues and issues raised by existing securities exchanges.

A separate aspect involves the creation of proxy asset bundles, which are groupings of proxy assets that may be traded as a bundle even if the individual components do not trade individually. Under this approach, the system implements the dismantling of the proxy asset bundles under select circumstances. The bundling and dismantling will be illustrated below. In some embodiments, the rules include trigger events for which termination occurs and the specifics of disbanding the proxy assets set and distributing the entirety of the resources pool. In these embodiments, trigger events include reaching a certain duration for the proxy assets set since its inception, reaching a certain percent of the pooled resources in one proxy asset or subset of proxy assets, achieving a fixed threshold value in one proxy asset or subset of proxy assets, changing the proprietorship of the proxy assets set, or changing the definition or computation of the index on which one of the proxy assets is based, or any combination of these events.

The indices used to define the proxy asset or set of proxy assets can be any measure not determined by an investor in the proxy asset or set. There is only required an investor interested in an investment that corresponds to changes in the index. Several further examples of indices an investor would want an asset to respond to in other embodiments are given below.

The indices can include a composite stock index such as the Standard and Poors

(S&P) 500 index or the Dow Jones Industrial index. The indices can include any economic indicators.

In one embodiment, the composite stock index is used to define one proxy asset that tracks earnings, e.g., that strips a portion from the total growth of the index due to earnings in a quarter. Another proxy asset in the set then tracks appreciation of the underlying composite stocks in “an appreciation strip.” If an appreciation strip is computed first, the earnings are tracked with a residual between the stock price and the appreciation strip. In other embodiments, the earnings strip proxy asset can strip earnings as figured over one or more years.

In other embodiments, indices are defined that track earnings in different combinations or subcombinations of corporations or other companies. For example, in one embodiment, an index represents earnings of one or more corporations. In another embodiment, an index represents earnings in a particular time period for a plurality of corporations. In another embodiment, an index is used that represents price to earnings ratio for a corporate stock. In another embodiment, an index is based on a tracking stock for a subdivision of a company.

In one embodiment, the economic indicator is the consumer price index (CPI). Persons of fixed income may want proxy assets that track the CPI as a hedge against inflation. The CPI is a natural for an up/down proxy asset pair. In another embodiment, the index is a component of the CPI, such as energy or medical costs. An industry needing cheap energy to compete may want to hedge its position by investing in a proxy asset that increases in value as energy prices climb. The CPI components are material for multi-asset pooling, described below.

In another embodiment, the economic indicator is a balance of trade. Up/down proxy assets can pit the U.S. versus the rest of the world. Multi-asset pooling can define a set of proxy assets that track each country against the world or any pair of countries. Those investing in currencies may need such proxy assets to hedge their currency holdings in one or more currencies.

In another embodiment, lenders can hedge their positions with proxy assets that track consumer credit default rates as one of the indices. Again, this can be done with up/down proxy asset pairs or with multiple assets by country.

In another embodiment, the indices include same store sale statistics for those needing proxy assets that hedge their position in retail outlets.

In another embodiment, the indices include bid-ask spreads in one or more commodity markets. Any one market lends itself to an up/down proxy asset pair, while multiple markets can be used for multiple proxy assets. Those with seats on a commodity market may want to hedge their position with one that increases as the bid-ask spread decreases.

In other embodiments, at least one index measures income flow. One such embodiment uses indices associated with the income flow of a country. Examples of such national income flows include national income, gross domestic product, proprietor's income, imports, exports and any other item from national income and product accounts (NIPA) of a country. These measures can be nominal, real, in total, or per capita.

Another embodiment uses indices associated with the income flow that is a measure of human labor. Examples of such human labor income flows include an index of occupational incomes, such as the income of doctors or lawyers or economists, or an index of wages or salaries or both accruing to certain classes of labor, or accruing to clusters of labor with similar characteristics.

Other embodiments use indices associated with consumption expenditures. Examples include an index of consumption and consumer confidence.

Still other embodiments use indices associated with other spreads, such as a spread in different types of mortgage rates and a spread in different types of interest rates, or any combination of these.

In short, any economic or macro-economic indicator in which investors are interested in establishing a position can be used as an index used in defining a proxy assets set.

Example I - Up-Down Proxy Assets

Applying the above structure to a real estate example, two proxy assets are established for each city (and associated base year) to be managed by the system: one (the up proxy asset) for a long position in real estate in that city, and the other (the down proxy asset) for a short, or reciprocal position, in the city. We shall suppose that when the proxy assets for this base year were first issued in that base year, the home price index was scaled so that the index equaled 100 then, and the initial Accounts for both the up proxy asset and the down proxy assets originally contained \$100. The account formula for the up proxy asset at quarterly intervals after that is just the price index:

Up Cash Account Balance Per Share End of Quarter = Home Price Index.

The cash account formula for the down proxy asset cash account balance per share, that

determines its cash account balance at time t is:

$$\begin{aligned} &\text{Down Cash Account Balance Per Share End of Quarter} = \\ &2 \times \text{Total Account Balances Per Share} - \text{Home Price Index.} \end{aligned}$$

(In terms of the mathematics shown above, the up proxy asset account balance at the end of quarter t equals the home price index at time t , I_t , and the down proxy asset cash account balance equals $2V_t/S_t I_t$). Transfers between the accounts are made each quarter to assure that at the end of each quarter these account formulas are satisfied. Thus, if the index is 100 in the base year and is now 120, (reflecting an increase in real estate prices since the base year), then the underlying account for each up asset share has \$120 in it. The account balance for one share of the down asset is just the combined investment value of the balances in a pair of up and down assets in that city minus the index. The combined investment value in the up and down accounts was \$200 for two shares on the base date, when the index was 100 by definition. Today it is the accumulated investment value (in the money market fund where the resource pool is invested) since the base date, after paying out dividends according to the distribution payout formula. Thus, for example, if the combined value in the up and the down cash accounts per share is now \$205, then when the index is at 120, the up share is \$120 and the down account has \$85 corresponding to each down asset share.

To support issuance-redemption and trade execution, the proxy asset data processor searches over the buy and sell orders to find a complete set whose total prices exceed the total value of a set. Since a complete set consists of one up proxy asset share and one down proxy asset share, then whenever an offer to buy an up proxy asset share at price P_1 and a down proxy asset share at price P_2 are found such that $P_1 + P_2 \geq 2V_t/S_t$ both orders are executed. One new share is issued for each proxy asset and the resources pool is incremented by $2V_t/S_t$. From the proceeds of the combined sale the proxy asset data processor allocates an amount equal to the value corresponding to one up share to the up account, and an amount equal to the value corresponding to one down share to the down account. Thus, after this issuance of new shares, each share has the same account balance as before, and there are now more shares outstanding. When offers to sell the shares are found at prices such that $P_1 + P_2 \leq V_t/S_t$, then the shares are redeemed. When shares are redeemed, the number of shares is decreased, the resources pool is decreased by V_t/S_t times the number of redeemed shares, and an amount is deducted from each proxy asset account in proportion to the amounts already in these accounts.

Trades occur when an offer to buy one up proxy asset share at price P_1 and an offer

to sell one up proxy asset share at price P_2 are found by the proxy asset data processor so that $P_1 \geq P_2$. Then the order is executed without issuance or redemption, merely by selling an existing share. The same occurs for offers to buy and sell down proxy assets. In the above examples, we have neglected, for illustrative purposes only, the commission charged for the sales and also the profit accruing from these trades.

The distribution payout formula for both up and down proxy assets in this example is given by:

$$\text{Dividend Per Share} = r \times (\text{Amount in Own Account Per Share})$$

if positive and if amount in own account is less than the combined value in the two accounts

$$= 0 \text{ if Account is Negative}$$

$= r \times (\text{Combined Amount in the Two Accounts})$ if amount in own account is greater than the combined value

where r is a payout rate defined by the proxy asset system rules. In one version, the payout rate r is a fixed number such as 2% per annum, corresponding to an estimate of the long-term real interest rate on money market accounts. (It must of course be less than 100% so that the dividend payout is always feasible, but presumably it will be much less.

Preferably, it is less than the actual growth of the resources pool.) In another version, the rates r are predetermined to be a given number for the up asset and a different number, e.g., a smaller number or zero, for the down asset.

The down proxy asset's cash account could have a negative value in it, in which case no dividend will be paid to its shareholders. In this case, the up proxy asset's cash account would have more than the total cash in the two accounts, in which case the dividend paid for the up proxy asset per share would just be the payout rate, r , times the total cash in the two accounts per share. The investor holding the down asset will receive no payout in this case. The market price of the down proxy asset may still be positive, since there is always the possibility that the index will drop enough to bring its balance to a positive number again.

Note that in this embodiment the market price of the up proxy asset will tend to the index, so long as the index does not differ too far from 100. In this case, investing in the up proxy asset will be a proxy for investing in the real estate itself. So long as the unobserved dividends (in the form of housing services) on the actual real estate are approximated by the distribution payout formula payout rate, then the owner of the proxy asset will be receiving the same dividends as would be received by investing in the real estate itself. So long as the

proxy asset price stays close to the price index for the real estate, then investing in the proxy asset will also tend to produce essentially the same capital gains and losses as investing in real estate. However, investing in the proxy asset will not produce the identical capital gains and losses because the proxy asset market will be more liquid, allowing investors to take better advantage of predictable movements in index values.

The down proxy asset will be extremely useful to homeowners wishing to hedge the risks of their investment in their own home. As is well known, many recent declines in real estate markets have caused homeowners to lose the real equity in their homes. A single decision of a homeowner to put part of his or her investments in a down proxy asset for the city will then effectively hedge the homeowner indefinitely against such price risk. Because the down proxy asset has such a simple form, and is easily understood, it is easy for people to do this.

The system will provide continuous information about the balance in the account. This will reinforce for investors the fact that their accounts are "backed" by some real assets - the pooled resources. They will also know that if certain predefined circumstances pertain (such as termination of the system), they will automatically receive the balance in their account, further strengthening their impression that their investment has substantive value. This impression will result even though such circumstances are so defined as to be unlikely for the foreseeable future.

Bundling is applied to our up/down proxy assets to facilitate the marketing of the assets. For example, it is possible that in each city there is a demand for the down asset for that city, corresponding to the natural hedging demand for people of that city, but little or no demand for the individual up assets of individual cities, because investors all want to be diversified. The system creates and markets down assets for each of the cities, but the corresponding up proxy assets for each city is bundled for distribution as a single global up proxy asset which is a portfolio of the up proxy assets for all cities. These up assets could then later be taken apart, under defined circumstances.

In some embodiments, the initial down proxy assets are for individual zip codes or even census tracts, thereby facilitating very accurate hedging for individual homeowners. Also in some embodiments, the up proxy assets marketed are only highly aggregated bundles of the corresponding individual up proxy assets.

Example II - Swap Proxy Assets

A second form of proxy asset, continuing the real estate example, is labeled here

swap proxy assets. Investors wishing to swap out of the risk in their own city can buy an asset that is short in their own city and long in some other city. With such assets, they cannot adjust their overall real estate exposure (as they could with up/down proxy assets) but they can diversify their real estate exposure across cities (horizontal hedging). Adjusting the exposure to their own city can be a useful portfolio management device because many investors are not overinvested in real estate *per se* but are overexposed to real estate in one region. With between-city-swap proxy assets, this kind of hedging of one's risk and diversification into other cities can have the appearance of buying ordinary shares in other cities. Buying the proxy asset is like buying a share in real estate in the other city and selling exposure in a first city.

If we begin the system for N cities, then there are $N^2 - N$ ordered pairs of cities, and there will be one swap proxy asset for each such pair. For the ij th pair, the account formula for the cash account for one share of swap proxy asset ij is:

$$\begin{aligned} \text{Account Balance Per Share for Swap Proxy Asset } ij = \\ \text{Average Account Value Per Share} + 2 * (\text{Index}_i - \text{Index}_j); \end{aligned}$$

and for the ji th pair, a swap proxy asset cash account formula is:

$$\begin{aligned} \text{Account Balance Per Share for Swap Proxy Asset } ji = \\ \text{Average Account Value Per Share} + 2 * (\text{Index}_j - \text{Index}_i) \end{aligned}$$

Note that the average account value per share is the total balance in all accounts in the system per share, denoted V_t/S_t , above. In this example the swap proxy assets are more leveraged than in the previous up/down example, in that the indices are multiplied by two. (Another multiplier, other than two, could of course be used, to create a different amount of leverage; the number given is just for illustration.) The prices of the swap proxy assets will not have the simple interpretation of the price of the up proxy asset of the previous example, but the assets will have the offsetting advantage that they offer effective means of diversifying risk.

One way of defining the complete sets for the purpose of issuance and redemption is that all pairs of investments, one share in ij and one in ji , are complete sets. In this case, we can use the same dividend rule as was defined in the previous example of up/down proxy assets. There are other possible ways to define complete sets. A complete set could consist of a share in ij , a share in jk , and a share in ki proxy assets. These sets are circles of assets. If we defined such alternative complete sets, then we may wish to alter the distribution payout formula so that, in the case where some balances are negative, some swap proxy assets are

paying no dividend. The dividends on the remaining swap proxy assets still sum to the payout rate r times the combined balances.

Figure 1 shows an illustration of the kinds of closed paths (complete sets) that the swap system processor identifies among the orders to buy and sell shares. The first set, set A, is just a San Francisco-Denver swap proxy asset paired with a Denver-San Francisco swap proxy asset. The second set, set B, is a complicated closed path involving three cities and three swap proxy assets.

The proxy asset data processor applies these more complicated definitions of complete sets and searches the data to find opportunities to issue, redeem, and allow trading of proxy assets, a process much more complicated than was the case with the up/down proxy assets. For example, setting the average account balance in the system (V_t/S_t) at \$105.50 dollars per share, suppose that three book windows on the trading display screen are as shown:

Boston/Chicago Base 19980101

Bid	Quantity	Offer	Quantity
11015	100	11015	50
11014	50	11016	50
11013	50	11018	100
1999/03/02 10:53			

Chicago/Seattle Base 19980101

Bid	Quantity	Offer	Quantity
8593	50	8594	50
1999/03/02 10:53			

Seattle/Boston Base 19980101

Bid	Quantity	Offer	Quantity
12042	50	12043	50
		12045	50
		12046	100

1999/03/02 10:53

The proxy asset system and processor would discover that a bid for 50 Boston-Chicago shares at \$110.15 matches with the offer to sell 50 Boston-Chicago shares, and so this trade would automatically be executed. Thus the match shown on the hypothetical window above would not persist for more than an instant. To execute these orders, there is no need for issuance or redemption. The computer will also discover that there is a bid for Boston-Chicago for another 50 shares at \$110.15, a bid for 50 Chicago-Seattle shares at \$85.93, and a bid for 50 Seattle-Boston shares for \$120.42. It will discover that the sum of these prices is \$316.50, or three times the average cash account value per share ($3 V_i/S_i$), and so it automatically fills these orders by issuing the new proxy assets and allocating the proceeds from the sale into the respective cash accounts in proportion to amounts already there. Once again, these orders would not persist on the book window for more than an instant.

Note that in interfacing with an electronic trading system, such as the Globex or other system, embodiments of the invention include some modifications in the electronic trading system. For one example, traders would benefit from an embodiment which maintains more than one book window on the screen at a time, because of the interaction of orders within complete sets. For another example, traders who have asked the trading system to alert them when the price has hit a specific level, also benefit from an embodiment which alerts them in case any combination of orders for other proxy assets within the same complete set would suggest an opportunity to obtain the specified price by issuance or redemption at the specified price. This embodiment to provide such an alert relies on the embodiments which search for complete sets among the orders.

These swap proxy assets will work very well for those investors who already hold both real estate and other investments, but whose real estate investment is largely accounted for by their own homes, which are too concentrated in each city. For example, a person who owns a \$400,000 home in Los Angeles and is worried about possible poor performance of real estate in Los Angeles relative to New York can invest \$100,000 in proxy asset shares like those just described above, that are short in Los Angeles and long in New York. This

creates a situation in which the investor is effectively invested in the Los Angeles market only in the amount of \$200,000, and is effectively invested in the New York market in the amount of \$200,000. The investor will thereby diversify risks equally between the two cities. The person could also invest \$40,000 in each of four swaps, a New-York-Los Angeles swap proxy asset, a Miami-Los Angeles swap proxy asset, a Chicago-Los-Angeles swap proxy asset and a Denver-Los Angeles swap proxy asset. The investor will thereby diversify from an exclusive Los Angeles real estate position to a real estate position that is equally diversified across five cities.

The swap proxy assets are optionally bundled together and sold only as a group (called here a proxy asset bundle). For example, if there is much demand among residents of each city to swap their city real estate index for an average of all other cities, thereby effecting a diversified investment, then the only assets that need be marketed are the bundles of swaps that respond positively to a single city. Under certain conditions, these proxy asset bundles will provide the underlying swaps to the public which then may be disassembled later if demand appears for the individual components of the bundles.

If there is much demand among investors to invest in how well each city's real estate index will perform relative to all of the others combined, the relevant assets are the proxy asset bundles of swap proxy assets of each city versus all of the others. In this case, complete sets with only two elements would not exist; complete sets would require representation of all cities. Such structures permit investors to go long in the chosen city while requiring no one to hedge any city. Such a structure could be of value if the demand for hedging is minimal.

Example III - Multi-Asset Pooling Proxy Assets

A third form of proxy asset is labeled here as multi-asset pools. This arrangement has no down securities, only up securities; the up securities for a given index function also as down securities for the others together. Here, N proxy assets, each, corresponding to an index I_{at} , $a=1,...,N$, at time t , swaps the one index against the remaining $N-1$ indices. A complete set is one of each of the N proxy assets. The account function that defines the balance per share after transfer in cash account a at time t may be given by:

$$\text{balance}_{at} = V_t/S_t + I_{at} - \sum_{\alpha \neq a} I_{\alpha t} / (N-1) \quad a=1,...,N$$

For example, if $N=2$, then the assets are analogous to swaps between pairs of assets, as with the swap proxy assets described above. For another example, if $N=5$, there are five proxy

assets, for example, one for the real estate of each of the five largest cities of the country. Note that this formula satisfies the adding-up constraint; the total value of all accounts after transfers still equals the total amount in all accounts before transfer (but, after payout, if any).

Another account formula defines the balance in the cash account a at time t with a nonlinear formula:

$$balance_{at} = V_t / S_t \frac{N w_a INDEX_{at}}{\sum_{\alpha=1}^N w_{\alpha} INDEX_{\alpha t}} \quad a=1, \dots, N$$

where the weights $w_a, a=1, \dots, N$ correspond to the relative amounts outstanding of the various assets. (For example, cities with more people in them would get more weight.) A complete set is again one of each of the N proxy assets. With such a formula, the individual proxy asset accounts would never hit zero. Note that this formula also satisfies the adding-up constraint; the total value of all accounts after transfers still equals the total amount in all accounts before transfer (but, after payout, if any). The amounts in the various accounts would always correspond to the values in the various indices. Thus, there will be less of a need to issue securities with a new base year as time goes on. This multi-asset pooling proxy asset security will tend to be less volatile than the one defined by the linear formula.

With the foregoing description in mind, attention is now directed to Fig. 2 providing a schematic block diagram of the proxy asset account manager in the up/down proxy asset version. In this exemplary arrangement, two proxy assets are created, and the two constitute a complete set.

In particular, the system proprietor issues shares of up proxy asset (A) (block 10), following orders placed in the system on behalf of investors by conventional brokerage arrangements (block 40). Similarly, the system proprietor also issues, at block 20, the down proxy assets (B), also following orders placed in the system by brokers on behalf of investors. Importantly, the shares must be issued only in complete sets, which in this example means that the number of A proxy assets issued must equal the number of B proxy assets issued. Receipts from the sale of both the up and the down securities are pooled by the system proprietor in the bank and then the individual cash accounts credited with shares of this pool, block 30, in proportions to the amounts per share already in these accounts.

As provided above, it can be recognized that no actual underlying illiquid asset has been identified or purchased by the system proprietor and, accordingly, no substantial

transaction expenses have been incurred. The system operates to provide a proxy to real estate. The up proxy assets are marketed with a set of defining parameters including a link to an established index and the account, ACCT A, tied to these account balance would grow in proportion with the index. In a reciprocal manner, the down proxy asset's cash account balance would drop in value in proportion to an increase in the real estate index value. This is practically implemented by taking the actual capital from ACCT B and depositing it in ACCT A in correspondence with the changing index value, as shown at 70. ACCT A would grow and ACCT B would shrink by a like amount. As the underlying index is capable of both growth and retraction, Fig. 2 depicts capital flows in both directions.

In accordance with stored program logic, the system receives input on adjusted account balances and determines a dividend payment, W, corresponding to this new balance. An inverted relation is found between the index and the dividend stream of ACCT B, linked to the down securities. As real estate markets appreciate, funds in ACCT B are transferred out, leaving less capital for distribution generation W', and thus a reduced distribution for the holders of the down proxy assets B even as the pooled resources grow in value. These proxy assets, however, should remain in demand at some price, because of the account value, and because of their usefulness as a hedging vehicle against a drop in real estate values.

Implementation of the foregoing features is best accomplished via digital computer utilizing a uniquely defined controlling logic, wherein the computer system includes an integrated network between and among the various participants in the proxy asset security. This is depicted generally in Fig. 3A, wherein a block diagram highlights the components of a computer system useful for implementing these assets. The computer system is of conventional design, having a central processor (CPU) block 100 linked to a main database, DB(I), block 110. The main database includes archival data on the various securities, and allows proper manipulation of the underlying parameters in accordance with system logic. The database structure is outlined in detail in the database structure section below. The logic controlling system operation is stored in discrete memory block 120.

One aspect of the foregoing system involves the input of price or income indices and recording price movements and/or income changes necessary to implement changes in proxy asset accounts. Accordingly, the system includes commlink, block 140, to a network for proper controlled communication to various institutions and investors involved in the proxy asset. These participants have separate workstations, block 150, located at remote locations, but in communication with the system. It is expected that the bank, the index provider(s) and

the brokers handling trades with individuals, as well as possibly the investing individuals themselves, will each communicate with the system proprietor.

The actual hardware configuration used is not particularly critical, as long as the processing power is adequate in terms of memory, accounts, periods of updating indexed values, the number of proxy assets and their respective cash account formulas and dividend payout formulas, and order execution, redemption and issuance. A network of PCs with a windows NT operating system is expected to give acceptable performance. Oracle based database engines allow substantial account coverage and expansion. The controlling logic uses a language and compiler to match that on the CPU 100. These selections will be set according to *per se* well known conventions in the software community.

Another embodiment of computer hardware on a network is shown in Fig. 3B. Figure 3B is a block diagram that illustrates a computer system 900 upon which an embodiment of the invention may be implemented. Computer system 900 includes a bus 902 or other communication mechanism for communicating information, and a processor 904 coupled with bus 902 for processing information. Computer system 900 also includes a main memory 906, such as a random access memory (RAM) or other dynamic storage device, coupled to bus 902 for storing information and instructions to be executed by processor 904. Main memory 906 also may be used for storing temporary variables or other intermediate information during execution of instructions to be executed by processor 904. Computer system 900 further includes a read only memory (ROM) 908 or other static storage device coupled to bus 902 for storing static information and instructions for processor 904. A storage device 910, such as a magnetic disk or optical disk, is provided and coupled to bus 902 for storing information and instructions.

Computer system 900 is coupled via bus 902 to a display 912, such as a cathode ray tube (CRT), for displaying information to a computer user. An input device 914, including alphanumeric and other keys, is coupled to bus 902 for communicating information and command selections to processor 904. Another type of user input device is cursor control 916, such as a mouse, a trackball, or cursor direction keys for communicating direction information and command selections to processor 904 and for controlling cursor movement on display 912. This input device typically has two degrees of freedom in two axes, a first axis (e.g., x) and a second axis (e.g., y), that allows the device to specify positions in a plane.

The invention is related to the use of computer system 900 for proxy assets. According to one embodiment of the invention, proxy assets are defined and managed by

computer system 900 in response to processor 904 executing one or more sequences of one or more instructions contained in main memory 906. Such instructions may be read into main memory 906 from another computer-readable medium, such as storage device 910. Execution of the sequences of instructions contained in main memory 906 causes processor 904 to perform the process steps described herein. In alternative embodiments, hard-wired circuitry may be used in place of or in combination with software instructions to implement the invention. Thus, embodiments of the invention are not limited to any specific combination of hardware circuitry and software.

The term "computer-readable medium" as used herein refers to any medium that participates in providing instructions to processor 904 for execution. Such a medium may take many forms, including but not limited to, non-volatile media, volatile media, and transmission media. Non-volatile media includes, for example, optical or magnetic disks, such as storage device 910. Volatile media includes dynamic memory, such as main memory 906. Transmission media includes coaxial cables, copper wire and fiber optics, including the wires that comprise bus 902. Transmission media can also take the form of acoustic or light waves, such as those generated during radio-wave and infra-red data communications.

Common forms of computer-readable media include, for example, a floppy disk, a flexible disk, hard disk, magnetic tape, or any other magnetic medium, a CD-ROM, any other optical medium, punchcards, papertape, any other physical medium with patterns of holes, a RAM, a PROM, and EPROM, a FLASH-EPROM, any other memory chip or cartridge, a carrier wave as described hereinafter, or any other medium from which a computer can read.

Various forms of computer readable media may be involved in carrying one or more sequences of one or more instructions to processor 904 for execution. For example, the instructions may initially be carried on a magnetic disk of a remote computer. The remote computer can load the instructions into its dynamic memory and send the instructions over a telephone line using a modem. A modem local to computer system 900 can receive the data on the telephone line and use an infra-red transmitter to convert the data to an infra-red signal. An infra-red detector can receive the data carried in the infra-red signal and appropriate circuitry can place the data on bus 902. Bus 902 carries the data to main memory 906, from which processor 904 retrieves and executes the instructions. The instructions received by main memory 906 may optionally be stored on storage device 910

either before or after execution by processor 904.

Computer system 900 also includes a communication interface 918 coupled to bus 902. Communication interface 918 provides a two-way data communication coupling to a network link 920 that is connected to a local network 922. For example, communication interface 918 may be an integrated services digital network (ISDN) card or a modem to provide a data communication connection to a corresponding type of telephone line. As another example, communication interface 918 may be a local area network (LAN) card to provide a data communication connection to a compatible LAN. Wireless links may also be implemented. In any such implementation, communication interface 918 sends and receives electrical, electromagnetic or optical signals that carry digital data streams representing various types of information.

Network link 920 typically provides data communication through one or more networks to other data devices. For example, network link 920 provides a connection through local network 922 to a host computer 924 or to data equipment operated by an Internet Service Provider (ISP) 926. ISP 926 in turn provides data communication services through the world wide packet data communication network now commonly referred to as the "Internet" 928. Local network 922 and Internet 928 both use electrical, electromagnetic or optical signals that carry digital data streams. The signals through the various networks and the signals on network link 920 and through communication interface 918, which carry the digital data to and from computer system 900, are exemplary forms of carrier waves transporting the information.

Computer system 900 can send messages and receive data, including program code, through the network(s), network link 920 and communication interface 918. In the Internet example, a server 930 might transmit a requested code for an application program through Internet 928, ISP 926, local network 922 and communication interface 918. In accordance with the invention, one such downloaded application provides for values of pooled resources as described herein.

The received code may be executed by processor 904 as it is received, and/or stored in storage device 910, or other non-volatile storage for later execution. In this manner, computer system 900 may obtain application code in the form of a carrier wave.

An alternative configuration involves, instead of the 150 workstation linked by Windows NT, an Internet web site that allows trade directly over the Internet. Use of the system would still be restricted to brokers, if that is the objective, by suitable password

procedures.

Table I below shows an exemplary arrangement of the database for the proxy asset data processor. This table shows the records and fields that will be necessary for proper management under this embodiment.

Table I - Database Structure

Format:

Records

Fields

Shareholder Information:

Customer or Client I.D. Number:

Name or firm:

Address:

Proxy Asset or Bundle ID Numbers*:

Current Numbers of Shares or Bundles Owned in Each*:

Transaction ID Numbers*:

Transaction Information:

Transaction ID Number:

Proxy Asset or Bundle ID Number:

Buyer ID Number:

Seller ID Number:

Exchange, Issuance or Redemption:

Date and Time:

Number of Shares or Bundles:

Price per Share or Bundle:

Complete Set ID Number:

Buy and Sell Orders:

Order Number:

Customer ID Number:

Buy Order or Sell Order:

Proxy Asset ID Number or Bundle ID Number:

If Market Order: Numbers of Shares or Bundles

If Limit Order: Price and Numbers of Shares or Bundles

If Stop Order: Price and Numbers of Shares or Bundles

Order Date and Time*:

Order Expiration Date and Time: e.g. fill order until 1:00 pm 1/5/98

Pooled Cash Account Information:

Total Investable Assets Held for Cash Accounts (in Bank) (V_t):

Total Number of Shares Outstanding in Entire System (S_t):

Average Cash Account Balance per Share in System (V_t/S_t):

Complete Sets:

Set Number:

Proxy Asset or Bundle ID Numbers in Set*:

Index Information:

Index ID Number:

Update Frequency: e.g. quarterly

Date of Last Update:

Market Description: e.g. single family homes in Metro Los Angeles

Price or Income Index: e.g. price

Date*: e.g. First Quarter 1980

Index Level*: e.g. 100.00

Cash Account Formula:

Cash Account Formula ID Number:

Proxy Asset Type: Swap, Up or Down, etc.:

Cash Account Formula: e.g.,

- a) for up Cash Account = index (index ID number)
- b) for down Cash Account $2 \times V_t/S_t$ - index (index ID number)
- c) for swap Cash Account $V_t/S_t + 2 \times (A \text{ Index} - B \text{ Index})$ (index ID numbers)

Dividend Payout Formula:

Dividend Payout Formula ID Number:

Proxy Asset Type: Swap, Up or Down, etc.:

Dividend Payout Dates*:

Dividend Payout Formula: e.g.,

$$\text{dividend paid per share} = 0.02 \times (\text{Cash Account balance})$$

Proxy Asset Balance Change Information:

Proxy Asset Cash Balance Change Formula ID:

Proxy Asset ID Number:

Index ID Number*:

Cash Account Formula ID Number:

Cash-Balance Change Frequency: e.g. quarterly

Next Cash Balance Change Date:

Historical Cash Balance Changes:

Historical Cash Balance Change ID Number

Historical Cash Balance Change Date*:

Historical Cash Balance Before Change Amount*:

Historical Cash Balance Change Amount*:

Historical Cash Balance After Change Amount*:

Proxy Asset Definition:

Proxy Asset ID Number:

Proxy Asset Type: Swap, Up or Down:

Initial Cash per Share: e.g. \$100.00

Base Date: e.g. January 10, 1998

Current Number of Shares Outstanding: e.g. 500,000

Current Cash Account Balance per share: e.g. \$100

Dividend Frequency:

Next Dividend Due: e.g. January 10, 1998

Cash Account Formula ID Number:

Dividend Payout Formula ID Number:
 Next Cash Balance Change Due: e.g. January 10, 1998
 Cash Account Number:
 Next Interest Deposit Due:
 Issuance ID*:
 Redemption ID*:

Proxy Asset Bundle Definition:

Proxy Asset Bundle ID:
 Proxy Asset ID Numbers*:
 Number of Shares of Each Proxy Asset in Bundle*:

Issuance History:

Proxy Asset or Bundle ID Number:
 Complete Set ID Number:
 Issuance ID Number:
 Issuance Date:
 Number of Shares:
 Issuance Amount per Share:

Redemption History:

Proxy Asset or Bundle ID Number:
 Complete Set ID Number:
 Redemption ID Number:
 Redemption Date:
 Number of Shares:
 Redemption Amount per Share:
 *May be a multiple field

There are three primary functions of the logic command instructions. The first is to allow controlled creation of proxy assets, by defining new proxy assets from scratch, by bundling existing proxy assets together, by debundling existing proxy asset bundles, or by combining some or all of the above. The second is to transfer balances among accounts so that the account formula is satisfied by the balances. The third is to define and allocate dividends on the proxy assets. In each case, the critical controlling data must be stored in the properly configured database.

The first of these three functions is important, as success in risk management requires identifying the appropriate risk categories; such categories may be changing all the time. For example, investor demand for proxy assets in real estate may suddenly shift to a small configuration of neighborhoods that might be represented by a combination of zip-code or census-tract real estate price indices. The system is designed to allow the creation of new proxy assets as automatically as possible by a trained representative of the system proprietor operating the proxy asset data processor or even possibly by broker clients themselves. If the

cost of creating new proxy assets is made very low, then many more such proxy assets should be created.

The first function is accomplished in accordance with the logic flow chart depicted in Figure 4. Logic conceptually begins at start block 200 and continues to block 210 wherein the proxy asset under consideration AST(I) is entered by the system user. By AST(I) we mean, for the real estate example, a definition of the geographical area, identification of real estate price index, base year, cash account formula, and dividend payout formula. Since users will find it difficult to specify these, the system may provide tools, such as maps showing locations of zip codes or census tracts, and some summary statistics about the price indices for each of these.

The system first tests whether the entered proxy asset definition AST(I) is new and cannot be approximated by either existing proxy assets, an identical proxy asset already defined, by proxy assets with a slightly different base year, new bundles of existing proxy assets, components of existing proxy asset bundles, or by combinations thereof. In an initial run, test 220, the system searches over the existing proxy assets, the possibilities for new proxy asset bundles from existing proxy assets and components of existing proxy asset bundles to display the characteristics of the proxy assets that may be thus generated. The display includes information about the cash account balance that would be implied for the proxy asset under consideration. Possibly, some combination or division of proxy assets with a slightly different base year may be close enough to the proposed proxy asset. If the user signals that the entered proxy asset is not sufficiently new, if one of the possibilities put forward by the data processor is satisfactory, logic branches to block 230 and the existing records are pulled from the database for the already extant proxy asset or proxy asset bundles, with logic shifted to a separate subroutine.

A positive response to test 220 branches logic to block 250 wherein the parameters of the new proxy asset are entered into the system, and the parameters of the remaining elements of the complete set specified. In the case of simple up/down proxy assets, as illustrated in Figure 2, the complete set can be automatically defined by the system, providing a definition of the proxy asset pair (AST_PAR(I)), both elements of which must now be created. At this point, it must be decided whether the new proxy asset pair should be defined in terms of a single index or whether the pair should be defined as a Proxy Asset Bundle in terms of a cluster of component indices. If the former, the system branches to block 290. If the latter, the system branches to block 270, where the bundle is defined,

possibly by entering new indices into the system, and updating the database, block 280.

At test 310, the system queries about a default cycle for the asset adjustment period. A negative response to this allows custom entry of a controlling cycle, CYC(I), setting the time interval between adjustments for the accounts and dividends for the up/down proxy assets. The more common response to test 310 defaults the controlling interval to a system stored value, blocks 320-330. This completes the first portion of the processing with logic shifted to the next sequence, block 350.

Creation of the underlying cash accounts and associated computer files and displays forming the foundation for the up/down proxy asset pair is accomplished by the logic control commands shown in Figure 5. Beginning at start block 1400, logic first enables the entry of the pending proxy asset pair, AST_PAR(I) block 1410. The system checks whether this is a new proxy asset pair at test 1420. If new, logic continues to block 1440, wherein the cash account balance per share AST-BAL(I) is entered for both elements of the pair. These balances provide the financial backbone of the proxy assets. Implementation is made at blocks 1450-1460 setting up the two corresponding accounts ACCTA(I) and ACCTB(I): operation allows the entry of custom account parameters ("yes" to test 1470 - and entry at block 1490) or entry of pre-selected default values, block 1480.

As previously described, the system includes a communication link between various participants and governing institutions. A book window is created, block 1500, for traders on the trading system, indicating, the initial defined cash account balances per share for both proxy assets in the pair, even though no shares yet exist. Orders may now be placed by customers that will appear on the book window. To create the first proxy asset share, since no shares yet exist, the trading system must first identify a complete set within the orders whose value equals (or exceeds) the combined cash account balances per share. Thereafter, the system can fill orders both by exchanging existing shares and by finding complete sets among orders. When a complete set is first created, the bank or similar repository of capital in account form must be notified with wire transfer of funds and automatic structuring of accounts particularized in advance in response to the order. During routine operation of the proxy asset system, the system proprietor will be directly responsible for rebalancing the accounts (maintained by the bank in pooled form only) within complete sets with the changing indices governing the accounts.

Returning to Figure 5, after the database is updated with the current (and new) AST(I) information, logic queries on the next AST value (I+1) at test 1530; if another batch

is ready, logic continues to the beginning and the process is repeated for the next in series.

Day to day operation of the system requires analysis of a variety of time-varying inputs and selective calculation of a number of distinct variables to allow operation of the proxy asset. In Figure 6, several of these operations and routine procedures are depicted as examples of system processing, recognizing that many other variables are tracked in like fashion.

Beginning with block 1600, logic in Figure 6 first pulls the current date, $date(J)$, and enters this into the process, block 1610. The current proxy asset pair file is recalled, block 1620 read, which includes the current asset balances updated for interest earned by the bank. The periodic date is compared to the present date to determine if the current date is an event date for adjusting the proxy asset accounts. A positive response to test 1630 reflects the match of dates and need to update the accounts. Accordingly, logic continues to block 1640 and the system recalls the current index value for the tracked asset, $IDX(I,J)$. In this context, the counter variable J tracks the cycle - and thus absolute and relative time periods.

Continuing with Figure 6, the system applies the cash account-formula to the down proxy asset, block 1650, making the balance per share equal the combined balances per share in the two accounts before the transfer minus the index, and applies the account formula to the up proxy asset, block 1660, making the balance per share just equal to the index. Note that the combined balances of the two accounts is unchanged by this transfer, so the transfer is always feasible, even though the down proxy asset cash account balance may be negative. Then the foregoing calculations are applied to calculate the appropriate dividend level per share for each proxy asset pair, using the distribution payout formula. In block 1670, the system queries whether the balance in the down proxy asset is negative. If not, the system proceeds to blocks 1680 and 1690, where each account is given a dividend at the rate $DR(I)$. If so, then the system branches to block 1700, where the up proxy asset is defined a dividend equal to $DR(I)$ times the combined values in the two accounts, and block 1710, where the down proxy asset is given a dividend of 0. These values are then stored in the main database, $DB(x)$ at block 1720, and the entire process repeated for the next proxy asset under management by incrementing index variable I , block 1730.

As previously described, this embodiment of the system includes a communications link between various participants and governing institutions. These participants include a bank or similar repository of capital in account form, with wire transfer of funds and automatic structuring of accounts particularized in advance, and individual brokers or even

individual investors who might place orders directly with the system. During routine operation of the proxy management system, the bank will be directly responsible for investing the pooled balances of the cash accounts, while the proxy asset system will be responsible for maintaining the cash accounts for the individual proxy assets, thereby in effect dividing up the balance in the bank among proxy asset shareholders.

Execution of orders, by issuance and redemption or matching and clearing of buy and sell orders, for the proxy assets is accomplished by the logic and control commands detailed in Figs. 7 and 8. Figure 7 shows the proxy asset order processor. Beginning at start block 400 in Fig. 7, the order entry subroutine is detailed. Orders are received at block 410 from investors or brokers via workstations 150 (Fig. 3) or Internet link. Orders may consist of market orders (to buy or sell a specific number of a specific proxy asset at any price) or limit orders (to buy a specific number of proxy assets at or below a certain price or to sell a specific number of proxy assets at or above a certain price, bids and offers, hits and takes), or possibly other kinds of orders. These buy and sell orders are stored, at block 420, in a pending order list for each proxy asset in what is essentially equivalent to a book window in the trading system. In one embodiment, they are arranged in the book window with the highest bid at the top of one column and the highest offer at the top of another column, with prices in descending value below these.

With reference to Fig. 8, the proxy asset trading, issuance and redemption system begins at block 500. In a subroutine beginning at block 510, the pending order lists corresponding to each proxy asset are individually accessed and searched. At block 520, if a buy order for a proxy asset is matched with an identical sell order for that proxy asset, those shares are traded at block 530 without the issuance or redemption of any additional shares. Those orders are removed from the pending order list and processing returns to block 520 to search for additional matching orders. When no additional matches are present in the pending order list for the current proxy asset, the NO path from block 520 is followed and processing loops to the next asset in the system.

When all matching orders in the system have been processed, logic extends to block 550, whereupon the buy orders for all proxy assets in the system are together searched for a complete set or closed path. As discussed in Example I, a complete set is just an up/down pair. In Example II above, closed paths may consist of reciprocal swap proxy assets (e.g., ij and ji) or a more complicated set, such as an ij swap, a jk swap, and a ki swap (or any other path beginning and ending on the same asset). The combination of the proxy assets in the

path have a total value as discussed in Example II. The sum of the buy orders in the path must equal or exceed this value. If so, test block 560 branches to a processing routine, beginning at block 570, for issuing new shares of these proxy assets, updating the accounts of the respective proxy assets in the proportion to amounts already there, then deletes these buy orders from the pending order list, before returning to loop 550 to search for additional closed paths. Alternately, if the sum of the buy orders in the identified path does not meet the total value of the path, the path identified in block 550 is rejected at test 560 and different path combinations are searched.

When no additional complete sets (closed paths) are located in subroutine 550, processing continues to a subroutine beginning at block 600, searching for closed paths of sell orders in the pending order lists of all proxy assets in the system. The sum of the sell orders is compared to the total value of the proxy assets in the identified path at block 610. If greater, the orders are executed beginning with block 620 by redeeming existing shares of these proxy assets, updating the accounts to reflect the redeemed proxy assets and deleting the sell orders from the pending order list. Processing then continues to exhaust all possible closed paths. When all closed paths are identified, the subroutine ends at block 630. Alternately, the subroutines of Figure 8 may be performed in a different order, e.g., beginning at blocks 510, 550 or 600 as separate, and/or concurrent subroutines.

The execution of the buy and sell orders may also be connected to procedures whereby trade is suspended in unusual market situations, akin to the circuit breakers of organized exchanges. The execution of the buy and sell orders may be limited to certain classes of customers, such as registered broker dealers. The execution of the buy and sell orders may also be connected to a market surveillance system, like those at existing exchanges, to check for attempts at market manipulation or other illegal trading practices.

Figure 9 is a relational block diagram depicting the proxy asset bundle manager. In this diagram, four proxy assets, proxy assets A, B, C, and D are shown for illustration. In this example, only proxy asset D is sold directly to the public. Proxy assets A, B, and C are bundled together as shown, and the bundle is sold to the public. Since the accounts for proxy assets A, B, and C are already in place, and their account formulas and distribution payout formulas already defined, people will have some idea of the effects of taking this proxy asset bundle apart at a later date. Knowing that the proxy asset bundle may be decomposed later may facilitate its marketing to the public today.

Table 2 below shows an outline of the functions of the proxy asset data processor

according to one embodiment. The table gives an outline of the basic steps that this data processor must handle, on a continuing or daily basis, and the steps that are undertaken only on a less frequent basis.

Table II - Functions Of Proxy Asset Data Processor

1. Functions Ordered by System Proprietor

Add Index Data (run manually)

Load new Index into Index Record Database

Fill in other Fields of Index Record

Update Interest Payment (run daily)

For Each Proxy Asset:

Is Interest Deposit Due Today?

If Yes:

Adjust Current Cash Balance with Interest Payment

Fill in Next Interest Deposit Due

Pay Dividends (run daily)

For Each Proxy Asset:

Interest Deposit Run for Today?

If Yes:

Dividend Payment Due Today?

If Yes:

Use Dividend Payout Formula to Calculate Dividend

Pay Dividend, adjust Current Cash Account Balance

Fill in Next Dividend Payment Due

Update Indices (run daily)

For each Index

Date for an Index Update?

If Yes:

Receive Index Update Into Index Record

Update Cash Account Balances Using Cash Account Formulas (run daily)

Index, Interest and Dividend Update Performed Already for Today?

If Yes

For each Proxy Asset:

Look up Cash Balance Change Formula and Necessary Indices

Calculate Cash Account Balances Change

Is Transfer Between Accounts due today?

If Yes:

Make Transfers Among Cash Accounts according to

Cash Account Formula

Define New Swap Proxy Asset (run manually)

Select the Two Indices to be used, Rescale to 100 on Base Date

Select Formula Type

Fill in Base Date and Initial Cash Per Share

Fill in Cash Account Formula

Fill in Dividend Payout Formula

Make List of all Complete Sets

Define New, Up/Down Proxy Asset Pair (run manually)

Select the Index to be Used, Rescale to 100 on Base Date

Select Formula Type
 For both Up and Down Proxy Asset:
 Fill in Base Date and Initial Cash Per Share (same for both)
 Fill in Cash Account Formula
 Fill in Dividend Payout Formula
 Make List of All Complete Sets

2. *Functions Ordered by Brokers*

Process Buy Or Sell Orders (run when an order comes in)
 (If for a Bundle, treat each Proxy Asset in Bundle as shown below)
 Receive Transaction Request and Enter into Database
 Display Order on Screen with Other Unfilled Orders
 Display Historical Values of Indices
 Display Cash Account Balances
 Search for combinations of non-expired Buy and Sell Orders of same Proxy Asset
 Identify Matches in Limit Orders and Numbers of Shares
 If found, Execute Orders through Exchange of Existing Shares
 If None Found,
 Combine Order with other Orders of same type (e.g. Buys for same Proxy Asset)
 If a Bid for Proxy Asset

 Search for Complete Set Among Bids
 If Total Bid Prices in Set $\geq$ Total Cash Account Balances

Then:

 Issue New Shares
 Create Transaction Records
 Create Complete Set Record
 Fill in Issuance Records
 Create Investor Records
 Fill in Historical Cash Balance Changes Record
 Update Number of Shares and Current Cash Balance in Proxy Asset Record

If an Offer to Sell a Proxy Asset
 Search for Complete Sets among Offers
 If Total Offer Prices in Set $\leq$ Total Cash Account Balances

Then:

 Redeem Existing Shares
 Create Transaction Records
 Create Complete Set Record
 Fill in Redemption Records
 Update Investor Records
 Fill Historical Cash Balance Changes Record
 Update Number of Shares and Current Cash Balance in Proxy Asset

Record

Provide Information for Electronic Trading System

 Order Processing and Confirmation
 Provide Information for Book Window for Trading Screen
 Provide Responses to Requests for Alerts - e. g., alert traders when a specified price level has been reached either by a trade in subject proxy asset or by trades in

other proxy assets within the same complete set

3. *Functions ordered by Investors (Informational Web Site):*

View Indices

View Outstanding Limit Orders (Book Window)

View. Composition of Bundles View Proxy Asset

Base Date

Indices used

Cash Account Balance per Share

Starting Cash Account Balance per Share

Cash Account Balance Change History

Dividend Payment History

Cash Account Formula

Dividend Payout Formula

Although the invention has been described in detail for the purpose of illustration, it is to be understood that such detail is solely for that purpose and that variations can be made therein by those skilled in the art without departing from the spirit and scope of the invention. Indeed, some variations may need to be made to satisfy requirements of regulators, tax authorities, existing exchanges, brokers and underwriters, requirements that may vary through time and across countries.

CLAIMS

1. A method for providing a proxy asset set of two or more proxy assets that responds to a set of one or more indices, each proxy asset of the proxy assets set having a proxy asset account value and a number of proxy asset shares representing equal claims on the proxy asset account value, the proxy asset set having a total number of shares equal to a sum over all the number of proxy asset shares in the proxy assets set and having a proxy assets set account value equal to a sum over all the proxy asset account values of the proxy assets set, the method comprising:

- A. defining a proxy asset account value with a predetermined account formula responsive to at least one corresponding index of the set of one or more indices;
- B. constraining the proxy assets set account value by a value of a resources pool; and
- C. reevaluating the proxy asset account value according to the account formula upon occurrence of each event of a plurality of predetermined events.

2. The method of claim 1, further comprising:

initially assigning the total number of shares to a set of investors, each investor of the set of investors assigned at least one investor account, each investor account having an investor account number of proxy asset shares for one proxy asset of the proxy assets set; and

initially receiving from each investor for each investor account a contribution to the resources pool in an amount equal to a product of the investor account number of proxy asset shares and an initial value for a proxy asset account value per share.

3. The method of claim 1, further comprising for a particular proxy asset of the proxy assets set, publishing an updated particular proxy asset account value per share substantially equal to a quotient of a reevaluated proxy asset account value of the particular proxy asset divided by the number of proxy asset shares of the particular proxy asset.

4. The method of claim 1, wherein, during the reevaluating step, substantially all value lost from the proxy asset account value of one proxy asset is given to the proxy asset account

3 value of one or more other proxy assets of the proxy assets set.

1 5. The method of claim 1, said reevaluating comprising:

2 receiving a set of one or more updated index values corresponding to the set of one or
3 more indices at an update time of a current event of the plurality of predetermined events;
4 receiving an updated value of the resources pool at the update time; and
5 calculating an updated proxy asset account value for each proxy asset using the
6 account formula and the updated value of the resources pool.

1 6. The method of claim 5, said reevaluating step further comprising:

2 calculating a payout amount from the resources pool according to a predetermined
3 payout formula; and
4 reducing the updated value of the resources pool by the payout amount, before said
5 calculating the updated proxy asset account value.

1 7. The method of claim 6, further comprising publishing, for a particular proxy asset, a
2 particular payout per share responsive to the payout amount and the total number of shares.

1 8. The method of claim 7, wherein the particular payout per share is further responsive
2 to the proxy asset account value of the particular proxy asset and the proxy assets set account
3 value.

1 9. The method of claim 7, wherein the particular payout per share is further responsive
2 to a change in proxy asset account value of the particular proxy asset from a preceding value
3 of the proxy asset account value at a preceding event of the plurality of predetermined
4 events.

1 10. The method of claim 1, wherein:

2 a proxy asset account value per share substantially equals a quotient of the proxy
3 asset account value divided by the number of proxy asset shares for a corresponding proxy
4 asset;

5 the set of one or more indices is a set consisting of a single economic indicator,
6 the proxy assets set includes an up proxy asset and a down proxy asset; and

said defining a proxy asset account value step further includes defining an up proxy asset account value with an up account formula wherein an up proxy asset account value per share is proportional to the single economic indicator for at least some values of the single economic indicator, and

defining a down proxy asset account value with a down account formula wherein the down asset account value substantially equals a difference between the value of the resources pool minus a product of the number proxy asset shares for the up proxy asset and the up proxy asset value per share.

11. The method of claim 1, wherein:

an average value per share substantially equals a quotient of the proxy assets set account value divided by the total number of shares;

a proxy asset account value per share substantially equals a quotient of the proxy asset account value divided by the number of proxy asset shares for a corresponding proxy asset;

the set of one or more indices contains a number N of independent indices, where N is greater than one; the proxy assets set has exactly N proxy assets; and

said step of defining a proxy asset account value further includes, for a particular proxy asset of the proxy assets set, a particular account function for setting a particular proxy asset account value per share substantially equal to the average share value plus a difference between a particular index of the N independent indices and an average of all other indices of the N independent indices, said particular index corresponding to the particular proxy asset.

12. The method of claim 1, wherein:

an average value per share equals a quotient of the proxy assets set account value of the proxy assets set and the total number of shares of the proxy assets set;

a proxy asset account value per share equals a quotient of the proxy asset account value divided by the number of proxy asset shares for a corresponding proxy asset;

the set of one or more indices contains a number N of independent indices, where N is greater than one;

the proxy assets set has exactly N proxy assets; and

said step of defining a proxy asset account value further includes, for a particular

10 proxy asset of the proxy assets set, a particular account function for setting a particular proxy
 11 asset account value per share substantially equal to the average value per share multiplied by
 12 a quotient of a corresponding particular index of the N indices divided by a sum of the N
 13 independent indices.

1 13. The method of claim 1, further comprising:
 2 defining a particular proxy asset bundle comprising a share of a first proxy asset and
 3 a share of a second proxy asset; and
 4 publishing a value of the particular proxy asset bundle.

1 14. The method of claim 13, wherein the first proxy asset is from the proxy assets set and
 2 the second proxy asset is from the proxy assets set.

1 15. The method of claim 13, wherein the first proxy asset is from a first proxy assets set
 2 and the second proxy asset is from a different proxy assets set.

1 16. The method of claim 1, wherein:
 2 an average value per share equals a quotient of the proxy assets set account value of
 3 the proxy assets set and the total number of shares of the proxy assets set;
 4 a complete set of shares satisfies certain conditions and has a complete set number of
 5 shares; and
 6 the method further comprises at least one of issuing a complete set of shares and
 7 redeeming a complete set of shares.

1 17. The method of claim 16, wherein the certain conditions include for each particular
 2 proxy asset in the proxy assets set, maintaining a ratio of shares of the particular proxy asset
 3 in the complete set to the complete set number of shares substantially equal to a ratio of the
 4 number of proxy asset shares of the particular proxy asset to the total number of shares.

1 18. The method of claim 16, said issuing a complete set of shares comprising:
 2 increasing the number of proxy asset shares of a particular proxy asset by a number
 3 of shares of the particular proxy asset in the complete set, for each particular proxy asset in
 4 the proxy assets set; and

5 increasing the resources pool with additional resources in an amount substantially
6 equal to a product of the complete set number of shares multiplied by the average value per
7 share.

1 19. The method of claim 16, said redeeming a complete set of shares comprising:
2 decreasing the number of proxy asset shares of a particular proxy asset by a number
3 of shares of the particular proxy asset in the complete set, for each particular proxy asset in
4 the proxy assets set; and
5 decreasing the resources pool by a payout of resources of an amount substantially
6 equal to a product of the complete set number of shares multiplied by the average value per
7 share.

1 20. The method of claim 1, wherein each different event of the plurality of predetermined
2 events is a different update time of a set of predetermined times.

1 21. The method of claim 1, wherein at least one index of the set of one or more indices
2 represents prices for a liquid asset.

1 22. The method of claim 1, wherein at least one index of the set of one or more indices
2 represents prices for a illiquid asset.

1 23. The method of claim 22, wherein said illiquid assets includes at least one of:
2 real estate;
3 privately held corporate stocks;
4 infrequently traded corporate stocks;
5 a ship;
6 an aircraft;
7 a rare coin;
8 a precious gemstone;
9 a masterpiece painting;
10 livestock; or
11 a thoroughbred.

1 24. The method of claim 1, wherein at least one index of the set of one or more indices
2 represents an income flow.

1 25. The method of claim 24, wherein the income flow comprises income associated with:
2 a country;
3 an individual person;
4 human labor; or
5 human capital.

1 26. The method of claim 1, wherein at least one index of the set of one or more indices
2 represents an economic indicator.

1 27. The method of claim 26, wherein the economic indicator comprises at least one of:
2 a consumer price index;
3 an unemployment rate; or
4 consumer confidence.

1 28. The method of claim 1, wherein at least one index of the set of one or more indices
2 represents at least one of:
3 a macro-economic indicator;
4 one or more corporate stocks;
5 one or more mutual funds;
6 a composite index of corporate stocks;
7 an appreciation strip of the composite index of corporate stocks;
8 an appreciation strip residual of a composite index of corporate stocks;
9 earnings for at least one corporation;
10 earnings in a particular time period for a plurality of corporations;
11 price to earnings ratio for a corporate stock;
12 a tracking stock for a subdivision of a company;
13 an index of consumption;
14 a spread of different types of interest rates or mortgage rates;
15 a spread in a bid ask price for one or more items on an exchange;
16 an occupational income; or

17 a balance of trade for one or more countries.

1 29. The method of claim 28 wherein the occupational income is associated with at least
2 one of:

3 a class of labor; or

4 a cluster of labor sharing certain characteristics.

1 30. The method of claim 28, wherein said composite index is chosen from a group
2 comprising:

3 1) NASDAQ;

4 2) S & P 500;

5 3) Dow Jones Industrial Average;

6 4) NYSE Composite; and

7 5) Nikkei.

1 31. The method of claim 1, wherein the resources pool includes at least one of:

2 illiquid assets;

3 income flows;

4 cash;

5 liquid assets; or

6 an item with present value;

1 32. The method of claim 1, further comprising, trading a proxy asset on an exchange.

1 33. The method of claim 32, further comprising, identifying complete sets among orders
2 for proxy assets of the proxy assets set on an exchange, wherein a complete set satisfies
3 certain conditions.

1 34. The method of claim 33, further comprising, using predetermined order-filling rules
2 to fill orders with at least one of trades among investors and redeeming shares in complete
3 sets and issuing shares in complete sets.

1 35. The method of claim 1 further comprising defining termination rules for ending the

2 proxy assets set and distributing all resources in the resources pool.

1 36. The method of claim 1, said step of defining a proxy asset account value further
2 comprising:

3 receiving input from investors indicating one or more candidate indices from which
4 the set of one or more indices is selected; and
5 automatically building the predetermined account formula in response to the one or
6 more candidate indices indicated.

1 37. The method of claim 1, further comprising:

2 D. offering at least some of said proxy assets shares for private trading.

1 38. The method of claim 1, further comprising:

2 D. offering at least some of said proxy assets shares for public trading.

1 39. The method of claim 1, further comprising:

2 D. trading at least some of said proxy asset shares.

1 40. The method of claim 1, further comprising:

2 D. forming, from said proxy asset shares, a first set of shares configured to
3 experience an increase in value as a function of a positive change in said set
4 of indices; and
5 E. forming, from said proxy asset shares, a second set of shares configured to
6 experience an increase in value as a function of a negative change in said set
7 of indices.

1 41. The method of claim 40, further comprising:

2 F. shifting value between said first set of shares and said second set of shares as
3 a function of a change in the set of indices.

1 42. The method of claim 1, further comprising:

2 D. redeeming at least some of said proxy asset shares.

43. The method of claim 1, further comprising:

D. offering at least some of said proxy asset shares; and

E. terminating the offering of said proxy asset shares as a function of a triggering event, wherein said triggering event is chosen from a group of events comprising:

- 1) a termination of a predetermined period of time;
- 2) a value variation in said set of indices;
- 3) a change in rate of return of said proxy asset shares;
- 4) a change in a set of one or more economic indicators;
- 5) a change in level of risk reward;
- 6) a change in the value of the resource pool; and
- 7) a change in the prime lending rate.

44. The method of claim 1, further comprising:

D. adjusting the value of said resource pool as a function of a triggering event, wherein said triggering event is chosen from a group of events comprising:

- 1) a termination of a predetermined period of time;
- 2) adding or deleting an index from said set of indices;
- 3) a value variation in said set of indices;
- 4) a change in a set of one or more economic indicators;
- 5) a change in a level of risk reward; and
- 6) a change in the prime lending rate.

45. The method of claim 1, wherein the account formula includes a leverage factor, and wherein said leverage factor is applied to weight one or more of said set of indices.

46. A method for banking investments in a proxy assets set of two or more proxy assets that respond to a set of one or more indices, the method comprising:

- maintaining a database having information indicative of a value for a resources pool,
- and
- information indicative of a particular investor account including a particular investor of a set of investors, a particular proxy asset of the proxy assets set, and an investor account number of proxy asset shares;

8 sending over a communications link a signal indicative of the value of the resources
9 pool; and

10 receiving over the communications link a proxy asset account value per share
11 responsive to an index of the set of one or more indices for each proxy asset of the proxy
12 assets set.

1 47. A method for trading on an exchange shares of a proxy assets set of two or more
2 proxy assets that respond to a set of one or more indices, each proxy asset of the proxy assets
3 set having a proxy asset account value and a number of proxy asset shares, a sum over the
4 proxy asset set of the proxy asset account value substantially equaling a value of a resources
5 pool, the method comprising:

6 presenting to a trader a complete set of shares of the proxy assets set among one or
7 more offers to trade shares of the proxy assets set;

8 wherein a complete set satisfies a certain condition among shares of the proxy assets
9 set.

1 48. The method of claim 47, said presenting a complete set further comprising
2 maintaining more than one book window on a trading screen at one time.

1 49. The method of claim 47 further comprising allowing a trader to set an alert
2 responsive to an average price of a complete set of sell orders satisfying a proxy assets set
3 redemption condition.

1 50. The method of claim 47 further comprising allowing a trader to set an alert
2 responsive to an average price of a complete set of buy orders satisfying a proxy assets set
3 issuance condition.

1 51. The method of claim 47 further comprising automatically finding a complete set of
2 shares of the proxy assets set among one or more offers to trade.

1 52. The method of claim 47 further comprising automatically filling one or more orders
2 to trade proxy assets of the proxy assets set according to predetermined order-filling rules.

53. A method for managing a proxy asset set of two or more proxy assets that respond to a set of one or more indices, each proxy asset of the proxy assets set having a proxy asset account value and a number of proxy asset shares representing equal claims on the proxy asset account value, the proxy asset set having a total number of shares equal to a sum over the proxy assets set of the number of proxy asset shares and having a proxy assets set account value equal to a sum over the proxy assets set of the proxy asset account value, the method comprising:

receiving a value of a resources pool;

receiving a value of an index of the set of indices;

evaluating a proxy asset account value according to an account formula responsive to the value of the index and a constraint on the proxy assets set account value by the value of the resources pool, said evaluating performed upon occurrence of each event of a plurality of predetermined events.

54. A system for providing a proxy asset set of two or more proxy assets that respond to a set of one or more indices, each proxy asset of the proxy assets set having a proxy asset account value and a number of proxy asset shares, the proxy asset set having a total number of shares equal to a sum over the proxy assets set of the number of proxy asset shares and having a proxy assets set account value equal to a sum over the proxy assets set of the proxy asset account value, the system comprising:

A. a network;

B. a computer readable medium connected to the network, said computer readable medium storing a value of a resources pool and a number of shares of each proxy asset for each investor of a set of investors;

C. one or more bank processors connected to the network configured to compute the value of the resources pool; and

D. one or more proxy assets set processors configured for evaluating a proxy asset account value as a function of at least one corresponding index of the set of one or more indices, and for constraining the proxy assets set account value by the value of the resources pool.

55. The system of claim 54, wherein one or more of said set of indices represents a composite index chosen from a group comprising:

- 3 1) NASDAQ;
- 4 2) S & P 500;
- 5 3) Dow Jones Industrial Average;
- 6 4) NYSE Composite; and
- 7 5) Nikkei.

1 56. The system of claim 54, wherein at least one index of the set of one or more indices
2 represents one or more corporate stocks.

1 57. The system of claim 54, wherein at least one index of the set of one or more indices
2 represents one or more mutual funds.

1 58. The system of claim 54, wherein said proxy assets set processor is further configured
2 to offer at least some of said proxy assets shares for private trading.

1 59. The system of claim 54, wherein said proxy assets set processor is further configured
2 to offer at least some of said proxy assets shares for public trading.

1 60. The system of claim 54, wherein said proxy assets set processor is further configured
2 to trade at least some of said proxy asset shares.

1 61. The system of claim 54, wherein said proxy assets set processor is further configured
2 to:

3 form, from said proxy asset shares, a first set of shares configured to experience an
4 increase in value as a function of a positive change in said set of indices; and

5 form, from said proxy asset shares, a second set of shares configured to experience an
6 increase in value as a function of a negative change in said set of indices.

1 62. The system of claim 61, wherein said proxy assets processor is further configured to
2 shift one or more of said proxy assets between said first set of shares and said second set of
3 shares.

1 63. The system of claim 54, wherein said proxy assets set processor is further configured
2 to redeem at least some of said proxy asset shares.

1 64. The system of claim 54, wherein said proxy assets set processor is further configured
2 to:

3 offer at least some of said proxy asset shares; and

4 terminate said offer of said proxy asset shares as a function of a triggering event,

5 wherein said triggering event is chosen from a group of events comprising:

- 6 1) a termination of a predetermined period of time;
- 7 2) a value variation in said set of indices;
- 8 3) a change in rate of return of said proxy asset shares;
- 9 4) a change in a set of one or more economic indicators;
- 10 5) a change in level of risk reward;
- 11 6) a change in the value of the resource pool; and
- 12 7) a change in the prime lending rate.

1 65. The system of claim 54, wherein said proxy assets set processor is further configured
2 to:

3 adjust the value of said resource pool as a function of a triggering event, wherein said
4 triggering event is chosen from a group of events comprising:

- 5 1) a termination of a predetermined period of time;
- 6 2) adding or deleting an index from said set of indices;
- 7 3) a value variation in said set of indices;
- 8 4) a change in a set of one or more economic indicators;
- 9 5) a change in a level of risk reward; and
- 10 6) a change in the prime lending rate.

1 66. The system of claim 54, wherein the account formula includes a leverage factor, and
2 wherein said leverage factor is applied to weight one or more of said set of indices.

1 67. An apparatus for banking investments in a proxy assets set of two or more proxy
2 assets that respond to a set of one or more indices, the apparatus comprising:

3 a computer readable medium for storing information indicative of a value for a

resources pool, and information indicative of a particular investor account including
a particular investor of a set of investors,
a particular proxy asset of the proxy assets set, and
an investor account number of proxy asset shares; and
one or more processors connected to the computer readable medium, the one or more
processors configured to send over a communications link a signal indicative of the value of
the resources pool; and
receive over the communications link a proxy asset account value per share
responsive to an index of the set of one or more indices for each proxy asset of the proxy
assets set.

68. An apparatus for trading on an exchange shares of a proxy assets set of two or more
proxy assets that respond to a set of one or more indices, each proxy asset of the proxy assets
set having a proxy asset account value and a number of proxy asset shares, a sum over the
proxy asset set of the proxy asset account value substantially equaling a value of a resources
pool, the apparatus comprising:

a display device; and
one or more processors connected to the display device, the one or more processors
configured to present on the display device a complete set of shares of the proxy assets set
among one or more offers to trade shares of the proxy assets set;

wherein a complete set satisfies a certain condition among shares of the proxy assets
set.

69. An apparatus for managing a proxy asset set of two or more proxy assets that respond
to a set of one or more indices, each proxy asset of the proxy assets set having a proxy asset
account value and a number of proxy asset shares representing equal claims on the proxy
asset account value, the proxy asset set having a total number of shares equal to a sum over
the proxy assets set of the number of proxy asset shares and having a proxy assets set
account value equal to a sum over the proxy assets set of the proxy asset account value, the
apparatus comprising:

a computer readable medium for storing a value of a resources pool and a value of an
index of the set of indices; and

one or more processors connected to the computer readable medium, the one or more

11 processors configured to evaluate a proxy asset account value according to an account
 12 formula responsive to the value of the index and a constraint on the proxy assets set account
 13 value by the value of a resources pool, said evaluating performed upon occurrence of each
 14 event of a plurality of predetermined events.

1 70. A computer program product for banking investments in a proxy assets set of two or
 2 more proxy assets that respond to a set of one or more indices, the computer program
 3 product comprising:

4 a computer readable medium for storing information indicative of a value for a
 5 resources pool, and information indicative of a particular investor account including
 6 a particular investor of a set of investors,
 7 a particular proxy asset of the proxy assets set, and
 8 an investor account number of proxy asset shares; and
 9 instructions stored on the computer readable medium, said instructions for causing
 10 one or more processors to send over a communications link a signal indicative of the value
 11 of the resources pool; and

12 receive over the communications link a proxy asset account value per share
 13 responsive to an index of the set of one or more indices for each proxy asset of the proxy
 14 assets set.

1 71. A computer program product for trading on an exchange shares of a proxy assets set
 2 of two or more proxy assets that respond to a set of one or more indices, each proxy asset of
 3 the proxy assets set having a proxy asset account value and a number of proxy asset shares, a
 4 sum over the proxy asset set of the proxy asset account value substantially equaling a value
 5 of a resources pool, the computer program product comprising:

6 a computer readable medium; and
 7 instructions stored on the medium for causing one or more processors to present on a
 8 display device a complete set of shares of the proxy assets set among one or more offers to
 9 trade shares of the proxy assets set;

10 wherein a complete set satisfies a certain condition among shares of the proxy assets
 11 set.

1 72. A computer program product for managing a proxy asset set of two or more proxy

assets that respond to a set of one or more indices, each proxy asset of the proxy assets set having a proxy asset account value and a number of proxy asset shares representing equal claims on the proxy asset account value, the proxy asset set having a total number of shares equal to a sum over the proxy assets set of the number of proxy asset shares and having a proxy assets set account value equal to a sum over the proxy assets set of the proxy asset account value, the computer program product comprising:

a computer readable medium for storing a value of a resources pool and a value of an index of the set of indices; and

instructions stored on the computer readable medium causing one or more processors to evaluate a proxy asset account value according to an account formula responsive to the value of the index and a constraint on the proxy assets set account value by the value of a resources pool, said evaluating performed upon occurrence of each event of a plurality of predetermined events.

73. A signal transmission for banking investments in a proxy assets set of two or more proxy assets that respond to a set of one or more indices, the signal transmission comprising:

a carrier wave for transmitting signals;

signals transmitted on the carrier wave indicative of a value for a resources pool;

signals transmitted on the carrier wave indicative of a particular investor account including a particular investor of a set of investors, a particular proxy asset of the proxy assets set, and an investor account number of proxy asset shares; and

signals transmitted on the carrier wave indicative of instructions to cause one or more processors to send over a communications link a signal indicative of the value of the resources pool; and

receive over the communications link signals indicative of a proxy asset account value per share responsive to an index of the set of one or more indices for each proxy asset of the proxy assets set.

74. A signal transmission for trading on an exchange shares of a proxy assets set of two or more proxy assets that respond to a set of one or more indices, each proxy asset of the proxy assets set having a proxy asset account value and a number of proxy asset shares, a sum over the proxy asset set of the proxy asset account value substantially equaling a value

of a resources pool, the signal transmission comprising:

a carrier wave for transmitting signals; and

signals transmitted on the carrier wave indicative of instructions for causing one or more processors to present on a display device a complete set of shares of the proxy assets set among one or more offers to trade shares of the proxy assets set;

wherein a complete set satisfies a certain condition among shares of the proxy assets set.

75. A signal transmission for managing a proxy asset set of two or more proxy assets that respond to a set of one or more indices, each proxy asset of the proxy assets set having a proxy asset account value and a number of proxy asset shares representing equal claims on the proxy asset account value, the proxy asset set having a total number of shares equal to a sum over the proxy assets set of the number of proxy asset shares and having a proxy assets set account value equal to a sum over the proxy assets set of the proxy asset account value, the signal transmission comprising:

a carrier wave for transmitting signals;

signals transmitted on the carrier wave indicative of a value of a resources pool and a value of an index of the set of indices; and

signals transmitted on the carrier wave indicative of instructions for causing one or more processors to evaluate a proxy asset account value according to an account formula responsive to the value of the index and a constraint on the proxy assets set account value by the value of a resources pool, said evaluating performed upon occurrence of each event of a plurality of predetermined events.

76. A method of providing shares in a proxy asset set, each proxy asset in said proxy asset set having a proxy asset account value, said method comprising:

A. defining a proxy asset set account value equal to the sum of the account values of all proxy assets in said proxy asset set, including constraining said proxy asset set account value by a value of a resource pool;

B. offering a first set of shares representing claims on a first subset of said proxy assets, wherein said first set of shares experience an increase in value as a function of a positive change in said set of indices according to a first formula;

- 10 C. offering a second set of shares representing claims on a second subset of
- 11 proxy assets, wherein said second set of shares experience an increase in
- 12 value as a function of a negative change in said set of indices according to a
- 13 second formula; and
- 14 D. shifting value between said first set of shares and said second set of shares as
- 15 a function of a change in the set of indices.

1 77. A method as in claim 76, wherein said first and second set of shares are publicly
2 offered for sale.

1 78. A method as in claim 76, wherein said first and second set of shares are privately
2 offered for sale.

1 79. A method as in claim 76, wherein one or more of said set of indices represents one or
2 more corporate stocks or mutual funds.

1 80. The method of claim 76, wherein one or more of said set of indices represents a
2 composite index chosen from a group comprising:

- 3 1) NASDAQ;
- 4 2) S & P 500;
- 5 3) Dow Jones Industrial Average;
- 6 4) NYSE Composite; and
- 7 5) Nikkei.

1 81. The method of claim 76, further comprising:

- 2 E. reevaluating the proxy asset account value according to an account formula
- 3 upon the occurrence of one or more predetermined types of events.

1 82. The method of claim 76, further comprising:

- 2 E. terminating the offering of said proxy asset shares as a function of a
- 3 triggering event, wherein said triggering event is chosen from a group of
- 4 events comprising:
- 5 1) a termination of a predetermined period of time;

- 6 2) a value variation in said set of indices;
- 7 3) a change in rate of return of said proxy asset shares;
- 8 4) a change in a set of one or more economic indicators;
- 9 5) a change in level of risk reward;
- 10 6) a change in the value of the resource pool; and
- 11 7) a change in the prime lending rate.

1 83. The method of claim 76, further comprising:

- 2 E. adjusting the value of said resource pool as a function of a triggering event,
- 3 wherein said triggering event is chosen from a group of events comprising:
- 4 1) a termination of a predetermined period of time;
- 5 2) adding or deleting an index from said set of indices;
- 6 3) a value variation in said set of indices;
- 7 4) a change in a set of one or more economic indicators;
- 8 5) a change in a level of risk reward; and
- 9 6) a change in the prime lending rate.

1 84. A set of proxy asset shares generated by a process comprising:

- 2 a. defining a set of proxy assets;
- 3 b. defining for said set of proxy assets at least one proxy asset account value
- 4 responsive to one or more indices;
- 5 c. constraining a sum of said at least one proxy asset account value by a value of
- 6 a resources pool; and
- 7 d. defining at least one set of proxy asset shares representing claims on said at
- 8 least one proxy asset account value.

1 85. The set of proxy asset shares as in claim 84, wherein said set of proxy assets includes

2 a set of illiquid assets, wherein said set of illiquid assets includes one or more of:

- 3 i) real estate;
- 4 ii) privately held corporate stocks;
- 5 iii) infrequently traded corporate stocks;
- 6 iv) a ship;
- 7 v) an aircraft;

- 8 vi) a rare coin;
- 9 vii) a precious gemstone;
- 10 viii) a masterpiece painting;
- 11 ix) livestock;
- 12 x) a thoroughbred; and
- 13 xi) a stream of income.

1 86. The set of proxy asset shares as in claim 84, wherein said one or more indices
 2 includes one or more of:

- 3 i) a composite index;
- 4 ii) one or more stock prices;
- 5 iii) interest rates; and
- 6 iv) an index representing values of proxy assets in the set of proxy assets.

1 87. The set of proxy asset shares as in claim 84, wherein said at least one set of proxy
 2 assets shares includes a first subset of proxy assets shares and a second subset of proxy asset
 3 shares representing opposing positions in the set of proxy assets.