

WEALTH MANAGEMENT PLATFORM AND METHOD FOR MINIMIZING RESERVES REQUIRED FOR POTENTIAL BUCKET SHORTFALLS

5 TECHNICAL CONTRIBUTION

The present disclosure relates to wealth management platforms employing bucket investment strategies. More particularly, the present disclosure relates to a wealth management platform and computer-implemented method for minimizing reserve supplemental funding required to
10 offset potential bucket shortfalls.

BACKGROUND

The structured allocation of investments for the retirement of wealth management clients has
15 many trade-offs. While cash and government bonds offer the benefit of low volatility, their average annual returns are much lower than the average annual returns of equity investments and often do not keep up with inflation. While equity funds tied to the S&P 500, for example, have an average annual return of about eight percent, these higher average annual returns come hand-in-hand with higher volatility year-to-year.

20 Over the long term, the higher volatility of equities is essentially averaged out. Bull markets erase the losses of bear markets. For instance, in 2008 the S&P 500 fell over thirty-five percent but by early 2021 the S&P 500 had grown over four hundred percent from its bottom in 2008. If the volatility of equities can be well managed, equities offer a considerable
25 advantage over cash and government bonds.

Of particular concern when constructing a wealth management plan is the potential impact of the sequence of returns for volatile investments. If there is a bear market during the early years of retirement, funds for living expenses could be withdrawn from an equity investment
30 mix of lowered value and the effect of this early shortfall would be compounded over all the years of the retirement. Negative returns in the early years of retirement therefore create a high risk that the retirement fund could be pre-maturely exhausted.

Bucket investment strategies are used for wealth management to take advantage of the higher returns of equity investments while mitigating risks from potential unfavorable sequences of annual returns. Each bucket is defined by bucket portfolio data such as a bucket investment mix, a bucket present value (calculated as of the target inception date of the wealth management plan), a bucket volatility index, and a bucket start date. The bucket investment mix in the later buckets (e.g., 15 to 30 years from one's retirement date) can have a higher bucket volatility index as there is more time for dips in the market to be overcome. The earliest bucket has a bucket investment mix with a lower bucket volatility index (e.g., cash or government bonds). As the bucket start date for later buckets nears, the funds in these later buckets can be, in turn one-by-one, converted from a riskier investment to a lower risk investment.

Bucket investment strategies are only as strong as the assumptions used to construct the buckets. Especially with the increased longevity of many wealth management clients, bucket strategies can be impacted by rising healthcare costs, inflation (making low return investments impractical), and compulsive or undisciplined spending (especially in the early years of retirement). Frequent solutions for such dangers include delaying the inception date of retirement, increasing the funding of each bucket, reducing retirement spending during poor market conditions, and setting aside a reserve (or emergency) fund.

With regard to reserve funds, the questions arise of how best to select a reserve investment mix for the reserve and how best to determine the reserve total (e.g., a present value of the reserve fund at the inception of retirement). In regard to the reserve investment mix, cash provides low volatility but at the cost of low returns that do not compensate for inflation. Equity investments are better suited to overcome inflation, but present a volatility risk. In regard to the reserve total, ballpark figures for the reserve total can be estimated, but at the risk of either underfunding or overfunding the reserve.

What is needed is a wealth management platform and method suited for modeling financial risk potential for each bucket (given its bucket investment mix and bucket start date) and determining an optimal reserve total to compensate for such risk potential.

SUMMARY

A general embodiment of the invention is platform for and a method of wealth management employing the use of buckets augmented by reserve supplements. The invention first identifies which buckets are most susceptible to future bucket shortfalls and then second calculates the reserve supplements necessary to compensate for the future bucket shortfalls of each of the buckets most susceptible to future bucket shortfalls. The invention takes into account the historical returns of the buckets, the duration of the buckets, median returns, lower bound returns, and confidence level.

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The reserve module of the platform embodiment of the invention is configured to, for each guidance request, select a reserve profile for the one or more reserve supplements funded, the reserve profile defined by reserve portfolio data with a reserve investment mix. The reserve module is configured to, for the reserve profile, calculate a continuous return of the reserve profile and a continuous standard deviation of the reserve profile based on the reserve portfolio data of the reserve profile. The reserve module is also configured, for each reserve supplement funded, calculate: (1) a lower bound return of the reserve supplement based on the continuous return of the reserve profile, the continuous standard deviation of the reserve profile, the confidence level (ZScore) for the guidance request, and the duration of the bucket associated with the reserve supplement; and (2) a present value reserve for the reserve supplement. The present value reserve of the reserve supplement is a present value of the future bucket shortfall of the bucket associated with the reserve supplement. Each present value is calculated as of the target inception date using the lower bound return of the reserve supplement. The reserve module is configured to, for each guidance request, calculate a reserve total, the reserve total equal to a summation of all of the one or more present value reserves for the guidance request.

The output module of the platform embodiment of the invention is configured to, for each guidance request, output a guidance report including: (i) a bucket summary; and (ii) a reserve summary including at least the reserve total.

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A platform embodiment of the invention is a wealth management platform for receiving and processing a plurality of guidance requests, the platform comprising: (a) a web server in data communication with a network; (b) a guidance request database in data communication with the web server, the guidance request database configured to store each guidance request in one of a plurality of request records of the guidance request database; (c) a bucket module configured to construct a plurality of buckets for each guidance request; (d) a shortfall module; (e) a reserve module; and (f) an output module. The web server is configured to provide a wealth management portal to receive the guidance requests. Each guidance request is associated with one of a plurality of wealth management clients. Each guidance request includes: (1) biographical information and financial data from the wealth management client associated with the guidance request; and (2) a target inception date. Each bucket is defined by bucket portfolio data including: (1) a bucket investment mix; (2) a bucket present value, calculated as of the target inception date; (3) a bucket volatility index; and (4) a bucket start date. The plurality of buckets for each guidance request includes at least three buckets and the bucket start date of a first bucket is the target inception date.

The shortfall module of the platform embodiment of the invention is configured to, for each guidance request, determine for each bucket of the guidance request whether to fund a reserve supplement for the bucket. The reserve supplement for the bucket is funded if both: (1) the bucket volatility index of the bucket is above a pre-determined volatility threshold; and (2) the bucket start date of the bucket is less than a pre-determined time duration from the target inception date. The shortfall module of the first embodiment of the invention is also configured to, for each guidance request, store or link to: (1) a confidence level (ZScore) for the guidance request; and (2) historic return data for the bucket investment mix associated with each bucket. The shortfall module of the first embodiment of the invention is also configured to, for each reserve supplement funded in each guidance request, calculate for the bucket associated with the reserve supplement: (1) a continuous return of the bucket and a continuous standard deviation of the bucket based on the historic return data of the bucket investment mix of the bucket; (2) a lower bound return of the bucket calculated based on the continuous return of the bucket, the continuous standard deviation of the bucket, the confidence level (ZScore) for the guidance request, and a duration of the bucket, wherein the duration of the bucket is measured between the target inception date and the bucket start date

of the bucket; (3) a lower bound portfolio value of the bucket as of the bucket start date of the bucket based on the lower bound return of the bucket, the bucket present value of the bucket at the target inception date, and the duration of the bucket; (4) a median return of the bucket calculated based on the continuous return of the bucket and the duration of the bucket; (5) a median portfolio value of the bucket as of the bucket start date of the bucket based on the median return of the bucket, the bucket present value of the bucket at the target inception date, and the duration of the bucket; and (6) a future bucket shortfall of the bucket as of the bucket start date of the bucket. The future bucket shortfall of the bucket is equal to: (a) the median portfolio value of the bucket as of the bucket start date of the bucket; minus (b) the lower bound portfolio value of the bucket as of the bucket start date of the bucket.

The output module of the platform embodiment of the invention is configured to, for each guidance request, output a guidance report including: (i) a bucket summary; and (ii) a reserve summary including at least the reserve total.

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A method embodiment of the invention is a computer-implemented wealth management method for receiving and processing a plurality of guidance requests. The method comprises: (a) maintaining a web server in data communication with a network; (b) storing each guidance request in one of a plurality of request records of a guidance request database, wherein the guidance request database is in data communication with the web server; (c) for each guidance request, constructing a plurality of buckets; (d) for each guidance request, determining for each bucket of the guidance request whether to fund a reserve supplement for the bucket; (e) for each guidance request, storing or linking to a confidence level (ZScore) for the guidance request and historic return data for the bucket investment mix associated with each bucket; (f) for each reserve supplement funded in each guidance request, making calculations for the bucket associated with the reserve supplement; (g) for each guidance request, selecting a reserve profile for the one or more reserve supplements funded, the reserve profile defined by reserve portfolio data with a reserve investment mix; (h) for the reserve profile of each guidance request, calculating a continuous return of the reserve profile and a continuous standard deviation of the reserve profile based on the reserve portfolio data of the reserve profile; (i) for each reserve supplement funded in each guidance request, making calculations for the reserve supplement; (j) for each guidance request, calculating a reserve total, the reserve total equal to a summation of all of the one or more present value

reserves for the guidance request; and (k) for each guidance request, outputting a guidance report including a bucket summary and a reserve summary including at least the total reserve total. The web server is configured to provide a wealth management portal to receive the guidance requests. Each guidance request is associated with one of a plurality of wealth management clients. Each guidance request includes: (1) biographical information and financial data from the wealth management client associated with the guidance request; and (2) a target inception date. Each bucket is defined by bucket portfolio data including: (1) a bucket investment mix; (2) a bucket present value, calculated as of the target inception date; (3) a bucket volatility index; and (4) a bucket start date. The plurality of buckets for each guidance request includes at least three buckets and the bucket start date of a first bucket is the target inception date. For each bucket, the reserve supplement for the bucket is funded if both: (i) the bucket volatility index of the bucket is above a pre-determined volatility threshold; and (ii) the bucket start date of the bucket is less than a pre-determined time duration from the target inception date.

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In the method embodiment of the invention, for each reserve supplement funded in each guidance request, the step of making calculations for the bucket associated with the reserve supplement includes calculating: (i) a continuous return of the bucket and a continuous standard deviation of the bucket based on the historic return data of the bucket investment mix of the bucket; (ii) a lower bound return of the bucket calculated based on the continuous return of the bucket, the continuous standard deviation of the bucket, the confidence level (ZScore) for the guidance request, and a duration of the bucket, wherein the duration of the bucket is measured between the target inception date and the bucket start date of the bucket; (iii) a lower bound portfolio value of the bucket as of the bucket start date of the bucket based on the lower bound return of the bucket, the bucket present value of the bucket at the target inception date, and the duration of the bucket; (iv) a median return of the bucket calculated based on the continuous return of the bucket and the duration of the bucket; (v) a median portfolio value of the bucket as of the bucket start date of the bucket based on the median return of the bucket, the bucket present value of the bucket at the target inception date, and the duration of the bucket; and (vi) a future bucket shortfall of the bucket as of the bucket start date of the bucket. The future bucket shortfall of the bucket is equal to: (a) the median

portfolio value of the bucket as of the bucket start date of the bucket; minus (b) the lower bound portfolio value of the bucket as of the bucket start date of the bucket.

5 In the method embodiment of the invention, for each reserve supplement funded in each guidance request, the step of making calculations for the reserve supplement includes calculating: (i) a lower bound return of the reserve supplement based on the continuous return of the reserve profile, the continuous standard deviation of the reserve profile, the confidence level (ZScore) for the guidance request, and the duration of the bucket associated with the reserve supplement; and (ii) a present value reserve for the reserve supplement. The present
10 value reserve of the reserve supplement is a present value of the future bucket shortfall of the bucket associated with the reserve supplement. Each present value is calculated as of the target inception date using the lower bound return of the reserve supplement

15 In contrast to the background art, the invention does treat the creation of the reserve as an afterthought. The invention is driven by statistical analysis drawing from historic return data of both the bucket investment mix and the reserve investment mix. Only the vulnerable buckets are targeted for reserve supplements, reducing the overall funds required to fund the reserve total. Employing a confidence level parameter, the invention, while being flexible enough to address the specific risk aversion of each client, avoids unhelpful efforts to
20 compensate for the most unlikely tail events. Also, because the same platform and method of the invention are used to construct both the buckets and the reserve, the invention can leverage the data and financial assumptions used to create the buckets when creating the reserve. In this manner, the invention further increases the reliability of a steady retirement income against a potential poor sequence of returns risk with a reserve investment mix that
25 beats inflation.

BRIEF DESCRIPTION OF THE DRAWINGS

Embodiments of the present disclosure are described herein with reference to the drawings in which:

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FIG. 1 is a block diagram representing a wealth management platform in a wealth management system in an embodiment of the invention.

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FIG. 2 is a flowchart representation of a computer-implemented wealth management method in an embodiment of the invention.

FIG. 3 is a flowchart detailing sub-steps for deciding whether a reserve supplement is required for a particular bucket in an embodiment of the invention.

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FIG. 4 is a flowchart detailing sub-steps for calculating future bucket shortfalls for each bucket requiring a reserve supplement in an embodiment of the invention.

FIG. 5 is a flowchart detailing sub-steps for determining present value of the future bucket shortfall of each bucket requiring a reserve supplement in an embodiment of the invention.

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FIG. 6 is an example analysis of whether a reserve supplement is required for each particular bucket in an embodiment of the invention.

FIGs. 7-10 list equations employed in various embodiments of the invention.

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FIG. 11 is a chart detailing example bucket and reserve supplement calculations in an embodiment of the invention.

FIG. 12 is a graph depicting example bucket and reserve supplement values over the duration of a wealth management client's retirement in an embodiment of the invention.

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DETAILED DESCRIPTION

In the following detailed description, reference is made to the accompanying drawings, which form a part hereof. The illustrative embodiments described in the detailed description, drawings and claims are not meant to be limiting. Other embodiments can be utilized, and other changes can be made, without departing from the spirit or scope of the subject matter presented herein. Unless specified otherwise, the terms “comprising,” “comprise,” “including” and “include” used herein, and grammatical variants thereof, are intended to represent “open” or “inclusive” language such that they include recited elements but also permit inclusion of additional, un-recited elements. As used herein, a platform may reside within a single stand-alone computer, a server, multiple dedicated servers, a cloud-based service, and/or a virtual server running on a larger network of servers. As used herein, a database may store data to and access data from a single stand-alone computer, a data server, multiple dedicated data servers, a cloud-based service, and/or a virtual server running on a larger network of servers.

FIG. 1 is a block diagram representing a wealth management platform **11** in a wealth management system **10** in an embodiment of the invention. The platform **11** includes a web server **11A** in data communication with a network **12C**, a guidance request database **11B**, a bucket module **11C**, a shortfall module **11D**, a reserve module **11E**, and an output module **11F**. The off-platform **12** items of the system **10** include the network **12C**, a wealth management portal **12A** implemented via a webpage displayed on a laptop computer, and a historic return database **12B**. As depicted, the platform **11** is in data communication with the wealth management portal **12A** and the historic returns database **12B**. In other embodiments of the invention, the historic returns database **12B** can be integrated within the platform **11**. While depicted as a laptop computer, the wealth management portal **12A** could also be implemented using an API interface to one or more online client investment accounts. Instead of a laptop or a desktop computer displaying a webpage, the wealth management portal **12A** could also be implemented as an app running on a smart phone or tablet.

FIG. 2 is a flowchart representation of a computer-implemented wealth management method **20** in an embodiment of the invention. The data inputs for the flowchart are a plurality of guidance requests **21** and data stored on a historic returns database **12B**. Each guidance request **21** includes biographical information **21A** and financial data **21B**. This data is used to construct buckets in step **1-01** (this step is background art). Embodiments of the invention add the steps of: deciding which buckets require the creation of a reserve supplement for each bucket in step **1-02**; calculating future bucket shortfalls for each bucket at a confidence level in step **1-03**; determining a present value of each future bucket shortfall in step **1-04**; and summing the present values of the shortfalls of each bucket to calculate the reserve total in step **1-05**. Steps **1-03** to **1-05** are only performed for buckets that satisfy decision step **1-02** (see **FIG. 3** for details of step **1-02**).

FIG. 3 is a flowchart detailing sub-steps for deciding whether a reserve supplement is required for each bucket in an embodiment of the invention (e.g., step **1-02**). A first yes/no question **1-02A** is whether the bucket volatility index is above a volatility threshold. A second yes/no question **1-02B** is whether the bucket start date is less than “Y” years from the target inception date. While years are used for simplicity in this **FIG. 3**, the measure of time could also be, for instance, calendar days or months. Steps **1-03** to **1-05** (see **FIGs. 4-5**) are only performed for buckets that satisfy decision step **1-02**.

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FIG. 4 is a flowchart detailing sub-steps for calculating future bucket shortfalls for each bucket requiring a reserve supplement in an embodiment of the invention (e.g., step **1-03**). Step **1-03A** is storing or linking, for each bucket, to a confidence level and historic return data. Step **1-03B** is a calculation, for each bucket, of a continuous return and a continuous standard deviation. Step **1-03C** is a calculation, for each bucket, of the lower bound return and the median return at the confidence level. Step **1-03D** is a calculation, for each bucket, of the lower bound portfolio value and the median portfolio value as of the start date of bucket. And step **1-03E** is a calculation of a future bucket shortfall for each bucket requiring a reserve supplement, as calculated at the bucket start date of the bucket. Note that the bucket start date is the date that funds from the bucket commence to be paid out to the wealth management client; riskier investments, such as equity stocks, are typically converted to less volatile investments such as cash or government bonds when the bucket start date nears.

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FIG. 5 is a flowchart detailing sub-steps for determining present value of the future bucket shortfall of each bucket requiring a reserve supplement (e.g., step **1-04**) in an embodiment of the invention. Step **1-04A** includes storing or linking to reserve portfolio data for a reserve profile. Step **1-04B** includes calculating, for the reserve profile, a continuous return and a continuous standard deviation. Step **1-04C** includes calculating, for each reserve supplement, a lower bound return at the confidence level. Step **1-04D** includes calculating, for each reserve supplement, the present value of the future bucket shortfall using the lower bound return of the reserve profile.

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FIG. 6 is an example analysis of whether a reserve supplement is required for each bucket in an embodiment of the invention. In this example, there are six buckets numbered *bucket-1* to *bucket-6* for years 2021 to 2046+. Under step **1-02** (e.g., whether to create a reserve supplement for each bucket), the two decisions for steps **1-02A** and **1-02B** are both answered as “yes” for *bucket-2* and *bucket-3* because these two buckets are for risky investments and the bucket start date of these two buckets is less than 15 years (e.g., *Y* equals 15 years in this example) from the target inception date. No reserve supplement is needed for *bucket-1* because it is cash, which has a low volatility index. No reserve supplements are needed for *bucket-4*, *bucket-5*, and *bucket-6* because all these buckets have a bucket start date more than 15 years from the target inception date. The bucket start date of *bucket-2* and *bucket-3* are at the start of year 2026 and year 2031, respectively. In this example, the target inception date is the bucket start date of *bucket-1* (start of year 2021).

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FIG. 7 lists equations employed in various embodiments of the invention. **FIG. 7** includes *Equation-1A* and *Equation-1B* for continuous return and continuous standard deviation. As discussed in more detail below, these two equations are employed twice in the invention: (i) first in relation to a calculation for each bucket based on the historic return data of the bucket investment mix of the bucket; and (ii) second in relation to a calculation for the reserve profile based on the reserve investment mix of the reserve profile. Note that each bucket may have a different bucket investment mix, and thereby a different continuous return and a different continuous standard deviation. Likewise, the reserve profile may have a reserve investment mix that is different from the bucket investment mix of any bucket, and thereby have a different continuous return and a different continuous standard deviation.

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FIG. 8 lists equations employed in various embodiments of the invention. **FIG. 8** includes *Equation-2A*, *Equation-2B*, and *Equation-2C* for the standard deviation of TAV, lower bound return, and median return. As discussed in more detail below, these equations are employed

5 twice in the invention: (i) first in relation to a calculation for each bucket of a lower bound return and a median return; and (ii) second in relation to a calculation for the reserve supplement for each bucket. Note that each bucket will have a different duration, and thereby a different lower bound return and a different median return, even if they have the same bucket investment mix. The reserve profile may have a reserve investment mix that is

10 different from the bucket investment mix of any bucket, and thereby have a different continuous return and a different continuous standard deviation (which could lead to a different lower bound return between the reserve supplement and the bucket associated with the reserve supplement).

15 **FIG. 9** lists equations employed in various embodiments of the invention. **FIG. 9** includes *Equation-3A* and *Equation-3B* for the lower bound portfolio value and the median portfolio value (as of the bucket start date) of each bucket. Values between calculation for each bucket will most likely differ because each bucket has a different duration, most likely a different bucket present value, and possibly a different bucket investment mix.

20 **FIG. 10** lists equations employed in various embodiments of the invention. **FIG. 10** includes *Equation-4* and *Equation-5* for the future bucket shortfall and the present value of the future bucket shortfall, respectively. *Equation-4* is a simple subtraction. *Equation-5* is a present value calculation that considers lower bound return, duration, and future bucket shortfall. The

25 lower bound return is that of the reserve profile. The present value calculated is the present value reserve of the reserve supplement associated with the bucket.

FIG. 11 is a chart **11-00** detailing example bucket and reserve supplement calculations in an embodiment of the invention. Calculation results for *bucket-1* to *bucket-6* are listed in the chart **11-00**. In this example, like **FIG. 6**, *bucket-2* and *bucket-3* have reserve supplements. Note that the future bucket shortfall in the chart **11-00** is a larger number than its present value (the present value reserve) because the future bucket shortfall is calculated as of the bucket start date (after years of compounded returns). The sum of each present value return is the reserve total (e.g., the total amount of funds required to fund the reserve as of the target inception date). The total funding is the sum of each bucket and the reserve total as of the target inception date.

FIG. 12 is a graph **12-00** depicting example bucket and reserve supplement values over the duration of a wealth management client's retirement in an embodiment of the invention. As illustrated on the graph **12-00**, each bucket is drawn down during its time window starting from the bucket start date of the bucket to fund living expenses of the wealth management client. Other than *bucket-1* which is cash, the bucket present value (e.g., the initial funding of the bucket as of the target inception date) grows due to compounding interest over the years before it is drawn down. The last bucket, *bucket-6*, grows to the largest value because it remains untouched for 25 years before being drawn down. The reserve grows over time from its initial reserve total funding at the target inception date with compounding returns over time. The graph line for *bucket-6* has an uptick at around age 62 due to the vesting of a client's asset. If the reserve were to be drawn down, the graph line for the reserve would show a downward slope after initial growth, similar to graph lines for *bucket-2* to *bucket-5*.

A general embodiment of the invention is a platform **11** for and a method **20** of wealth management employing the use of buckets augmented by reserve supplements. The invention first identifies which buckets are most susceptible to future bucket shortfalls and then second calculates the reserve supplements necessary to compensate for the future bucket shortfalls of each of the buckets most susceptible to future bucket shortfalls. The invention takes into account the historical returns of the buckets, the duration of the buckets, median returns, lower bound returns, and confidence level.

A platform embodiment of the invention is a wealth management platform **11** for receiving and processing a plurality of guidance requests **21**, the platform **11** comprising: (a) a web

server **11A** in data communication with a network **12C**; (b) a guidance request database **11B** in data communication with the web server **11A**, the guidance request database **11B** configured to store each guidance request **21** in one of a plurality of request records of the guidance request database **11B**; (c) a bucket module **11C** configured to construct a plurality of buckets for each guidance request; (d) a shortfall module **11D**; (e) a reserve module **11E**; and (f) an output module **11F**. The web server **11A** is configured to provide a wealth management portal **12A** to receive the guidance requests **21**. Each guidance request **21** is associated with one of a plurality of wealth management clients. Each guidance request **21** includes: (1) biographical information **21A** and financial data **21B** from the wealth management client associated with the guidance request **21**; and (2) a target inception date. Each bucket is defined by bucket portfolio data including: (1) a bucket investment mix; (2) a bucket present value, calculated as of the target inception date; (3) a bucket volatility index; and (4) a bucket start date. The plurality of buckets for each guidance request **21** includes at least three buckets and the bucket start date of a first bucket is the target inception date.

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The shortfall module **11D** of the platform embodiment of the invention is configured to, for each guidance request **21**, determine for each bucket of the guidance request **21** whether to fund a reserve supplement for the bucket. The reserve supplement for the bucket is funded if both: (1) the bucket volatility index of the bucket is above a pre-determined volatility threshold; and (2) the bucket start date of the bucket is less than a pre-determined time duration from the target inception date. The shortfall module **11D** of the first embodiment of the invention is also configured to, for each guidance request **21**, store or link to: (1) a confidence level (ZScore) for the guidance request **21**; and (2) historic return data for the bucket investment mix associated with each bucket. The shortfall module **11D** of the first embodiment of the invention is also configured to, for each reserve supplement funded in each guidance request **21**, calculate for the bucket associated with the reserve supplement: (1) a continuous return of the bucket and a continuous standard deviation of the bucket based on the historic return data of the bucket investment mix of the bucket; (2) a lower bound return of the bucket calculated based on the continuous return of the bucket, the continuous standard deviation of the bucket, the confidence level (ZScore) for the guidance request **21**, and a duration of the bucket, wherein the duration of the bucket is measured between the target inception date and the bucket start date of the bucket; (3) a lower bound portfolio value of the

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bucket as of the bucket start date of the bucket based on the lower bound return of the bucket, the bucket present value of the bucket at the target inception date, and the duration of the bucket; (4) a median return of the bucket calculated based on the continuous return of the bucket and the duration of the bucket; (5) a median portfolio value of the bucket as of the bucket start date of the bucket based on the median return of the bucket, the bucket present value of the bucket at the target inception date, and the duration of the bucket; and (6) a future bucket shortfall of the bucket as of the bucket start date of the bucket. The future bucket shortfall of the bucket is equal to: (a) the median portfolio value of the bucket as of the bucket start date of the bucket; minus (b) the lower bound portfolio value of the bucket as of the bucket start date of the bucket.

The reserve module **11E** of the platform embodiment of the invention is configured to, for each guidance request **21**, select a reserve profile for the one or more reserve supplements funded, the reserve profile defined by reserve portfolio data with a reserve investment mix.

The reserve module **11E** is configured to, for the reserve profile, calculate a continuous return of the reserve profile and a continuous standard deviation of the reserve profile based on the reserve portfolio data of the reserve profile. The reserve module **11E** is also configured, for each reserve supplement funded, calculate: (1) a lower bound return of the reserve supplement based on the continuous return of the reserve profile, the continuous standard deviation of the reserve profile, the confidence level (ZScore) for the guidance request **21**, and the duration of the bucket associated with the reserve supplement; and (2) a present value reserve for the reserve supplement. The present value reserve of the reserve supplement is a present value of the future bucket shortfall of the bucket associated with the reserve supplement. Each present value is calculated as of the target inception date using the lower bound return of the reserve supplement. The reserve module **11E** is configured to, for each guidance request **21**, calculate a reserve total, the reserve total equal to a summation of all of the one or more present value reserves for the guidance request **21**.

The output module **11F** of the platform embodiment of the invention is configured to, for each guidance request **21**, output a guidance report including: (i) a bucket summary; and (ii) a reserve summary including at least the reserve total.

In a first alternative embodiment of the platform embodiment, the bucket portfolio data of each bucket further includes: (i) annual planning returns for the bucket; and (ii) annual standard deviation for the bucket. In this first alternative embodiment of the platform embodiment of the invention, the continuous return of each bucket and the continuous standard deviation of each bucket are calculated according to:

Continuous Return

$$= \text{Ln}(1 + \text{Annual Planning Returns: Arithmetic}) - \frac{\text{Continuous Standard Deviation}^2}{2}$$

(Equation-1A); and

Continuous Standard Deviation

$$= \text{Ln}(1 + \frac{\text{Annual Standard Deviation}^2}{(1 + \text{Annual Planning Returns: Arithmetic})^2})$$

(Equation-1B).

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The second alternative embodiment of the platform embodiment, in addition to the elements of the first alternative embodiment of the platform embodiment, is further defined such that: (a) the bucket portfolio data of each bucket further includes TAV for the bucket investment mix of the bucket; and (b) the lower bound return of each bucket and the median return of each bucket are calculated, for the duration of the bucket, according to:

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$$\sigma_{\text{TAV}} = \frac{\text{Continuous Standard Deviation}}{\sqrt{\text{Duration}}}$$

(Equation-2A);

$$\text{Lower Bound Return} = \sqrt[\text{Duration}]{e^{(\text{Continuous Return} - \text{ZScore} \times \sigma_{\text{TAV}}) \times \text{Duration}}} - 1$$

(Equation-2B); and

$$\text{Median Return} = \sqrt[\text{Duration}]{e^{(\text{Continuous Return} \times \text{Duration})}} - 1$$

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(Equation-2C).

The third alternative embodiment of the platform embodiment, in addition to the elements of the first alternative embodiment and second alternative embodiment of the platform embodiment, is further defined such that the lower bound portfolio value at the bucket start date of each bucket and the median portfolio value at the bucket start date of each bucket are calculated, for the duration of the bucket, according to:

$$\begin{aligned} & \text{Lower Bound Portfolio Value at Bucket Start Date} \\ &= \text{Portfolio Value at Target Inception Date} \\ & \times (1 + \text{Lower Bound Return})^{\text{Duration}} \end{aligned} \quad (\text{Equation-3A}); \text{ and}$$

$$\begin{aligned} & \text{Median Portfolio Value at Bucket Start Date} \\ &= \text{Portfolio Value at Target Inception Date} \\ & \times (1 + \text{Median Return})^{\text{Duration}} \end{aligned} \quad (\text{Equation-3B}).$$

- 10 In a fourth alternative embodiment of the platform embodiment, the reserve portfolio data of the reserve profile further includes annual planning returns for the reserve profile and annual standard deviation for the reserve profile. Also, in the fourth alternative embodiment of the platform embodiment, the continuous return of the reserve profile and the continuous standard deviation the reserve profile are calculated according to:

$$\begin{aligned} & \text{Continuous Return} \\ &= \text{Ln}(1 + \text{Annual Planning Returns: Arithmetic}) \\ & - \frac{\text{Continuous Standard Deviation}^2}{2} \end{aligned} \quad (\text{Equation-1A}); \text{ and}$$

$$\begin{aligned} & \text{Continuous Standard Deviation} \\ &= \text{Ln}(1 + \frac{\text{Annual Standard Deviation}^2}{(1 + \text{Annual Planning Returns: Arithmetic})^2}) \end{aligned} \quad (\text{Equation-1B}).$$

In a fifth alternative embodiment of the platform embodiment of the invention, in addition to the elements of the fourth alternative embodiment of the platform embodiment: (a) the reserve portfolio data of the reserve profile further includes TAV of the reserve investment mix of the reserve profile; and (b) wherein the lower bound return of each reserve supplement
 5 funded is calculated, for the duration of the bucket associated with the reserve supplement, according to:

$$\sigma\text{TAV} = \frac{\text{Continuous Standard Deviation}}{\sqrt{\text{Duration}}}$$

(Equation-2A); and

$$\text{Lower Bound Return} = \text{Duration} \sqrt{e^{(\text{Continuous Return} - \text{ZScore} \times \sigma\text{TAV}) \times \text{Duration}} - 1}$$

10

(Equation-2B).

In a sixth alternative embodiment of the platform embodiment of the invention, in addition to the elements of the fourth and fifth alternative embodiments of the platform embodiment for each reserve supplement funded and the duration of the bucket associated with the reserve supplement, the present value of the future bucket shortfall of the bucket associated with the
 15 reserve supplement is calculated according to:

$$\begin{aligned} &\text{Present Value of Future Bucket Shortfall} \\ &= \text{PV}(\text{Lower Bound Return, Duration, Future Bucket Shortfall}) \end{aligned}$$

(Equation-5).

A method embodiment of the invention is a computer-implemented wealth management
 20 method **20** for receiving and processing a plurality of guidance requests **21**. The method comprises: (a) maintaining a web server **11A** in data communication with a network **12C**; (b) storing each guidance request in one of a plurality of request records of a guidance request database **11B**, wherein the guidance request database **11B** is in data communication with the web server **11A**; (c) for each guidance request **21**, constructing a plurality of buckets; (d) for
 25 each guidance request **21**, determining for each bucket of the guidance request **21** whether to fund a reserve supplement for the bucket; (e) for each guidance request **21**, storing or linking to a confidence level (ZScore) for the guidance request **21** and historic return data for the bucket investment mix associated with each bucket; (f) for each reserve supplement funded in each guidance request **21**, making calculations for the bucket associated with the reserve

supplement; (g) for each guidance request **21**, selecting a reserve profile for the one or more reserve supplements funded, the reserve profile defined by reserve portfolio data with a reserve investment mix; (h) for the reserve profile of each guidance request **21**, calculating a continuous return of the reserve profile and a continuous standard deviation of the reserve profile based on the reserve portfolio data of the reserve profile; (i) for each reserve supplement funded in each guidance request **21**, making calculations for the reserve supplement; (j) for each guidance request **21**, calculating a reserve total, the reserve total equal to a summation of all of the one or more present value reserves for the guidance request **21**; and (k) for each guidance request **21**, outputting a guidance report including a bucket summary and a reserve summary including at least the total reserve total. The web server **11A** is configured to provide a wealth management portal **12A** to receive the guidance requests **21**. Each guidance request **21** is associated with one of a plurality of wealth management clients. Each guidance request includes: (1) biographical information **21A** and financial data **21B** from the wealth management client associated with the guidance request **21**; and (2) a target inception date. Each bucket is defined by bucket portfolio data including: (1) a bucket investment mix; (2) a bucket present value, calculated as of the target inception date; (3) a bucket volatility index; and (4) a bucket start date. The plurality of buckets for each guidance request **21** includes at least three buckets and the bucket start date of a first bucket is the target inception date. For each bucket, the reserve supplement for the bucket is funded if both: (i) the bucket volatility index of the bucket is above a pre-determined volatility threshold; and (ii) the bucket start date of the bucket is less than a pre-determined time duration from the target inception date.

In the method embodiment of the invention, for each reserve supplement funded in each guidance request **21**, the step of making calculations for the bucket associated with the reserve supplement includes calculating: (i) a continuous return of the bucket and a continuous standard deviation of the bucket based on the historic return data of the bucket investment mix of the bucket; (ii) a lower bound return of the bucket calculated based on the continuous return of the bucket, the continuous standard deviation of the bucket, the confidence level (ZScore) for the guidance request **21**, and a duration of the bucket, wherein the duration of the bucket is measured between the target inception date and the bucket start date of the bucket; (iii) a lower bound portfolio value of the bucket as of the bucket start date of the bucket based on the lower bound return of the bucket, the bucket present value of the

- bucket at the target inception date, and the duration of the bucket; (iv) a median return of the bucket calculated based on the continuous return of the bucket and the duration of the bucket; (v) a median portfolio value of the bucket as of the bucket start date of the bucket based on the median return of the bucket, the bucket present value of the bucket at the target inception date, and the duration of the bucket; and (vi) a future bucket shortfall of the bucket as of the bucket start date of the bucket. The future bucket shortfall of the bucket is equal to: (a) the median portfolio value of the bucket as of the bucket start date of the bucket; minus (b) the lower bound portfolio value of the bucket as of the bucket start date of the bucket.
- 10 In the method embodiment of the invention, for each reserve supplement funded in each guidance request **21**, the step of making calculations for the reserve supplement includes calculating: (i) a lower bound return of the reserve supplement based on the continuous return of the reserve profile, the continuous standard deviation of the reserve profile, the confidence level (ZScore) for the guidance request **21**, and the duration of the bucket associated with the reserve supplement; and (ii) a present value reserve for the reserve supplement. The present value reserve of the reserve supplement is a present value of the future bucket shortfall of the bucket associated with the reserve supplement. Each present value is calculated as of the target inception date using the lower bound return of the reserve supplement
- 15
- 20 In a first alternative embodiment of the method embodiment, the bucket portfolio data of each bucket further includes: (i) annual planning returns for the bucket; and (ii) annual standard deviation for the bucket. In this first alternative embodiment of the platform embodiment of the invention, the continuous return of each bucket and the continuous standard deviation of each bucket are calculated according to:

Continuous Return

$$= \text{Ln}(1 + \text{Annual Planning Returns: Arithmetic}) - \frac{\text{Continuous Standard Deviation}^2}{2}$$

25

(Equation-1A); and

Continuous Standard Deviation

$$= \text{Ln}(1 + \frac{\text{Annual Standard Deviation}^2}{(1 + \text{Annual Planning Returns: Arithmetic})^2})$$

(Equation-1B).

The second alternative embodiment of the method embodiment, in addition to the elements of the first alternative embodiment of the platform embodiment, is further defined such that: (a) the bucket portfolio data of each bucket further includes TAV for the bucket investment mix of the bucket; and (b) the lower bound return of each bucket and the median return of each bucket are calculated, for the duration of the bucket, according to:

$$\sigma_{TAV} = \frac{\text{Continuous Standard Deviation}}{\sqrt{\text{Duration}}}$$

(Equation-2A);

$$\text{Lower Bound Return} = \frac{\text{Duration} \sqrt{e^{(\text{Continuous Return} - Z\text{Score} \times \sigma_{TAV}) \times \text{Duration}}}}{1}$$

10 (Equation-2B); and

$$\text{Median Return} = \frac{\text{Duration} \sqrt{e^{(\text{Continuous Return} \times \text{Duration})}}}{1}$$

(Equation-2C).

The third alternative embodiment of the method embodiment, in addition to the elements of the first alternative embodiment and second alternative embodiment of the platform embodiment, is further defined such that the lower bound portfolio value at the bucket start date of each bucket and the median portfolio value at the bucket start date of each bucket are calculated, for the duration of the bucket, according to:

$$\begin{aligned} &\text{Lower Bound Portfolio Value at Bucket Start Date} \\ &= \text{Portfolio Value at Target Inception Date} \\ &\times (1 + \text{Lower Bound Return})^{\text{Duration}} \end{aligned} \quad (\text{Equation-3A}); \text{ and}$$

$$\begin{aligned} &\text{Median Portfolio Value at Bucket Start Date} \\ &= \text{Portfolio Value at Target Inception Date} \\ &\times (1 + \text{Median Return})^{\text{Duration}} \end{aligned} \quad (\text{Equation-3B}).$$

In a fourth alternative embodiment of the method embodiment, the reserve portfolio data of the reserve profile further includes annual planning returns for the reserve profile and annual standard deviation for the reserve profile. Also, in the fourth alternative embodiment of the platform embodiment, the continuous return of the reserve profile and the continuous standard deviation the reserve profile are calculated according to:

Continuous Return

$$= \text{Ln}(1 + \text{Annual Planning Returns: Arithmetic}) - \frac{\text{Continuous Standard Deviation}^2}{2}$$

(Equation-1A); and

Continuous Standard Deviation

$$= \text{Ln}(1 + \frac{\text{Annual Standard Deviation}^2}{(1 + \text{Annual Planning Returns: Arithmetic})^2})$$

(Equation-1B).

In a fifth alternative embodiment of the method embodiment of the invention, in addition to the elements of the fourth alternative embodiment of the platform embodiment: (a) the reserve portfolio data of the reserve profile further includes TAV of the reserve investment mix of the reserve profile; and (b) wherein the lower bound return of each reserve supplement funded is calculated, for the duration of the bucket associated with the reserve supplement, according to:

$$\sigma\text{TAV} = \frac{\text{Continuous Standard Deviation}}{\sqrt{\text{Duration}}}$$

(Equation-2A); and

$$\text{Lower Bound Return} = \text{Duration} \sqrt{e^{(\text{Continuous Return} - \text{ZScore} \times \sigma\text{TAV}) \times \text{Duration}}} - 1$$

(Equation-2B).

In a sixth alternative embodiment of the method embodiment of the invention, in addition to the elements of the fourth and fifth alternative embodiments of the platform embodiment, for each reserve supplement funded and the duration of the bucket associated with the reserve supplement, the present value of the future bucket shortfall of the bucket associated with the
5 reserve supplement is calculated according to:

$$\begin{aligned} &\text{Present Value of Future Bucket Shortfall} \\ &= \text{PV}(\text{Lower Bound Return, Duration, Future Bucket Shortfall}) \end{aligned}$$

(Equation-5).

While various aspects and embodiments have been disclosed herein, it will be apparent that
10 various other modifications and adaptations of the invention will be apparent to the person skilled in the art after reading the foregoing disclosure without departing from the spirit and scope of the invention and it is intended that all such modifications and adaptations come within the scope of the appended claims. The various aspects and embodiments disclosed herein are for purposes of illustration and are not intended to be limiting, with the true scope
15 and spirit of the invention being indicated by the appended claims.

CLAIMS

5

1. A wealth management platform for receiving and processing a plurality of guidance requests, the platform comprising:

(a) a web server in data communication with a network,

10 (i) wherein the web server is configured to provide a wealth management portal to receive the guidance requests;

(ii) wherein each guidance request is associated with one of a plurality of wealth management clients; and

(iii) wherein each guidance request includes:

15 (1) biographical information and financial data from the wealth management client associated with the guidance request; and

(2) a target inception date;

(b) a guidance request database in data communication with the web server, the guidance request database configured to store each guidance request in one of a plurality of request records of the guidance request database;

20 (c) a bucket module configured to construct a plurality of buckets for each guidance request,

(i) wherein each bucket is defined by bucket portfolio data including:

(1) a bucket investment mix;

(2) a bucket present value, calculated as of the target inception date;

25 (3) a bucket volatility index; and

(4) a bucket start date; and

(ii) wherein the plurality of buckets for each guidance request includes at least three buckets and the bucket start date of a first bucket is the target inception date;

- (d) a shortfall module configured to, for each guidance request:
- (i) determine for each bucket of the guidance request whether to fund a reserve supplement for the bucket, wherein the reserve supplement for the bucket is funded if both:
 - 5 (1) the bucket volatility index of the bucket is above a pre-determined volatility threshold; and
 - (2) the bucket start date of the bucket is less than a pre-determined time duration from the target inception date;
 - (ii) store or link to:
 - 10 (1) a confidence level (ZScore) for the guidance request; and
 - (2) historic return data for the bucket investment mix associated with each bucket; and
 - (iii) for each reserve supplement funded, calculate for the bucket associated with the reserve supplement:
 - 15 (1) a continuous return of the bucket and a continuous standard deviation of the bucket based on the historic return data of the bucket investment mix of the bucket;
 - (2) a lower bound return of the bucket calculated based on the continuous return of the bucket, the continuous standard deviation of the bucket, the
 - 20 confidence level (ZScore) for the guidance request, and a duration of the bucket, wherein the duration of the bucket is measured between the target inception date and the bucket start date of the bucket;
 - (3) a lower bound portfolio value of the bucket as of the bucket start date of the bucket based on the lower bound return of the bucket, the bucket present
 - 25 value of the bucket at the target inception date, and the duration of the bucket;
 - (4) a median return of the bucket calculated based on the continuous return of the bucket and the duration of the bucket;
 - (5) a median portfolio value of the bucket as of the bucket start date of the
 - 30 bucket based on the median return of the bucket, the bucket present value of the bucket at the target inception date, and the duration of the bucket; and

- (6) a future bucket shortfall of the bucket as of the bucket start date of the bucket, wherein the future bucket shortfall of the bucket is equal to:
- (a) the median portfolio value of the bucket as of the bucket start date of the bucket; minus
 - 5 (b) the lower bound portfolio value of the bucket as of the bucket start date of the bucket;
- (e) a reserve module configured to, for each guidance request:
- (i) select a reserve profile for the one or more reserve supplements funded, the reserve profile defined by reserve portfolio data with a reserve investment mix;
 - 10 (ii) for the reserve profile, calculate a continuous return of the reserve profile and a continuous standard deviation of the reserve profile based on the reserve portfolio data of the reserve profile;
 - (iii) for each reserve supplement funded, calculate:
 - (1) a lower bound return of the reserve supplement based on the continuous
 - 15 return of the reserve profile, the continuous standard deviation of the reserve profile, the confidence level (ZScore) for the guidance request, and the duration of the bucket associated with the reserve supplement; and
 - (2) a present value reserve for the reserve supplement,
 - (a) wherein the present value reserve of the reserve supplement is a
 - 20 present value of the future bucket shortfall of the bucket associated with the reserve supplement; and
 - (b) wherein each present value is calculated as of the target inception date using the lower bound return of the reserve supplement; and
 - (iv) calculate a reserve total, the reserve total equal to a summation of all of the one or
 - 25 more present value reserves for the guidance request; and
- (f) an output module configured to, for each guidance request, output a guidance report including:
- (i) a bucket summary; and
 - (ii) a reserve summary including at least the reserve total.
 - 30

2. The platform of claim 1,
- (a) wherein the bucket portfolio data of each bucket includes:
- (i) annual planning returns for the bucket; and
- (ii) annual standard deviation for the bucket; and
- 5 (b) wherein the continuous return of each bucket and the continuous standard deviation of each bucket are calculated according to:

Continuous Return

$$= \text{Ln}(1 + \frac{\text{Annual Planning Returns: Arithmetic} - \frac{\text{Continuous Standard Deviation}^2}{2}}{2})$$

(Equation-1A); and

Continuous Standard Deviation

$$= \text{Ln}(1 + \frac{\text{Annual Standard Deviation}^2}{(1 + \text{Annual Planning Returns: Arithmetic})^2})$$

10

(Equation-1B).

3. The platform of claim 2,
- (a) wherein the bucket portfolio data of each bucket further includes TAV for the bucket
- 15 investment mix of the bucket; and
- (b) wherein the lower bound return of each bucket and the median return of each bucket are calculated, for the duration of the bucket, according to:

$$\sigma_{\text{TAV}} = \frac{\text{Continuous Standard Deviation}}{\sqrt{\text{Duration}}}$$

(Equation-2A);

$$\text{Lower Bound Return} = \frac{\text{Duration}}{\sqrt{e^{(\text{Continuous Return} - \text{ZScore} \times \sigma_{\text{TAV}}) \times \text{Duration}}}} - 1$$

20

(Equation-2B); and

$$\text{Median Return} = \frac{\text{Duration}}{\sqrt{e^{(\text{Continuous Return} \times \text{Duration})}}} - 1$$

(Equation-2C).

4. The platform of claim 3, wherein the lower bound portfolio value at the bucket start date of each bucket and the median portfolio value at the bucket start date of each bucket are calculated, for the duration of the bucket, according to:

5

$$\begin{aligned} & \text{Lower Bound Portfolio Value at Bucket Start Date} \\ &= \text{Portfolio Value at Target Inception Date} \\ &\times (1 + \text{Lower Bound Return})^{\text{Duration}} \end{aligned} \quad (\text{Equation-3A}); \text{ and}$$

$$\begin{aligned} & \text{Median Portfolio Value at Bucket Start Date} \\ &= \text{Portfolio Value at Target Inception Date} \\ &\times (1 + \text{Median Return})^{\text{Duration}} \end{aligned} \quad (\text{Equation-3B}).$$

- 10 5. The platform of claim 1,
- (a) wherein the reserve portfolio data of the reserve profile includes:
- (i) annual planning returns for the reserve profile; and
- (ii) annual standard deviation for the reserve profile; and
- (b) wherein the continuous return of the reserve profile and the continuous standard deviation the reserve profile are calculated according to:
- 15

$$\begin{aligned} & \text{Continuous Return} \\ &= \text{Ln}(1 + \text{Annual Planning Returns: Arithmetic}) \\ &\quad - \frac{\text{Continuous Standard Deviation}^2}{2} \end{aligned} \quad (\text{Equation-1A}); \text{ and}$$

$$\begin{aligned} & \text{Continuous Standard Deviation} \\ &= \text{Ln}\left(1 + \frac{\text{Annual Standard Deviation}^2}{(1 + \text{Annual Planning Returns: Arithmetic})^2}\right) \end{aligned} \quad (\text{Equation-1B}).$$

20

6. The platform of claim 5,
- (a) wherein the reserve portfolio data of the reserve profile further includes TAV of the reserve investment mix of the reserve profile; and
- (b) wherein the lower bound return of each reserve supplement funded is calculated, for the duration of the bucket associated with the reserve supplement, according to:

$$\sigma_{TAV} = \frac{\text{Continuous Standard Deviation}}{\sqrt{\text{Duration}}}$$

(Equation-2A); and

$$\text{Lower Bound Return} = \text{Duration} \sqrt{e^{(\text{Continuous Return} - \text{ZScore} \times \sigma_{TAV}) \times \text{Duration}} - 1}$$

(Equation-2B).

10

7. The platform of claim 6, wherein, for each reserve supplement funded and the duration of the bucket associated with the reserve supplement, the present value of the future bucket shortfall of the bucket associated with the reserve supplement is calculated according to:

$$\begin{aligned} \text{Present Value of Future Bucket Shortfall} \\ = \text{PV}(\text{Lower Bound Return, Duration, Future Bucket Shortfall}) \end{aligned}$$

15

(Equation-5).

8. A computer-implemented wealth management method for receiving and processing a plurality of guidance requests, the method comprising:
- (a) maintaining a web server in data communication with a network,
 - (i) wherein the web server is configured to provide a wealth management portal to receive the guidance requests;
 - (ii) wherein each guidance request is associated with one of a plurality of wealth management clients; and
 - (iii) wherein each guidance request includes:
 - (1) biographical information and financial data from the wealth management client associated with the guidance request; and
 - (2) a target inception date;
 - (b) storing each guidance request in one of a plurality of request records of a guidance request database, wherein the guidance request database is in data communication with the web server;
 - (c) for each guidance request, constructing a plurality of buckets,
 - (i) wherein each bucket is defined by bucket portfolio data including:
 - (1) a bucket investment mix;
 - (2) a bucket present value, calculated as of the target inception date;
 - (3) a bucket volatility index; and
 - (4) a bucket start date; and
 - (ii) wherein the plurality of buckets for each guidance request includes at least three buckets and the bucket start date of a first bucket is the target inception date;
 - (d) for each guidance request, determining for each bucket of the guidance request whether to fund a reserve supplement for the bucket, wherein the reserve supplement for the bucket is funded if both:
 - (i) the bucket volatility index of the bucket is above a pre-determined volatility threshold; and
 - (ii) the bucket start date of the bucket is less than a pre-determined time duration from the target inception date;
 - (e) for each guidance request, storing or linking to:
 - (i) a confidence level (ZScore) for the guidance request; and
 - (ii) historic return data for the bucket investment mix associated with each bucket;

- (f) for each reserve supplement funded in each guidance request, calculating for the bucket associated with the reserve supplement:
- (i) a continuous return of the bucket and a continuous standard deviation of the bucket based on the historic return data of the bucket investment mix of the bucket;
 - (ii) a lower bound return of the bucket calculated based on the continuous return of the bucket, the continuous standard deviation of the bucket, the confidence level (ZScore) for the guidance request, and a duration of the bucket, wherein the duration of the bucket is measured between the target inception date and the bucket start date of the bucket;
 - (iii) a lower bound portfolio value of the bucket as of the bucket start date of the bucket based on the lower bound return of the bucket, the bucket present value of the bucket at the target inception date, and the duration of the bucket;
 - (iv) a median return of the bucket calculated based on the continuous return of the bucket and the duration of the bucket;
 - (v) a median portfolio value of the bucket as of the bucket start date of the bucket based on the median return of the bucket, the bucket present value of the bucket at the target inception date, and the duration of the bucket; and
 - (vi) a future bucket shortfall of the bucket as of the bucket start date of the bucket, wherein the future bucket shortfall of the bucket is equal to:
 - (1) the median portfolio value of the bucket as of the bucket start date of the bucket; minus
 - (2) the lower bound portfolio value of the bucket as of the bucket start date of the bucket;
- (g) for each guidance request, selecting a reserve profile for the one or more reserve supplements funded, the reserve profile defined by reserve portfolio data with a reserve investment mix;
- (h) for the reserve profile of each guidance request, calculating a continuous return of the reserve profile and a continuous standard deviation of the reserve profile based on the reserve portfolio data of the reserve profile;

- (i) for each reserve supplement funded in each guidance request, calculating:
 - (i) a lower bound return of the reserve supplement based on the continuous return of the reserve profile, the continuous standard deviation of the reserve profile, the confidence level (ZScore) for the guidance request, and the duration of the bucket associated with the reserve supplement; and
 - (ii) a present value reserve for the reserve supplement,
 - (1) wherein the present value reserve of each reserve supplement is a present value of the future bucket shortfall of the bucket associated with the reserve supplement; and
 - (2) wherein each present value is calculated as of the target inception date using the lower bound return of the reserve supplement; and
- (j) for each guidance request, calculating a reserve total, the reserve total equal to a summation of all of the one or more present value reserves for the guidance request; and
- (k) for each guidance request, outputting a guidance report including:
 - (i) a bucket summary; and
 - (ii) a reserve summary including at least the reserve total.

9. The method of claim 8,
- (a) wherein the bucket portfolio data of each bucket includes:
- (i) annual planning returns for the bucket; and
- (ii) annual standard deviation for the bucket; and
- 5 (b) wherein the continuous return of each bucket and the continuous standard deviation of each bucket are calculated according to:

Continuous Return

$$= \text{Ln}(1 + \text{Annual Planning Returns: Arithmetic}) - \frac{\text{Continuous Standard Deviation}^2}{2}$$

(Equation-1A); and

Continuous Standard Deviation

$$= \text{Ln}(1 + \frac{\text{Annual Standard Deviation}^2}{(1 + \text{Annual Planning Returns: Arithmetic})^2})$$

10

(Equation-1B).

10. The method of claim 9,
- (a) wherein the bucket portfolio data of each bucket further includes TAV of the bucket
- 15 investment mix of the bucket; and
- (b) wherein the lower bound return of each bucket and the median return of each bucket are calculated, for the duration of the bucket, according to:

$$\sigma_{\text{TAV}} = \frac{\text{Continuous Standard Deviation}}{\sqrt{\text{Duration}}}$$

(Equation-2A);

$$\text{Lower Bound Return} = \frac{\text{Duration}}{\sqrt{e^{(\text{Continuous Return} - \text{ZScore} \times \sigma_{\text{TAV}}) \times \text{Duration}}}} - 1$$

20

(Equation-2B); and

$$\text{Median Return} = \frac{\text{Duration}}{\sqrt{e^{(\text{Continuous Return} \times \text{Duration})}}} - 1$$

(Equation-2C).

11. The method of claim 10, wherein the lower bound portfolio value at the bucket start date of each bucket and the median portfolio value at the bucket start date of each bucket are calculated, for the duration of the bucket, according to:

5

$$\begin{aligned} & \text{Lower Bound Portfolio Value at Bucket Start Date} \\ &= \text{Portfolio Value at Target Inception Date} \\ & \times (1 + \text{Lower Bound Return})^{\text{Duration}} \end{aligned} \quad (\text{Equation-3A}); \text{ and}$$

$$\begin{aligned} & \text{Median Portfolio Value at Bucket Start Date} \\ &= \text{Portfolio Value at Target Inception Date} \\ & \times (1 + \text{Median Return})^{\text{Duration}} \end{aligned} \quad (\text{Equation-3B}).$$

- 10 12. The method of claim 8,
- (a) wherein the reserve portfolio data of the reserve profile includes:
- (i) annual planning returns for the reserve profile; and
- (ii) annual standard deviation for the reserve profile; and
- (b) wherein the continuous return of the reserve profile and the continuous standard deviation the reserve profile are calculated according to:
- 15

$$\begin{aligned} & \text{Continuous Return} \\ &= \text{Ln}(1 + \text{Annual Planning Returns: Arithmetic}) \\ & - \frac{\text{Continuous Standard Deviation}^2}{2} \end{aligned} \quad (\text{Equation-1A}); \text{ and}$$

$$\begin{aligned} & \text{Continuous Standard Deviation} \\ &= \text{Ln}\left(1 + \frac{\text{Annual Standard Deviation}^2}{(1 + \text{Annual Planning Returns: Arithmetic})^2}\right) \end{aligned} \quad (\text{Equation-1B}).$$

20

13. The method of claim 12,

(a) wherein the reserve portfolio data of the reserve profile further includes TAV of the reserve investment mix of the reserve profile; and

(b) wherein the lower bound return of each reserve supplement funded is calculated, for the duration of the bucket associated with the reserve supplement, according to:

$$\sigma_{TAV} = \frac{\text{Continuous Standard Deviation}}{\sqrt{\text{Duration}}}$$

(Equation-2A); and

$$\text{Lower Bound Return} = \text{Duration} \sqrt{e^{(\text{Continuous Return} - \text{ZScore} \times \sigma_{TAV}) \times \text{Duration}} - 1}$$

(Equation-2B).

10

14. The method of claim 13, wherein, for each reserve supplement funded and the duration of the bucket associated with the reserve supplement, the present value of the future bucket shortfall of the bucket associated with the reserve supplement is calculated according to:

$$\begin{aligned} \text{Present Value of Future Bucket Shortfall} \\ = \text{PV}(\text{Lower Bound Return, Duration, Future Bucket Shortfall}) \end{aligned}$$

15

(Equation-5).