Open Problems and Simple Money

November 2012

TABLE OF CONTENTS

I. OPEN PROBLEMS (SAMPLE)

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Hazard Rate Matrix for Credit Rating Transitions

- Bond credit ratings fundamental to bond risk analysis
- Rating “transition matrix” approach studied for past 20 years
- We introduced a “hazard rate matrix” alternative in 2012 with an intuitive differential equation.
- New discovery: the eigenvector of the penultimate eigenvalue of the matrix provides a “natural rating distribution”.
- Some aspects of the derivation are unresolved. For example, should complex eigenvalues be prohibited?

See http://www.maxwell-consulting.com/Finance-Articles.html

I. OPEN PROBLEMS (SAMPLE)

Bond Insurers

- Bond insurance began in the 1970s and grew tremendously
- Not well known or appreciated outside the financial world
- The Credit Crisis killed off about 95% of Bond Insurance
- Will Bond Insurance survive? Should it survive? It's a challenging "business model" question!
- The new idea in Bond Insurance is to create a "mutual" association. Will that work? Should it work?

See http://www.maxwell-consulting.com/Finance-Articles.html

I. OPEN PROBLEMS (SAMPLE)

Risk Neutrality

- Concept of "risk neutrality" is central to quantitative finance.
- In 2002 I published "The Lesser Meaning of Risk Neutrality" to note that many academics and experts were mis-using or misunderstanding "risk neutrality".
- Hence, results of these experts and academics were "wrong".
- Can argue this error is a root cause of model malfunctions.
- This analysis needs review and revival.

See http://www.maxwell-consulting.com/Finance-Articles.html

I. OPEN PROBLEMS (SAMPLE)

Investment Decision Theory

- In rational, quantitative terms, how does one decide to invest or not invest? Simple question but there is no overarching theory that is ACTUALLY APPLIED.
- Investment Committees use “experience”, “judgment”, “gut feel”, and overly simple rules – and these are the GOOD committees!
- MPT, Sharpe ratio, VAR, CVAR, economic capital, RAROC, EVA, SVA and other concepts are all attempts at rigor, but they are all incomplete in some way.
- Simpler examples of bank lending and credit ratings
- Is there a “right answer”? How large a role for psychology?

II. SIMPLE MONEY

II. SIMPLE MONEY

Money is Simple

- Build wealth now to give yourself freedom.
- It may take 20 years …. But it's easy – it's a choice.
- Just spend less than you earn and invest the difference.
- Does NOT require high income – any income level can work.

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Money is Simple

- Freedom means you need not work for a salary.

- Freedom means you can devote time (or money) to other people, businesses, or causes.

- Freedom means you are able to help family and others.

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Rich Habits and Moving Money

- Simple Rule: Keep Expenses < 90% of Income.
- Invest the >10% difference – wealth will build to 10x Income.
- Wealth is assets (savings), NOT current income!

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Rich Habits and Moving Money

- What goes wrong?
  - People <u>choose</u> to spend >90% of Income.
  - Or people don't invest correctly.

- Focus on Expenses – keep them within the limit.

- Do not borrow money for anything other than a house. Pay cash, write a check, use a debit card, or use a credit card that you pay in full every month for all expenses.

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Rich Habits and Moving Money

- Open a bank account (e.g., checking account) – this account holds cash to pay ~2 months of expenses. Deposit all income into this account. Choose a "safe bank".

- Open a brokerage account with a known, reputable firm (such as a major bank, Fidelity, Putnam, TD Ameritrade, Schwab, E*Trade, etc.). This account will hold investments such as stocks, bonds, and mutual funds.

- As the bank account grows beyond ~2 months of expenses, transfer excess cash to the brokerage account. Buy investments in the brokerage account and transfer cash – IF AND WHEN NEEDED – back to the bank account for large, unusual expenses such as house or car purchase, college tuition, etc.

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Risk Tolerance

- When investing, know your “risk tolerance”.
- Different people have different risk comfort levels. There is no “right” or “wrong” tolerance level.
- One purpose of saving and investing is to reduce stress and anxiety, do not add to anxiety with investments.

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Principles of Acceptable Investments

- Stay within your risk tolerance.
- Realize that you may "lose everything" in a risky investment.
- Know what you're buying.
- Choose only "liquid" investments.

Principles of Acceptable Investments

- Investments must have "daily prices" that you can find from a public source (eg, *Wall Street Journal*, financial websites).
- Never borrow money to make investments (ie, "no leverage").
- Diversify your investments.

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Efficient Markets

- Burton Malkiel, *A Random Walk Down Wall Street*
- Day-to-day price movements in efficient markets are random.
- Prices of efficient market investments at which you buy and sell are "fair". Cannot make this statement for investments in inefficient markets.
- Professionals cannot "beat the market" reliably – that's why there are "index funds" and dartboard contests.

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Stocks, Bonds, Mutual Funds

- Recommend investments limited to these sectors.
- "Stock" and "equity" have the same meaning.
- As a "stockholder" (also, "shareholder" or "equity investor"), you are an owner of the company. Your stock value goes up or down in the same manner as the company value. The company has no obligation to pay you anything. But management should act in the best interests of stockholders.

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Stocks, Bonds, Mutual Funds

- For efficient markets, one cannot "pick" the best stocks to buy in terms of which will gain the most.
- But the investor can choose low-risk vs high-risk stocks and should diversify.
- Advice: buy the stock of companies you respect or admire. Be a proud owner! As a shareholder, you will be a supporter of drug development, improved healthcare, new technology, life improvement, etc, if "your companies" have these missions.

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Stocks, Bonds, Mutual Funds

- Bonds may be issued by a company or governments at the national, state, and local levels.
- Buying a bond is equivalent to lending to the bond issuer. The issuer has an obligation to pay you interest and return your principal at "maturity".
- As a "bondholder" of a company, you are not an owner. Bonds have much lower risk than stocks.

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Stocks, Bonds, Mutual Funds

- Bonds of different issuers (“borrowers”) have different risk of repayment (also called “credit risk”).

- Credit “ratings” provide assessment of bond risk level.

- Even for a low credit rating, the risk of issuer “default” is fairly small (generally less than 10%).

- Nevertheless, it is advisable to buy highly rated gov’t bonds rather than corporate bonds.

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Stocks, Bonds, Mutual Funds

- Mutual funds are pools of stocks or bonds chosen and managed by a "fund advisor".
- Good for diversification and convenience.
- Choose mutual funds with low fees (consider "index funds"). Don't be fooled by "survival bias"!
- You have no control over what the fund buys – which is "good" or "bad" for different investors.

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Stocks, Bonds, Mutual Funds

- Unlike advice for buying individual bonds, it is reasonable to buy shares of mutual funds with either <u>corporate</u> bonds or government bonds.

- Different mutual funds have widely different risk levels (based on review of fund “style”). But most mutual funds have less risk than individual stocks.

- Caution: be aware of interest rate risk in bond mutual funds.

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Exotic, Unacceptable Investments

- Violation of prior “Principles of Acceptable Investments”
- Speculation (short-term buying and selling)
- Options, futures, short sales, IPOs, hedge funds, PE funds, Real Estate – none of these are “bad” activities, but they violate one or more of our “principles” (leverage, liquidity, price transparency, etc)
- Ponzi Schemes ….

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Summary

- It’s simple: Spend less than you earn and invest the difference.
- Remember that the goal is <u>freedom</u> and all the good that you can create with financial freedom.
- The plan is available to everybody. Choose to execute it!