Should People Invest in Complex Financial Products

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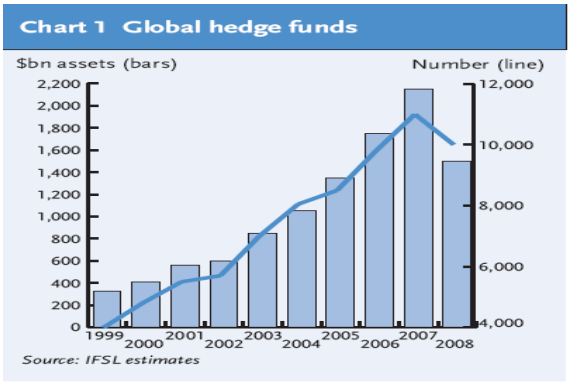
Abstract

In 2002, Warren Buffett in his letter to shareholders made a very profound statement – "Highly complex financial instruments are time bombs and 'financial weapons of mass destruction' that could harm not only their buyers and sellers, but the whole economic system". The total market for derivatives increased tremendously after 2002, from 100 trillion to 500 trillion US dollars. There was an unprecedented optimism about the complex financial products amongst banks, investor community and all other market participants. But the market least realized that Warren Buffett's words would be exactly replicated in the financial market – Mass destruction of the whole economic system.

Through this paper, I shall analyze the problems with highly complex instruments. Will these instruments suit all kinds of investors? If these instruments have the power to affect the world economy, then what education & awareness should the investor community possess and what are the regulations that need to be in place? The complexities involved in valuing these complex instruments have also been analyzed in this paper.

Investment in Complex Securities:

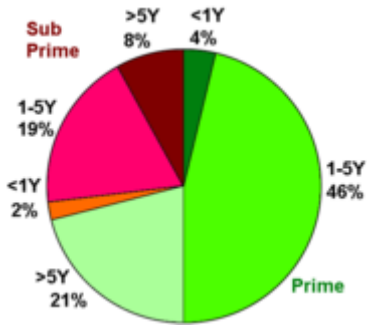


There was an unprecedented rise in the usage of complex instruments created by financial engineering. Even though initial growth of these instruments were driven by economic reasons (hedging the risk), these products were almost entirely used for speculative purposes by institutions as well as investors. The data given below provides the growth in each of these products. The volumes in these instruments (because of the leverage used) exceeded the GDP of lot of nations!

Global CDO Issuance Volume

Year	USD billion
2004	157.4
2005	271.8
2006	520.6
2007	481.6
2008	61.9

CDS issue by percentage



The data regarding CDS shows the composition of United States 15.5 trillion US dollar CDS market at the end of 2008 Q2.
Green tints show Prime asset CDSs
Red tints show sub-prime asset CDSs
Numbers followed by "Y" indicate years until maturity.

Risk Management Process – Failure Reasons

Risk Management Models:

Value at Risk (VAR) has been a sophisticated tool used to determine the risk inherent in a particular transaction/portfolio. Most of the banks, institutions made use of VAR as their primary tool for risk management. But VAR as a tool gives only the maximum loss associated with a particular confidence level. Banks had to maintain adequate capital to cover losses at the 99% VAR levels. VAR method will work as long as the losses are within a certain level of confidence say 99%. The models to predict volatility (which ultimately determines the Value at Risk) like EWMA, GARCH, Monte Carlo simulation, make use of the historical figures at least in some way. The problem with the highly complex instruments is that the exact level of risk cannot be predicted. VAR using historical figures gave totally wrong predictions because the products were relatively new and had not stood the test of time. The banks were completely taken back by complete deviation between liquidity risk that was evident during the crisis (there were absolutely no takers for the products) and the capital for liquidity risk allocated by them.

Stress Testing:

A Wall Street banker had apparently said "We are seeing things that were 25-standard deviation moves, several days in a row." To provide some context, assuming a normal distribution, a 7.26-sigma daily loss would be expected to occur once every 13.7 billion or so years. That is roughly the estimated age of the universe. To some extent we can attach some credibility to the above statement by saying that volatilities were extremely high in the market which would not have been expected by any means. But there have also been a lot of slip-ups in modeling the complex instruments. A lot of f actors triggered the failure of the stress testing. A few of them have been listed below

Disaster Myopia: Forgetting things that happened in the past and attaching less weight to them (e.g.: LTCM failure).

Misaligned Incentives: Risks were grossly understated because of the agency costs.

Network Externalities: Failing to recognize that any asset portfolio is, in essence, a financial network. So the balance sheet of a large financial institution is a network, with nodes defined by the assets and links defined by the correlations among those assets. The financial system is similarly a network, with nodes defined by the financial institutions and links defined by the financial interconnections between these institutions.

Some of the other reasons for failure are –

1. Many firms realized that their analysis had underestimated the effect of credit spread.
2. Many firms had difficulty convincing both senior management and business line managers to invest in the development of forward looking stress tests, particularly those that assumed large price movements.

Basel II Norms:

There were no explicit norms regarding the derivatives and other complex financial instruments. Large numbers of banks were taking positions in the complex instruments purely on a speculative basis. These positions should not have been allowed as these banks did not have the expertise to value/model the complex instruments. This meant that the internal models developed by the bank understated the risk.

Issues that need to be addressed by the Various Participants:

Underwriters/Structuring Agents:

In the markets there is tension in the sampling process between the desire for thorough review and the desire to respond quickly to an originating client's desire to come to market quickly. The sample size is sometimes a point of negotiation between the issuer and the underwriter with whom it is considering transacting. Investment Bank should ensure that the product developed has economic logic associated with it. They should not just be pushing the products to the clients to increase their top line.

Credit Rating Agencies:

Credit rating agencies should be funded by the government to a certain extent. Though there are some government authorized credit rating agencies in US (ECAI – External Credit Assessment Institution) they are not funded by the government. There should be a separate arm of the credit rating agency which rates the highly complex instruments, and this arm should be sufficiently funded by the government. This approach to a large extent will reduce the tension which exists in rating using the subscriber-pay model.

Regulators:

Stress on Qualitative Factors:

Traditionally risk management has been associated with quantifying the risk. But the qualitative factors have not been seriously considered. Regulators should stress more on the qualitative aspects of risk management. Such qualitative judgments may create "soft" risk management boundaries, but nonetheless are important in detecting the irrational and subjective elements in market behavior. One such approach, developed at Imperial College by Nicos Christofides, uses techniques from control engineering, including neural networks and dynamic programming to produce mathematically complex but highly intuitive results. This approach is visualized through a State Transition Graph (STG) — a path of possible future price movements with probabilities assigned to each outcome. An STG can be developed for any combination of traded assets and based on long periods of historical data, including several market dislocations. STGs produce probability distributions of future price moves, which, in contrast to standard models, do not assume continuous or "normally" distributed market movements.

Other factors to be considered are –

a) Only credit risk with proper economic logic should be retained. Investors should not allow investing in complex securities purely on speculative motives beyond a certain level.

b) There should be stringent capital requirements for investment in complex securities on speculator basis. Banks should not be seriously disncentivized for investing in complex securities with hedging motives.

c) Credit rating should not take an 'At the point' approach. They have to take a long term view of the market. Rating a company at a particular point amplifies the effect of the business cycle.

Standards of Sophistication:

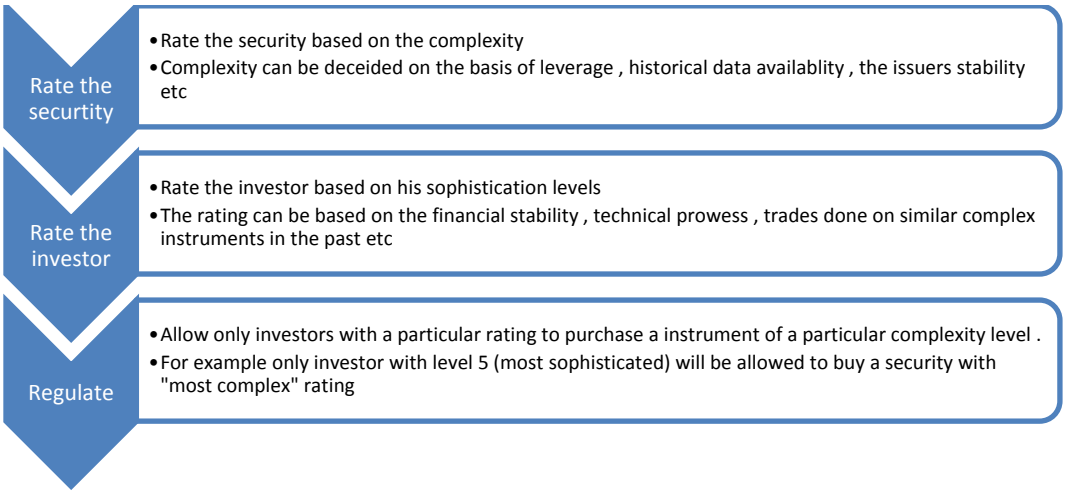
The high-risk complex financial instruments should be sold only to sophisticated investors. The investors in this market should have the following attributes –

1. Education and training in the nuances of these instruments,
2. Systems and models sufficient for tracking performance, managing risk, and running stress scenarios,
3. Strong governance procedures and internal controls,
4. Financial resources sufficient to withstand potential losses associated with high-risk complex financial instruments.

While these standards must apply to participants at every stage in the process, perhaps the most vital point of application is the investor. Investor should have the minimum level of sophistication to invest in such highly complex instruments. Section 144A of SEC which describes the qualified institutional investors addresses this issue to a certain extent. There has to be more clarity introduced in such regulations which define the sophistication of investors.

For this purpose there has to be a system wherein the securities are rated on complexity basis. For example, an instrument like CDO Squared (CDO on CDO) should be given a rating of "Most Complex" whereas an instrument which has reasonable history should be given a "Simple" rating. Now as we have rated the instruments based on its complexity, the investors should also be rated based on their sophistication levels from Level 1 to Level 5 (in the increasing order of sophistication). Investors will be rated based on their technical prowess, financial stability etc. A

regulation can be introduced such that only investors with a particular degree of sophistication can invest in an instrument of particular complexity level.



Issues to consider while investing in Complex Securities:

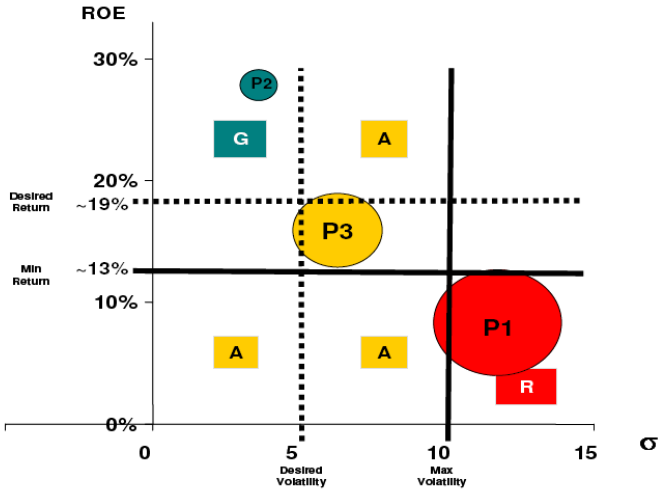
When an investor is planning to invest in a complex security he has to carefully asses the pros and cons of investing in the security. I have identified three key areas to be evaluated before an individual/organization invests in complex securities.

- Valuation Issues
- Behavioral Finance Perspective
- Shareholder Approval (In case of an individual, a go-ahead signal by family members)

1) Valuation Issues:

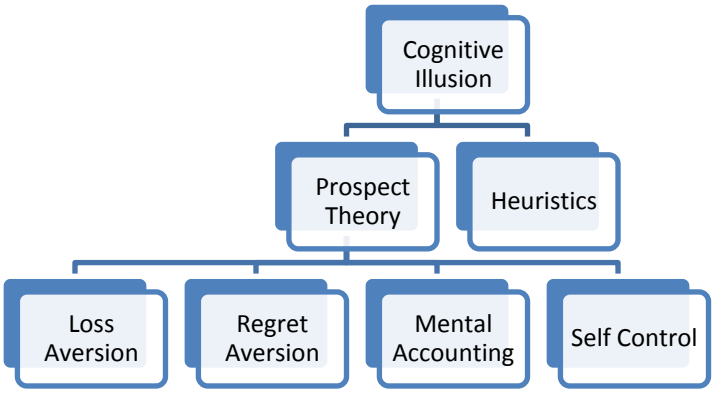
The recent financial crisis occurred primarily because of the lack of proper valuation standards for complex securities. The instruments were very new in the market and hence did not have any historical prices. Hence, even sophisticated participants were not aware of the various risks that could arise from the positions.

I would recommend that an investor should be very clear about the value of the financial instrument. They need to understand that the models used to value complex securities differ from traditional financial models and the principles upon which the models are based can be challenging concepts to understand. While more familiar valuation techniques can be effective under the right circumstances, at other times they may result in grossly inaccurate valuations. The consequences range from paying too much for a financial asset to reporting valuations that cannot be supported. An investor should identify the organizations which really possess the expertise in valuing these instruments and ask them to do the due diligence for them.



2) Behavioral Theory Perspective:

Decision making is a very complex activity. Decisions are not just made upon personal resources and the complex model that is possessed by an organization. Extreme situations can drive any individual crazy. Lot of decisions taken generally depends on the psychology of the individual. When Indian markets were going down people never believed in the strong fundamental of the demand driven Indian market story and went on selling stocks and brought down the market to 8000 levels. Hence we need to analyze the investment process from a behavioral finance perspective.



When an individual/organization invests in complex securities they need to think whether they will be able to overcome the problems as stated by the prospect theory.

Loss Aversion: The investor is a risk-seeker when faced with the prospect of losses, but is risk-averse when faced with the prospect of enjoying gains. Given the fact that complex instruments can create unforeseen risks, is the investor mentally strong enough to take the losses at an earlier stage and exit out of the investment?

Regret Aversion: It arises from the investors' desire to avoid pain/sense of regret arising from a poor investment decision. This aversion encourages investors to hold poorly performing shares as avoiding their sale also avoids the recognition of the associated loss and bad investment decision. Also organizations are scared to take losses out of their investments because it might badly affect their EPS which in turn will affect their stock price. Though 'mark to market' loss has been designed to force organization to report the investments at fair value, stressed times create liquidity problem and identification of fair value is also not possible.

Mental Accounting: Mental accounting is the set of cognitive operations used by the investors to organize, evaluate and keep track of investment activities. Three components of mental accounting receive the most attention. This first captures how outcomes are perceived and experienced, and how decisions are made and subsequently evaluated. A second component of mental accounting involves the assignment of activities to specific accounts. Both the sources and uses of funds are labeled in real as well as in mental accounting systems. The third component of mental accounting concerns the frequency with which accounts are evaluated and

'choice bracketing'. Investors need to understand their own mental accounting process before they invest in the complex instruments.

Self Control: Investors need to evaluate their self control before they invest in highly complex securities. They need to clearly understand the amount of risk borne by investing in a particular investment. They need to evaluate the future financial needs that might be arising and the ways of funding the financial needs. It's been empirically proved that lot of people buy when the market is at peak and sell the stocks when they are at the bottom. They need to clearly asses their self control while investing in such complex securities.

3) **Shareholder approval:**

An organization/individual who invest(s) in the complex securities should have a clear rational for doing so. Hence it needs to explain its shareholders the rationale behind investing in the securities, the expected returns from the investment and also need to clearly explain the risk associated with the investment. In the case of an individual he has to discuss the investment objective with his family members. There should be clarity in terms of the future financing needs (education of children, medical expense) and the ways in which they are going to be funded. Also they should realize that such investments (which have high returns and unknown volatility associated) cannot be guaranteed as a source for funding the future needs. An individual/manager can be tempted to be speculative in his decision, but getting an approval from the shareholders brings in a strong discipline factor into the decision making process.

Recommendations:

Area of Recommendation	Suggestion
Risk Management Process	There should be an *independent risk oversight committee* which should directly monitor the firm-wide risk and directly report to the CEO Value at Risk might not identify the complete risk. More rigorous models using *'extreme value' theories* have to be done. Risk governance/Reporting structure should be improved. Risk monitoring unit should directly *report to the CEO* of the company
Issues to consider before investing in complex securities	*Valuation Issues* – Be clear about the various risks associated and their interrelatedness and hence value the security appropriately *Behavioral Finance Issues* – Whether the individual will be able to take big losses (in case they occur). *Shareholder Approval* – Are the shareholders/family members aware of the risk involved and have given approval.
Regulation	Stress on the *Qualitative Factors* Credit risk should be supported by a proper economic logic (like Hedging). *Speculation should be restricted* beyond certain levels.

	Rate the investors by their *level of sophistication* and *rate the securities based on the degree of complexity*. Allow only investors with a particular sophistication level to invest in a security with particular complexity

I believe that investment mistakes are done because of lack of understanding of product, expectation of very high returns, lack of proper guidance etc. Hence the investors should follow a checklist before they invest big sum of money. The same is provided in Appendix 1.

Conclusion:

Through this paper I have analyzed various reasons for the risk management failure, the various measures that can be taken by the different participants in the financial market. I have also analyzed the problem with investing in complex securities from three different perspectives: Valuation issues, Behavioral finance perspective and the Shareholder approval perspective. Finally I have designed a checklist for investors with different motives before investing in complex securities.

Appendix 1

Checklist for Investors

For those who expect an enhanced return/Hedging purpose:

1. Are you sufficiently compensated for the risk that you take(Ask your financial consultant to show your risk adjusted returns estimation through Sharpe ratio, Information ratio etc.,
2. If the instrument has no history and the consultant is using a proxy(existing instrument) to show you the risk adjusted returns, then question him the characteristics of this instruments which are in parallel with the proxy.
3. Is your broker capable enough to dynamically hedge in case the pricing of securties move rapidly.
4. Check with your broker whether the new instruument has been sufficiently addressed by the regualatory bodies.

For investors who invest for the Thrill of Investing:

1. Do you understand that these instruments have no history of trading and hence your entire amount can vanish in a day.
2. Do you understand that these instruments work extensively on leverage , hence risk is amplified multifold times.

For investors who invest for comulsory future needs - like Childrens education, retirement needs:

1. Chose instruments that have historically given stable returns(consistently 'AAA' rated like Treasury bonds).
2. Keep a track of regulations of the investment houses (like pension funds) being allowed to invest in such regulations..Reduce your exposure to such investment houses if you don’t want volatile returns.
3. Are your family members aware of the risk that is being taken? Will they aprove if there is high volatility in the future income.

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