RUTTER ASSOCIATES LLC

Calculating Derivative Complexity

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Abstract

Participants in the markets for complex financial instruments must be vigilant in their due diligence and exercise caution when entering into trades with which they find themselves on terra incognita. To do otherwise leads to suboptimal decision-making and the acceptance of uncertainty that is not compensated by enhanced expected return. In order to help decision makers who are considering transacting complex derivatives, Rutter Associates has developed a complexity gauge that is available on our website free of charge.

Derivatives vary in complexity from fairly simple "plain vanilla" transactions to highly exotic structures. In order to make a sound decision about a potential derivative transaction, an end-user (whether hedger or speculator) needs to understand fully its risk/return profile at inception and throughout its life, and this can be particularly difficult for small to mid-sized corporate and retail market participants considering "complex" structures. Many of these market participants will want to seek out independent advice.

In fact, European financial markets will soon be subject to the Markets in Financial Instruments Directive (or "MiFid II") that requires dealers to conduct appropriateness testing for products classified as "complex" in order to determine suitability for an end-user. MiFid II has generated much discussion about the definition of "complex" in the context of financial derivatives, and much concern is expressed about the seemingly arbitrary nature of any cut-off between "simple" and "complex". Rutter Associates sees discussions about regulatory "cut-offs" as ultimately unimportant to end-users what is "complex" to one end-user may be relatively "simple" to another. But how might a particular end-user gauge "complexity"?

"Complexity" relates to the costs incurred in modeling effort and data acquisition required to perform an adequate analysis of ex-ante derivative risk/return profiles and valuation and risk management throughout the derivative's life. "Complexity" is not the same as "risk". The mere fact that a derivative is complex does not mean that it is inappropriately risky, but it does mean that far more resources must be expended to understand its risk/return profile and its effectiveness in a hedge application than would otherwise be expended on analyzing simpler structures. And to be sure, there are economies of scale in analyzing derivatives fixed costs fall with increasing volumes of trades being examined and variable costs fall as operational efficiency improves with volume. These analysis costs cannot be avoided by end-users without incurring potentially greater costs of heightened operational risk (i.e., failures of people and processes in risk management) and legal risk of costly litigation with uncertain outcomes. Therefore, it is advisable for an end-user to consider these analysis costs (those at inception and over the life of the trade) as part of the cost of transacting a complex derivative and to take these costs into account in deciding between a complex derivative and a simpler alternative.

The questions Rutter Associates advises potential derivative end-users (hedgers and speculators) to ask their dealers and/or independent advisors before transacting a derivative contract include the following:

1. If a hedge transaction, do the derivatives actually match closely the risk exposures we are trying to hedge?
    a Do they present a sufficient level of appropriately defined hedge effectiveness?
    b Are there scenarios where the derivative can create a net loss to the combined position although the underlying account would have registered a gain? If so, would these scenarios cause the end-user financial distress?
    c Are there scenarios where the derivative can reinforce a loss to the underlying account, i.e., where the combined position loses more than would have the unhedged underlying account? If so, would these scenarios cause the end-user financial distress?
2. Do the derivatives embed "knock out" barriers limiting upside potential?
3. Is downside potential limited or is there no effective practical limit to potential liability?
4. Are the derivatives "geared" (i.e., levered) in such a manner that a given change in the underlying generating a positive impact on the derivative price generates a much larger negative impact if the change in underlying is of opposite sign (for example in the case of an interest rate derivative, are potential gains and losses asymmetric such that the losses from a 100 basis point increase in rates are twice or three times the amount of the gains from a 100 basis point decrease?)
5. What embedded options are we selling to the dealer in the transaction? ("Zero cash outlay" does not mean "zero cost" when transacting a derivative; if the end-user is being sold an option profile and no cash is charged, it is likely

that the end-user is implicitly writing an option).

6. How will we monitor the fair market price and evolving risk profile of the derivative at inception and throughout its lifetime? What are the costs embedded in the derivative that we are paying at inception? Do we have access to the models required for valuation, scenario analysis and stress testing?

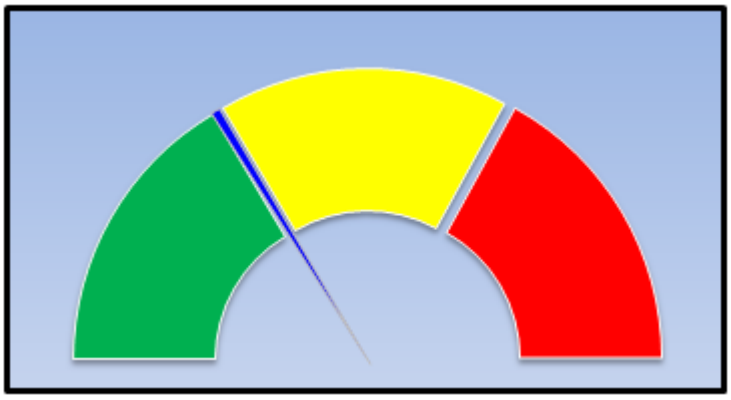
In order to help retail and corporate decision makers gain a sense of whether a proposed derivative transaction is "too complex" to enter into without the application of additional resources, Rutter Associates has created a "complexity calculator", that assesses "complexity" with respect to the access to information and analytical sophistication of the end-user. A series of simple questions about the derivative under consideration is posed, and a level of relative complexity is returned.

The following is a sample of features about which the calculator asks:

1. The existence of early termination options and triggers;
2. Limits on downside risk;
3. "Gearing" or "leverage";
4. Types of and number of instruments underlying the derivative;
5. Nature of the payoff formulation;
6. Availability of market data for derivative pricing;
7. Availability of appropriate models for fair value determination including valuation adjustments for credit and funding;
8. Potential hedge effectiveness.

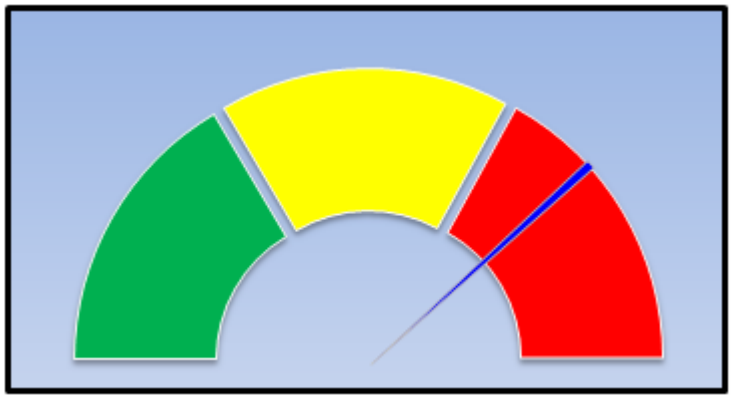
There are no right or wrong answers, and "I don't know" is a valid response. A higher level of relative complexity may indicate the need for further research, independent advice, or a simpler set of alternative derivative contracts. The calculator indicates level of relative complexity as shown in the diagrams below, and leaves it to the end-user to determine "how much is too much".

Figure 1: Low Complexity Derivative



The derivative assessed above has no termination options or triggers, is dependent only on the spot value of a single underlying instrument, but the end-user is not sure if there are limits to downside risk. We would strongly advise researching downside risk limits on this instrument.

Figure 2: High Complexity Derivative



The "high complexity" derivative assessed above has termination options or triggers that the end-user does not completely understand, the payoff formulation is an average of past prices of an underlying asset, and the end- user has no means of fair value determination. Here, the end-user would be well-advised to seek help in evaluating this instrument or look for a simpler alternative.

Look for our Complexity Calculator to be posted on our website (www.rutterassociates.com) in March. In the meantime, if you would like to run a derivative under consideration through the calculator, call Nancy Kovacik at Rutter Associates, at (212) 949-1180.

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