Sententia LLC

Customer Portfolio Margin

"Know Before You Go"

By: Paul Carroll

Customer Portfolio Margin ("CPM") is a risk-based methodology for calculating the regulatory minimum margin equity that a carrying broker dealer, also referred to as the creditor, must require from a customer on whose behalf a leveraged portfolio is held.

The calculation seeks to assess the probability of a one day loss utilizing current market conditions and historic market data. Currently, the only SEC approved model for calculating the minimum CPM margin requirement is the Options Clearing Corporation's Theoretical Intermarket Margin System ("TIMS"). CPM-eligible products include margin equity securities, options and warrants on eligible equity securities or index of equity securities, a securities futures product, an unlisted derivative on an equity security or index of equity securities or a related instrument as defined in FINRA Rule 4210 (g)(2)(D).[1]

Customer Portfolio Margin methodology acknowledges the evolution of market risk management theory and incorporates those principles within the TIMS mathematical arrays, or formulas, used to quantify short term projected risk. Supplementing the regulatory objectives of the SEC-approved TIMS model, an approved CPM carrying broker is allowed to increase the "House Risk" maintenance margin required based on a proprietary assessment of risk by the carrying-broker. Consequently, it should be noted that an otherwise identical CPM customer account may be subject to different CPM "House Risk " requirements at different CPM carrying brokers, and that such incremental margin equity requirements can change on very short notice at the discretion of the carrying broker.

Portfolio margin risk models are, and should remain, subject to constant refinement in line with technological changes in measuring market volatility, as well as an ability to address the bevy of emerging investment products of

[1] FINRA Rule 4210(g)(6)(B)

increasing complexity, some of which represent nothing more than the market sentiment of the general direction of broad or sector-based market changes whose underlying risk may be difficult to understand, much less predict, for even the most seasoned investor. Conceptually, the heightened leverage afforded by the one day probability of loss methodology embedded within CPM is predicated on the more rapid ability of the carrying broker to require the infusion of customer capital in response to calculated margin deficiencies. Consequently, CPM accounts tend to have a shortened time frame by which the investor must meet a margin call for additional collateral. For example, typical 'House Risk' CPM margin policies allow only 1 business day to meet a margin call versus 3 or more days for traditional Reg-T margin accounts. Investors with the ability and means to immediately deposit additional collateral to support potential losses may find themselves able to 'weather the storm' and ride out temporary setbacks thus avoiding the need to liquidate positions under adverse conditions.

Background

Federal Reserve Board Regulation-T (Reg-T) regulates the extension of credit by brokers and dealers and imposes *initial* margin requirements on certain securities transactions. Reg-T section 220.4 governs transactions in a customer's margin account. Reg-T's requirements are set, and must be met, at or promptly thereafter, the time of the initiating transaction (buys, sells; asset & funds deposits & withdrawals and interest or dividends) but is typically not affected by changes in the market values of the positions held. Note: Reg-T's option margin requirement is the amount specified by the creditor's examining authority, for securities governed by the SEC, in most instances, this is the Financial Industry Regulatory Authority (FINRA).

Reg-T Section 220.5 - Special Memorandum Account (SMA) – SMA is maintained in conjunction with a margin account and represents the amount of Reg-T excess which can be used for additional trading or asset withdrawals from a margin account. If the SMA is less than 0, the creditor must demand additional collateral from the investor. This 'deficiency' is referred to as a Federal or FED call. Since SMA is governed by initiating transactions only, the amount of SMA may become greater than the amount of maintenance margin excess available under FINRA Rule 4210(f) (below section) or the creditor's house margin requirements, in instances when adverse market conditions affect an existing portfolio.

Note: SMA is analogous to a home equity credit line whereby an initial assessment is made of the property's collateral's value and an amount of available credit is established which can be utilized on demand. The 'available credit' is directly affected when funds are withdrawn or deposited, but is not affected by adverse changes to the home's market value. Similarly, SMA may increase by increases in portfolio market values but does not decrease by declines in portfolio value.

Since Reg-T focuses solely on initial margin requirements, a creditor may become exposed when adverse market movements result in the market value of the collateral on deposit being insufficient to adequately cover the carrying broker's exposure to the market risk of the open positions going forward.

When purchasing a marginable equity security in a margin account, Reg-T imposes a requirement of 50% of the cost to acquire the position. The use of margin leverage, increases the risk/reward profile of the account creating the potential for increased profit, should the value of the security subsequently change in favor of the investor or greater loss should the change in value be unfavorable to the investor.

Example, a customer has $1,000,000 in a margin-approved brokerage account with a margin requirement of 50%. That investor could then purchase 100,000 shares at $20.00 for a cost of $2,000,000; $1,000,000 (50%) coming from the account's prior balance and the other 50% or $1,000,000 as a collateralized loan.

Market Value:	[100,000 * 20]	$2,000,000
Debit Balance:	[1,000,000 Cr - 2,000,000 Cost]	$1,000,000
Margin Equity:	[Mkt. Val - Balance]	$1,000,000
% of Equity:	[Equity/Mkt Val]	50%

If the value of the stock goes up by 30% [$20 * 30% = $6], the investor gains $600,000 [2,000,000 * 30%] on his $1,000,000.00 investment. The closing price is now $26 and the market value of the shares is $2,600,000. The equity in the account has risen by the market value increase [$2,000,000 to $2,600,000 = $600,000] from the original $1,000,000 to 1,600,000 or a 60% increase to the initial deposit.

Conversely, a 30% drop in the value subjects the investor to a loss of $600,000. The price of the security has declined from $20 to $14 [$20 - $6 = 14]. The shares now have a market value of $1,400,000 while the debit balance remains as $1,000,000.

Market Value:	[100,000 * 14]	$	1,400,000
Debit Balance:		$	1,000,000
Margin Equity:	[Mkt. Val - Balance]	$	400,000
% of Equity:	[Equity/Mkt Val]		29%

The difference between the collateral value and the debit balance represents a $600,000 loss to the investor's original equity of $ 1,000,000 resulting in $400,000 of remaining margin equity. The percent of equity has declined to 29% [equity/market value or $400,000/$1,400000] from the original 50%. The account is still in compliance with Regulation T.

A further drop in the price of the security to $12 subjects the investor to an overall loss of $800,000 on their initial $1,000,000 investment, and brings the equity margin to 17%. The account remains Reg T compliant, FINRA Rule 4210 requires a minimum of 25% of long market value to be maintained. The deficiency in the required minimum is referred to as a margin call. A "margin call" can be met by depositing additional collateral, reducing the margin requirement of the account by closing or hedging positions or by favorable market movement.

Market Value:	[100,000 * 12]	$ 1,200,000
Debit Balance:		$ 1,000,000

Margin Equity:	[Mkt. Val - Balance]	$	200,000
% of Equity:	[Equity/Mkt Val]		17%
Requirement:	[1,200,000 * 25%]	$	300,000
Deficiency or 'Margin Call'		$	100,000

Reg-T and the applicable maintenance provisions of FINRA 4210(a) to (f) are strategy based margin requirements set as a fixed percentage of a security's market value with limited recognition of risk-limiting offsets at the portfolio level between correlated securities positions held within the portfolio, or of the potential adverse consequences of securities subject to wide volatility swings, lack of adequate market liquidity, or portfolios evidencing heightened specific risk derived from a few concentrated holdings.

FINRA Rule 4210(a) to (f)

Regular Maintenance Margin Rules

- Establish initial margin requirement in some cases (see Reg-T option comment above)
- Requires daily mark to market
- Requires ongoing maintenance margin for all positions held

Note: Member firms are required to compute a maintenance margin which is no less than the minimums prescribed under FINRA 4210. Member firms may require margin in excess of the prescribed regulatory minimums in accordance with FINRA 4210(d) Additional Margins.

FINRA Rule 4210(a) - (f) supplements the Regulation T requirements pertaining to initial margin by establishing ongoing minimum maintenance margin requirements calculated no less than at the close of business for each business day. FINRA Rule 4210(f) is the primary rule which sets the minimum levels of margin which must be maintained on a daily basis in an account governed by Reg-T. The broker/creditor is required under FINRA Rule 4210 to assess the market risk represented by the positions and is permitted and expected to require additional margin in instances when the minimum maintenance required under the Rule may be insufficient to protect the creditor. The calculated 'House' margin required is subtracted from the account equity and if the account's equity is below the calculated requirement, a margin deficiency exists and a "margin call" is made for additional collateral.

The Federal Reserve Board's primary role lies in the supervision of banks and the setting of monetary policy. In 2006, the Federal Reserve Board granted to the Securities and Exchange Commission oversight of the establishment of risk-based margin requirements in accounts which have been specifically approved for the use of risk-based margin in place of Reg-T strategy-based margin rules. The risk-based margin approach is referred to as Customer Portfolio Margin and FINRA Rule 4210(g) governs the margin requirements for eligible products.

Customer Portfolio Margin (CPM)

FINRA Rule 4210(g)

Following a pilot program, CPM was approved by the SEC on December 12, 2006 effective April 2, 2007.

There are several key features of Customer Portfolio Margin which distinguishes it from the Regulation T or regular margin account.

- CPM is a risk-based assessment which utilizes the Options Clearing Corporation's Theoretical Intermarket Margining System (TIMS) methodology alongside an approved firm's risk model as an alternative to the uniform strategy-based percentages prescribed under Reg-T and 4210(f).
- A broker dealer must submit a detailed application to FINRA to be approved by FINRA before offering CPM to customers.[2]
- Customer accounts must be specifically approved in writing before receiving CPM margin treatment. The CPM account opening process must include an approval for naked option writing for all applicants whether or not the applicant anticipates using naked options in the account.
- The lowest minimum equity requirement for a CPM account is $100,000.00 (Minimum equity for a Reg-T margin account is $2,000.00).
- Customers must acknowledge receipt of a Portfolio Margin Risk Disclosure Agreement in writing or electronically.
- Only marginable equity-based products, options on equity-based products (including some equity index products) are eligible to receive CPM margin treatment.
- Brokers seeking approval to offer CPM must submit the Firm's risk-based model to FINRA for review to determine whether the model meets minimum acceptable modeling standards. Note: although FINRA may approve the model's usage, FINRA makes no representation as to the model's effectiveness.
- Risk models must contain detailed procedures to identify and charge additional margins when dealing with volatile, illiquid, concentrated and low-priced securities.
- Brokers must have specific detailed procedures in place governing the approval of accounts for CPM, management of the risk represented by the portfolios and the control of the types of products afforded CPM treatment.

Accounts approved for CPM are exempt from Regulation T for eligible transactions in a CPM account. CPM is not an exemption from Reg-T for any non-eligible product concurrently held in a CPM account, or activities conducted, in a regular margin or cash account. CPM non-eligible products may be held in a CPM account, but FINRA 4210 (f) strategy-based margin requirements must be applied. Firms permitted to offer CPM to customers are required to calculate minimum margin requirements for eligible products utilizing the Options Clearing Corporation's (OCC) TIMS model. The OCC publishes the embedded risk formulas, known as arrays, on a daily basis after the close of business. This methodology acts as the baseline for the minimum margin requirement calculations for broker-dealers. Brokers offering CPM are permitted and expected to charge additional margin based on the broker's margin risk policy. The brokers risk policy must include the ability to identify situations where the portfolio contains concentrated, volatile, illiquid or low-priced securities and charge additional margins were indicated.

The principle underlying the TIMS methodology is to calculate a 1 day assumed dollar loss in the individual positions held in the account. Probability assumptions within the OCC arrays utilize implied volatility assumptions in the model. TIMS does not stress volatility within the model. However, volatility stressing is

[2] http://www.finra.org/sites/default/files/NoticeDocument/p018677.pdf

a common element of many proprietary risk models used by CPM creditors. As mentioned above, Reg-T or regular margin calculations were traditionally set as a fixed percentage of movement i.e. 25% for long equity securities, 30% for short equity securities or 20% of the underlying security of an option, with no regard to the implied volatility of current markets.

TIMS methodology considers[3]:

- TIMS seeks to identify and quantify a 1-day probability of profit and loss movement under recognized scenarios.
- TIMS stresses movement up and down 10 equidistant movements based on the model's assumptions.
- Potential profit and loss under identified scenarios within approved security groupings.
- The aggregate total of the loss identified in all recognized scenarios after allowing for offsets.
- Percentage movements for individual equity securities are 15% up and 15% down. Broad Index movements are up 6 and down 8 while narrow based indices are stressed up and down +/- 10%.
- TIMS does not consider an individual securities concentration within the portfolio or the liquidity of the securities in the marketplace based on the number of shares held. (Note: security concentration and liquidity considerations must be included as part of a firm's risk policy.)

Under this framework, US and certain foreign margin equity securities, listed and unlisted options on margin equity and approved index options, and US single stock futures holdings are grouped into separate "Class Group" (CGs). For instance, a customer's account holds shares long which are offset by short call options on the same security (a covered call strategy). The scenarios calculated under TIMS considers the net effect of market movement on the combined positions to create a net profit/loss under each separate scenario for that specific issuer. The scenario with the highest probability of loss becomes the margin requirement for a standalone CG. CPM continues to calculate a separate margin requirement for each CG held in the portfolio.

Certain index CGs with an identified and approved high correlation to each other may be grouped into a higher Product Group (PG) for the calculation of the PGs margin requirement. Some, but not all, product groups may further be grouped into a Portfolio Group consisting of closely related PGs.

For each separate CG, PG and Portfolio Group, the total representing the largest probability of loss within the individual group is the group's margin requirement. The sum of all individual group requirements is the accounts margin requirement under CPM.[4]

The intent of CPM is to encourage the use of offsetting market exposures within diversified portfolios. The aggregation of probable losses within approved correlated index PGs is such an example. However, the lack of recognition of offsets between correlated individual equity securities in separate CGs does nothing to reward the risk reducing effect of diversified portfolios consisting of long and short individual equity securities with identifiable historic market correlation. For example, a long equity of one issuer may not offset a short equity of another issuer in the same market sector even when an identifiable historic correlation exists. Sophisticated market professionals often employ techniques to 'balance' the perceived market risk by including both long and short equity positions within market sectors in an attempt to mitigate

[3] https://www.theocc.com/risk-management/cpm/

[4] https://www.theocc.com/components/docs/risk-management/cpm/user_guide.pdf

the specific risk of distinct securities. Current CPM calculations entail an array requirement of down 15% for a long security and up 15% of a short security of a separate issuer, even if the two such securities are correlated even though the 2 otherwise offsetting events - long side declines by 15% and short side increases by 15% at the same time - are less likely to occur at the same time. A broker dealer's internal risk model should come up with a higher requirement than TIMS in portfolios with extensive directional bias (all long or all short), concentrated securities or illiquid portfolios but may calculate a lower 'house' requirement for well-hedged portfolios where the performance of the short side is expected to hedge the risk of the long side. Consequently, the account's effective equity requirement defaults to the greater of the regulatory minimum CPM or 'House' Risk" policy.

An illustration from the CBOE Exchange, Inc. ('CBOE") of the margin reduction realized between traditional strategy-based Reg T vs CPM methodologies can be found via the link given in the below footnote[5] and focuses on the offsetting nature of option strategies with a common underlying issuer.

It must be noted that the enhanced leverage offered by CPM can represent a potentially significant impact to the broker's capital in instances when adverse market movement exceeds the potentially reduced amount of customer equity on deposit to support the exposure. As such, creditors must have in place effective risk management policies and tools to promptly identify unique exposures, address margin deficiencies and close out or recapitalize high risk, thinly collateralized portfolios on a timely basis.

CPM requirements would not be viewed as difficult to understand by a disciplined creditor or investor familiar with market risk analysis theories, as CPM methodology uses similar risk identifying processes common to most widely accepted models of market risk for equity-based products. Ironically, the most confusing and least understood aspect of margin regulations has traditionally been the SMA calculations under Reg T and, in my opinion, SMA still holds that title!

Volatility Products

Marketplace evolution continues to create increasingly complex products bearing little resemblance to traditional equity securities, single security option strategies and the models developed to monitor basic market exposure.

A fast-growing family of products, Exchange Traded Products (ETPs), attempt to track the market sentiment of where markets may be sometimes in the future and are increasingly being held by retail investors in regular and portfolio margin accounts. These products often have a direct or indirect relationship to the CBOE Volatility Index (VIX), also known as the fear index, which looks out 30 days into the future.

Numerous ETPs in the form of mutual funds (ETFs) or unsecured notes (ETNs) are loosely based on the VIX index. While local and global economic and political events can impact stock prices, the volatility products regularly display outsized movements in relationship to the actual movement of the market segment it references. Even stout hearted, savvy professionals can be challenged to understand how to

[5]http://www.cboe.com/framed/pdfframed?content=/micro/margin/margin_req_examples.pdf&section=SEC_OPTIONS_PRODUCTS&title=Margin+Requirements+Examples+for+Sample+Options-based+Positions

manage the risk of these bespoke products and investment vehicles to emerging global market events. The speed at which markets move is a formidable and ongoing challenge to the creditors proprietary risk management systems attempting to keep pace. The debate is to what extent should these complex investments and others like them, be limited to only those investors with an advanced degree of risk awareness who have access to risk measurement tools designed to identify the degree and probability of an adverse risk event occurring. Neophytes who choose to wade into these products, and the brokers who carry the positions on their behalf, may be ill equipped to deal with the risk complexity which may result in a rapid decline of an account's equity.

Closing Thoughts

Portfolio Margin is a useful tool for knowledgeable, alert investors to employ when managing leverage and the attendant market risk of a portfolio. By design, it allows investors higher degrees of leverage in the presence of diversified positions, particularly those that employ offsetting risk limiting hedges. Since the inception of CPM, the overwhelming majority of margin leverage has migrated to and is currently held within CPM margin accounts. A question which remains is does the underlying investor truly understand the inherent risks? Oft times, investors believe that their brokerage representative, investment advisor or broker dealer stands ready to protect them from the increased leverage-based risks. As mentioned earlier, margin rules are meant to protect the creditor - Mutuo Caveo. Margin creditors are permitted by the margin regulations to protect themselves from client based risk by increasing requirements, demanding additional collateral and/or liquidating positions. Much remains to be done to improve investor education pertaining to both Reg-T and CPM margin accounts and the unique and sometimes opaque leverage offered by certain types of derivative products.

Due to the enhanced leverage of CPM and the shortened time frame to meet margin deficiencies, investors must be vigilant in monitoring their account on a daily intraday basis and stand ready to reduce their exposure or deposit additional collateral promptly. For those who fail to monitor their exposure or cannot promptly meet a call, liquidation by the creditor may result.

For accounts not employing options strategies or index hedging, the difference between the standard regular margin maintenance requirement for long equity securities under 4210 (f) of 25% to 4210 (g) CPM's 15% is substantial and represents a 40% reduction in the amount of equity required. Investors should consider always maintaining sufficient excess equity to meet unanticipated market moves or they may find themselves quickly liquidated by the broker dealer at what may probably be the worst possible time. As mentioned earlier, member firm "House Risk" CPM may be and often is, greater than the prescribed regulatory minimums and may be increased by the broker at any time.

As with any margin lending situation, broker/dealer creditors offering CPM or Reg T regular margin should satisfy themselves that they have the tools necessary to proactively manage the risk to their capital of the portfolios held on their books on behalf of clients, that the client seeking the leverage understands the risk represented by their investments and that the potential for loss can be swift and exceed the amount of margin on deposit. Reliance on the standard boiler plate margin and option disclosure documents provided to the customer or the fine print in the signed margin agreement may not protect a creditor from incurring unsecured losses in customer accounts carried on their books.

In closing, the margin rules are designed to protect the creditor broker/dealer's capital from losses when carrying a customer margin account on a leverage basis. Brokers are within their rights to close out

exposures in an orderly manner should the associated risk rise to a level which the creditor is unwilling to accept. An effective system of supervisory procedures accompanied by sound risk policies supported by trained employees serve as the basis for successful margin lending. When creditor broker dealers compliment the foregoing internal standards with detailed customer disclosure and provide clients with access to timely reporting and useful tools to assist them in identifying, assessing and understanding the risks present in their portfolios, both the creditor and the client can accomplish their objectives. Creditors should only approve margin levels commensurate with their ability to support the portfolios held and clients should limit their investing strategies to those which they fully understand. Creditors and investors should insure themselves that they have the understanding and tools necessary to manage the margin risk exposure. Vigilance on the part of the investor and creditor is necessary to protect both parties.

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Paul has over 35 years of experience in the Financial Services Industry. Primary areas of focus covered operational controls, processes and procedures inclusive of trade capture, settlement, custody and margin lending. Paul served as Vice President in Global Operations for Goldman Sachs & Co., Limited Partner at Spear Leeds & Kellogg, Past-President of SIFMA's Credit and Margin Society and member of the SEC/FINRA Portfolio Margin Sub-Committee.

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