

# Margin and Leverage in Futures and Forex Trading

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This short paper deals with margin and leverage and their use in futures and forex trading. After defining the relevant terms and clarifying a common misconception about them I present a simple formula for calculating the amount of equity that is required for minimizing the probability of a margin call when trading highly volatile markets such as futures and forex.

## 1. Introduction

I receive frequent emails from traders asking my opinion about minimum equity requirements for trading in the futures and forex markets. This is a very important question and its answer is closely related to proper risk and money management. It is known that having a winning trading system is not sufficient for trading success, although it is necessary in the medium to longer term. One also needs to understand how volatility impacts equity requirements in the presence of high leverage. Undercapitalization is the number one cause of failure even in the presence of a sound trading methodology. Every experienced trader knows this but, as it turns out, many novice traders are often very optimistic about their system performance in the short-term and believe they can survive high volatility and get away with an undercapitalized account. However, for the majority of traders who are not lucky enough, the result is a margin call and possible account position liquidation very early in the game. Let us start with a couple of definitions:

**Margin** usually means borrowed money to purchase securities. This is the usual meaning of the term in the equity markets. In the futures and forex markets, margin is the amount a trader must deposit in cash or in the form of marginable securities with a broker, on a per contract basis, before opening a position.

In the case of futures there is initial margin and maintenance margin. In the case of stocks, the initial margin is 50% of transaction value and in the case of futures it is set by the relevant exchange as an amount on a per contract basis. In the case of forex, margin can be as low as 1% or even 0.5% of the amount of currency exchanged. Retail forex traders can control \$100,000 by depositing as little as \$1,000.

**Leverage** refers to the use of borrowed capital, margin, or even certain financial instruments for increasing potential return on investments. Thus, a stock trader who buys securities on margin and a futures trader who posts margin to go long or short a futures contract **may** be involved in leveraged transactions.

One common misconception, especially amongst people not familiar with the mechanics of trading, is that futures and forex trading expose traders to high leverage. Nothing can be further

from the truth. The correct assessment of the situation is that futures and forex trading **can** expose traders to high leverage but leverage **is not** necessary for participating in those markets. In order to understand the point just made, note that leverage is defined as the ratio of assets to equity, as follows:

$$L = \frac{\text{Assets}}{\text{Equity}}$$

Confusion often arises when the denominator in the above equation is replaced by required margin and the numerator is set to contract value. In this case, margin is transformed directly to leverage. For example, if the S&P 500 futures trade at 900, then the value of one contract is  $900 \times \$250 = \$225,000$ . If the initial margin is about \$28,000 then the leverage  $L = 225,000/28,000 = 8$ . However, a trader need not, **and actually should not**, have only \$28,000 in his account in cash when opening a position. For example, a trader with \$225,000 in his account may decide to buy or sell one contract only. In this case,  $L = 1$ . Furthermore, if the trader has \$450,000 in the account, leverage  $L = 0.5$ , meaning that leverage can be less than 1.

The same holds in the case of forex trading. A USD account holder can put down as much as \$1,000 to sell \$100,000 USD for EUR. The leverage  $L$  is equal to 100 in this case. This means that a change of 1% against the position of the trade will result in a loss equal to the margin posted. It is a common misconception that forex is **necessarily highly** leverage trading. Again, the correct way to put it is that forex trading **can** involve high leverage. But nobody requires that a trader gets involved in high leverage when trading forex. Actually, a trader can have USD 100,000 in cash and exchange then for EUR. In this case,  $L = 1$  and a 1% move in favor of the trader's position will result in 1% gain in the account in this case. If  $L = 100$ , then a 1% favorable move will result in 100% gain. Notice though that in both cases, the amount gained is the same and equal to \$1,000. It is only the percent return on invested equity that differs. Thus, traders use leverage to get higher return on equity in exchange for higher risk of ruin.

The important thing to realize is that futures and forex markets offer high leverage but leverage is **symmetric** with respect to profits and losses. It amplifies gains as much as it amplifies losses. However, these markets **do not** require that any transaction involves leverage. Although this sounds trivial to experienced traders, it turns out that many people who are not familiar with the subject do not understand this simple fact.

## 2. Account capitalization determination

Each time a new position is opened, the cash amount in the account of a trader should cover margin plus any drawdown due to price volatility. A simple method of determining account capitalization per contract traded in the case of short-term and intraday trading is by considering a volatility measure like a 14-bar ATR. One should allow an adverse move equal to  $2 \times \text{ATR}$  before (equity-margin) is depleted. This may avoid any margin call and position liquidation. Thus,

$$\text{Equity} = 2 \times \text{ATR} \times \text{Contract value} + \text{margin}$$

For example, if the price of S&P 500 futures is 900 and the 14-bar ATR is equal to 1.5%, then the required equity is:

$$\text{Equity} = 2 \times 0.015 \times \$225,000 + \$28,00 = \$34,750$$

In this case, the leverage L is equal to  $L = 225,000 / 34,750 = 6.47$

In the case of a loss, the equity will decrease and the leverage L will increase for the next trade. A more conservative calculation of the account equity per contract is given by:

$$\text{Equity} = f \times \text{Expected Maximum Drawdown} + \text{margin}$$

The expected maximum drawdown (on an intraday basis) is not known in advance but it can be estimated based on historical back testing. The factor f is a safety factor, usually set equal to 1. More information about the use of this formula can be found in the book [Profitability and Systematic Trading](#) (Wiley, 2009).

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