# DAILY PRICE FLUCTUATION LIMITS:

# FREQUENTLY ASKED QUESTIONS

**1. What is a daily price fluctuation limit?**

Fluctuation limits are one of the risk mitigation mechanisms for **futures contracts** traded via B3's trading platform. They prevent the insertion of orders priced more than a certain percentage above or below the previous day's settlement price. Each contract has an upper limit for its price to rise on any day and a lower limit below which its price is not allowed to fall. These two values may be the same in module.

The mechanism is suspended during the last trading session for the contract, except for cash-settled commodity futures, whose fluctuation limits are suspended from the third business day before the expiration date, and physically settled commodity futures, whose fluctuation limits are suspended from the third business day before the first day of the delivery notice period. The purpose of these suspensions is to allow prices of futures to converge to the price of the underlying asset on the cash market.

Fluctuation limits and how they work are described in B3's Operating Procedures Manual, Chapter III, Section 7.3.1, where they are referred to as the "type 1 rejection tunnel". Their values are published in the file *Oscilação Diária de Negociação* ("Daily Trading Fluctuations"). The relevant links to the manual and file are:

- http://www.b3.com.br/pt_br/regulacao/estrutura-normativa/operacoes/
- http://www.b3.com.br/en_us/solutions/platforms/puma-trading-system/for-members-and-traders/rules-and-trading-parameters/trading-rules/

**2. Does the cash market have daily price fluctuation limits?**

Assets traded on the cash market are not subject to price fluctuation limits. The risk mitigation mechanism for this market is the circuit breaker, which plays a similar role to fluctuation limits. However, there are differences between them. Three differences are worth highlighting. The first is that the circuit breaker suspends trading completely. All trading is halted when the circuit breaker is tripped. The second is that it is activated only when prices are falling. The third is that it is based on the Bovespa Index, the key stock market indicator, since stock prices have a strong common component, especially during a bear run. There are other mechanisms to safeguard the individual behavior of assets traded on the cash market, such as auction and rejection tunnels, which are explained in B3's Operating Procedures Manual, Chapter III, Sections 7.3 and 7.4.

The rules governing the circuit breaker are described in B3's Operating Procedures Manual, Chapter III, Sections 10.

**3. What is the purpose of daily price fluctuation limits and the circuit breaker?**

They are both designed to protect the integrity of the trading platform's price formation process and mitigate the credit risk of B3's clearinghouse, which acts as central counterparty to all trades so as to guarantee settlement. Its main credit risk is the possibility of default by participants who find themselves unable to pay unexpectedly large sums at cash settlement owing to sharp price fluctuations.

These mechanisms restrict trading at times of extreme price variation, mitigating the risk of "fat-finger" execution error (keyboard input error or mouse misclick) and/or allowing more time for market participants to reflect and analyze the new information that has so sharply changed asset prices. They are sometimes referred to elsewhere as cooling-off and calming strategies.

**4. When did B3 introduce these mechanisms?**

Price fluctuation limits were established by BM&F from its inception in 1986. The circuit breaker was introduced by BOVESPA in 1997.

**5. How are daily price fluctuation limits set for a contract?**

Values are set so that trading in the contract is limited only in exceptional circumstances, i.e. in the event of a very severe price rise or fall.

The degree of severity is calibrated by the margin requirement for the contract, which in turn is based on the cumulative price change in a period of two consecutive days. The confidence level for a contract's margin requirement is typically 99.96%. This means the price change implicit in the margin should be exceeded in only 0.04% of all cases. This event should not occur more than once every ten years on average.

Agricultural commodity futures are an exception to the rule, in that their margin requirements have a 99.5% confidence interval. It should be noted that the confidence level for a margin requirement on any contract settled by B3's clearinghouse can be changed whenever deemed appropriate by B3.

Considering that fluctuation limits are daily and margin coverage is for two consecutive days, the values of fluctuation limits are initially set at about 50% of the price variation implicit in the respective margins. For example, the margin for dollar futures is based on a price variation of ±12%, and its fluctuation limit is ±6%.

The contracts traded on B3's trading platform that result from cross-listing agreements with other exchanges are not governed by the general rule described above. Fluctuation limits for these contracts follow the parameters established by the exchanges that originally introduced them.

**6. Can daily price fluctuation limits be changed?**

Fluctuation limits can be changed by B3 at any time. They may even be changed during a trading session when they have been triggered. B3 bases its decision to change these limits on considerations explained in the answers to questions 7-10.

If fluctuation limits are changed, B3 must notify participants by issuing an External Communication, or via the NBC system (which sends messages to all trading participants) and Virtual Target (which sends messages to all trading participants' authorized persons). External Communications are used to announce changes to the fluctuation limits for the most traded contracts. The new limits go into effect not less than 30 minutes after they are announced.

**7. What is the governance process for changes to daily price fluctuation limits?**

The decision to change any fluctuation limit is made by B3's Central Counterparty Risk Internal Committee.

**8. What factors lead the committee to raise a fluctuation limit during a trading session?**

Given the complexities and uncertainties involved in extraordinary situations, it is not possible to offer an exhaustive list of the factors that can potentially be analyzed. However, past experience provides examples of such factors and how they tend to influence the committee's decisions on changes to fluctuation limits.

The following factors in isolation tend to increase the probability that the fluctuation limit for a contract **will not be changed** during a trading session in which it has been triggered:

- Relative proximity to the end of the trading session;
- Relative lack of clarity on the causes of existing variation in the price of the contract;
- Probability of execution error as the cause of this variation.

The following factors in isolation tend to increase the probability that the fluctuation limit for a contract **will be changed** during a trading session in which it has been triggered:

- Relative proximity to the start of the trading session;
- Relative clarity on the causes of existing variation in the price of the contract;
- The existence of highly correlated contracts (sharing risk factors with the contract concerned to a significant extent) whose trading has not been influenced by fluctuation limits;
- Contracts whose prices are formed mainly in other trading environments rather than B3's trading platform;
- A relatively high number of fluctuation limit triggers on consecutive days;
- Relative proximity to the contract's last trading day;
- Relatively low credit risk for the clearinghouse and its participants thanks to low exposure to the contract's risk or relatively low exposure to the economic capacity of the responsible participants.

**9. Is there a rule for changing daily price fluctuation limits?**

There is no fixed rule for setting new fluctuation limits.

However, on recent occasions when the committee has changed a fluctuation limit it has opted to raise the limit to approximately 70% of the price variation implicit in the margin requirement for the contract concerned.

A 70% limit more accurately converts the severity of the two-day variation implicit in the margin requirement to a daily fluctuation limit. This means the clearinghouse can use all the one-day coverage offered by the margin requirement.

**10. Can a fluctuation limit be changed more than once in the same trading session? Can a fluctuation limit exceed the price variation implicit in the margin requirement?**

If a higher limit proves insufficient to allow the trading process to return to normal, it can be changed once again. The new limit may occasionally surpass the price variation implicit in margin requirement.

Although the probability of such events is remote, they cannot be completely ruled out in light of the complexities and uncertainties involved in out-of-the-ordinary situations.