

# IT IS POSSIBLE TO CONTROL PRICE VOLATILITY ON STOCK MARKETS

The volatility auction, a mechanism created by the Colombian Stock Exchange, does reduce price fluctuations. A team of researchers made up of experts from the Universidad del Rosario and the Universidad EAFIT were able to prove it.

By: Alejandro Ramírez Peña  
Photos: 123RF, Alberto Sierra

**W**e now know for certain that the Bolsa de Valores de Colombia [Colombian Stock Exchange] has managed to intervene in and reduce the volatility of stock prices with the use of a mechanism known as the volatility auction. It was proved by a study of markets, investments and financial performance undertaken by Professor Carlos Castro, of the Universidad del Rosario, and Professor Diego Agudelo, of the Universidad EAFIT.

The idea of the joint project which yielded this piece of good news arose three years ago, when the two experts first met in the middle of a symposium on subjects related to the micro-structure of markets. There, they discussed the mechanism which the stock markets of the world are implement-





Symbol	Open	High	Low	Close
44% FOOD COMPANY (AS)	38.11	39.00	37.50	38.50
CENTRE WORKMIND	147	149	145	148
AGAINST NOTICE TEAM	20	21	19	20
MARKETING	520	525	515	522
STOCKS	870	880	860	875
STOCKS EXCHANGE	38.12	39.00	37.50	38.50
BTE 44% FOOD COMPANY (AS)	1.167.00	1.170.00	1.160.00	1.165.00
STOCKS	1.401.00	1.410.00	1.390.00	1.405.00

Symbol	Open	High	Low	Close	
SET: IND	1,855.92	1,861.94	1,847.70	1,855.92	
OPEN	1,853.02				
CLOSE	1,855.98				
DAY RANGE					
WEEK RANGE					
24.7050	86.560	0.650	86.560	0.650	57.030
47.0540	57.030	807.5	57.030		5.7540
6760.70	5.7540	0.607	5.7540	807.5	0.7540
34.7080	0.7540	540.5	0.7540	540.5	86.560
EWPE	-WEF	EFF	-WEF	EFF	-WEF
16.0680	0.7040	405.4	2.240		
20.6500		054.0	4.987		
	7.5030		8.63		

ing to control strong price changes in stocks in a given interval of time. The Colombian Stock Exchange had already installed it, but at that time, in 2016, it had not yet assessed its effectiveness.

Professors Agudelo and Castro, along with Sergio Preciado, who was finishing his Masters in Quantitative Finances, decided to make this the subject of a thesis. In the end, the study which was intended for their degree turned into the earliest version of an article, based on their research, whose aim was to determine whether the mechanism, meant to halt the market, did achieve the desired results and the effects it might have on other variables of market quality, like liquidity and the volume of transactions.

“The research team managed to assess the mechanism used on the local market, which was of great interest to the Exchange. It showed that it did have the effect of lessening volatility, but not in the same way with the other variables of market quality. And, furthermore, it proposed a new method of causal inference to evaluate these kinds of studies of events in stock markets,” explains Castro, a researcher at the Faculty of Economics of the Rosario.

In Colombia, the mechanism is known as a volatility auction and what it does is to stop trading on the market for a few minutes in the midst of the movements of buying and sell-

## HOW DOES THE VOLATILITY AUCTION MECHANISM WORK?

The volatility auction works in the following way: For example, a minimum and maximum price is set for the price of a share of ECOPETROL, in accordance with the expected price fluctuations in normal market conditions.

In a continuous market, purchase and sales orders are received and according to the order in which they arrive, the orders are transacted with the aim of finding the best price for all of the participants. If, in a given moment while trading goes on, the share price for ECOPETROL is above the maximum and the number of shares for which there is a demand is significant, the continuous process is halted and the volatility auction is activated.

ing, when the price of a stock goes beyond a predetermined price range in a very short time.

In that moment, the mechanism activates an auction in which there is no simultaneous encounter between buyers and sellers, but it simply uses the mechanism to make a list of who is selling and who is buying in order to find the equilibrium auction price.

“The auction has two parts: On the one hand, the orders to buy enter, which want low prices, and the orders to sell also appear, which want to negotiate at high amounts. In a given moment, the two positions cross and some of them can be executed. In that way, you reach an equilibrium but the interesting feature is that you halt the market for two or three minutes (it is not a fixed time because the closure is really a random one, intended to prevent a manipulation of the market), which also freezes further bids and establishes the number of shares which are going to be negotiated,” explains Diego Agudelo.

The mechanism is automatically activated by a previous calibration based on a calculation of certain price bands which trigger it, depending on whether that price is above or below the range which has been fixed.

### Results of the analysis

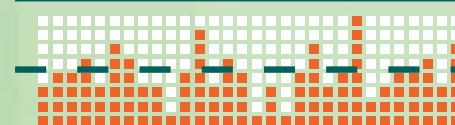
According to the researchers, their study enabled them to show that there was a clear and significant reduction of volatility, which indicates, in turn, that the mechanism implemented by the Colombian Stock Exchange is doing what it is expected to do.

Likewise, their analysis allowed them to review other variables of market quality, like liquidity and the volume of transactions. Even though these professors expected to obtain some improvements in those variables, they found none, but the two variables did not show a deterioration either.

“When it comes to drawing the balance sheet, I believe that the results were positive for the mechanism, in the sense that it fulfills the purpose it was designed for – to reduce volatility somewhat, without jeopardizing important variables like liquidity and the overall activity of the stock exchange,” notes Carlos Castro.

That being so, this is a mechanism which is designed to find a better price when it detects a kind of anomaly in the performance of a share or shares or they go beyond the range which is calculated on a daily basis. It thus provides the best scenario possible for those who sell and those who buy, because each of the parties always seeks the biggest benefit from these kinds of operations.

During the approximately two and half minutes the volatility auction lasts, the purchase and sales orders build up. Then, at a given moment before this two and a half minute period ends, the auction is closed and the best price for the exchange of shares is determined in order to maximize the amounts which are being traded.



Reference price



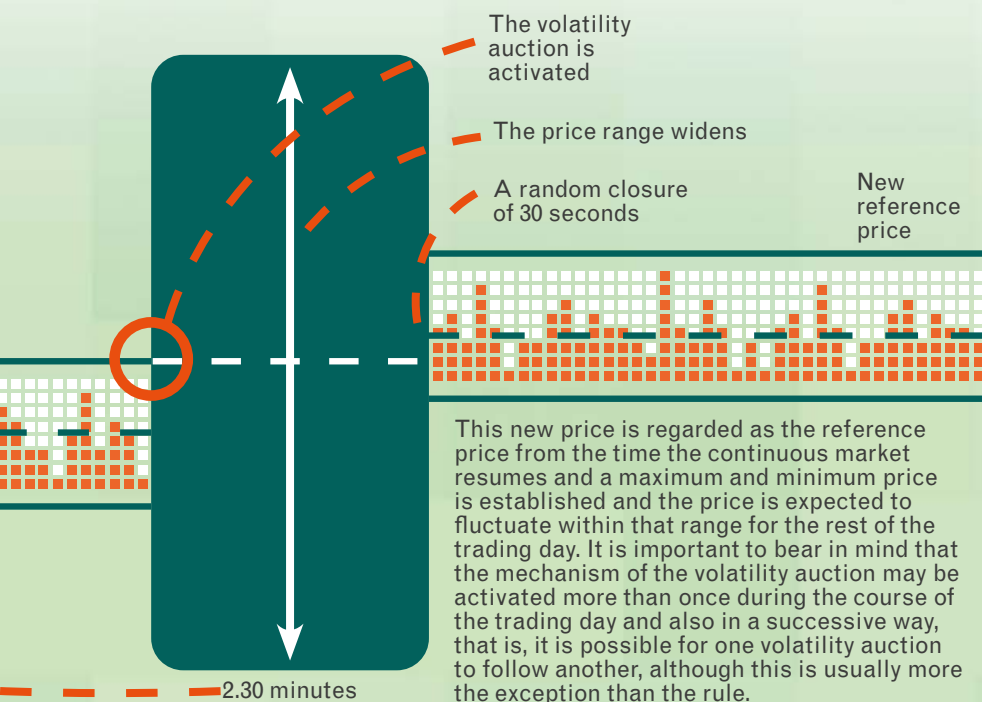


←  
“The results were positive for the mechanism of the volatility auction, in the sense that it fulfills the purpose it was designed for – to reduce volatility somewhat, without jeopardizing important variables like liquidity and the overall activity of the stock exchange,” notes Carlos Castro.



←  
In the opinion of Diego Agudelo, the implementation of volatility auctions makes a lot of sense, because there are shares which, while they are traded in a continuous market and are regarded as liquid, actually show periods of high and low trading which may distort the process of forming prices.

## THE VOLATILITY AUCTION



Source: Bolsa de Valores de Colombia [Colombian Stock Exchange].

And it also seems that both the buyers and the sellers have understood that: They appreciate the transparency it affords to their transactions, without any margin of manipulation and with a random closure of the auction. Furthermore, it offers the possibility of finding out whether a person wants to induce volatility in the market with a price which is above that established by the band and it keeps it within the auction, which stops that person from achieving his aim.

“Going beyond the investors perception of the mechanism, the important thing is that its design allows it to fulfill its purpose and, in turn, prevents people from being able to strategically use it to influence the performance of the market”, Castro adds.

Another aspect which should be taken into account is that, in accordance with international experience, these kinds of mechanisms are now being implemented in almost all of the stock exchanges in the world.

The researchers explain that when you put that into a global context, our markets – with stocks which are as liquid as that of ECOPE-TROL, the State oil company – can transact around 500 operations in a day, which are not many if you compare it what happens on markets, like the New York Stock Exchange or Nasdaq, whose operations take place in thousandths of a second and easily reach a million in half an hour.

In these highly liquid markets, discussions about the virtues of the volatility auction mechanism have focused on its effects on algorithmic trading and the implications these new technologies have for the behavior in the market of different types of investors.

“In the case of Colombia, the implementation of volatility auctions makes a lot of sense, because there are shares traded in a continuous market and hence regarded as liquid, but in reality they show periods of high and low trading which may distort the process of forming prices,” Agudelo adds.

Finally, the authors of the study underline their use of the synthetic portfolio method, which is none other than the methodology with which you establish the “proxy” for what might have happened with the share if it had not entered into the auction. This portfolio is constructed with stocks which did not enter the auction so that you can follow the performance of those which did enter it and thus have a referent.

There is no doubt that studies of this kind have been very important for the spotting of structural factors which allow one to understand how the local market works. ■