Payment for order flow: an analysis of the quality of execution of a zero-commission broker on Spanish stocks

Policy and International Affairs
Directorate General

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1 Introduction

In July 2021, The European Markets and Securities Authority (ESMA) issued a public statement[1] to remind firms that the receipt of payment for order flow (PFOF) raises significant investor protection concerns and is, in many cases, unlikely to be compatible with MiFID II obligations.

The European Commission (EC) proposed afterwards, in its proposal for MIFID review, a ban on PFOF. Since then, the regulatory discussion has picked up on whether PFOF poses risks like the ones ESMA and the EC pointed out or, on the contrary, it could improve the quality of execution of customers of those firms.

Trade Republic, a German broker that incorporates in its business model the practice of PFOF, contributed to this debate by sponsoring an academic research in October 2021 that was conducted by three academics and was made public shortly after. The study concluded that execution prices under that model were better than those observed in Xetra for those same stocks and that, thus, implicit costs for clients were lower.

In this context, the Dutch supervisor for financial markets, the AFM, published in February 2022 a study based on transaction reporting data received daily by supervisors concluding that, as opposed to the mentioned sponsored study, execution price was most of the times worse in this model than the one obtained in other comparable venues.

The CNMV also wants to contribute to this debate, in order to facilitate good policy making, based on objective evidence using regulated and complete data sets. Accordingly, CNMV has carried out a study of the transactions executed in a particular trading venue (PFOF TV) on behalf of the clients of a single prominent broker (PFOF broker hereinafter) with which a payment for order flow agreement was in place. The study includes only Spanish shares and compares execution prices in the PFOF TV against those observed in the most liquid trading venues for Spanish securities at each moment in time.

1 ESMA (2021). "ESMA warns firms and investors about risks arising from payment for order flow and from certain practices by 'zero-commission brokers'". Available at: https://www.esma.europa.eu/press-news/esma-news/esma-warns-firms-and-investors-about-risks-arising-payment-order-flow

2 Data and methodology

The dataset used in this study contains all trades that took place in the first half of 2021 in the relevant trading venue (PFOF TV hereinafter) on behalf of the PFOF broker that involved a Spanish security. These comprise 41,444 transactions and 82 Spanish shares. In order to find relevant comparable transactions, we first identify the 10 most liquid trading venues for those 82 Spanish securities (i.e., those in which most trades took place for the 82 Spanish securities in combination). Systematic internalisers have been kept out of the selection, as well as the PFOF TV itself.

Once the 10 most liquid trading venues for those 82 Spanish shares have been identified, we extract any transaction that could be comparable to a PFOF TV trade, this is, happening within the same second and involving the same instrument.

The resulting comparable trades are summarised in Table 1. The initial number of transactions in the PFOF TV that can be matched to comparable trades is 4,713. The corresponding transactions in the top 10 trading venues sum up to 49,208.

For those PFOF TV transactions, we have data regarding date and time with detail to the microsecond, volume, execution price, position (buy/sell), number of trading venues with comparable trades and number of comparable trades, and minimum and maximum execution prices for those comparable transactions.

Transaction reporting data is currently the most complete, comprehensive and accurate dataset about execution in the EU equities market. Not only its reporting is standardised and structured in the same manner in all EU Member States and for all trading venues, but it is the only dataset that is subject to enforcement in case of faulty or incorrect data.

In any case, as all data sets, inaccurate data cannot be ruled out and the dataset was cleansed due to extreme data points with large deviations against comparable trades, either between the minimum and maximum prices of comparable trades executed in the top 10 trading venues or among the price of the PFOF TV transactions and the price of comparable trades executed in the top 10 trading venues. Deviations larger than 3% were identified as outlying observations. In order to determine if these differences were caused by reporting errors, they were compared against the underlying instrument intraday price range. If the reported price lay out of range, the observation was discarded. Table 1 shows the remaining transactions in the sample: 4,676 PFOF TV transactions on 50 unique ISINs and a total of 48,773 comparable trades in the top 10 trading venues. Table 2 includes the amount of comparable trades for every PFOF TV transaction by quartile.

Number of PFOF TV trades and comparable transactions TABLE1

	PFOF TV	Top 10 trading venues
Initial number of transactions	4,713	49,208
Initial unique ISINs	53	
Final number of transactions	4,676	48,773
Final unique ISINs	50	

Source: CNMV.

Number of comparable trades for each PFOF TV transaction TABLE 2

Percentile of distribution	Number of comparable trades in any of the reference trading venues
Minimum	1
First quartile	2
Median	5
Third quartile	12
Maximum	911

Source: CNMV.

The methodology applied in the analysis is the one proposed by the AFM,[2] which uses post-trade data to compare the execution prices of shares in one trading venue to the prices of execution in other multiple trading venues. This comparison could be done using the average price of the reference trading venues or by establishing a range of prices (i.e., minimum and maximum prices in the reference trading venues). We have chosen the latter option for one reason: it is more conservative when classifying the execution price in the PFOF TV as worse, since it would have to be less favourable than the worst price observed in any of the 10 reference trading venues. If the average of the prices observed in the 10 reference trading venues were used instead, the execution price in the PFOF TV could be classified as worse even if less favourable execution prices could be found in any of the 10 reference trading venues.

The Comparative Pricing Model classifies transaction prices as better, similar or worse execution in the following manner:

– If the PFOF TV trade is a buy position, then it will be considered worse execution if its price is higher than the maximum price of the comparable transactions (same instrument, same second) executed in any of the top 10 trading venues. Conversely, it will be considered better execution if its price is lower than the minimum price of the comparable transactions.

2 AFM (2022). *Assessing the quality of executions on trading venues: The "Comparative Pricing Model".* Available at: https://www.afm.nl/~/profmedia/files/nieuws/2022/afm-paper-assessment-execution-quality-pfof-venues.pdf?la=en

– If the PFOF TV trade is a sell position, then it will be considered worse execution if its price is lower than the minimum price of the comparable transactions (same instrument, same second) executed in any of the top 10 trading venues. Conversely, it will be considered better execution if its price is higher than the maximum price of the comparable transactions.

– If the PFOF TV trade has an execution price that falls within the minimum and maximum price range of the comparable transactions (same instrument, same second) executed in any of the top 10 trading venues, then it will be considered as similar execution.

There are several potential caveats in the analysis, all of which are discussed in AFM, Annex II:

i) Post-trade data is used in the analysis instead of pre-trade data. One reason for this choice lies on the fact that pre-trade data for large samples is very difficult to obtain and might not be available. Also, by using post-trade data we ensure that transactions are compared to actual execution prices.

ii) The time frame for which a transaction is deemed comparable (one second) might be too long. Within a timeframe of a second, early orders could sweep part of a book's liquidity and obtain better execution prices while late orders would be obtaining worse prices. It is also possible that the fundamental value of a security could change due to new information. These factors should not determine the quality of execution of a trade, but they could if the timestamps of the compared transactions do not match exactly. However, as the AFM argues, provided that there are enough observations, some trades would be favoured by those factors while some others would be disadvantaged, but the average effect would be cancelled out.

iii) The inclusion of different order types (e.g. limit orders) might affect the quality of execution of a trade. For instance, for a buy transaction, if there is a visible market order in one trading venue with a higher price than an invisible limit order in another trading venue, and the trade is executed in the former, then it would be unfairly considered worse execution. Again, this could be favourable for one trade, as the one in the example, as it could be disadvantageous for another. Overall, with sufficient observations, we assume the effect would be neutral.

3 Results

The results of the analysis are summarised in Table 3. An 86.4% of the trades in the PFOF TV fall under the worse execution category, with a price deterioration of 0.14%. A 10.2% of the trades can be considered of similar execution and only a 3.3% would tagged as better execution, with a price improvement of 0.24%. The weighted average price deviation is – 0.11%, which means that, on average, a PFOF broker client would have borne a higher cost of €1.09 per €1,000 traded if compared to the least favourable execution price observed in the 10 reference trading venues. The conservative methodological assumption of considering worse execution only cases in which the PFOF TV price is worse than in any other TV in the control group is worth noting. If the comparison was to be made with the average price observed in the comparable TVs, the percentage of worse execution would be much higher. This comparison will also yield conservative results in terms of price difference, providing a lower bound for price deterioration (i.e., the minimum deviation observed within comparable trades) and an upper bound for price improvement (the maximum deviation observed within comparable trades). Figure 1 shows the distribution of the price deviations against the top 10 trading venues.

Price execution of PFOF TV trades compared to 10 trading venues TABLE 3

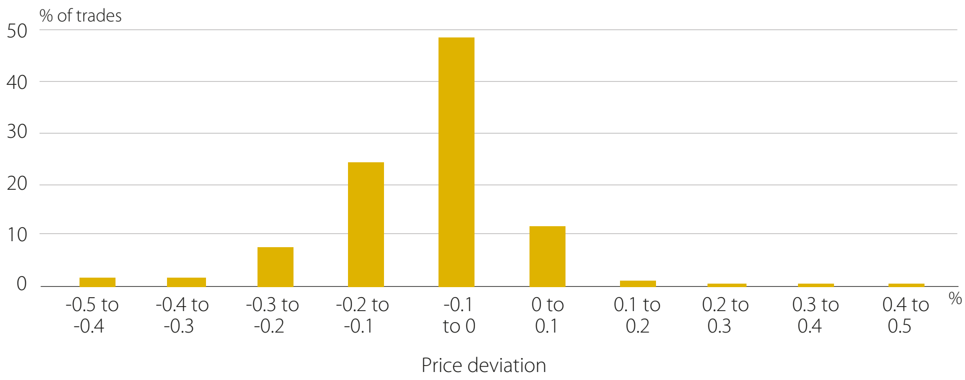
	Percentage of trades (%)	Average price difference (%)[1, 2]	Price difference per €1,000[2]
Worse	86.4	-0.14	-1.41
Better	3.3	0.24	2.36
Similar	10.2	0.05	0.46
Total	**100.0**	**-0.11**	**-1.09**

Source: CNMV.

1 The average price difference of a PFOF TV trade is computed against the least favourable price of all comparable trades executed in any of the 10 reference trading venues. A positive number means there is a price improvement whereas a negative number means there is a price deterioration.

2 The total average price difference and total price difference per €1,000 are computed as the average of all execution quality categories weighted by the percentage of trades in each category.

Distribution of price difference against top 10 trading venues FIGURE 1



Source: CNMV.

The execution of trades in the PFOF TV has also been compared to a subset of the comparable transactions sample; the comparable transactions that took place in the most liquid trading venue for the 82 Spanish stocks previously identified, which is considered the reference market.

Table 4 shows that the percentage of worse execution in trades decreases very little, to an 85.9%, while the percentage of better execution increases just 0.2 percentage points, to 3.5%. Therefore, when compared only to trades performed in the reference market, the classification of the quality of execution of transactions in the PFOF TV remains almost unchanged, improving only very slightly. This could be expected, as the PFOF TV trades are compared now to a subset of the sample and therefore the percentage of worse trades could never increase. However, it is interesting to see that the price deviation deteriorates overall, as the price improvement for better executed trades does not compensate for the deterioration in the price of worse and similarly executed trades. The weighted average price deviation is now -0.12%. Graph 2 shows the distribution of deviations against comparable trades in the reference market.

Price execution of PFOF TV trades compared to the reference market TABLE 4

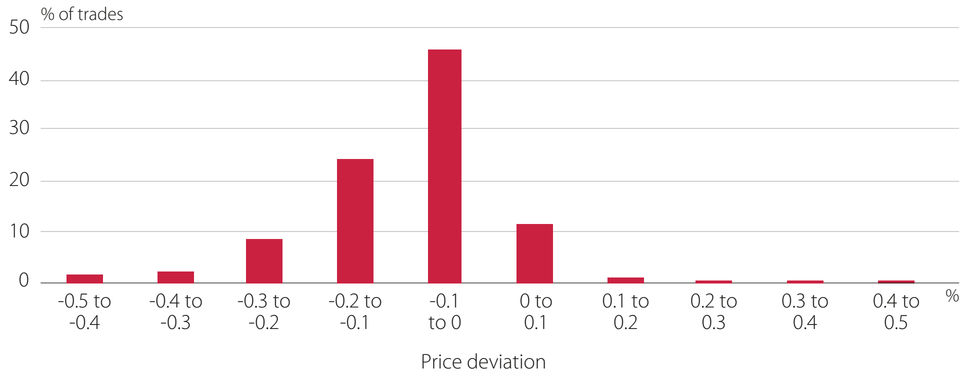
	Percentage of trades (%)	Average price difference (%)[1, 2]	Price difference per €1,000[2]
Worse	85.9	-0.16	-1.57
Better	3.5	0.31	3.11
Similar	10.6	0.05	0.50
Total	**100.0**	**-0.12**	**-1.19**

Source: CNMV.

1 The average price difference of a PFOF TV trade is computed against the least favourable price of all comparable trades executed in the reference market. A positive number means there is a price improvement whereas a negative number means there is a price deterioration.

2 The total average price difference and total price difference per €1,000 are computed as the average of all execution quality categories weighted by the percentage of trades in each category.

Distribution of price difference against the reference market FIGURE 2



Source: CNMV.

4 Conclusions

This analysis focuses on quality of execution and what the implicit cost, measured as the price deviation with respect to comparable transactions in liquid trading venues, of PFOF trades would have been for this particular broker, period and selected stocks. It shows that for the trades executed on behalf of the PFOF broker's clients through the PFOF TV on Spanish stocks during the first half of 2021, best execution was seldom achieved (only a 3.3% of the trades) and in most cases (86%) the prices obtained by clients were worse than the worse alternative in the group of comparable trading venues. The average price deterioration is estimated at €1.09 per €1,000 traded.

Since other brokers apply explicit commissions, in order to determine how the PFOF practice affects the PFOF broker's clients in net terms (worse prices obtained but lower or zero commissions paid), the overall cost should include both implicit and explicit components (i.e., both quality of execution and commissions). This analysis would require to determine first the explicit costs and commissions that PFOF broker's clients would have borne by engaging the services other competing non-zero commission brokers in several jurisdictions, which is not a set of data available at this time for CNMV.