

CORTEX EQUITIES

CORTEX ALTERNATIVE TRADING SYSTEM ("ATS")

ATS Monthly Statistics

November 2021

Cortex ATS is BNP Paribas' Alternative Trading System ("ATS"). The Cortex ATS is a non-displayed order book for listed equities that can be accessed by clients directly, or using one of BNP Paribas' equity trading platforms.

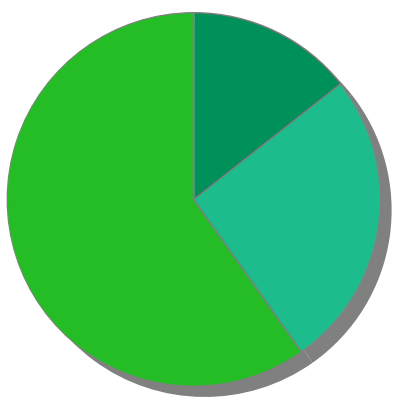
Summary Statistics	
ADV - Shares (MM) *	9.06
ADV - Notional (MM) *	11,024.8
# Symbols traded	8,369

* These figures are single counted.

Trade Size Statistics	
Avg Trade Size (shares)	114
% trades >= 10k shares	4.54%
% trades >= \$200k	8.99%

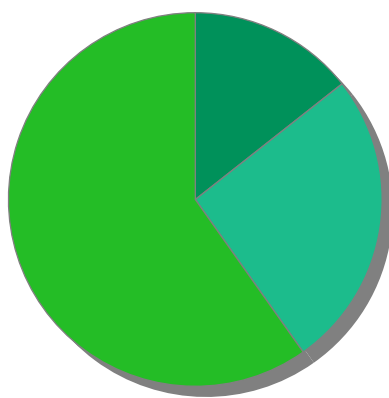
Trade Price Summary

% Trades



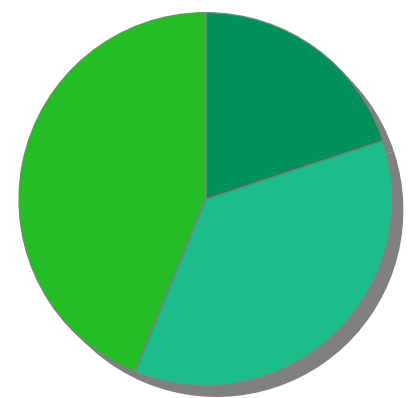
IntraSpread : 14%	Mid : 26%
NBBO : 60%	

% Shares



IntraSpread : 14%	Mid : 26%
NBBO : 60%	

% Notional

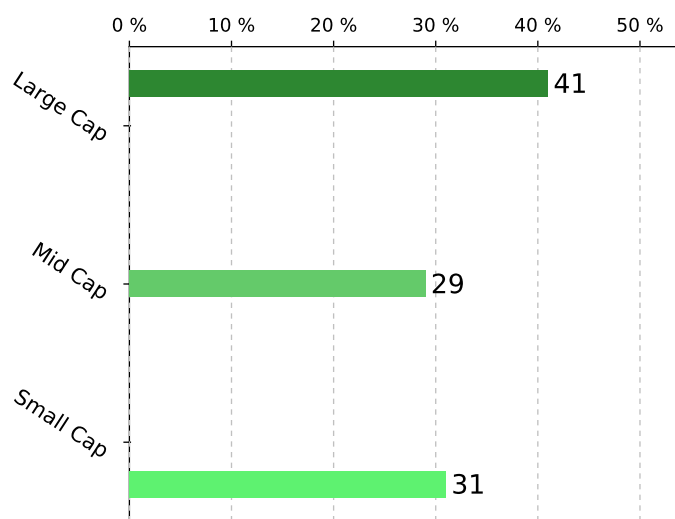


IntraSpread : 20%	Mid : 36%
NBBO : 44%	

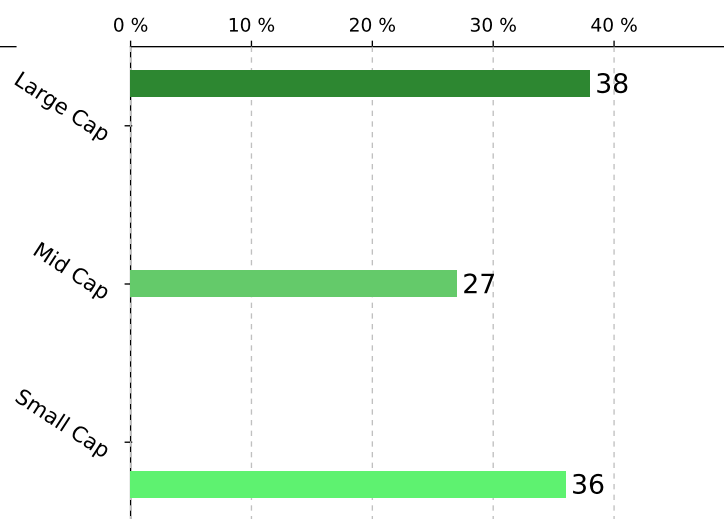
Source: BNP Paribas, November 2021

Market Cap Summary

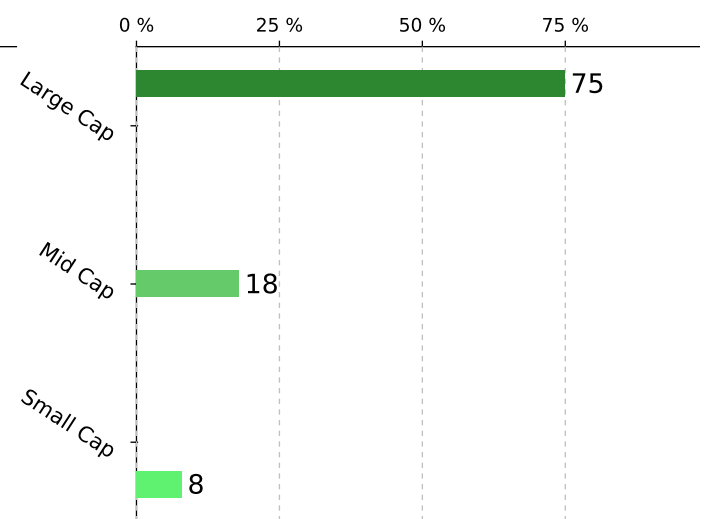
% Trades



% Shares



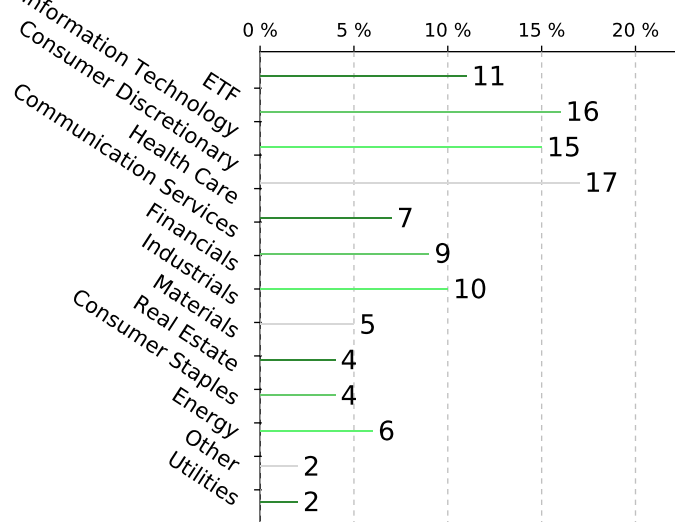
% Notional



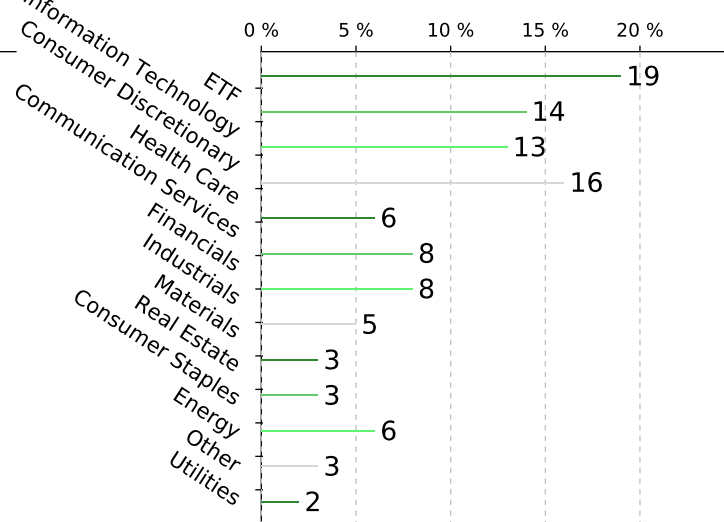
Source: BNP Paribas, November 2021

Sector Summary

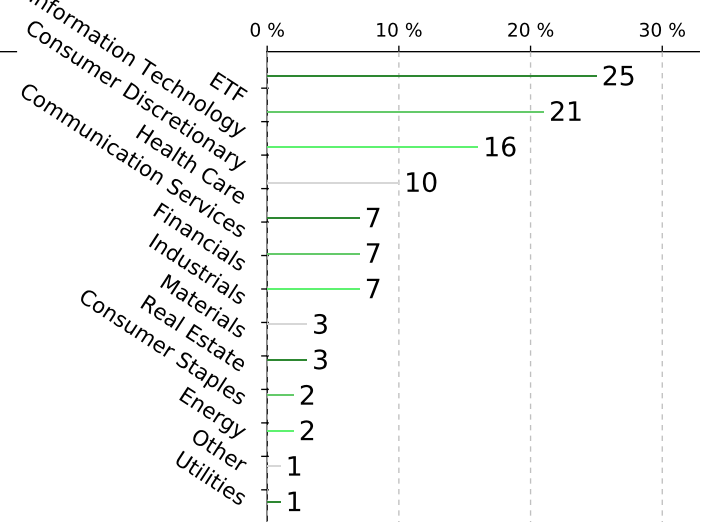
% Trades



% Shares



% Notional



Source: BNP Paribas, November 2021

Counterparty Type Summary

CounterParty Type	% Filled Shares	Average Fill Size	Spread Savings (bps)	Spread Savings (%)	Midpoint Slippage (bps)	T+20ms (bps)	T+30s (bps)	T+30m (bps)
1 Principal	0.00%	550.00	20.63	0.43	9.89	-4.96	2.52	89.74
2 Agency	3.82%	102.72	7.15	0.33	2.40	-0.79	-2.06	-7.84
3 Direct Low	68.09%	109.06	4.29	0.55	-0.48	0.57	0.52	0.48
4 Direct Medium	11.94%	107.83	4.16	0.46	0.58	-0.99	-0.88	0.79
5 Direct High	16.15%	150.57	4.17	0.33	0.95	-1.47	-0.97	-0.60
Total	100.00%	113.70	4.39	0.50	-0.00	0.00	0.00	-0.00

Source: BNP Paribas, November 2021

Glossary

Counterparty Type

- 1 Principal: BNP Paribas acting as principal
- 2 Agency: Agency client order flow sent from Algorithms or Smart Order Routers, where the router or the Algorithm logic elects to route to Cortex ATS
- 3 Direct Low: Agency client orders directly routed to Cortex ATS that are determined by BNP Paribas to have a low average price reversion
- 4 Direct Medium: Agency client orders directly routed to Cortex ATS that are determined by BNP Paribas to have a medium average price reversion
- 5 Direct High: Agency client orders directly routed to Cortex ATS that are determined by BNP Paribas to have a high average price

% Filled Shares: Percentage of shares executed against a counterparty type.

Average Fill Size: The arithmetic average of fill size across all executions.

Spread (bps): The average difference in ask and bid prices expressed in basis points.

Spread Savings (bps): The notionally-weighted difference between fill price and the far touch price at fill time expressed in basis points.

Spread Savings (%): The notionally-weighted difference between fill price and the far touch price as a percentage of the bid-ask spread.

Midpoint Slippage (bps): The notionally-weighted difference between fill price and the midpoint price of the stock expressed in basis points.

T+X (bps): The notionally-weighted difference between the midpoint price at fill +X time units and the midpoint price at fill time expressed in basis points.

The above numbers are side-adjusted.

Positive mark outs reflect that prices moved in your favor. e.g. When buying, prices increased after the trade.

Negative mark outs reflect that prices moved against you. e.g. When buying, prices decreased after the trade.



The bank for a changing world

Disclaimer

Legal Notice: This document is CONFIDENTIAL AND FOR DISCUSSION PURPOSES ONLY; it constitutes a marketing communication and has been prepared by a Sales and Marketing function within BNP Paribas and/or its subsidiaries or affiliates (collectively "we" or "BNP Paribas"). As a confidential document it is submitted to selected recipients only and it may not be made available (in whole or in part) to any other person without BNP Paribas' written consent.

This document is not a recommendation to engage in any action, does not constitute or form any part of any offer to sell or issue and is not a solicitation of any offer to purchase any financial instrument, nor shall it or any part of it nor the fact of its distribution form the basis of, or be relied on in connection with, any contract or investment decision. To the extent that any transaction is subsequently entered into between the recipient and BNP Paribas, such transaction will be entered into upon such terms as may be agreed by the parties in the relevant documentation.

The information contained in this document has been obtained from sources believed to be reliable, but there is no guarantee of the accuracy, completeness or suitability for any particular purpose of such information or that such information has been independently verified by BNP Paribas or by any person. None of BNP Paribas, its members, directors, officers, agents or employees accepts any responsibility or liability whatsoever or makes any representation or warranty, express or implied, as to the accuracy or completeness of the information, or any opinions based thereon, contained in this document and it should not be used in place of professional advice. Additional information may be provided on request, at our discretion. Any scenarios, assumptions, historical or simulated performances, indicative prices or examples of potential transactions or returns are included for illustrative purposes only. Past performance is not indicative of future results. Investors may get back less than they invested. BNP Paribas gives no assurance that any favourable scenarios described are likely to happen, that it is possible to trade on the terms described herein or that any potential returns illustrated can be achieved. This document is current as at the date of its production and BNP Paribas is under no obligation to update or keep current the information herein. In providing this document, BNP Paribas offers no investment, financial, legal, tax or any other type of advice to, and has no fiduciary duty towards, recipients. Certain strategies and/or potential transactions discussed in this document may involve the use of derivatives which may be complex in nature and may give rise to substantial risks, including the risk of total or partial loss of any investment or losses without limitation and which should only be undertaken by those with the requisite knowledge and experience. BNP Paribas makes no representation and gives no warranty as to the results to be obtained from any investment, strategy or transaction, or as to whether any strategy, security or transaction described herein may be suitable for recipients' financial needs, circumstances or requirements. Recipients must make their own assessment of strategies, securities and/or potential transactions detailed herein, using such professional advisors as they deem appropriate. BNP Paribas accepts no liability for any direct or consequential losses arising from any action taken in connection with or reliance on the information contained in this document even where advised of the possibility of such losses. As an investment bank with a wide range of activities, BNP Paribas may face conflicts of interest and you should be aware that BNP Paribas and/or any of its affiliates may be long or short, for their own account or as agent, in investments, transactions or strategies referred to in this document or related products before the material is published to clients and that it may engage in transactions in a manner inconsistent with the views expressed in this document, either for their own account or for the account of their clients. Additionally, BNP Paribas may have acted as an investment banker or may have provided significant advice or investment services to companies or in relation to investments mentioned in this document. The information in this document is not intended for distribution to, or use by, any person or entity in any jurisdiction where (a) the distribution or use of such information would be contrary to law or regulations, or (b) BNP Paribas or a BNP Paribas affiliate would become subject to new or additional legal or regulatory requirements. Persons in possession of this document should inform themselves about possible legal restrictions and observe them accordingly.

Each fiduciary of a pension, profit-sharing or other employee benefit plan subject to the Employee Retirement Income Security Act of 1974, as amended ("ERISA") (a "Plan"), should consider the fiduciary standards of ERISA in the context of the Plan's particular circumstances before authorizing any investment. Accordingly, among other factors, the fiduciary should consider whether an investment would satisfy the prudence and diversification requirements of ERISA and would be consistent with the documents and instruments governing the Plan. The U.S. Department of Labor has issued five prohibited transaction class exemptions ("PTCEs") that may provide exemptive relief for direct or indirect prohibited transactions resulting from the purchase or holding of financial products. Those class exemptions are PTCE 96-23 (for certain transactions determined by in-house asset managers), PTCE 95-60 (for certain transactions involving insurance company general accounts), PTCE 91-38 (for certain transactions involving bank collective investment funds), PTCE 90-1 (for certain transactions involving insurance company separate accounts) and PTCE 84-14 (for certain transactions determined by independent qualified professional asset managers). Due to the complexity of these rules and the penalties that may be imposed upon persons involved in non-exempt prohibited transactions, it is particularly important that fiduciaries or other persons considering purchases on behalf of or with "plan assets" of any Plan consult with their counsel regarding the availability of exemptive relief.

The information in this document is not intended for distribution to, or use by, any person or entity in any jurisdiction where (a) the distribution or use of such information would be contrary to law or regulations, or (b) BNP Paribas or a BNP Paribas affiliate would become subject to new or additional legal or regulatory requirements.

This document is intended only for those defined under U.S. securities laws as "institutional investors" and/or "major institutional investors". Securities transactions with BNP Paribas that result from the provision of this document will be effected by or through BNP Paribas Securities Corp., a U.S. registered broker-dealer and member of FINRA, the New York Stock Exchange and other principal exchanges.

© BNP Paribas. All rights reserved.

BNP Paribas Securities Corp., an affiliate of BNP Paribas, is a U.S. registered broker-dealer and a member of FINRA, the NYSE and other principal exchanges. Securities products offered by BNP Paribas Securities Corp. are not FDIC insured, are not bank deposits or bank guaranteed, and are subject to investment risk, including possible loss of the principal invested.



The bank for a changing world