

## Authorized Counterparties Annex

Counterparty name	LEI	Asset Class		
		Equities	Fixed Income	Derivatives
ABG Sundal Collier Inc.	2138005DRCU66B8BNY04	Yes	Yes	No
ABN AMRO Bank NV	BFXS5XCH7N0Y05NIXW11	No	Yes	No
ABSA Bank Kenya PLC	SLI1CVYMJ21DST0Q8K25	No	Yes	Yes
Amherst Pierpont Securities LLC	549300LGG2RLWD21SU97	No	Yes	No
Arbor Research & Trading LLC	ZXV72XFMG8HDWWYVVP59	No	Yes	No
Arctic Securities AS	5967007LIEEXZX4RVS72	No	Yes	No
Auerbach Grayson & Company LLC	254900THN5ANAH8X1V30	Yes	No	No
Australia and New Zealand Banking Group Limited	JHE42UYNWWTJB8YTTU19	No	Yes	No
Baader Helvea Inc.	5299005SXWC5JPSP0729	Yes	Yes	No
Baader Helvea Ltd	529900DXD7EPV64JOG51	Yes	No	No
Baer Crosby and Pike Agencia de Valores SA	9598002N44FY4MZFPQ62	No	Yes	No
Banca Akros SpA	549300GRXFI7D6PNEA68	No	Yes	No
Banco Bilbao Vizcaya Argentaria Sociedad Anonima SA	K8MS7FD7N5Z2WQ51AZ71	No	Yes	Yes
Banco Bradesco SA	549300CTUU1RFXHQJE44	No	Yes	No
Banco BTG Pactual SA	ZXLTQRYIK6IJH3R0IK66	No	Yes	No
Banco Santander SA	5493006QMFDDMYWIAM13	No	Yes	No
Banctrust Investment Bank Ltd	213800L2NNQOBXPF1425	No	Yes	No
Bank Gutmann AG	549300KFLI6V2PUY8522	No	No	Yes
Bank Julius Baer & Co. AG	PNWU8O0BLT17BBV61Y18	No	Yes	Yes
Bank of America NA	B4TYDEB6GKMZO031MB27	No	No	Yes
Bank of America Securities Europe SA	549300FH0WJAPEHTIQ77	Yes	Yes	Yes
Bank of America Securities Inc.	549300HN4UKV1E2R3U73	Yes	No	No
Bank of Montreal London Branch	NQQ6HPCNCCU6TUTQYE16	No	Yes	No
Bank Vontobel AG	549300L7V4MGECYRM576	Yes	Yes	Yes
Banque Pictet & Cie S.A.	4LCYDN74UCFU5VPM4774	Yes	Yes	Yes
Barclays Bank Ireland PLC	2G5BKIC2CB69PRJH1W31	No	Yes	Yes
Barclays Bank PLC	G5GSEF7VJP5I7OUK5573	Yes	Yes	Yes
Barclays Capital Incorporated	AC28XWWI3WIBK2824319	No	Yes	No
Barclays Capital Securities Limited	K9WDOH4D2PYBLSOB484	Yes	No	No
Batlivala & Karani Securities India Private Limited	335800UPB6WYCL1OGO02	Yes	Yes	No
Bayerische Landesbank AG	VDYMYTQGZZ6DU0912C88	No	Yes	No
BCP Securities LLC	2549006Q2SCXK1988H68	No	Yes	No
Berenberg Joh. Berenberg Gossler & Co. KG	529900UC2OD7II24Z667	Yes	No	No
Bernstein Autonomous LLP	213800LBM6PT85IGM996	Yes	No	No
BGC Brokers LP	ZWNFQ48RUL8VJZ2AIC12	No	Yes	Yes
Bloomberg Global Limited	549300O9PUG5E512LD66	Yes	Yes	No
Bloomberg Swap Execution Facility LLC	5493003IUYOH354SNS58	No	No	Yes
BNP Paribas SA	R0MUWSFPU8MPRO8K5P83	Yes	Yes	Yes
BNP Paribas Securities Services	549300WCGB70D06XZS54	No	Yes	Yes
BOCI Securities Limited	549300VO4FJKJIJG2H24	No	Yes	No

Bondpartners SA	391200DMGAI5C0MDYA12	No	Yes	No
Bradesco Securities Incorporated	5493005BOEQJY4OBZP25	No	Yes	No
Bradesco Securities UK Limited	54930045S6RXC5Q0W70	No	Yes	No
Bridport & Cie SA	213800VGFKO4K5IJUI20	No	Yes	No
BTG Pactual US Capital LLC	549300EUEDL5GKQW8U35	Yes	Yes	No
BTIG Hong Kong Ltd	213800BSSRY2B397835	Yes	No	No
BTIG LLC	549300GTG9PL6WO3EC51	Yes	No	No
BTIG Singapore Pte. Ltd	213800G73Y7F1Y53188	Yes	Yes	No
Caceis Bank France	96950023SCR9X9F3L662	No	No	Yes
Canaccord Genuity LLC	WTX5X269IUOQ9YMI7R44	No	Yes	No
Canadian Imperial Bank of Commerce	2IGI19DL77OX0HC3ZE78	No	Yes	No
Cantor Fitzgerald & Co.	5493004J7H4GCPG6OB62	Yes	Yes	No
Cantor Fitzgerald Europe	549300KM6VUHPKQLQX53	Yes	Yes	No
Carnegie Inc.	549300TV0TOBI3QUPX65	Yes	Yes	No
China International Capital Corporation Hong Kong Securities Ltd	529900A2OXHI3I5TPV90	Yes	No	No
CICC US Securities	2549000DUR72WYLKY616	Yes	Yes	No
Citco	549300SGF4BS54YG8M65	No	No	Yes
Citibank Columbia SA	SSER7O0CV66FF0PRYK94	No	Yes	No
Citibank Europe PLC	N1FBEDJ5J41VKZLO2475	No	Yes	No
Citibank NA	E57ODZ7ZF41MRHTR1V493	No	Yes	No
Citigroup Global Markets Europe AG	6TJCK1B7E7UTXP528Y04	Yes	Yes	Yes
Citigroup Global Markets Inc	MBNUM2BPBDO7JBLYG310	Yes	Yes	No
Citigroup Global Markets Ltd	XKZZ2JZF41MRHTR1V493	Yes	Yes	Yes
CLSA UK	213800VZMAGVIU2JA72	Yes	Yes	No
Commerz Markets LLC	549300IMBXQ8SGH3HJ31	Yes	No	No
Commerzbank AG	851WYGNLUQLFZBSYGB56	No	Yes	Yes
Cooperatieve Rabobank U.A.	DG3RU1DBUFHT4ZF9WN62	No	Yes	No
Cowen and Company	5493008QIOEFC5WBED75	Yes	No	No
Credit Agricole Corporate & Investment Bank	1VUV7VQFKUOQSJ21A208	No	Yes	Yes
Credit Lyonnais Securities (Asia)	213800M2DXATWY7JMS07	Yes	No	No
Credit Suisse (Switzerland) Limited	549300CWR0W0BCS9Q144	No	No	Yes
Credit Suisse AG	ANGGYXNX0JLX3X63JN86	Yes	Yes	Yes
Credit Suisse International	E58DKGMJYYYJLN8C3868	No	No	Yes
Credit Suisse Securities (Europe) Limited	DL6FFRRLF74S01HE2M14	Yes	Yes	No
Credit Suisse Securities (USA) LLC	1V8Y6QCX6YMJ2OELI46	No	Yes	No
Daiwa Capital Markets America Inc.	M67H5PRC0NQKM73ZAS82	Yes	No	No
Daiwa Capital Markets Deutschland GmbH	549300NEBDPH0ZXIF850	No	Yes	No
Daiwa Capital Markets Europe Limited	MIM2K09LFDY4IB163W58	Yes	Yes	No
Davy Stockbrokers	635400XFL6O4CHQ88A56	Yes	No	No
DBS Bank Limited	ATUEL7OJR5057F2PV266	No	Yes	No
Deka Bank Deutsche Girozentrale (Deka)	0W2PZJM8XOY22M4GG883	No	Yes	Yes
Deutsche Bank AG London Branch	7LTFWZYICNSX8D621K86	No	Yes	Yes
Deutsche Bank Securities Inc.	9J6MBOOO7BECTDTUZW19	Yes	No	No
DNB Markets Inc.	549300JP2KNKSIPRRE59	Yes	No	No
DZ Bank AG Deutsche Zentral- Genossenschaftsbank	529900HNOAA1KXQJQU27	No	Yes	Yes
Erste Group Bank AG	PQOH26KWDF7CG10L6792	No	Yes	Yes
Evercore ISI	5493008F0LRLS5N8LZ81	Yes	No	No
First Abu Dhabi Bank PJSC	2138002Y3WMK6RZS8H90	No	Yes	No
FirstRand Bank	ZAYQDKTCATIXF9OQY690	No	Yes	Yes
Flow Traders BV	549300CLJI9XDH12XV51	No	Yes	No

Gazprombank (Joint Stock Company)	253400WSS48YWMBUA688	No	No	No
GFI Securities LLC	GUNTJCA81C7IHNBG1392	No	No	Yes
Goldman Sachs & Co. LLC	FOR8UP27PHTHYVLBNG30	Yes	Yes	No
Goldman Sachs Bank Europe SE	8IBZUGJ7JPLH368JE346	Yes	Yes	Yes
Goldman Sachs Bank USA	KD3XUN7C6T14HNAYLU02	No	No	Yes
Goldman Sachs International	W22LROWP2IHZNBB6K528	Yes	Yes	Yes
Goodbody Stockbrokers	635400IL71G3SXS7OE16	Yes	No	No
Gottex Securities AB	549300NUBCPBLVYI6F75	No	Yes	No
Guotai Junan International Holdings Limited	254900S5DYP2FGNCIP43	No	Yes	No
Guy Buttler Limited	213800AG2H8MB5FGJ538	No	Yes	No
Ho Chi Minh City Securities Corporation	213800SAZX6COB8ML838	Yes	No	No
HSBC Bank PLC	MP6I5ZYZBEU3UXPYFY54	Yes	Yes	No
HSBC Securities	CYYGQCGNHMHPMRL3R97	Yes	No	No
HSBC Trinkhaus & Burkhard AG	JUNT405OW8OY5GN4DX16	No	Yes	Yes
ICAP IL India Private Limited	335800WZ7D3MYZ882192	No	Yes	No
ICBC Standard Bank PLC	F01VVKN4DRF2NWKQG283	No	Yes	Yes
ICICI Securities Ltd.	335800RT5NJ3UPWK7351	Yes	No	No
IIFL Securities Limited	335800DFGY67CJENRH26	Yes	No	No
Imperial Capital International LLP	213800L9V84UL88WAV68	No	Yes	No
ING Bank NV	3TK20IVIUJ8J3ZU0QE75	No	Yes	Yes
Instinet Europe Limited	213800MXAKR2LA1VBM44	Yes	No	No
Instinet Germany GmbH	213800A7BEQATAOUAN40	Yes	No	No
Instinet LLC	549300MGMN3RKMU8FT57	Yes	No	No
Intesa Sanpaolo SpA	2W8N8UU78PMDQKZENC08	Yes	Yes	Yes
Investec Securities US LLC	84S0VF8TSMH0T6D4K848	Yes	No	No
ISP Securities AG	529900T4ZD3BVDVAVQ174	No	Yes	No
Itau BBA International PLC	5493009ADHYKU8V9P697	Yes	Yes	No
Itau Securities Inc.	5493008E85XK12EKYI22	Yes	No	No
Itau Unibanco S.A.	BZO2P8KHO2O10H5QQ663	No	Yes	No
J.P. Morgan AG (JPMAG)	549300ZK53CNGEEI6A29	No	Yes	Yes
J.P. Morgan Chase Bank N.A.	7H6GLXDRUGQFU57RNE97	No	No	Yes
J.P. Morgan Securities LLC	ZBUT11V806EZRVTW7807	Yes	No	Yes
J.P. Morgan Securities PLC	K6Q0W1PS1L1O4IQL9C32	Yes	Yes	Yes
Jane Street Financial Limited	549300ZHEHX8M31RP142	No	Yes	No
Jefferies GmbH	5493004I3LZM39BWHQ75	No	Yes	No
Jefferies International Limited	S5THZMDUJCTQZBTRVI98	Yes	Yes	No
Jyske Bank A/S	3M5E1GQGKL17HI6CPN30	No	Yes	No
KBC Group	213800X3Q9LSAKRUWY91	No	Yes	No
Kepler Capital Markets Inc.	254900VCHS9DMDUVZN16	Yes	No	No
Kezar Trading	254900ZBK50B4Y36MJ33	Yes	No	No
KNG Securities LLP	213800GV7S9JSGKG9548	No	Yes	No
Kotak Securities	335800UUZDPJ7XGOFU74	Yes	No	No
Landesbank Baden-Wuerttemberg (LBBW)	B81CK4ESI35472RHJ606	No	Yes	Yes
Landesbank Hessen-Thueringen Girozentrale	DIZES5CFO5K3I5R58746	No	Yes	No
Larrain Vial S.A.	54930031WU1KNWNY7T88	No	Yes	No
Liquidnet Europe Limited	213800ZIRB79BE5XQM68	No	Yes	No
Liquidnet Inc.	213800HSKBBO1GCVRG79	No	Yes	No
Lloyds Bank PLC	H7FNTJ4851HG0EXQ1Z70	No	Yes	No
Loop Capital Markets LLC	254900FPPM2WN90D4786	Yes	No	No
Macquarie Bank Limited London Branch	4ZHCHI4KYZG2WVRT8631	No	Yes	Yes
Macquarie Capital (Europe) Limited	549300GX4FPMFF91RJ37	Yes	No	No

Macquarie Capital Inc.	549300670K07JRB5UQ40	Yes	No	No
Marex Capital Markets Inc	5493006BWPDUYCYG6EQ34	No	Yes	No
MarketAxess Corporation	GPSMMRI21JE7ZCVYF972	No	Yes	No
MarketAxess Europe Limited	549300TTHIODYMGND828	No	Yes	No
MarketAxess Holdings Inc.	5493002U1CA1XJOVID83	No	Yes	No
MarketAxess NL B.V.	5299000UUYW66L5LT560	No	Yes	No
Max Capital S.A. Agente de Valores	254900P7CQ52LIZLBB43	No	Yes	No
Merrill Lynch International and/or their affiliates	GGDZP1UYGU9STUHRDP48	Yes	Yes	Yes
Merrill Lynch Pierce Fenner & Smith Incorporated	8NAV47T0Y26Q87Y0QP81	No	Yes	No
Millenium Europe Limited	213800M4PALWKTSLI88	No	Yes	No
Mirabaud Securities Limited	2138008Z5T61L1ZDWW35	No	No	No
Mitsubishi UFJ Investor Services & Banking (Luxembourg) S.A	2138002PVBMEHILJ1340	No	Yes	No
Mitsubishi UFJ Trust & Banking	JBONEPAGQXF4QP29B387	No	Yes	No
Mitsubishi UFJ Trust International Limited	213800ZXJI3S6VKHTX31	No	Yes	No
Mizuho International PLC	213800HZ54TG54H2KV03	No	Yes	No
Morgan Stanley & Co. International PLC	4PQUHN3JPFQFNF3BB653	Yes	Yes	Yes
Morgan Stanley & Co. LLC	9R7GPTSO7KV3UQJZQ078	No	No	Yes
Morgan Stanley Bank N.A.	G1MLHIS0N32I3QPILB75	No	No	Yes
Morgan Stanley Capital Group INC	VB7RXNZGO6KVDABYB880	No	No	Yes
Morgan Stanley Capital Services LLC	I7331LVCZKQKX5T7XV54	No	No	Yes
Morgan Stanley Europe SE (MESE)	54930056FHWP7GIWYY08	Yes	No	Yes
Motilal Oswal Securities Ltd.	3358004GYYY6FUXX1P93	Yes	No	No
MUFG Securities EMEA PLC	U7M81AY481YLIOR75625	No	Yes	No
Natixis S.A.	KX1WK48MPD4Y2NCUIZ63	No	Yes	No
Nomura Financial Products Europe GmbH	5493002XYZZ0CGQ6CB58	No	Yes	No
Nomura International PLC	DGQCSV2PHVF7I2743539	No	Yes	Yes
Norddeutsche Landesbank -Girozentrale-(Nord LB)	DSNHQ2B9X5N6OUJ1236	No	Yes	No
Numis Securities Inc.	213800GW3YJZDBPALN37	Yes	No	No
Octavian AG	506700FPZ0G1701H5810	No	No	No
Octo Finances S.A.	969500378YE4MLGK0898	No	Yes	No
Oddo BHF New York Corporation	969500PM0E65UZXZGK64	Yes	No	No
ODDO BHF SCA	9695002I9DJHZ3449O66	Yes	Yes	No
Oppenheimer Europe Limited	213800CH6IZ9J98PIS59	No	Yes	No
Optiver V.O.F.	7245009KRYSAJB2QCC29	Yes	No	No
Pareto Securities AS	549300H0QDQHRJXR779	No	Yes	No
Pavillion Global Markets Ltd.	89RLTMP2WM4KXYJMWI06	Yes	No	No
Pershing LLC	ZI8Q1A8EI8LQFJNM0D94	No	Yes	No
Pictet & Cie (Europe) S.A.	549300GSSPQ1QSKI1376	Yes	No	No
Puente Corredor de Bolsa S.A.	254900XOUU747GI8HO92	No	Yes	No
Raiffeisen Bank International	9ZHRYM6F437SQJ6OUG95	No	Yes	No
Raiffeisen Schweiz Genossenschaft	5299006GIHQ1ELISCV48	No	No	Yes
Raiffeisen Zentralbank Oesterreich AG (RCB) - Raiffeisen Centrobank AG	529900M2F7D5795H1A49	No	No	Yes
RBC Capital Markets (Europe) GmbH	549300SXSTGQY3EA1B18	No	Yes	No
RBC Capital Markets LLC	549300LCO2FLSSVFFR64	Yes	No	No
RBC Europe Limited	TXDSU46SXBWIGJ8G8E98	No	Yes	Yes
RBC Investor Services Bank S.A.	549300IVXKQHV6O7PY61	No	No	Yes
Redburn Securities	213800TYRTQILMQQLV79	Yes	No	No
Renaissance Securities (Cyprus) Limited	IK9CLH4U15AXJV22968	No	No	No
RJ O'Brien France S.A.	5493005C7D4YURSCIP31	No	Yes	No

Robert W. Baird & Co. Incorporated	549300772UJAHRD6LO53	No	Yes	No
Roth Capital Partners LLC	549300FMF3TPT1HFRF48	No	No	No
Royal Bank of Canada (RBC)	ES7IP3U3RHIGC71XBU11	No	No	Yes
Royal Bank of Scotland (NatWest Markets N.V.)	X3CZP3CK64YBON1LE12	No	Yes	No
Royal Bank of Scotland (NatWest Markets PLC)	RR3QWICWWIPCS8A4S074	No	Yes	Yes
Sanford C Bernstein (Hong Kong) Limited	549300DQEYY1QJS1ZF35	Yes	No	No
Sanford C. Bernstein & Co. LLC	549300I7JYZHT7D5CO04	Yes	No	No
Sanford C. Bernstein Limited	54930049G8WQ5OOUUSD19	Yes	No	No
Santander Investment Securities Inc.	549300FT36TF8GQFTL08	Yes	No	No
Sberbank CIB (UK) Limited	549300BKWHXYEXPV0328	No	No	No
SC Lowy Financial (HK) Limited	254900S5OKNBNULX1O50	No	Yes	No
Scotia Capital Inc.	549300BLWPABP1VNME36	No	No	No
Scotiabank Brasil S.A. Banco Multiplo	5493006BOR66ZCCLIQG62	No	Yes	No
Scotiabank Chile	54930018SOOHBHRLWC16	No	Yes	No
Scotiabank Colpatría S.A.	5493003NMRIY0Z3WLF37	No	Yes	No
Scotiabank Europe PLC	5G6NVP4WADOI32VUUB17	No	Yes	No
Seaport Global Securities LLC	54930028D6D0G5RZJ888	No	Yes	No
Seaport Group Europe LLP	2138003MLD2U3GEMHS70	No	Yes	No
SEB Securities	549300O01JBQJ46JL826	Yes	No	No
Seminario & Cia. Sociedad Agente de Bolsa S.A.	254900BWIMJ4JS1FDK25	No	Yes	No
Skandinaviska Enskilda Banken AB (publ.) SEB	F3JS33DEI6XQ4ZBPTN86	No	Yes	No
SMBC Nikko Capital Markets Limited based in London	G7WFA3G3MT5YHH8CHG81	No	Yes	No
SMBC Nikko Securities America Incorporated	6PJDTY319315T5LR2241	No	Yes	No
Societe Generale	549300F35UE0BOM1WJ55	Yes	No	No
Societe Generale International Limited	0IKLU6X1B10WK7X42C15	Yes	Yes	Yes
Societe Generale S.A.	O2RNE8IBXP4R0TD8PU41	Yes	Yes	Yes
Standard Chartered Bank	RILFO74KP1CM8P6PCT96	No	Yes	Yes
Standard Chartered Bank (Singapore Limited)	549300MDYVVHJ8D1DW28	No	No	No
State Street Global Markets LLC/Trumid	549300FDEDF5ORXCMQ56	Yes	Yes	No
Stifel	529900MC68RTGHKI4F05	Yes	No	No
Stifel Nicolaus & Company Incorporated	5WUVMA08EYG4KEUPW589	No	Yes	No
Stifel Nicolaus Europe Limited	213800BVEFNZ8UYPKL03	No	Yes	No
Stifel Schweiz AG	529900CK52XV44DGP082	Yes	No	No
StoneX Financial Ltd	549300AWF3TOHRYL7754	No	Yes	No
Strategas Securities LLC	254900D5NQ2O9DJLKH96	No	No	No
Sumridge Partners LLC	529900ECMK8VI6Q1FG89	No	Yes	No
Susquehanna Financial Group LLLP	549300E8QX0ZMRDC2M81	No	Yes	No
TD Global Finance Unlimited Company	F16C7E5PBUB3F9K43B44	No	Yes	No
TFS Derivatives Limited	549300WXUYR1CMLDQF25	No	No	Yes
The Bank of New York Mellon	HPFHU0OQ28E4N0NFVK49	No	Yes	No
The Bank of New York Mellon SA	MMYX0N4ZEZ13Z4XCG897	No	Yes	Yes
The Bank of Nova Scotia London Branch	L319ZG2KFGXZ61BMYR72	No	No	No
Toronto Dominion Bank (London Branch) TD Securities Limited	PT3QB789TSUIDF371261	No	Yes	No
TPCG Financial Services Agente de Valores S.A.	254900NWUJKO9QOWUU48	No	Yes	No
Tradeweb EU B.V.	724500D4BFEWKWVC1G62	No	Yes	Yes
TradeWeb Europe Limited	2138001WXZQOPMPA3D50	No	Yes	Yes

Tradition Securities and Futures (TSAF)	969500ULC0Y11G0A4O72	No	No	Yes
TSAF OTC Paris	969500V058ZSY03FNX80	No	Yes	No
U.S. Bank National Association	6BYL5QZYBDK8S7L73M02	Yes	No	No
UBS AG	BFM8T61CT2L1QCEMIK50	Yes	Yes	Yes
UBS Asset Management (UK) Limited	549300SGDHJDHGZYMB20	No	Yes	No
UBS Europe SE	5299007QVIQ71O64NX37	Yes	Yes	Yes
UBS Securities LLC	T6FIZBDPKLYJKFCRVK44	Yes	Yes	No
UniCredit Bank AG	2ZCNRR8UK83OBTEK2170	No	Yes	No
Valcourt SA	213800QCVQCX88M5U770	No	Yes	No
Virtu ITG	549300S41SMIODVIT266	Yes	No	No
Virtu ITG Europe Limited	213800EEEC95PRUCEUP63	Yes	No	No
VTB Capital PLC	74OG4PIVJ3TT4O5NSN12	No	No	No
Wells Fargo Bank National Association	KB1H1DSPRFMYMCUFXT09	No	Yes	No
Wells Fargo Securities International Limited	BWS7DNS2Z4NPKPNYKL75	No	Yes	No
Wells Fargo Securities LLC	VYVVCKR63DVZZN70PB21	Yes	Yes	No
Winterflood Securities Limited	8BRUP6V1DX3PIG2R0745	Yes	No	No
XP Investments US LLC	549300HDFLS7P433PO89	Yes	Yes	No
Zuercher Kantonalbank (ZKB)	165GRDQ39W63PHVONY02	Yes	Yes	Yes