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### ETF Fundamentals: Caveats

### • The term "ETF" includes a number of different legal structures

- Investment Company Act of 1940
- Securities Act of 1933
- UCITS IV
- Hong Kong Securities and Futures Ordinance and Code on Unit Trusts
- Singapore Securities and Futures Act
- Market structure is not uniform across the globe
  - U.S. National Market System—mandatory printing of trades to a central tape within 90 seconds
  - Predominantly OTC across Europe with no consolidated, mandatory prints
  - Varying requirements for market making activity
  - Available order types vary by exchange



#### **ETF Fundamentals:** *Drivers of Creations or Redemptions*

#### • Product seed

- Creates initial inventory available for trading
- Index reconstitution
  - PM can: (a) buy/sell securities in the portfolio, (b) request custom creations/redemptions from an AP, or (c) do a combination of both

## • Imbalances in the secondary market

- Significant flow in one direction trigger APs to cover short positions or unwind long positions
- Large trades
  - Often filled with a corresponding creation/redemption
- Arbitrage
  - Dislocation between an ETF's share price and fair value of the basket is an opportunity for profit



#### ETF Fundamentals: Participants and Their Roles

- ETF provider/issuer/sponsor—manages the ETF portfolio
- Transfer agent and registrar—maintain records of ETF share issuance
- Authorized Participant—purchases/redeems shares from an ETF provider in the <u>primary market</u>
- Lead Market Maker—maintains orderly two-sided markets and provides liquidity in specific ETFs
- Investor—buys and sells ETF shares in the secondary market



#### **ETF Fundamentals:** *Order Flow*



#### Knight

#### Creation/Redemption: In-Kind Create





#### Creation/Redemption: Cash Create with T-1 Cut-Off





### Creation/Redemption: Directed Cash Create (T-1 Cut-Off)

	Т-2		т	T+1			
ETF Sponsor	Construct and price PCF plus estimated cash (after market close)	Publish PCF through NSCC / Email (using prior night's closing prices)	Instruct "designated broker" to trade basket for prior day's C/R activity Publish NAV and actual cash	Send/receive trade confirms (for ETF C/R activity and portfolio/basket trades)	Transfer ETF shares in return for cash; settle basket and F/X transactions using incoming cash		
AP		Conduct market making activity intraday Send C/R trades to ETF sponsor by 4pm		Receive trade confirms for ETF C/R activity	Transfer cash in return for ETF shares "True-up" delta between executed basket and PCF + actual cash*		
DB			Trade basket as agent of ETF Sponsor	Execute F/X trades Send trade confirms for basket to ETF Sponsor			

\*Delta typically covered by AP and may reflect difference of commission arrangement between AP and Designated Broker versus ETF Sponsor's standard brokerage arrangement.



## Assessing an ETF's Liquidity

- 1. Objective for the trade
- 2. Timing relative to trading hours for the ETF and its basket constituents
- 3. Size of trade relative to ETF's volume traded (historical and current)
  - Informs path of execution and cost/impact expectations
- 4. Current size and depth of national limit order book
- 5. Potential impact of your trade on ETF's basket constituents (most relevant for large trades)
  - Market impact and other costs of trading the basket



## **Volume Traded**

EMLC US \$         27.22         02           At 11:48         Vol 231,836         02	∽∽∽ Z27.22 / 27.23 27.21 P H 27.24 D L 27.18	) 2×9 D Val 6.31M						
EMLC US Equity 99 Feedback		Page 1/5 Description: Profile						
1) Profile 2) Performance	e 3) Holdings 4) Allo	cations 5) Organizational						
MARKET VECTORS EMERGING MARK	Objective Eme	rging Market-Debt						
Market Vectors Emerging Markets Loca	l Currency Bond ETF is an exchange	e-traded fund incorporated in						
the USA. The Fund seeks investment re	sults the correspond with the perfo	rmance of the JP Morgan						
Government Bond Index - Emerging M	arkets Global Core. [BBGID BBG00	0BF8YP3]						
		A +						
6) Current Data (COMP)	Bloomberg Classification	Appropriations						
1 yr Tat Ret vs Index	Fund Type ETF	Leverage No						
EMLC US Equity 0.8565	Asset Class Debt	Actively Managed No						
we a show the	Size N.A.	Swap Based No						
when a way .	Style N.A.	Derivatives Based No						
V. M	Geo. Focus. International	Currency Hedged No						
Nar Jun Sen Dec Har		Replication Strategy Full						
2012 2013		Securities Lending Unknown						
7) Price (GP) USD 27.22	Trading Data	Characteristics						
8) NAV(NAV) USD 27.08	Bid Ask Spread 0.010	Und. Index 10) GBIEMCOR						
INAV USD 27.01	30D Avg Volume 682.7k	Index Weight Market Cap						
Fund Percent Premium 0.815%	Implied Liquidity N.A.	Px Track. Error 2.915						
52 Wk H 02/01/13 USD 27.67	Market Cap USD 1.55B	NAV Track. Error .655						
52 Wk L 06/01/12 USD 23.971	Shares Out 56.8M	Inception Date 07/23/10						
9) Options(OMON) Yes	Total Assets USD 1.54B	Expense Ratio .470%						
Australia 61 2 9777 8600 Brazil 5511 3048 4500 Europe 44 20 7330 7500 Germany 49 69 9204 1210 Hong Kong 852 2977 6000 Japan 81 3 3201 8900 Singapore 65 6212 1000 U.S. 1 212 318 2000 Copyright 2013 Bloomberg Finance L.P. SN 318416 6521-3542-0 08-Mar-13 11:49:20 EST GMT-5:00								

## **Order Book**

EML	CUS\$		27.	23	01	ħ <sub>Y</sub> ~	~~* <b>/</b> *		C27.23,	/27.2	4 P		2	×40			
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Excha	nges: 🔽 .	<mark> </mark> AR(	CA (	BATS (	🔳 Tot	alv						_					
							■L= ■	Zoom –	·•	100%	\$		Average B	uy/Sell Price			
1) Or	rder Book	2)	Broker E	Book						_), C	Cente	ar -	<ul> <li>Buy</li> </ul>	Amount		1	
E	Time	Total	Mmkr	Size	Bid 🛆	Ask	Size	Mmkr	Total	Time	E		I Sell	Avg Price	27.:	2400	
Z	11:54	1	BATS	1	27.23	27.24	2	EDGX	2	11:45	К	L		Remaining		0	
J	11:54	3	EDGA	2	27.23	27.24	1	BYXX	3	11:54	Y	L	9 Quote R	ecap (QR)			
Т	11:54	4	NSDQ	1	27.23	27.24	21	EDGA	24	11:54	J	1111	Time	Size	Prio	ce E	ľ
С	11:54	6	CINN	2	27.23	27.24	1	CBSX	25	11:54	0	L	11:55:28	587	127.23	3 UC	2
P	11:34	7	ARCX	1	27.22	27.24	10	NSDQ	35	11:54	T	L	11:55:28	587	27.23	34 UI	2
0	11:54	8	CBSX	1	27.22	27.24	23	BATS	58	11:55	Z		11:54:19	100	27.2	3 UC	2
P	11:54	10	ARCX	2	27.21	27.24	40	ARCX	98	11:55	P		11:54:18	100	27.23	3 UC	2
Υ 	11:54	11	ΒΥΧΧ	1	27.21	27.25	2	NQBX	100	11:54	В	Ш	11:54:17	200	27.23	3 V.	9
K	11:54	12	EDGX	1	27.21	27.25	1	CINN	101	11:54	C	Ш	11:54:16	200	27.23	3 UC	
В	11:54	13	NQBX	1	27.21	27.25	1	ARCX	102	11:55	P	J	11:54:16	100	27.2	3 VK	
Р	11:54	14	ARCX	1	27.20	27.26	11	ARCX	113	11:55	Р	Ш	11:54:14	100	127.23	3 UC	
P	11:54	25	ARCX	11	27.19	27.27	1	ARCX	114	11:55	Р		11:54:14	200	27.24	4 ₩,	0
P	11:54	26	ARCX	1	27.18	27.28	19	ARCX	133	11:50	Ρ		11:54:14	100	27.24	4 V.	J
P	11:54	37	ARCX	11	27.17	27.29	2	ARCX	135	11:47	Ρ		11:54:14	139	27.23	3 UF	٩,
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Beta				.993		Th	eo Auct	νοι			N.A						
% Ch	ange			04%									🔁 As o	f 11:55:28			
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### The Basket

# Bond baskets introduce additional nuances into assessing impact and other trading costs

- 1 CU of EMLC = 200,000 shares (\$5.4m)
- Basket composed of approximately 224 lines in 18 different currencies
- Sourcing challenges

			USD			Industry				Adj Last	Amount	% of
ISIN	Quantity	Face (Local)	Equiv	Security Name	Name	Sector	Country	Currency	Last Price	Crncy	Outstanding	Outstanding
US05964TAE91	211	211,000	108,233	BANSAF 10 1/4 08/08/16	BANCO SAFRA SA	Financial	BRAZIL	BRL	1.9495	0.5130	800,000,000	0.026%
US168863AU21	68689	68,689,000	145,666	CHILE 5 1/2 08/05/20	REPUBLIC OF CHILE	Government	CHILE	CLP	471.5500	0.0021	434,345,000,000	0.016%
XS0213272122	128130	128,130,000	71,140	COLOM 12 10/22/15	REPUBLIC OF COLOMBIA	Government	COLOMBIA	COP	1801.1000	0.0006	2,580,037,040,000	0.005%
XS0244595863	251	251,000	19,812	RENTEN 8 1/2 02/22/16	LANDWIRTSCH. RENTENBANK	Financial	GERMANY	MXN	12.6691	0.0789	1,265,000,000	0.020%
HU0000402524	7727	7,727,000	33,521	HGB 7 06/24/22	HUNGARY GOVERNMENT BOND	Government	HUNGARY	HUF	230.5100	0.0043	534,107,040,000	0.001%
IDG000007204	398954	398,954,000	41,193	INDOGB 11 09/15/25	INDONESIA GOVERNMENT	Government	INDONESIA	IDR	9685.0000	0.0001	26,474,000,000,000	0.002%
XS0553072611	4233	4,233,000	137,503	HYDRRM 7 7/8 10/28/15	RUSHYDRO (RUSHYDRO FIN L	Utilities	IRELAND	RUB	30.7848	0.0325	20,000,000,000	0.021%
MYBMS04003H7	217	217,000	69,865	MGS 5.734 07/30/19	MALAYSIAN GOVERNMENT	Government	MALAYSIA	MYR	3.1060	0.3220	6,500,000,000	0.003%
MX0MGO0000B2	630	630,000	49,727	MBONO 10 11/20/36	MEX BONOS DESARR FIX RT	Government	MEXICO	MXN	12.6691	0.0789	62,448,698,900	0.001%
NGFG6B2019S3	7898	7,898,000	50,067	NIGB 7 10/23/19	NIGERIA TREASURY BOND	Government	NIGERIA	NGN	157.7500	0.0063	188,900,000,000	0.004%
PEP01000CY33	117	117,000	44,943	PERUGB 7.84 08/12/20	PERU BONO SOBERANO	Government	PERU	PEN	2.6033	0.3841	8,830,637,000	0.001%
US718286BM88	2473	2,473,000	60,799	PHILIP 6 1/4 01/14/36	REPUBLIC OF PHILIPPINES	Government	PHILIPPINES	PHP	40.6750	0.0246	54,770,000,000	0.005%
PL0000106670	230	230,000	72,313	POLGB 5 3/4 10/25/21	POLAND GOVERNMENT BOND	Government	POLAND	PLN	3.1806	0.3144	21,848,426,000	0.001%
RO1215DBN073	65	65,000	19,389	ROMGB 5.8 10/26/15	ROMANIA GOVERNMENT BOND	Government	ROMANIA	RON	3.3524	0.2983	6,544,300,000	0.001%
RU000A0JS4M5	1427	1,427,000	46,354	RFLB 7 1/2 02/27/19	RUSSIA GOVT BOND - OFZ	Government	RUSSIA	RUB	30.7848	0.0325	143,779,276,000	0.001%
XS0207459594	5037	5,037,000	21,852	EIB 6 1/2 01/05/15	EUROPEAN INVESTMENT BANK	Government	SUPRANATIONAL	HUF	230.5100	0.0043	59,500,000,000	0.008%
ZAG000066697	796	796,000	87,303	ESKOM 9 1/4 04/20/18	ESKOM HOLDINGS LIMITED	Utilities	SOUTH AFRICA	ZAR	9.1177	0.1097	10,000,000,000	0.008%
XS0304158255	160	160,000	12,629	KOMINS 7.2 07/07/14	KOMMUNINVEST I SVERIGE	Government	SWEDEN	MXN	12.6691	0.0789	300,000,000	0.053%
TH0623A3S305	1004	1,004,000	33,748	THAIGB 5 1/8 03/13/18	THAILAND GOVERNMENT BOND	Government	THAILAND	THB	29.7500	0.0336	86,632,000,000	0.001%
TH062303T609	997	997,000	33,513	THAIGB 3 7/8 06/13/19	THAILAND GOVERNMENT BOND	Government	THAILAND	THB	29.7500	0.0336	126,994,000,000	0.001%
TRT150120T16	129	129,000	71,452	TURKGB 10 1/2 01/15/20	TURKEY GOVERNMENT BOND	Government	TURKEY	TRY	1.8054	0.5539	11,547,000,000	0.001%

## How an ETF Trades Relative to NAV

#### ETFs tend not to trade at NAV but rather within or around a "Fair Value Band"

The "Fair Value Band" sits around the intraday NAV of a fund and is affected by the following factors:

- Spread of underlying assets
- Commission charges on underlying assets
- Taxation of the underlying
  - Effects of tax on shares
  - Effects of tax on currency
- Creation / Redemption charges
- Size of Creation / Redemption unit
- Variability of hedging results in process

Propensity for trades to occur inside the fair value band dependent on many factors; ETF share turnover and competitive market making forces are most significant factors



## Is INAV a True Indication of Fair Value?

# Key questions with respect to INAV calculations:

- Do the underlying assets price transparently?
  - Equities have transparency while markets are open
  - Bonds have very little public transparency
- Are the assets part of a single market, a single currency?
  - Single currency and single market has less room for error
  - Multiple currencies, regions and markets are prone to error and timing complexity
- Is the INAV independently calculated by an exchange or an index provider?
- Does the calculation involve proxy settings for markets that are not open?





Knight

## Interdependencies of Execution Path, Risk, and Cost

Implementation Strategy	Points of Consideration	
Risk markets	<ul> <li>Certainty of execution price (lowest gap risk for investor)</li> <li>Broker bears the risk of hedging the position (risk premium for this)</li> <li>Tighter spreads during certain liquidity peaks in trading day</li> </ul>	Broker bears greater gap risk
Standard order types / hybrid	<ul> <li>Some control over either time or price, not both</li> <li>Alternative trading strategies via underlying basket may be available</li> </ul>	ars b risk
NAV-based	<ul> <li>Highest gap risk for investor</li> <li>Final price not known until NAV is disclosed – normally T+1 at earliest, sometimes 2-3 days</li> <li>Client usually pays full creation / redemption costs</li> </ul>	Client be dreater da

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