Home Price Hedging Fund (“HPHF”) Regional Home Price Index Agreements

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Overview

Objective

- HPHF is a centralized platform where approved counterparties can hedge (long or short) against a variety of home price indices using OTC home price index agreements.
- HPHF is the counterparty to all agreements. As such, users may net/ reverse exposures (although a forward unwind price is not guaranteed.)
- HPHF agreements reference publicly available, year-end indices, to cash-settle forward agreements.
- HPHF agreements have structured with pre-negotiated* bounds on index moves (e.g. +/-10-20% from an initial agreement).
- HPHF agreements are structured as offsetting puts (with floors) and calls (with caps) that conform to bounds on a range of index moves.
- Proceeds from each option will be owned by HPFH and may be invested in eligible assets to collateralize eventual payouts..

*- bounds likely subject to type of program, term, and volatility of reference index.
**-see slide on HPHF capital structure

Three types of HPHF Agreements

- HPHF agreements can be structured in three forms:
  - **Absolute Price (AP) Agreements:**
    - First HPHF offered.
    - These exposures are designed to mimic the that of an outright long or short position over a modest range of prices.
  - **Relative Performance (RP) Agreements**
    - These exposures are designed to reflect the performance of one regional index relative to a national index.
    - RP agreements can be used in conjunction with a long/short position to the CME Case Shiller 10-city index futures to create an exposure that maps versus wide ranges of an Absolute Price Move Agreement, but more efficiently
    - RP Agreements are now my preferred execution v Absolute Agreements for many cities.
  - At, or slightly out-of-the-money **Options** (puts)
    - These are options on the index where the user wants to pay a fixed upfront payment, knowing that they can't lose more than their initial payment, for one-sided risk protection.

^1 One-Year forward price to be negotiated to try to set strikes equidistant (but not guaranteed)
^2 Targeted to be last Tuesday to mimic CME Case Shiller home price index futures
Note: There are no outright shorts. Users are either long puts or calls.
HPHF may take other side of any initial or secondary trade

HPFA Absolute Price (“AP”) Agreement

- User wants to buy one-year protection on XYX index:
- Spot index: 245, One Year Forward Mid-Market: 250^1
- HPHF Creates two Deep in-the-money options @ ~+/- 10% of mid-market
  - 1) Put with Strike of 275 (and Floor payout at 225)
    - Offered to user seeking protection @25 (~250 forward sale)
  - 2) Call with Strike of 225 (and Cap payout at 275)
    - Either retained/ sold by HPHF ideally @>=25 (~250 forward buy)^2
  - Notional value/ contract = $100 * Mid-Market price
  - Put premium of 25=~10% margin for exposure to notional value/ consistent with 10:1 leverage on price moves.
  - Expiration: Feb 23, 2021^3
  - Settlement Value: Most recent index value at Expiration^4
  - Note: Maximum combined payout (in above example) is ~20% of initial mid-market notional value.
  - HPHF may take other side of any initial or secondary trade

^1 One-Year forward price to be negotiated to try to set strikes equidistant (but not guaranteed)
^2 Note: There are no outright shorts. Users are either long puts or calls.
^3 Note higher boundaries might be necessary for longer expirations, during more volatile markets, or for cities with volatile home prices. Example here is for a one-year expiration. Longer expirations also can be structured
^4 Targeted to be last Tuesday to mimic CME Case Shiller home price index futures.

Payouts on Absolute Price Agreement

- Put buyer (~Index seller) has upside to decline in index at expiration.
- Call buyer (~Index buyer) has upside to increase in index at expiration.
- Put and call premia collateralize final payout
- Notional exposure can be scaled by increasing number of contracts

		Payout Example:					**Payout Example:**		
		To Put (Strike =275)					**To Call (Strike =225)**		
		Bought at 25 (250)					**Bought at 25 (250)**		
	Index at Expiration	**Payout At Expiration**	**Upront**	**Total**		**Index at Expiration**	**Payout At Expiration**	**Upront**	**Total**
	<225	$5,000	$(2,500)	$2,500		<225	$0	$(2,500)	-$2,500
Floor	225	$5,000	$(2,500)	$2,500	**Floor**	225	$0	$(2,500)	-$2,500
	235	$4,000	$(2,500)	$1,500		235	$1,000	$(2,500)	-$1,500
	245	$3,000	$(2,500)	$500		245	$2,000	$(2,500)	-$500
	255	$2,000	$(2,500)	-$500		255	$3,000	$(2,500)	$500
	265	$1,000	$(2,500)	-$1,500		265	$4,000	$(2,500)	$1,500
Cap	275	$0	$(2,500)	-$2,500	**Cap**	275	$5,000	$(2,500)	$2,500
	<275	$0	$(2,500)	-$2,500		<275	$5,000	$(2,500)	$2,500

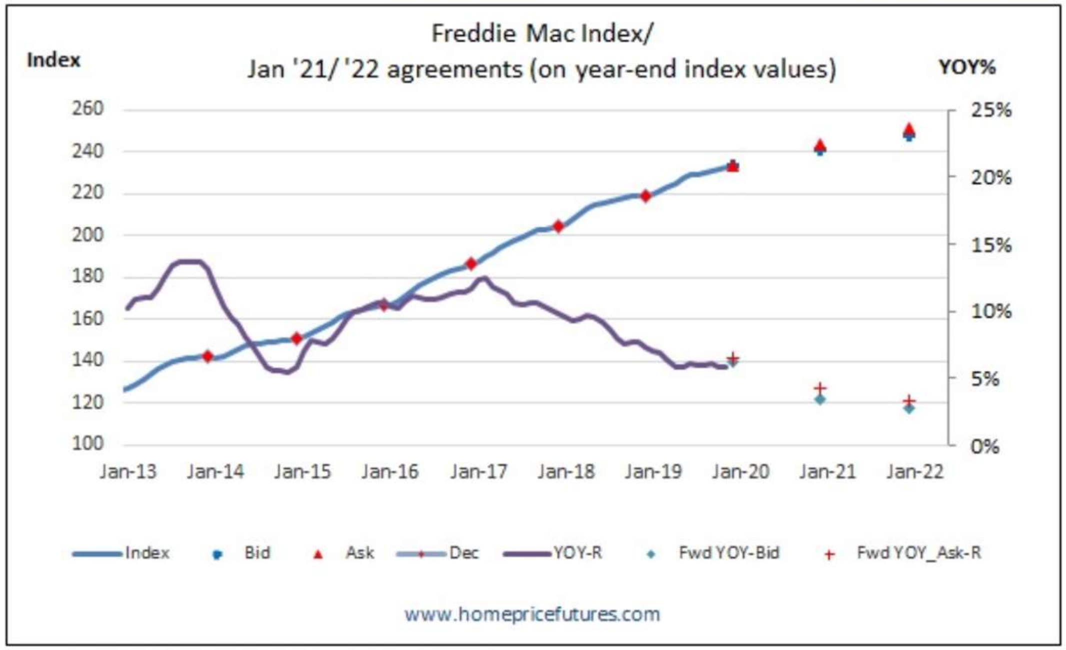
Example (Dated) HPFA AP Agreement*

Tampa-St. Petersburg-Clearwater, FL

a/o 1/21/2020

Home Price Hedging Agreement (#HPHF)

Region								
Tampa-St. Petersburg-Clearwater, FL				HPA last 12 mon				5.86%
Dec '18 Index	219.37			Value/Point:				$100
Last Seasonally Adjusted	231.14			Notional Value/Agreement:				$23,309
Last NSA Index	232.17							
HPHF Quotes: Expiration		**Bid**	**Ask**	**Mkt % spot**		**HPA => quotes**		
NSA	Jan '20	233.1	233.6	100.4%	100.6%	2019	6.250%	6.500%
	Jan '21	241.2	243.6	103.9%	104.9%	2020	3.500%	4.250%
	Jan '22	247.9	251.5	106.8%	108.3%	2021	2.750%	3.250%



^1 -Bid/Ask shown for one agrement. Subject to change

^2-http://www.freddiemac.com/research/indices/house-price-index.page

https://www.homepricefutures.com/posts/introducing-home-price-hedging-fund-hphf

HPFA Relative Performance Agreement

- Breaking an absolute price regional agreement into two components, makes for a more capital efficient execution, while accessing a deeper market.

Component 1:

- Performance of (**long 10-city index** – short region) swap, with

Component 2:

- Performance of **short 10-city index**, equals

Combination:

- Performance of short position in Region (as long/short positions in 10-city offset)

HPFA Relative Performance Agreement*

- Benefits of breaking an AB regional agreement into two components

Component 1 (Relative Performance of 10-city index v Regional index):

- – Volatility of differences between highly correlated indices, is lower than on Absolute Price agreements.* As such, smaller (%) boundaries can be used that still cover a reasonable range of results.
- – Smaller boundaries allow more agreements with same capital.
- – However, the longer the expiration, and/or the more volatile the market, or regional index, the broader the boundaries should be.
- – While most AB agreements are highly correlated (a portfolio of longs offers limited diversification), performance of RV agreements should be randomly distributed, reducing risk of portfolio of RV exposures.

Component 2 (CME 10-city Index trades):

- – Absolute performance of 10-city index can be captured in CME Case Shiller 10-city index contract.
- – Smaller margins (than premium on absolute performance agreement)
- – Better liquidity –both to start, and as RP agreements channel more activity to single contract for absolute price risk.

* Covariance of two indices each with 4% standard deviation is 4% if uncorrelated, but only 2% if correlated 50% .

Correlation of Regional Indices with 10-city index supportive of HPHF Relative Performance Agreements*

- There are ten public Case Shiller regional indices that are not referenced by CME contracts. Conceptually any of these regional indices can be hedged with HPHF Relative Performance Agreements.
- High (historical*) correlation suggests that relatively narrow boundaries on relative performance spreads will cover a wide range of likely* outcomes.

Correlation of YOY changes between 2nd Ten Case Shiller Indices to 10-city index, since Jan 2011

PHX	TPX	ATX	DEX	MNX	CRX	CEX	POX	DAX	SEX
83.6%	80.7%	81.5%	86.7%	75.9%	83.0%	61.5%	87.7%	82.7%	80.5%

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- Relative performance agreements also possible for larger cities referenced by Freddie Mac indices.**

- *Historical correlations do not guarantee future, or “likely” correlations.
- ** The smaller the city, the more likely that correlation to 10-city index futures will be lower. Correlation tables to follow.

HPFA RP Agreement + 10-city CME Futures = Performance of Regional Absolute Agreement

Return of Relative Performance Agreement and CME 10-City Futures Trade = Performance of Regional Absolute Agreement.*

CS 10-city Index		
Index	195.75	Contribution 1 (C1): Return on CS 10 index * Start value of Regional index
Fwd Value	226.93	Contribution 2 (C2): Performance of CS 10 vs. Region*

MIA	
Index	253.28
Fwd Value	286.56

End Price	Diff v Fwd	% Gain/ Loss							
			End Price	200	210	220	230	240	250
			Diff v Fwd	26.93	16.93	6.93	-3.07	-13.07	-23.07
			% GainLoss	11.87%	7.46%	3.05%	-1.35%	-5.76%	-10.17%
			CS>Region	0.89%	5.30%	9.71%	14.11%	18.52%	22.93%
			C1:	34.00	21.38	8.75	-3.88	-16.51	-29.13
			C2:	2.56	15.18	27.81	40.44	53.07	65.69
250	36.56	12.76%		36.56	36.56	36.56	36.56	36.56	36.56
				-2.60%	1.81%	6.22%	10.62%	15.03%	19.44%
			C1:	34.00	21.38	8.75	-3.88	-16.51	-29.13
			C2:	-7.44	5.18	17.81	30.44	43.07	55.69
260	26.56	9.27%		26.56	26.56	26.56	26.56	26.56	26.56
				-6.09%	-1.68%	2.73%	7.13%	11.54%	15.95%
			C1:	34.00	21.38	8.75	-3.88	-16.51	-29.13
			C2:	-17.44	-4.82	7.81	20.44	33.07	45.69
270	16.56	5.78%		16.56	16.56	16.56	16.56	16.56	16.56
				-9.58%	-5.17%	-0.76%	3.64%	8.05%	12.46%
			C1:	34.00	21.38	8.75	-3.88	-16.51	-29.13
			C2:	-27.44	-14.82	-2.19	10.44	23.07	35.69
280	6.56	2.29%		6.56	6.56	6.56	6.56	6.56	6.56
				-13.07%	-8.66%	-4.25%	0.15%	4.56%	8.97%
			C1:	34.00	21.38	8.75	-3.88	-16.51	-29.13
			C2:	-37.44	-24.82	-12.19	0.44	13.07	25.69
290	-3.44	-1.20%		-3.44	-3.44	-3.44	-3.44	-3.44	-3.44
				-16.56%	-12.15%	-7.74%	-3.34%	1.07%	5.48%
			C1:	34.00	21.38	8.75	-3.88	-16.51	-29.13
			C2:	-47.44	-34.82	-22.19	-9.56	3.07	15.69
300	-13.44	-4.69%		-13.44	-13.44	-13.44	-13.44	-13.44	-13.44
				-20.05%	-15.64%	-11.23%	-6.83%	-2.42%	1.99%
			C1:	34.00	21.38	8.75	-3.88	-16.51	-29.13
			C2:	-57.44	-44.82	-32.19	-19.56	-6.93	5.69
310	-23.44	-8.18%		-23.44	-23.44	-23.44	-23.44	-23.44	-23.44

* exposures need to be weighted by to forwad value of regional exposure

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Example: HPFA RV trade + Futures

- Instead of “Shorting” two MIA 1-year agreements at 285.56 (so notional value of 2* $100* 286.56 = $57,312)
- Sell 1.01 CME 10-year contracts at 226.93 (Notional value of 1.01 * 226.93*$250/contract = $57,300)
- Enter return swap that pays on return of 10-city index > MIA on $57,300 notional amount . (See relevant portion of table –below - from prior page).
- In both AP and (RP+ CME 10-city index futures) trade, gain from MIA index falling to 250 is 36.56.

CS 10-city Index	
Index	195.75
Fwd Value	226.93

MIA	
Index	253.28
Fwd Value	286.56

End Price	200
Diff v Fwd	26.93
% GainLoss	11.87%
CS>Region	0.89%

End Price	Diff v Fwd	% Gain/ Loss
250	**36.56**	12.76%

C1:	34.00
C2:	2.56
	36.56

Difference RP vs AP Agreement

- There is a tail risk difference between and Absolute Price Agreement and the combination of a Relative Performance Agreement and a 10-city futures sale, in that in the later, one is exposed to futures rallying further than the boundary of an Absolute Agreement.

- That is if AP agreement had 15% cap, and 10-city index rallied more than that, the AP (regional) short would not be exposed, but the short of a 10-city index futures, might be.

- This should be an outlier event (beyond the boundaries agreed to in an AP Agreement, but not impossible and a difference between exposures).

Example of HPFA Option Trade

- User wants to buy one-sided at-the-money option, limiting maximum exposure to option premium.
- Spot index: 245, Strike: 250 (~one-year forward bid)^1

- HPHF offers put with strike of 250, for Feb 23, 2021 expiration.
  - Notional value/ contract = $100 * Index
  - Put payout capped at 225 floor.
  - Put is exercisable only at expiration.
  - Put premium will likely impacted by index volatility, term to expiration, how far out-of-the –money strike is.
  - Settlement Value:
    - If Index at Expiration < Strike, (Strike-Index) *$100/contract
    - If Index at Expiration>= Strike, zero.

^1 Other strikes may be available subject to mutual agreement

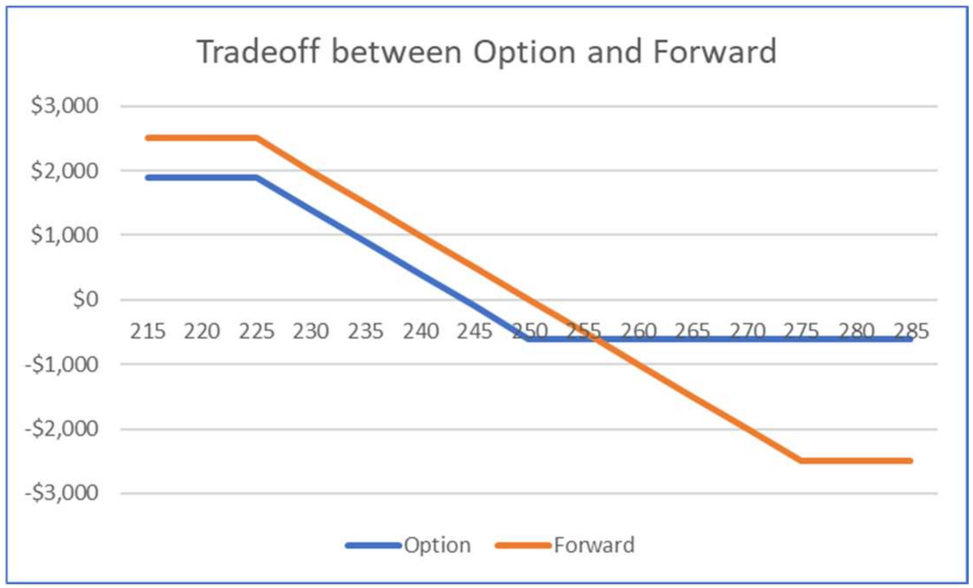
Example of Payout on Option Trade

- Strike =250, Floor =225
- Premium = 6 points

Payout Example:			
Index at Expiration	**Payout at Expiration**	**Upfront Premium**	**Total**
<225	$2,500	-$600	$1,900
225	$2,500	-$600	$1,900
230	$2,000	-$600	$1,400
235	$1,500	-$600	$900
240	$1,000	-$600	$400
245	$500	-$600	-$100
250	$0	-$600	-$600
<250	$0	-$600	-$600

Example of Payout on Option Trade

- AB Agreement has greater potential payoff but runs risk of losing money should index rise.
- Put buyer only has initial premium at risk
- Graph illustrates that P&L doesn't change beyond cap/floor.
- Each contract is unique. This is only a hypothetical example.



Timeline for new user

- User submits Account-opening forms
  - Needed for KYC, AML issues
  - Tees up distribution channel for later disbursement
- Once approved, user submits $500/contract (approval fee).
- Once down-payment clears, user is free to submit bid on puts, calls
  - Specific index, and source for index at settlement, to be identified prior to trade.
- If buyers/sellers matched HPHF will charge $50/contract.
- Trade is confirmed via email
- Once trade is done, user has 3 business days to fund trade
  - If trade is not funded by T+3 trade may be cancelled with down-payment forfeited
- User may ask to reverse trade any time after funds clear
  - There is no obligation for user or HPHF to have initial trade price or reversal price set at mid-market
- Upon expiration, settlement on Absolute Price will be calculated using most recently available regional index values. For Relative Value agreements, most recent values for begin and end of agreement will be used.

HPHF

- HPHF was created in Dec 2018 to provide a platform/ counterparty for home price index exposure hedging.
- HPHF is managed by John H Dolan, a former Wall Street trading desk manager, CIO at a $20 billion asset management company, and for the last eight years, the market maker for the S&P Case Shiller home price index futures traded on the CME.
- HPHF is independent from index calculation agents
- A portion of earnings will be donated to local homeless charities.

Disclosures

Risk Factors/Disclosure

- This report was prepared by an independent market maker of the CME Case Shiller futures contracts. The views expressed are his own and should not be construed to represent the views of the CME, S&P, Freddie Mac, CoreLogic, or any other entity.
- The author makes no representations as to the accuracy or completeness of any information contained in this report.
- The information gathered was at a point in time. The bids/offers described here are dated and may not exist in the current market.
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