Digital Gamma, Inc.
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TPR Use Case: Cash and Carry

Key Advantages:

1) Earn yield by taking advantage of listed futures market; currently > 15%
2) TPR enables BTC holder to convert coin to cash for margin deposit
3) TPR cash flows during life of trade match margin deposit needs on exchange
4) Current conditions enhance yield further as BTC borrow rates are above zero

Background:

Cash and carry trades take advantage of the futures term structure to earn yield by purchasing spot cryptocurrency, selling a future, and carrying the position until the future expires. The trade earns the investor a defined rate of return and is not long exposure to the asset itself.

Cash and carry in CME futures are offering attractive yields. The trade is long BTC and short a future. While the trade is extremely low risk, it is a capital-intensive trade because CME requires margin to be posted in USD rather than BTC.

Digital Gamma TPR enables a far more capital efficient execution of the BTC cash and carry trade by converting the long spot BTC leg into an available USD balance.

Use Case

A crypto fund looks to place a market neutral trade. The portfolio manager (PM) looks at her screen and see that spot is trading 9330 on Feb 28 and the CME March future is trading 9440. The last trading day is March 27 giving 28 days for the trade. She brings up her spreadsheet and calculates the yield:

$$r = \frac{(9440 - 9330)}{9330} \; x \; \frac{365}{28} = 15.4\% \; APR$$

As noted in the calculation, this is an APR. The actual one-month return is 1.2%. Given the low risk of the trade and the annualized return, she decides that the cash and carry trade is attractive. CME and the fund's futures broker (FCM) requires a margin deposit of $16,080 (or about 35%) for its 5 BTC contract.

To execute the trade, she purchases 5 BTC on the Gemini Exchange for a price of 9330. The Gemini Exchange was chosen because that is where TPR transactions currently clear and settle. She then enters a 28-day TPR on 5 BTC for 2 weeks and sells a CME future at $9440. The current rate on borrowing BTC for 28 days is 2.5%. The fund stands to earn an additional:

$$5 \; BTC \; x \; 2.5\% \; x \; \frac{28}{365} = 0.009589 \; BTC$$

The value in dollar terms at a BTC price of $9330 is an additional $89.46 total ($17.89 per BTC) based on a BTC price of $9330. Because borrowers are willing to pay to borrow BTC, the fund is able to earn additional yield. Using $9330 at the end of the transaction in 28 days, then the total yield for the fund is:

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$$yield = \frac{(9440 - 9330 + 17.89)}{9330} x \frac{365}{28} = 17.9\%$$

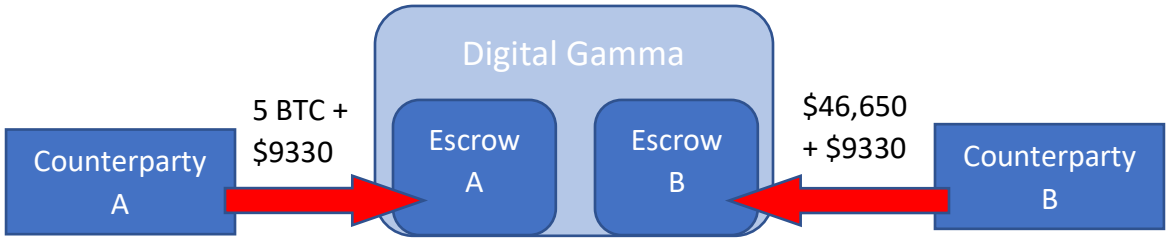
Step by Step Process

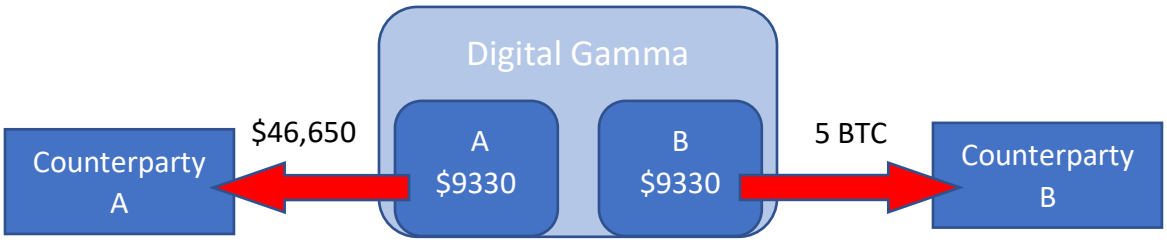
Time = 0; Initiation 2 pm EST

Fund enters TPR as Counterparty A lending BTC to Counterparty B against USD. Spot price is $9330 and notional value of 5 BTC transaction is $46,650. Retained collateral (escrow) amount is 20% of that, or $9330 (1 out of the 5 coins!). The fund's futures broker requires 50% margin, which is greater than the 35% required by the CME, for an initial margin requirement of $23,325. Fund receives a net amount of $46,650 less the $9330 escrow posting or $37,320. The fund then moves $24,000 (rounding up the $23,225 margin requirement) into its futures account. TPR vocabulary and mechanics are described in a separate note. Cash flows here show A depositing BTC plus USD as collateral to explicitly illustrate the process. In practice, Digital Gamma can utilize the collateral coming from B to fund A's Escrow account.

TPR Terms

Anchor currency	BTC
Pricing currency	USD
Anchor amount	5 BTC
Term	28 days
Retained Collateral	20% each
Rebalance	Daily. 1p pricing. 2p Settlement
Default terms	Mid-point + 2% penalty





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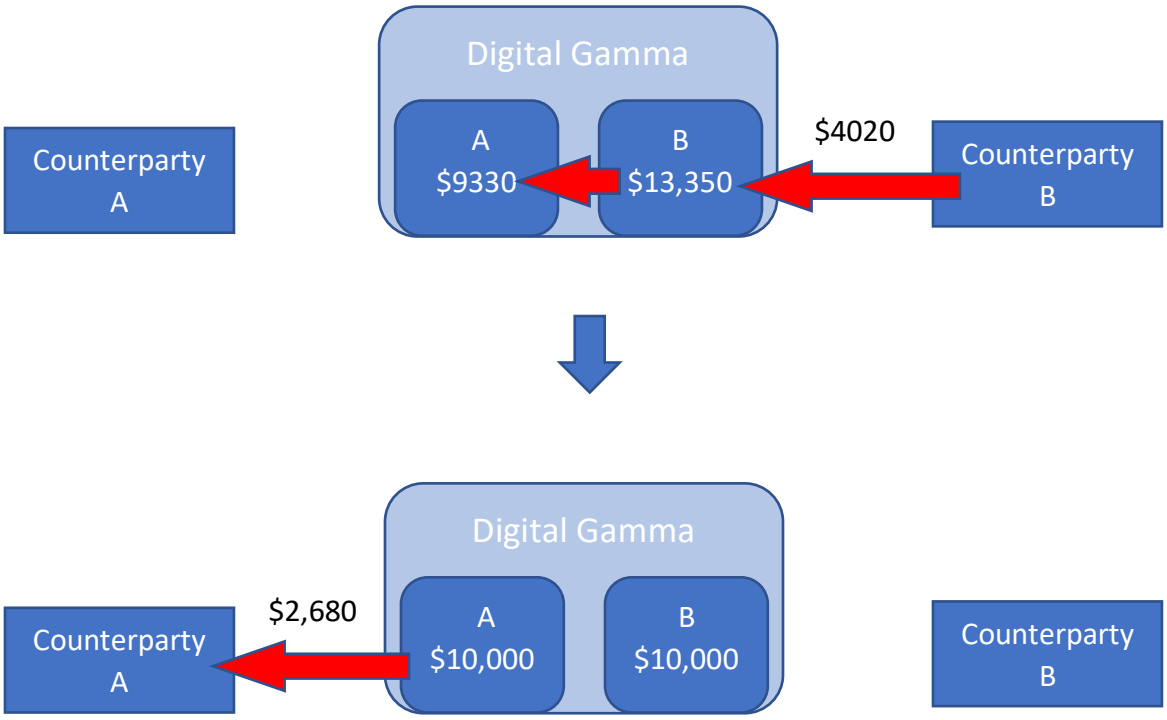
T + 1 day: Rebalance 1p price snapshot and 2 pm EST settlement

Assumptions:

- The current price of BTC is 10,000 USD

CME Margin Requirement	Broker Margin Requirement	Fund Futures Account Balance
$17,500	$25,000	$24,000

For the rebalance, the new notional amount is $50,000 ($10,000 * 5 BTC). Counterparty B must move additional $50,000 - $46,650 = $3,350. Additionally, the 20% escrow requirement is now on $50,000 notional and is therefore now $10,000 (additional $670 for each counterparty). First, B sends $4,020 ($3,350 + $670). Digital Gamma moves $3,350 to A's escrow. Then Digital Gamma transfers $2,680 ($3,350 - $670) to A.



The fund, Counterparty A, has received a total of $46,650 + $2,680 + $670 = $50,000 in collateral from B. A can then move the additional $1,000 to its futures broker to cover the margin call. Even if BTC were to jump significantly, the TPR via Counterparty B would supply an excess of USD for the margin so long as the margin rate is below 80%.

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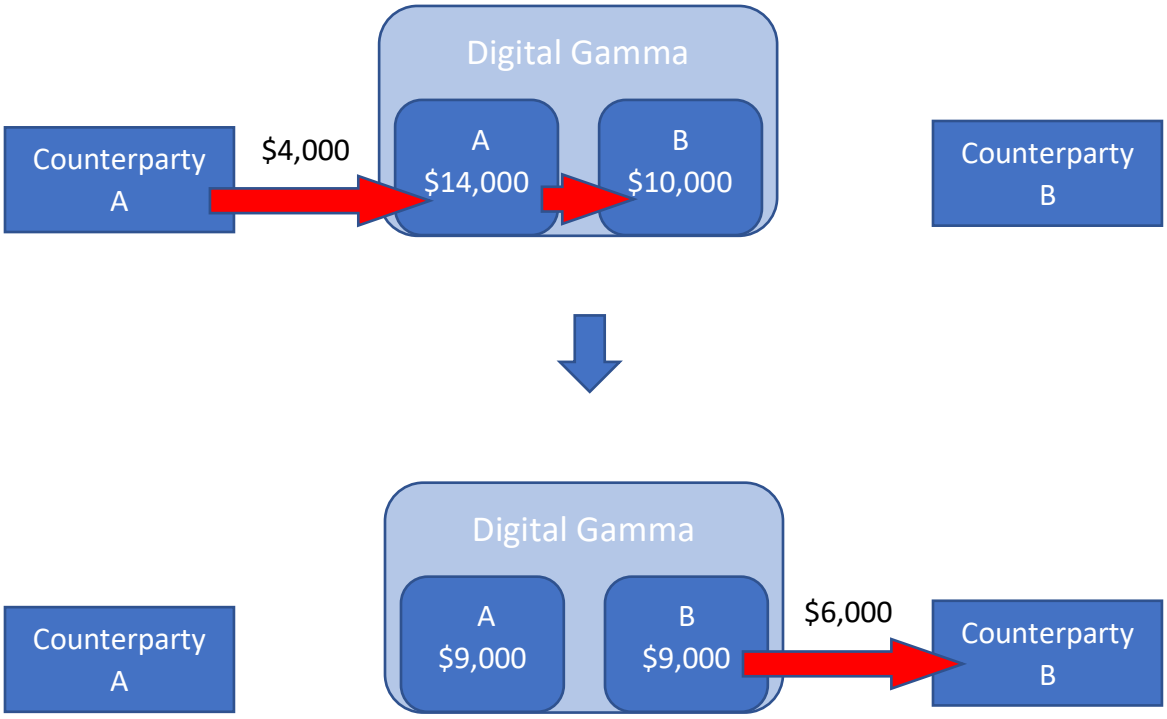
T + 2 days: Rebalance price set 1p and 2 pm EST settlement

Assumptions:

- The current price of BTC is 9,000

CME Margin Requirement	Broker Margin Requirement	Fund Futures Account Balance
$15,750	$22,500	$25,000

For the rebalance, the new notional amount is $45,000 ($9,000 * 5 BTC). The BTC is now worth less money so A must return some of the collateral received already from B. Counterparty A must move back $5,000 ($1,000 * 5 BTC) to B. In addition, the new escrow requirement is $9,000. B receives the $5,000 + $1,000 of the escrow.



In this case, there is no need for A to withdraw from the futures account because there is sufficient balance outside of it to satisfy the cash flows of the TPR.

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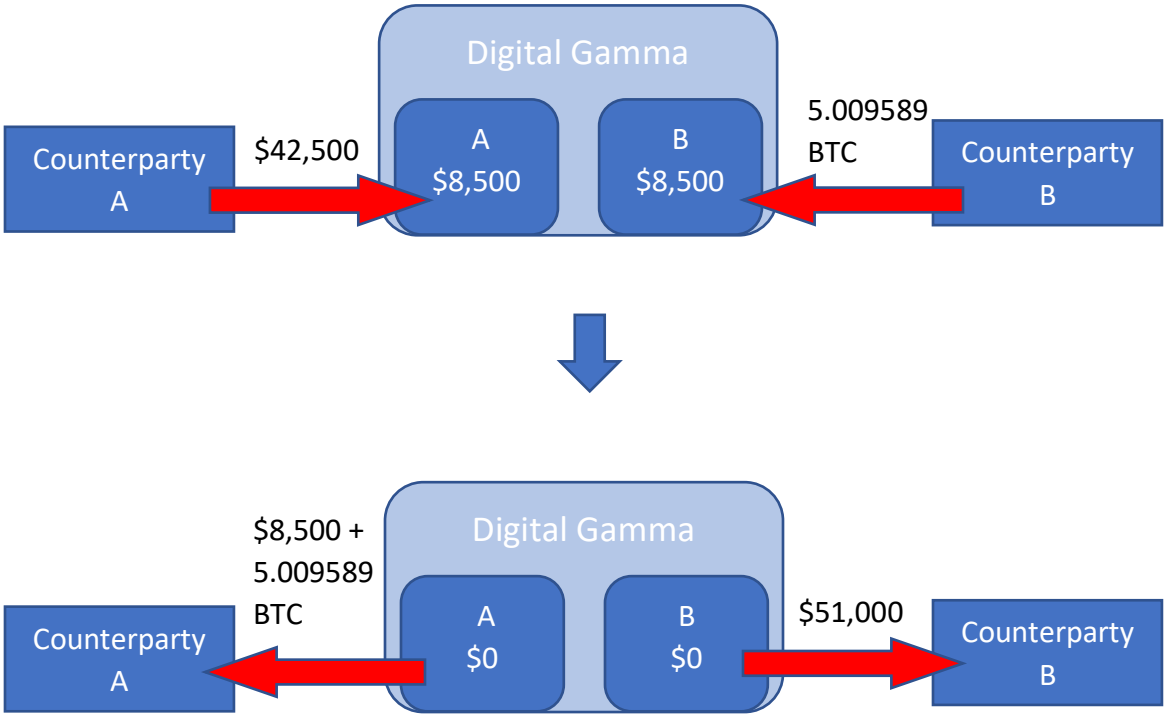
T + 28 days: Termination 1p pricing and 2 pm EST settlement

Assumptions:

- The current price of BTC is 9,000
- Prior rebalance price of BTC was $8,500

CME Margin Requirement	Broker Margin Requirement	Fund Futures Account Balance
$0 (futures settled)	$0	$25,000

At the conclusion of the TPR, the CME contract settles into the spot price of BTC. Both parties need to conclude the TPR transaction. For A, that means returning the USD collateral. For B, that means returning the BTC plus interest (paid in BTC). For both, they will receive their posted escrow. A has $42,500 ($8,500 * 5) of collateral received from B. Interest on BTC is 5 BTC * 2.5% * 28/365 = 5.009589 BTC.



The final return for the fund on this transaction is:

$$yield = \frac{(9440 - 9330 + (0.009589\ x\ \$8500))}{9330} x\ \frac{365}{28} = 17.6\%$$

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Risks:

In the case of a physically delivered contract, there is mark-to-market risk as the basis (simply the difference between the future and spot prices) changes but as the spot position will get delivered into the futures contract, there is no convergence risk. For a cash settled future, there is the potential that the settlement price may not exactly match market perceived spot prices.

Further risk resides in the TPR itself. Although Digital Gamma TPR mitigates the risk, should a counterparty fail to deliver AND should BTC move more than amount held in escrow, then there is a risk that the non-defaulting party will incur some loss in the TPR.

Conclusion: Efficient Trade Financing

CME and futures brokers require margining of positions in USD. Participants looking to bridge spot and futures pricing need to fund their on-exchange margin requirements. Margin funding needs to occur internally (self-funded), via unsecured funding (generally expensive), or with collateralized lending. For most participants in crypto markets, that sort of funding comes expensive: usually it is in the form of overcollateralization. Overcollateralization is risky and inefficient.

TPR from Digital Gamma provides a far more efficient solution to trade cash-futures basis. And, with current market conditions, lending the BTC with TPR adds additional yield to the trade.

Contact:

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