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Supplementary data

The integration of blockchain technology with arbitration mechanisms: its efficacy and implementation in international arbitration

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1. Dune command for mainnet courts (varying the court number appropriately):

```
WITH appeals AS (
SELECT
  “_disputeID” AS disputeIDAppeal,
  “call_success” AS successAppeal
FROM kleros_ethereum.KlerosLiquid_call_appeal
), creations AS (
SELECT
  “output_disputeID” AS disputeIDCreation,
  “call_success” AS successCreation,
  “call_block_time” AS timeCreation,
  BYTEARRAY_TO_INTEGER(
    BYTEARRAY_SUBSTRING(BYTEARRAY_REVERSE(BYTEARRAY_SUBSTRING(“_extraData
”, 32)), 32)
  ) AS courtNumber
FROM kleros_ethereum.KlerosLiquid_call_createDispute
), temp AS (
SELECT
  disputeIDCreation,
  successAppeal,
  courtNumber,
  1 as indicator
```



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```

FROM creations
INNER JOIN appeals
ON appeals.disputeIDAppeal = creations.disputeIDCreation AND creations.successCreation = TRUE
AND appeals.successAppeal = TRUE AND courtNumber<16
)
SELECT
SUM(indicator)
FROM temp [1]

```

2. Dune command for Gnosis Chain courts (varying the court number appropriately):

```

WITH appeals AS (
SELECT
“_disputeID” AS disputeIDAppeal,
“call_success” AS successAppeal
FROM kleros_gnosis.xKlerosLiquid_call_appeal
), creations AS (
SELECT
“output_disputeID” AS disputeIDCreation,
“call_success” AS successCreation,
“call_block_time” AS timeCreation,
BYTEARRAY_TO_INTEGER(
BYTEARRAY_SUBSTRING(BYTEARRAY_REVERSE(BYTEARRAY_SUBSTRING(“_extraData
”, 32)), 32)
) AS courtNumber
FROM kleros_gnosis.xKlerosLiquid_call_createDispute
), temp AS (
SELECT
disputeIDCreation,
successAppeal,
courtNumber,
1 as indicator
FROM creations
INNER JOIN appeals
ON appeals.disputeIDAppeal = creations.disputeIDCreation AND creations.successCreation = TRUE
AND appeals.successAppeal = TRUE AND courtNumber=16
)
SELECT
SUM(indicator)
FROM temp [1]

```

After obtaining the total number of disputes, appeals and the hours per voting round, from both courts, firstly, the total number of disputes is added up. Secondly, the total number of hours spent on all

these cases is obtained, on a court-to-court basis. For each court, the total number of voting rounds (disputes + appeals) was multiplied by hours per round, followed by the addition of all these. Lastly, to get the average dispute resolution time, total number of hours was divided by total number of disputes, getting the average number of hours per dispute, which was then converted into days.

The complete data calculation is attached in Table S1 [1].

Table S1. Data calculation.

Mainnet						
Court No.	Total Disp.No.	Appeal No.	Hrs./Vote Round	Total Disp.Time Over All Disputes	Avg.Disp. Length/Hrs	Avg.Disp. Length in Days
0	55	3	348	20184	366.9818182	15.29090909
1	1	0	348	348	348	14.5
2	363	73	216	94176	259.4380165	10.80991736
3	15	7	444	9768	651.2	27.13333333
4	30	12	348	14616	487.2	20.3
5	1	3	348	1392	1392	58
6	2	0	348	696	348	14.5
8	63	0	174	10962	174	7.25
9	105	20	174	21750	207.1428571	8.630952381
13	3	1	280.5	1122	374	15.58333333
20	4	0	280.5	1122	280.5	11.6875
21	2	1	280.5	841.5	420.75	17.53125
23	1015	56	352.5	377527.5	371.9482759	15.49784483
24	1	0	348	348	348	14.5
Overall Statistics						
Total Number of Disputes					2111	
Total Hours Spent					670489.5	
Avg. Disp. Time/Hours					317.617006	
Avg. Disp. Time/Days					13.2340419	
Gnosis						
Court No.	Total Disp.No.	Appeal No.	Hrs./Vote Round	Total Disp.Time Over All Disputes	Avg.Disp. Length/Hrs	Avg.Disp. Length in Days
0	66	0	510	33660	510	21.25
1	276	75	174	61074	221.2826087	9.220108696
3	8	0	280.5	2244	280.5	11.6875
4	3	0	280.5	841.5	280.5	11.6875
10	1	0	280.5	280.5	280.5	11.6875
11	10	0	280.5	2805	280.5	11.6875
12	1	0	280.5	280.5	280.5	11.6875
13	2	0	280.5	561	280.5	11.6875
14	8	0	280.5	2244	280.5	11.6875
16	1	1	174	348	348	14.5
17	73	0	150	10950	150	6.25
18	2	0	174	348	174	7.25

Note: This data was collected on 16th March 2025 and all the quantitative data collected is conclusive up till this date.

References

- [1] The total number of disputes and the hours per voting round data comes from the Kleros board page for each court, e.g. Available: <https://klerosboard.com/1/courts/0>. (accessed on 16 March 2025) The number of appeals was obtained using the Dune queries. Available: <https://dune.com/queries> (accessed on 16 March 2025).