Mini Project #2

Team 20

Agenda

Agenda

Team introduction

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USDC Transaction Behavior Across Retail, Institutional, and Median Flow Patterns

Opportunities to capitalize on the gaps

Persona: The Emerging Markets Analyst

Key Questions:

1. What transaction sizes are most common (small vs large transfers)?
2. How do on-chain fees compare to traditional remittance costs?
3. Do we see many smaller transfers (retail-sized)?
4. Are there any patterns around time of day or periods of stress?

Stablecoin Type: USDC issued by Circle

Time Period: Last 6 Months

Executive Summary

3 key findings + a clear recommendation

USDC Transaction Behavior Across Retail, Institutional, and Median Flow Patterns

USDC Key Trends across transaction and volatility

1 Transaction

Size Distribution

Small to mid-size payments (under $250) make up a sizable share, reflecting active retail and everyday payment usage, while mid-range transfers ($250–$5K) remain consistently strong, pointing to business payments and trading-related flows.

2 Volatility

USDC Transactions

The median transaction chart shows a highly volatile pattern from June to November 2025, with median transfer sizes swinging between roughly $50 and $600.

3 Transaction

Retail vs Institutional

USDC transaction activity leans strongly toward **retail-driven usage**, with small retail transfers ($100–$1K) forming the largest share of all activity. Micro-payments under $100 makes up a large portion

USDC Transaction Insights

Key usage patterns

Tailor more products and features toward retail users.
Since retail transactions dominate both in count and diversity of size, product teams should focus on enhancing user-friendly features—such as cheaper transfers, **smoother UX, and retail-focused integrations (e-commerce, remittances, wallets**).

Develop targeted solutions to grow institutional volume.
Institutional transfers are smaller in share. Offering better APIs, treasury tools, compliance modules, or cross-border settlement infrastructure **could help increase higher-value institutional activity.**

Monitor median transaction volatility to optimize fees and liquidity.
The median transaction size fluctuates heavily over time, signaling shifting user behavior. Using these trends to adjust fee strategies, liquidity provisioning, and analytics alerts can **improve reliability and predictability** for both users and partners.

Methods

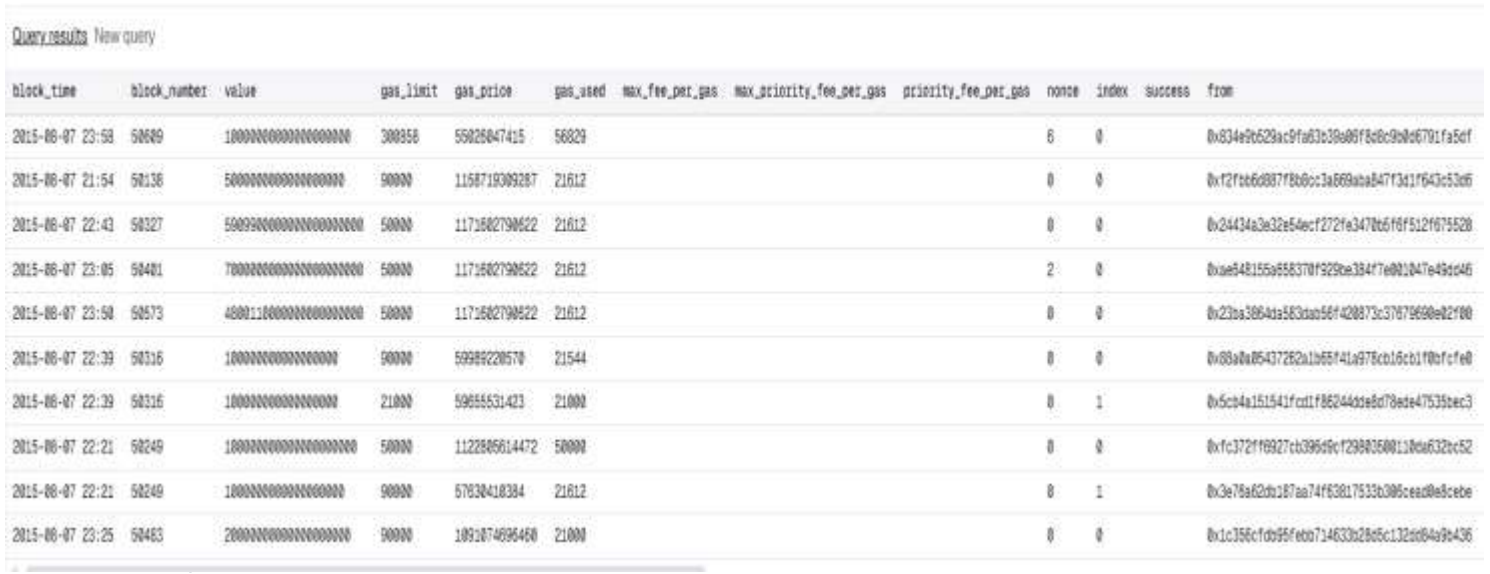
Data/tables and time window you used; any key limitations

Description of the Ethereum.Transactions Table

Ethereum.Transactions

This table **provides a detailed breakdown** of Ethereum transaction-level data, including timestamps, gas metrics, **sender/receiver addresses, fees, and execution details.**

It serves as the **foundational dataset for analyzing transaction costs, behavior**



Query results New query

block_time	block_number	value	gas_limit	gas_price	gas_used	max_fee_per_gas	max_priority_fee_per_gas	priority_fee_per_gas	nonce	index	success	from
2015-08-07 23:58	50689	10000000000000000000	300358	55026847415	56829				6	0		0x834e9b629ac9fa63b39a86f8c8c9a8d6791fa5df
2015-08-07 21:54	50136	50000000000000000000	90000	115871939287	21612				0	0		0xf2fbb6d887f8b0cc3a869aba847f3d1f643c53d6
2015-08-07 22:43	50327	59099000000000000000000	50000	117168279622	21612				0	0		0x24434a3e32e54ecf272fe3470b6f6f512f675528
2015-08-07 23:05	50401	70000000000000000000000	50000	117168279622	21612				2	0		0xae548155a658370f929be3847e801047e49dc46
2015-08-07 23:50	50573	40001100000000000000000	50000	117168279622	21612				0	0		0x23ba3864da583dab56f420873c37879690e02f80
2015-08-07 22:39	50316	10000000000000000	90000	59989220570	21544				0	0		0x88a0a054372b2a1b65f41a978cb16cb1f0bfcfe0
2015-08-07 22:39	50316	10000000000000000	21000	59655531423	21000				0	1		0x5cb4a151541fcd1f86244dde8d78ede47535bec3
2015-08-07 22:21	50249	10000000000000000000	50000	112288561447 2	50000				0	0		0xfc372ff6927cb396d9cf2980360011b0a632bc52
2015-08-07 22:21	50249	10000000000000000	90000	57630418384	21612				0	1		0x3e76a62db187aa74f63817533b386cead0e8cebe
2015-08-07 23:25	50463	20000000000000000000	90000	109187469646 0	21000				0	0		0x1c356cfdb95febb714633b28d5c132dd64a9b436

to	block_hash	data	hash	type
0x109c4f2ccc82c4d77bde15f306707320294aea3f	0x1e50bf55cb1ef8664a315210d24a9643f03e5921fc5bfa8d8a853b87f492aec5	0x	0x8dc26afbe18d035a00e09ed579033283114fa594a1de16670c66ad3010c32df1	Legacy
0x2910543af39aba0cd09dbb2d50200b3e800a63d2	0x8dd400764cb107b870b5864a83e2436fb392fe25e4bfe81745de595f04dc05e6	0x454e54573347503438	0xad943d88a2b3a739ec1e924eae3c59edc27cf28ad6d8133d0b3264a811a6468c	Legacy
0x2910543af39aba0cd09dbb2d50200b3e800a63d2	0xe9e14d2b06a9e25584a51c727ec4cce045f1b5a1d0b095beb332b0c226ffc180	0x454e354d5154544630	0x1b5b7488ac8fd80cf0bdd9a57f2e77ae405abe5f35161a8078379d974b32ed48	Legacy
0x2910543af39aba0cd09dbb2d50200b3e800a63d2	0x371914ca490619bd8dfe27854aad73960363c01bda57b7f21b9781dc3a52ff1a	0x454e32374555303430	0xb5c2c956c70724031ac66ac8236ff2ac5fb9ddb9cb06d2a3a62f60ea80184d27	Legacy
0x2910543af39aba0cd09dbb2d50200b3e800a63d2	0x1a0cf44179ebdce06baa45665f24981f4b4ba6d05b07b57454086df5787f43da	0x454e55594451543547	0x0577cc85af22f73f0fb16c5f5faff6ae5c54cdbefa01b6b40582d20ad6be0b8f	Legacy
0x644d27243cd3e3f0c41676abfcb1fa6fba1a400c	0x2c2952ae2d87cc310b1fb92f9ee03645815dc5303d4704087434ee3a3088de61	0x0123456789abcdef	0x0d851aab364ac1d28ad1c23c7651c9affebb09ba88b8a094122eff1e7b5595b0	Legacy
0x6cebfb928f09afea77a627fbc716f446b0d2f667	0x2c2952ae2d87cc310b1fb92f9ee03645815dc5303d4704087434ee3a3088de61	0x	0x407605dc23e482a74e4846bf6c242690f7618183fb2c6517b1218b8b35aa3943	Legacy
0x109c4f2ccc82c4d77bde15f306707320294aea3f	0x07c84194730ce4bb7f6e18cae97d89441479917c892cd6c81afee1c7b63ee530	0x	0xc7b726f297f9eb9b7d17864b31ed3b2f527672fcdf71d6fcd2728abaa6397851	Legacy
0x2910543af39aba0cd09dbb2d50200b3e800a63d2	0x07c84194730ce4bb7f6e18cae97d89441479917c892cd6c81afee1c7b63ee530	0x454e45554350585a30	0x58a2cf5eaf3920ff4387b0e4c206169140ff9f8a998a5becff3bf4f6f3b91a57	Legacy
0x1da881fae84444ebef7b72f3267a4e67aa61fae9	0xe6553e60c059b1042946d69cefe12a42c703c4c354d5a4153cf8667efe38aebc	0x	0xc94bfe30d490c03fbf3b013cbaf1acd01d4f381e09ac999f00dcdcc8e999494e	Legacy

Description of the erc_20_Ethereum.evt_Transfer

erc20_ethereum.evt_Transfer

This table captures all **token transfer event data**, including contract address, transaction hash, sender/receiver, block details, and the transferred amount.
It serves as the core dataset for analyzing USDC (or any ERC-20) movement, user behavior, and on-chain transfer patterns

evt_tx_index	evt_index	evt_block_time	evt_block_number	evt_block_date	from	to	value
	62	2025-11-24 20:14	23871011	2025-11-24 00:00	0xbca34ed5875079cc561840f3409a790769821dbc	0x8beca38f10f55f587ee417c1bfd395fcb9fe4244	3000000
	61	2025-11-24 20:14	23871011	2025-11-24 00:00	0x8f0d024e780b7e2fd633a4d6d43631a96e8cb059	0xee9e330bf68d59ba7e2b924712063e07c3f3a62f	1129000000
	60	2025-11-24 20:14	23871011	2025-11-24 00:00	0xe955e61fb93b0871953d5c55f8afd416ebaafda4	0x3e9562e02964d7574ac9524eee9a1705d86b97ec	6997000000
	56	2025-11-24 20:14	23871011	2025-11-24 00:00	0xd558baa73de9ff55e13086e5d88dc9a3acc6e357	0x9cf58228502116980c1ce785b2e0e291cb8e27de1	17000000000000000000000
	55	2025-11-24 20:14	23871011	2025-11-24 00:00	0x38f6d5fb32f970fe60924b282704899411126336	0x79e3f6310c148b0175994256183312606903e568	983438141200000
	54	2025-11-24 20:14	23871011	2025-11-24 00:00	0xab782bc7d4a2b306825de5a7730034f8f63ee1bc	0xa1610b2f52eea361963bd1b78f3206b99431bff8	570673958
	53	2025-11-24 20:14	23871011	2025-11-24 00:00	0x8329d783f96e48d50f0f1f5a3c7f83b73a5c0218	0xff1fa38a2c673aa934ba50b2de61172ef17bcbdf	185100568
	52	2025-11-24 20:14	23871011	2025-11-24 00:00	0x53779d391faabb80bd5e589ee717687a381b1be1	0x3563015e9f5694afe5d8cd86233f77557da784cc	9649862
	51	2025-11-24 20:14	23871011	2025-11-24 00:00	0xdcc22b2e9c861858550f69a1bdf7b1e8924b6add	0x3563015e9f5694afe5d8cd86233f77557da784cc	10000000
	50	2025-11-24 20:14	23871011	2025-11-24 00:00	0xf18b67391ca3f50a47a5d0f8f65d45000ea7cbd0	0x3563015e9f5694afe5d8cd86233f77557da784cc	10000000

contract_address	evt_tx_hash	evt_tx_from	evt_tx_to	e
0xdac17f958d2ee523a2206206994597c13d831ec7	0x485a2f53dceb5cd65cd2d833ee702f7eb9e9182f155e307a95c9ee74b5011d0a	0xbca34ed5875079cc561840f3409a790769821dbc	0xdac17f958d2ee523a2206206994597c13d831ec7	
0xdac17f958d2ee523a2206206994597c13d831ec7	0x3731135be87ae0bfdfb0de24432af003025d05035575ddae8ea82861de412d6c	0x8f0d024e780b7e2fd633a4d6d43631a96e8cb059	0xdac17f958d2ee523a2206206994597c13d831ec7	
0xdac17f958d2ee523a2206206994597c13d831ec7	0x2ef8b6e28bf8eb295ed8535097e43da184e67afff2b1872b703bdcc556619b33	0xe955e61fb93b0871953d5c55f8afd416ebaafda4	0xdac17f958d2ee523a2206206994597c13d831ec7	
0x940a2db1b7008b6c776d4faaca729d6d4a4aa551	0xd0f1f5cafce037668dcd0a42728baa6087e9e0eb8e9caa7b0834b00862d8cbee	0xd558baa73de9ff55e13086e5d88dc9a3acc6e357	0x940a2db1b7008b6c776d4faaca729d6d4a4aa551	
0xd29da236dd4aac627346e1bba06a619e8c22d7c5	0x4b81cc45b841e9affe72c38bc5f834481638369aa890d58d3bcfeea3e94394d2	0x38f6d5fb32f970fe60924b282704899411126336	0xd29da236dd4aac627346e1bba06a619e8c22d7c5	
0xa0b86991c6218b36c1d19d4a2e9eb0ce3606eb48	0xad91fee46d8920c33be61451eb592122d0ad9ef89889b9293118ea5d4ff533e9	0xab782bc7d4a2b306825de5a7730034f8f63ee1bc	0xa0b86991c6218b36c1d19d4a2e9eb0ce3606eb48	
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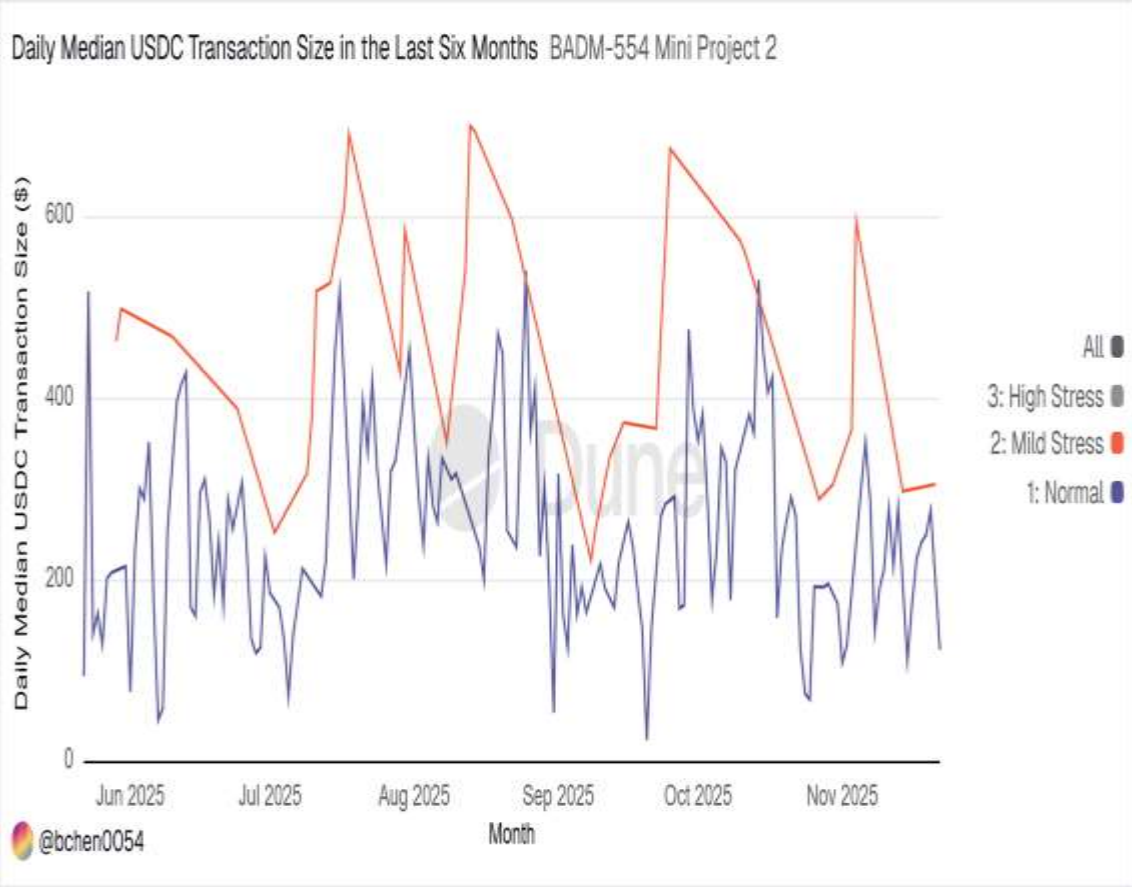
0xdac17f958d2ee523a2206206994597c13d831ec7	0xcba484010e21bb71db901acafc3c45f4457f4fa82b191e1e3a0321b503f234b2	0x53779d391faabb80bd5e589ee717687a381b1be1	0xdac17f958d2ee523a2206206994597c13d831ec7	
0xdac17f958d2ee523a2206206994597c13d831ec7	0x8195ec947c02ae576e7ac354b1cfb1b2ce7bfb1059b775d811fc2165a9283d5d	0xdcc22b2e9c861858550f69a1bdf7b1e8924b6add	0xdac17f958d2ee523a2206206994597c13d831ec7	
0xdac17f958d2ee523a2206206994597c13d831ec7	0x00e1e0c3e265ec9b33c050dcfbeac5c0b9b3b2e426e693a2448502fdd8323608	0xf18b67391ca3f50a47a5d0f8f65d45000ea7cbd0	0xdac17f958d2ee523a2206206994597c13d831ec7	

Deep Dive Charts

Median USDC Transaction Size

Median Transaction Size in Last 6 Months



Key Points

Volatile Trends

The chart tracks **daily median USDC transaction sizes** over the last six months, showing significant volatility throughout the period.

Stress Premium

Normal stress periods (blue line) fluctuate heavily, ranging roughly from $50 to $450, with no long-term upward or downward trend.

Higher Transfers

Mild stress periods (orange line) show consistently higher transaction medians, often clustering between **$400 and $650**

Stress Response

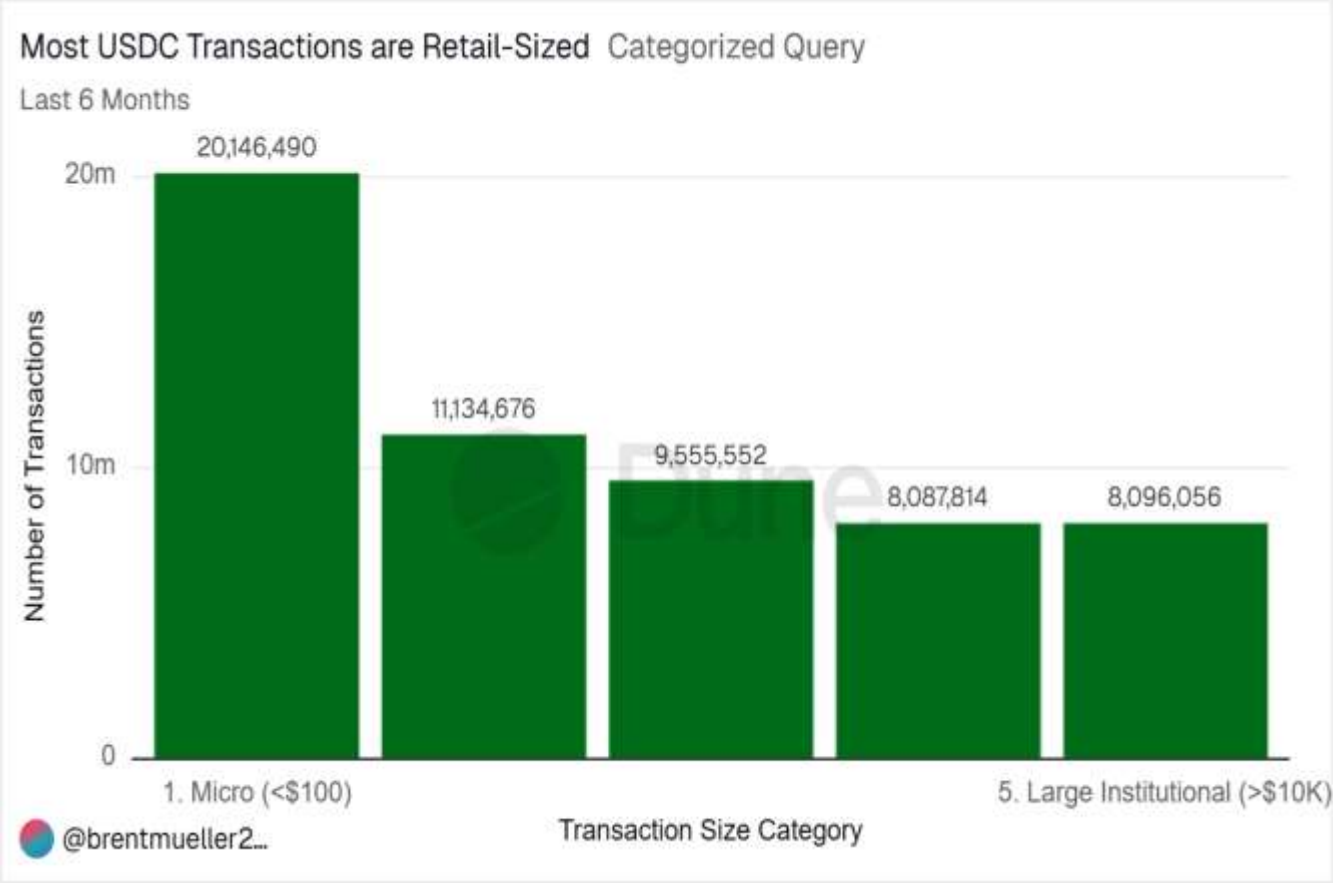
Users move **larger USDC amounts during mild stress**, likely driven by higher liquidity or safety needs. higher

Aligned Spikes

Peaks in both lines often align, showing that stress periods amplify overall transaction volatility.

USDC Transactions across Retail Market

USDC Transactions



Key Points

Micro Transactions

Micro-transactions dominate, with transfers under $100 making up 35.3% of all activity—showing strong peer-to-peer usage.

Medium Retail Transfers

Medium retail transfers ($500–$2K) account for 16.8%, matching common international remittance ranges.

Sized Transfers

Institutional-sized transfers (> $2K) represent only 28.4% of activity, confirming that USDC is primarily used by retail users.

Overall Summary

- USDC's volume profile aligns closely with **emerging-market remittance demand**, supported by over 20 million micro-transactions.

Ethereum USDC Transaction Costs: October-November 2025

Future Directions

Key Points

Reduction in Fees Cost : Fees dropped approximately 75% from the starting point (0.0039 ETH on Oct 26) to recent levels, with November averaging around 0.0015-0.0020 ETH per transaction.

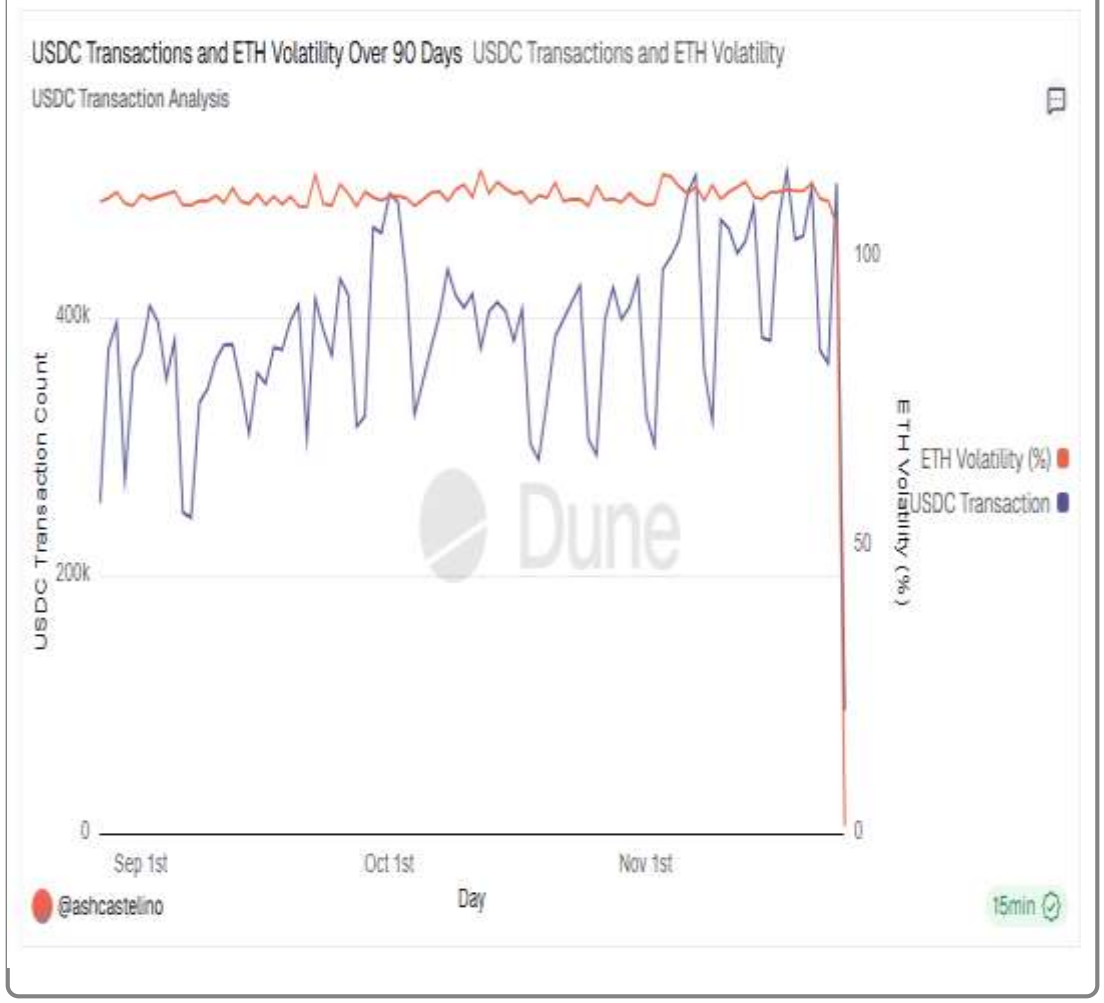
Complex installation & maintenance: Transaction costs peaked at 0.0052 ETH, more than double the surrounding days' averages, indicating a brief period of network congestion or high demand.

Lowest Fees in November : The most economical period for USDC transfers was November 1-2 and November 15, with fees dropping to around 0.0005-0.0006 ETH, representing optimal times for cost-conscious transfers.

Summary: While most days show relatively consistent fees in the 0.0012-0.0027 ETH range, the data demonstrates that transaction costs can unexpectedly double or halve day-to-day, making timing important for optimizing transfer costs.

USDC Transaction Activity Remains Stable Despite ETH Price Volatility

USDC Transactions and ETH Vol



Key Points

USDC Transactions Stability

Daily transaction counts consistently range between 200K-400K throughout the 90-day period, demonstrating steady stablecoin usage regardless of market conditions.

ETH Volatility

Ethereum price volatility hovers around the 100% level for most of the period, indicating a sustained high-volatility environment without major disruptions to USDC activity.

No Correlation between ETH and USDC

Despite significant ETH price swings, USDC transaction volumes maintain their pattern, suggesting stablecoin activity is largely independent of underlying network asset volatility.

Sharp decline in late November

Both metrics show a notable drop at the end of the period, with USDC transactions falling dramatically and ETH volatility decreasing, potentially indicating a market-wide shift or data collection cutoff.

Conclusion

USDC Retail Adoption & Remittance Opportunity

The transaction breakdown clearly shows that USDC is functioning primarily as a **retail-driven digital dollar**, with micro-transactions and mid-sized retail transfers representing the bulk of activity. This aligns closely with behaviors seen in emerging markets—where users rely on stablecoins for **low-cost peer-to-peer payments, savings protection, and cross-border remittances**.

USDC Adoption Is Retail-Led

1

Micro-transactions under $100 dominate activity, signaling **strong peer-to-peer usage.**

Mid-sized **retail transfers match common remittance** behavior in emerging markets.

Institutional activity remains limited, reinforcing the **bottom-up nature of adoption**

Use Cases

2

Transfer sizes mirror global migrant remittance patterns (especially $500–$2K).

Low-value, high-frequency transactions reflect daily financial needs in EMs.

Over **20M micro-transactions** suggest USDC is already functioning as a digital dollar for many users.

Strategic Next Steps

3

Identify high-potential remittance corridors (Latam, Africa, Southeast Asia).

Evaluate partnerships with **local fintech's, mobile money apps, and wallets.**

Assess **local regulatory openness** toward stablecoins to determine market entry feasibility.

Further Analysis

4

Conduct wallet clustering or **regional mapping** to pinpoint **geographic adoption hotspots.**

Examine transaction timing patterns (weekly, monthly) to understand **user financial rhythms.**

Compare USDC transfer costs vs. traditional remittance fees to **quantify user savings.**

Thank You!

Appendix

References

Github - https://github.com/ashcastelinocs124/BADM550-miniproject-2.git

Dashboard - https://dune.com/ashcastelino/project-2-badm554

AI Usage

1)Team used AI for brainstorming to draft initial ideas on how we wanted our queries to be

2)Used AI at times to help us with our queries

3)We used AI to enhance our thinking to make us understand the important concepts, as most of us were new to these concepts

4)Used AI to create our readme.md for our Github, after we were finished with the code to help others check our repo for future reference