Network Analysis and Financial Dynamics of Friend.tech

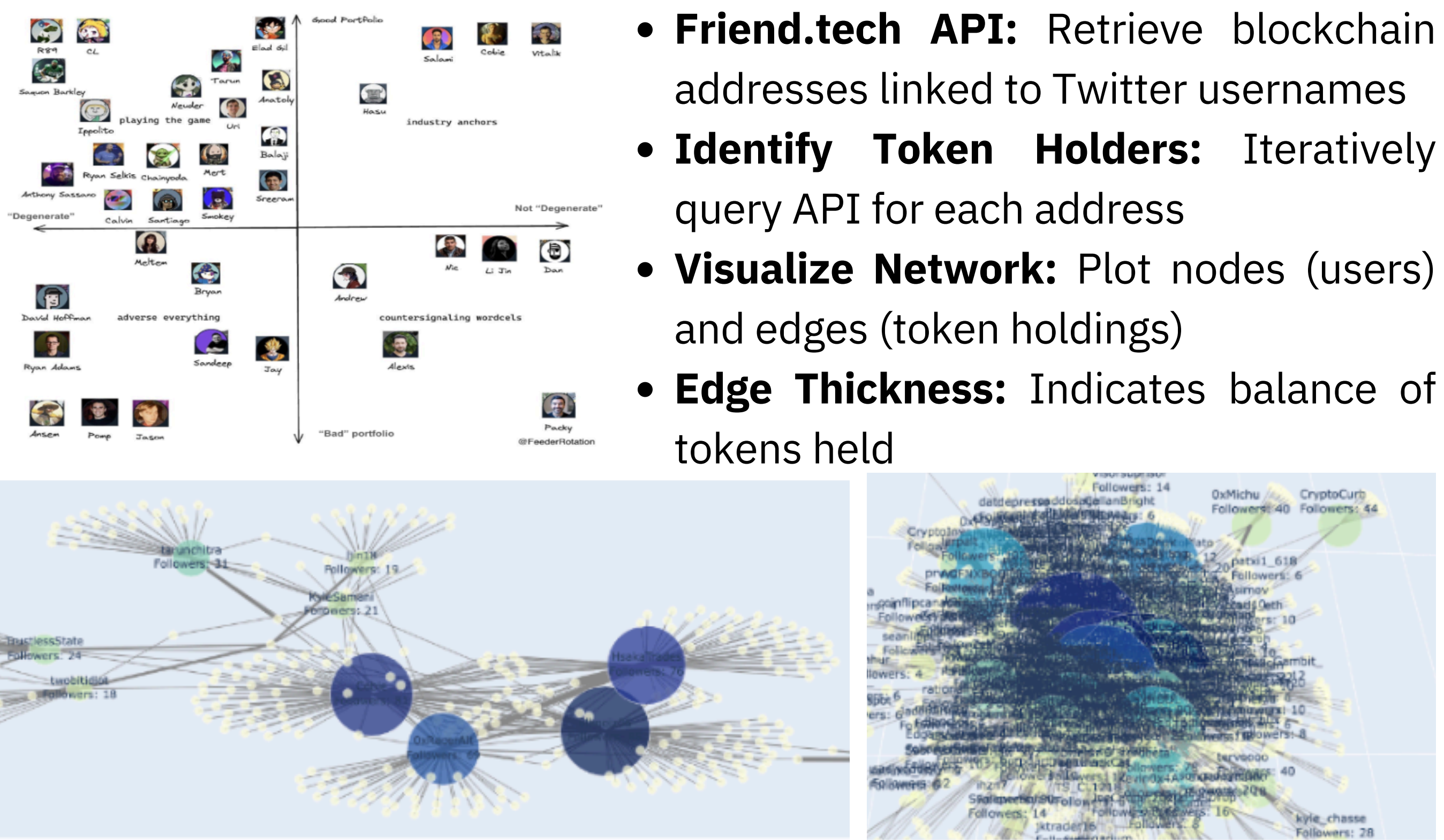Xiaofan Jiao, Yuhan Qian, Yanhui Li

Introduction

This project explores Friend.tech, a social platform integrating token trading and social interactions. Launched in 2023, Friend.tech combines social engagement with token trading, allowing users to buy and sell shares of their social connections. This innovative model has attracted a vibrant community and significant financial activity, with total protocol fees of $56M USD and a transaction volume of $624,768,935 USD. The platform boasts 915,579 unique buyers, highlighting its substantial trading volumes and continued influence on online engagement (Dune Analytics, n.d.).

Our Dataset

1. **Retrieving Addresses -** We used the Friend.tech API to collect blockchain addresses linked to specific Twitter usernames, forming initial network nodes.
2. **Gathering User Information -** Detailed user profiles from these addresses were extracted to enrich our understanding of each node.
3. **Identifying Token Holders -** We mapped network connections by identifying all token-holding addresses, iterating through API responses to build a comprehensive network graph.

Network Construction

- **Friend.tech API:** Retrieve blockchain addresses linked to Twitter usernames
- **Identify Token Holders:** Iteratively query API for each address
- **Visualize Network:** Plot nodes (users) and edges (token holdings)
- **Edge Thickness:** Indicates balance of tokens held
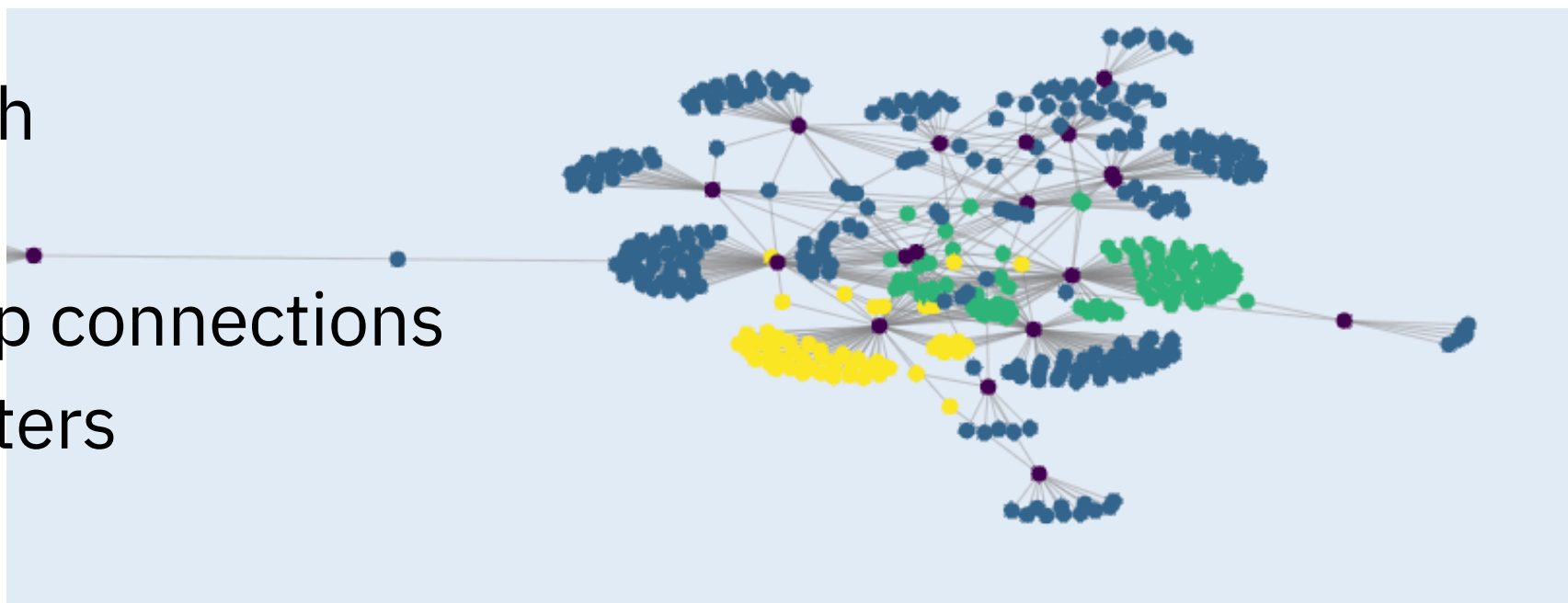

Key Distributor Analysis

- **Holder Count:** Avg 9 (range 3-11), exceptions up to 120
- **Holding Count:** Avg 42.5, max 7871 tokens
- **Follower Count:** Avg 573, top user 69,732 (e.g., 'blknoiz06')
- **Following Count:** Avg 88, max 14,056
    - **Top Users:**
        - Holdings: 'xiaopangpang99' (7871 tokens)
        - Following: 'RyanMoeller88' (14,856 accounts)

Key Holder Analysis

- **Holder Count:** Avg 6.84 (range 3-8), max 120
- **Holding Count:** Avg 27.08, max 7871 tokens
- **Follower Count:** Avg 263.85, max 69,734
- **Following Count:** Avg 59.73, max 14,856

Community Detection

- 50 industry leaders (Twitter usernames), connections among ~600 key holders
- K-means, k=3 (based on preliminary data)
- Key ownership patterns, similar profiles, shared interests, connections to leaders
- Interactive network graph
    - Nodes: Key holders
    - Edges: Key ownership connections
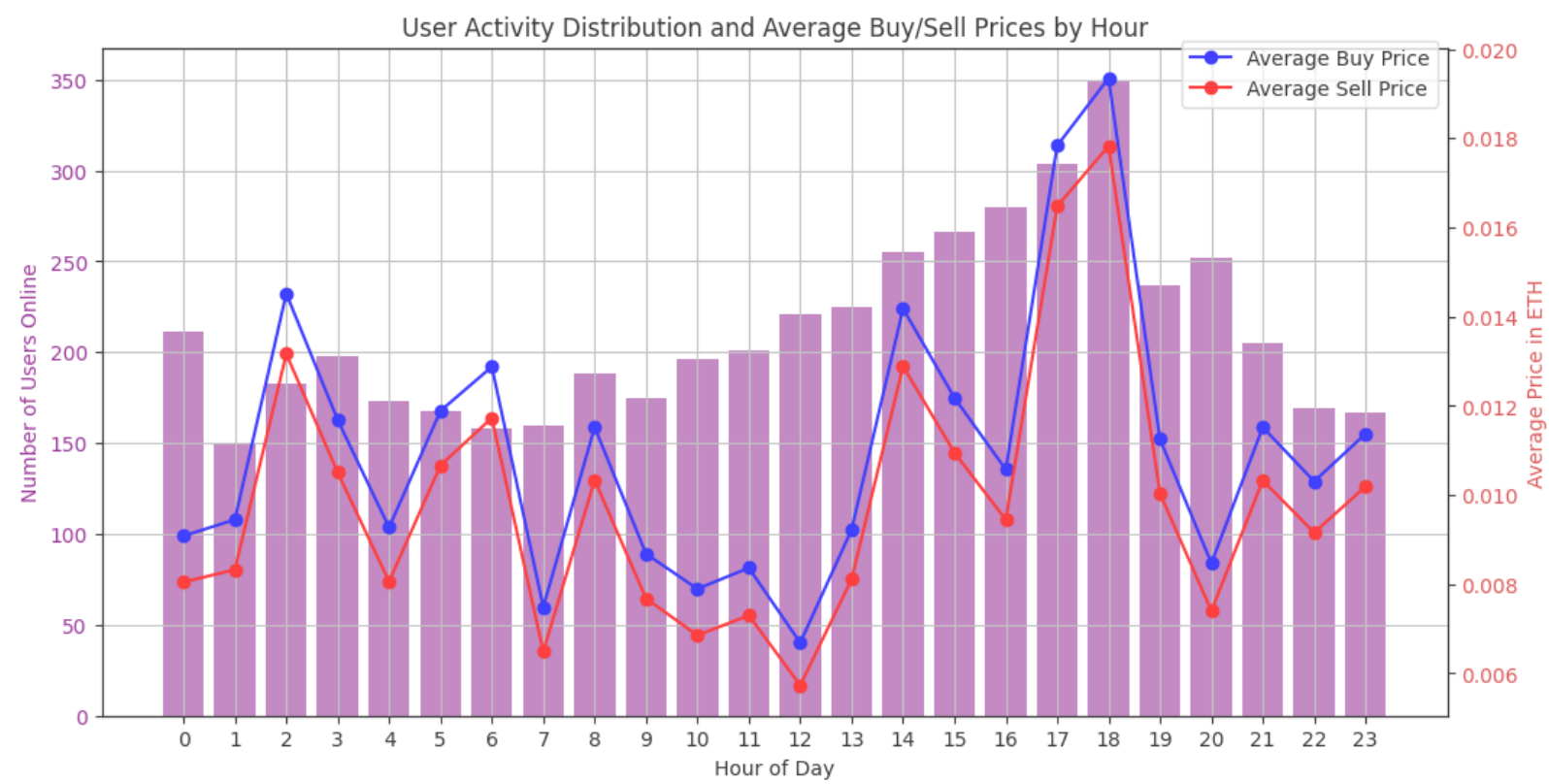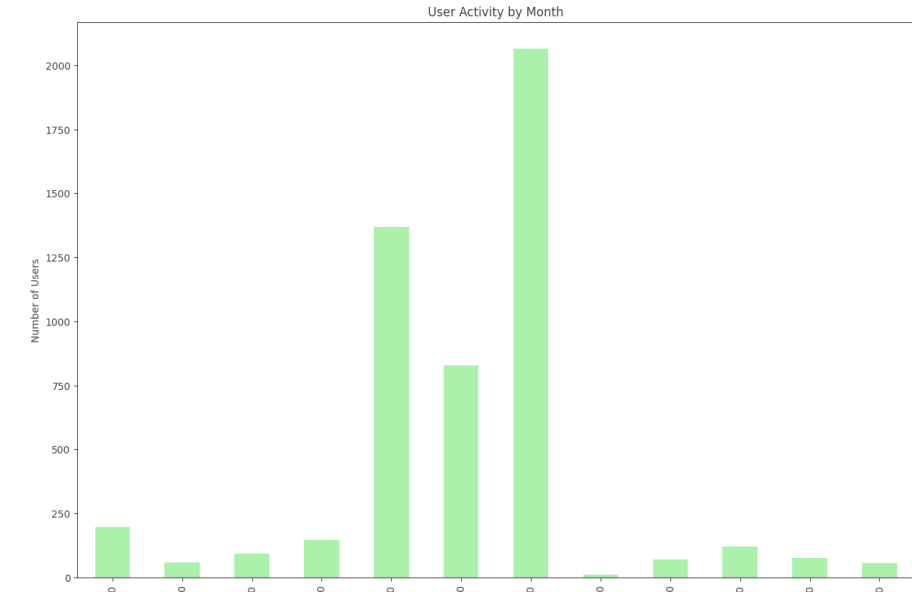   - Color-coded: By clusters

Financial Analysis

- Buy Price: Avg 0.011328 ETH
- Sell Price: Avg 0.010156 ETH

After Fees:
- Buy: 0.011894 ETH
- Sell: 0.009648 ETH

Price Range:
- Buy: 0.000063 ETH to 0.930250 ETH
- Sell: 0 ETH to 0.915063 ETH

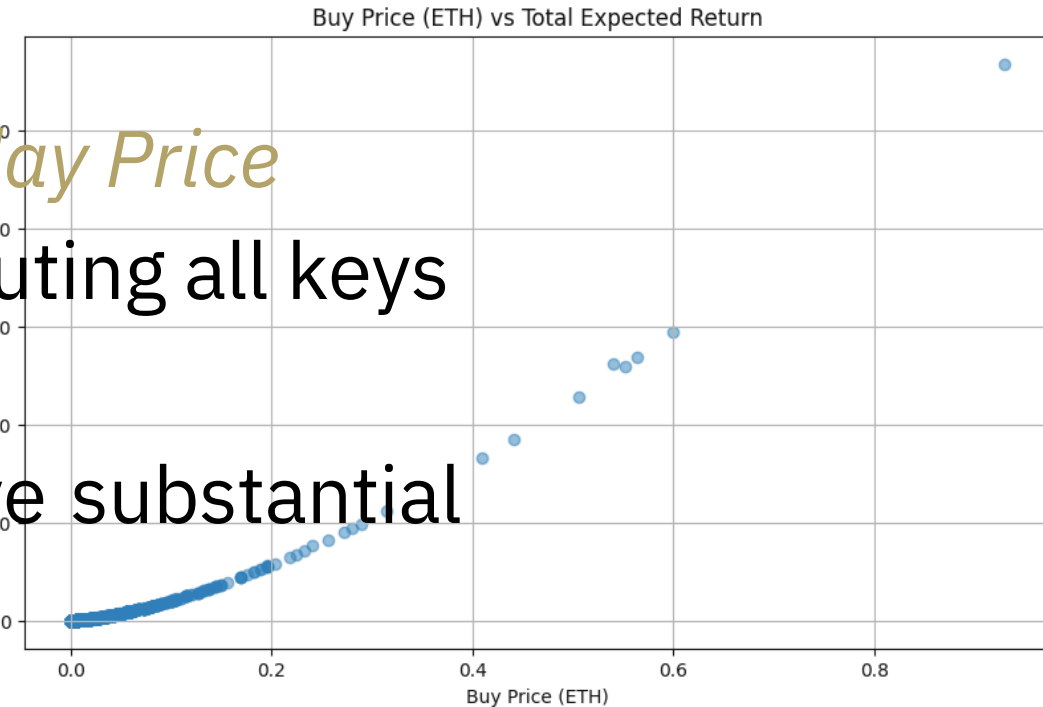**Impact:** Transaction fees, high price variability, diverse transaction landscape

User Activities

- **High Activity:** Leading up to and peaking in July
- **Data Collection:** July (most recent activity)
- **Measurement:** Last online time
- **Observation:** Many users inactive since earlier this year

- **Peak Times:** Buy and sell prices at 2:00, 6:00, 18:00 hours
- **Highest Peak:** 18:00 hours (high user activity)
- **Correlation:** High user engagement, increased trading activity
- **Dip Times:** Prices at 4:00, 7:00, 12:00 hours

Total Expected Return

Total Expected Return = Share Supply × Display Price

- Indicates overall expected return from distributing all keys
- Higher buy prices → Greater expected returns
- Influencers with higher key prices can achieve substantial financial returns

Price-Based Segmentation

- Better financial health, increased interest in higher-priced users.

	buy_price_tier	followerCount	holderCount	holdingCount	balance
0	Low	28.882392	2.463787	14.196678	1.096774
1	Medium-Low	52.682060	4.313499	20.769094	1.200000
2	Medium-High	185.279070	6.764441	29.741935	1.000000
3	High	865.266898	15.178510	47.015598	1.166667

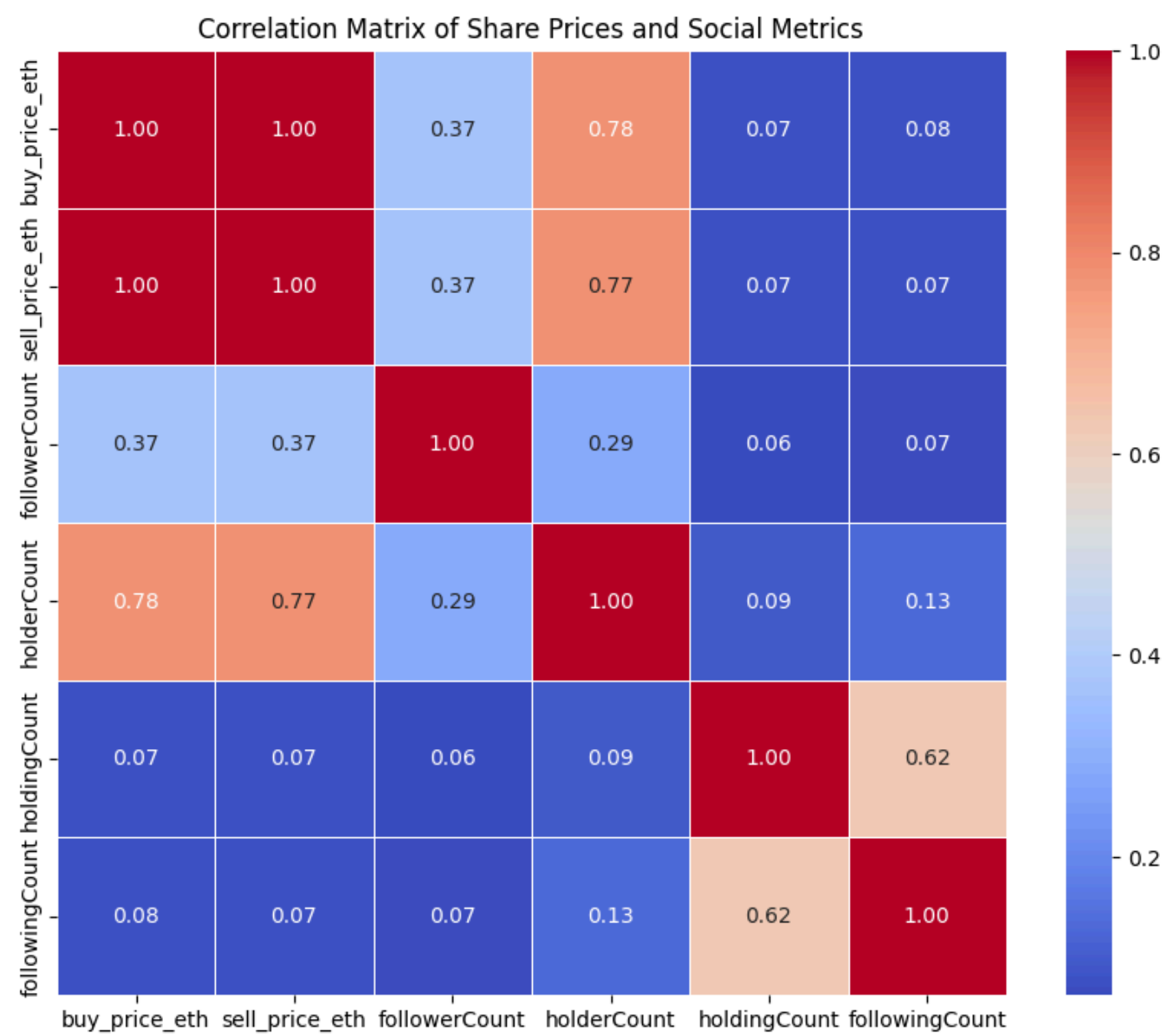## Holder Count and Holding Count Tier Analysis

- Users divided into Low, Medium, and High holder count tiers
- **Observation:** Higher holder counts → Higher prices
- **Conclusion:** More holders → Perceived higher value

- Trend: Higher holding counts → Higher prices
- Conclusion: More extensive holdings → Perceived higher value

	holder_count_tier	displayPrice	buy_price_eth	sell_price_eth
0	Low	0.001651	0.001650	0.001208
1	Medium	0.005030	0.005028	0.004090
2	High	0.030480	0.030467	0.028147

	holding_count_tier	displayPrice	buy_price_eth	sell_price_eth
0	Low	0.004877	0.004874	0.004141
1	Medium	0.008085	0.008077	0.006979
2	High	0.022629	0.022625	0.020835

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Correlation Analysis

Correlation Matrix of Share Prices and Social Metrics

- Share Prices and Follower Count:
  - Moderate positive correlation: 0.37 (buy and sell prices)
  - Popular users tend to have higher share prices
- Share Prices and Holder Count:
  - Strong positive correlation:
    - 0.78 (buy price)
    - 0.77 (sell price)
  - More holders → Significantly higher share prices
- Share Prices and Holding Count:
  - Weak correlation:
    - 0.07 (buy price)
    - 0.06 (sell price)
  - Little impact on share prices
- Share Prices and Following Count:
  - Very low correlation: 0.07 (both buy and sell prices)
  - Minimal impact on share prices
- Interrelationships Among Social Metrics:
  - Moderate positive correlation:
    - Holder count and holding count: 0.29
  - Strong positive correlation:
    - Holding count and following count: 0.62

Conclusion

- Valuable insights for enhancing user engagement strategies
- Optimization of platform design
- Contribution to Friend.tech's growth and success

Limitation and Future Studies

Limitations:
- **API Restrictions:** Constrained access to specific data on Friend.tech
- **Small Dataset:** Focus on prominent users may not represent broader user base

Future Studies:
- **Larger, More Diverse Datasets:** Capture a wider range of interactions and financial activities
- **Expanded Data Collection and Analysis:** Deeper understanding of platform dynamics
- **Impact of New Features:** Explore effects on user engagement and financial outcomes
- **Holistic View:** Integrate social networks with token economies