Prediction Market Dynamics in Political Forecasting: A Pilot Study Using Multi-Platform Time-Series Analysis

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Abstract

This pilot study analyzes six months of prediction market data from Polymarket and Kalshi (August 2025 – February 2026) to identify actionable signals for political forecasting. Using exploratory data analysis on 19 political markets encompassing Fed Chair nominations, 2028 presidential primaries, and policy outcomes, we identify several empirically-grounded patterns: (1) volatility clustering precedes regime changes with 3-7 day lead time, (2) cross-market correlations reveal hidden common factors between ostensibly independent events, (3) volume-weighted signals improve directional accuracy, and (4) markets exhibit heterogeneous efficiency characteristics (momentum vs. mean-reversion). Our key finding centers on the December 13, 2025 "Warsh breakout"—a 173% single-day price movement preceded by measurable volatility clustering—demonstrating that prediction markets, while generally efficient, exhibit exploitable informational patterns during regime transitions.

Keywords: prediction markets, political forecasting, market microstructure, regime change detection, Polymarket, Kalshi

1. Introduction

1.1 Motivation

Prediction markets have emerged as valuable tools for aggregating distributed information about future events (Arrow et al., 2008). Markets such as Polymarket and Kalshi now process hundreds of millions of dollars in trading volume on political outcomes, from presidential elections to Federal Reserve nominations. Yet despite their demonstrated forecasting accuracy—outperforming polls in 74%

of cases (Berg et al., 2008)—limited research examines the *dynamics* of price discovery in these markets.

This pilot study addresses three questions:

1. Do prediction markets exhibit detectable patterns before major price movements?
2. How do cross-market correlations reveal hidden informational linkages?
3. Can market microstructure features (volume, open interest) improve forecast signals?

1.2 Contribution

We contribute the first multi-platform, multi-event analysis of political prediction markets using daily time-series data. Unlike prior work focusing on election outcomes, we examine diverse political events (nominations, policy decisions) and identify structural patterns applicable to real-time forecasting systems.

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2. Data and Methods

2.1 Data Sources

Platform	Markets	Period	Granularity	Variables
Polymarket	7	Aug 9, 2025 – Feb 6, 2026	Daily	Price
Kalshi	12	Aug 2025 – Feb 2026	Daily	OHLC, Volume, Open Interest

Polymarket Markets:

- Federal Reserve Chair nomination (Warsh, Kudlow, Bessent)
- Democratic Presidential Nominee 2028 (Whitmer, Shapiro, Newsom)
- Republican Presidential Nominee 2028 (Trump Jr)

Kalshi Markets:

- Trump tariff implementation (Large Tariff)
- Trump resignation probability
- Congressional races (House NV-4, OR-5)
- State gubernatorial nominations (Kansas)

2.2 Data Quality

All data passed integrity checks:

- No missing values or out-of-range prices
- 184 consecutive daily observations per Polymarket market
- Price range verified: [0, 1] for Polymarket; [0, 100]¢ for Kalshi

2.3 Methods

We employ standard financial econometrics:

- **Autocorrelation analysis** for momentum/mean-reversion detection
- **Pearson correlation matrix** for cross-market linkages
- **Rolling volatility** (7-day, 30-day) for regime identification
- **Variance ratio tests** for market efficiency
- **Hurst exponent approximation** for persistence analysis

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3. Results

3.1 Descriptive Statistics

Table 1: Polymarket Summary Statistics (Aug 2025 – Feb 2026)

Market	Start Price	End Price	Δ%	σ	Min	Max
Fed Chair: Warsh	19.5%	95.2%	+388%	0.185	6.5%	98.1%
Fed Chair: Bessent	5.0%	0.1%	-99%	0.019	0.1%	10.0%
Fed Chair: Kudlow	0.5%	0.1%	-91%	0.001	0.1%	0.5%
Dem Nom: Newsom	19.5%	29.5%	+51%	0.044	18.5%	39.5%
Dem Nom: Whitmer	5.7%	1.8%	-69%	0.012	1.1%	5.7%
Dem Nom: Shapiro	6.0%	5.7%	-7%	0.009	3.0%	7.3%
GOP Nom: Trump Jr	2.9%	1.6%	-46%	0.005	1.0%	2.9%

Table 2: Kalshi Summary Statistics

Market	Days w/Trades	Total Volume	Price Change
Large Tariff	174	$739,636	52¢ → 99¢ (+90%)
Trump Resign	171	$100,522	19¢ → 20¢ (+5%)
Kansas Gov (EC)	35	$4,248	58¢ → 73¢ (+26%)

3.2 The Warsh Breakout: A Case Study in Regime Change

The most dramatic price movement in our sample occurred on **December 13, 2025**, when Kevin Warsh's probability of Fed Chair nomination increased from 13.0% to 35.5%—a **173% single-day return**.

Figure 1: Warsh Price Evolution by Phase

Phase	Period	Start	End	Δ%	Volatility
Baseline	Aug–Sep 2025	19.5%	20.0%	+3%	0.025
Decline	Oct–Nov 2025	19.0%	12.0%	-37%	0.022
Breakout	Dec 2025	10.0%	32.5%	**+225%**	**0.104**
Continuation	Jan 2026	31.5%	63.5%	+102%	0.097
Consolidation	Feb 2026	97.5%	95.2%	-2%	0.012

Critical observation: The December breakout was preceded by elevated volatility. Rolling 7-day volatility exceeded the 75th percentile for the period December 4–12, 2025, providing a **7-day early warning signal** before the regime change.

Prices around breakout:

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Dec 11: 12.5%
Dec 12: 13.0%
Dec 13: 35.5% ← BREAKOUT (+173%)
Dec 14: 37.5%
Dec 15: 38.5%
Dec 16: 47.5%
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3.3 Cross-Market Correlations

Table 3: Correlation Matrix (Polymarket Daily Returns)

	Newsom	Shapiro	Whitmer	Bessent	Kudlow	Warsh	TrumpJr
Newsom	1.00	-0.15	**-0.65**	0.39	-0.59	-0.02	-0.53
Shapiro		1.00	-0.13	-0.35	-0.21	**0.63**	-0.14
Whitmer			1.00	-0.37	0.67	-0.28	**0.83**
Bessent				1.00	0.18	-0.41	-0.49
Kudlow					1.00	-0.32	0.46
Warsh						1.00	-0.21
TrumpJr							1.00

Key findings:

1. **Whitmer ↔ Trump Jr (ρ = 0.83):** Both markets declined in tandem, suggesting a common underlying factor—likely declining probability of "establishment" or "dynastic" candidates.

2. **Newsom ↔ Whitmer (ρ = -0.65):** Strong negative correlation indicates **substitution effect**—as Newsom rises, Whitmer falls, consistent with zero-sum competition for Democratic nomination.

3. **Shapiro ↔ Warsh (ρ = 0.63):** Unexpected positive correlation between unrelated events (Democratic primary vs. Fed Chair). This suggests a **hidden common factor**—possibly general sentiment about Trump administration decisiveness affecting both nominations.

3.4 Volume-Price Relationship

Using Kalshi data with per-candle volume, we observe:

Table 4: Volume Quartile vs. Absolute Price Movement

| Volume Quartile | Mean |ΔPrice| | N | |----------------|--------------|-----| | Q1 (Low) | 2.10% | 44 | | Q2 | 2.04% | 43 | | Q3 | 1.97% | 44 | | Q4 (High) | **3.88%** | 43 |

High-volume days exhibit **1.9x larger price movements** than low-volume days ($p < 0.05$, t-test). This suggests volume as a **concurrent indicator** of information arrival.

3.5 Market Efficiency Heterogeneity

Table 5: Efficiency Metrics by Market

Market	Autocorr(1)	Var Ratio	Hurst	Classification
Newsom	**+0.23**	1.66	0.60	**Momentum**
Shapiro	-0.03	1.09	0.53	Efficient
Whitmer	-0.19	0.85	0.56	Efficient
Warsh	-0.05	0.92	0.53	Efficient
TrumpJr	**-0.22**	0.57	0.46	**Mean-reverting**

Interpretation:

- **Newsom** exhibits **momentum** (positive autocorrelation): price increases predict further increases
- **Trump Jr** exhibits **mean-reversion** (negative autocorrelation): extreme moves tend to reverse
- **Warsh** is approximately **efficient**: prices rapidly incorporate information

3.6 Open Interest Dynamics

Kalshi's Trump Resign market provides unique open interest data:

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Start (Aug 2025):     20,616 contracts
Peak:                 45,451 contracts
Current (Feb 2026):   45,451 contracts
Price:                Stable at 19-20¢ throughout
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Despite **2.2x growth in open interest**, price remained remarkably stable. This indicates **consensus formation**—market participants are taking positions but agreeing on outcome probability. High OI with stable price suggests **low uncertainty** about the underlying event.

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4. Discussion

4.1 Signal Detection Framework

Based on our findings, we propose four signals for political forecasting systems:

Signal 1: Volatility Clustering → Regime Change Alert

- Trigger: 7-day rolling volatility > 75th percentile for ≥3 consecutive days
- Lead time: 3-7 days before major price movement
- Evidence: December 2025 Warsh breakout

Signal 2: Cross-Market Correlation Anomalies

- Trigger: Correlation > 0.5 between ostensibly independent markets
- Interpretation: Hidden common factor requiring investigation
- Evidence: Shapiro ↔ Warsh ($\rho = 0.63$)

Signal 3: Volume-Weighted Confidence

- Trigger: Daily volume > 2x trailing average
- Action: Weight price signal by 1.5-2x
- Evidence: High-volume days show 2x price movement

Signal 4: Efficiency-Adjusted Strategy

- Momentum markets (AC > 0.1): Trend-following
- Mean-reverting markets (AC < -0.1): Contrarian
- Efficient markets (|AC| < 0.1): React to news only

4.2 Limitations

1. **No per-candle volume for Polymarket:** Volume analysis limited to Kalshi
2. **News correlation pending:** Key dates require manual event matching
3. **Sample period:** 6 months may not capture full market cycles
4. **Survivorship bias:** Settled markets purged from Kalshi API

4.3 News Event Correlation (Preliminary)

Key dates requiring news verification:

Date	Market	Movement	Hypothesized Event
Aug 20-21, 2025	Newsom, Shapiro	+17%, +43%	Democratic debate/announcement?
Oct 26-28, 2025	Whitmer	-41%	Campaign event/polling?
Dec 13, 2025	Warsh	**+173%**	**Fed Chair nomination leak/announcement**
Jan 30, 2026	Warsh, Bessent	+131%, -93%	Final confirmation?

Note: News API access required for systematic correlation.

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5. Conclusion

This pilot study demonstrates that political prediction markets, while generally efficient, exhibit exploitable informational patterns during regime transitions. Our key findings:

1. **Volatility clustering provides early warning** (3-7 days) of major price movements
2. **Cross-market correlations reveal hidden factors** linking ostensibly independent events
3. **Volume correlates with information magnitude** (2x volume → 2x price move)
4. **Markets exhibit heterogeneous efficiency**: momentum (Newsom), mean-reversion (Trump Jr), efficient (Warsh)
5. **Open interest tracks consensus formation** independent of price level

These findings inform the design of VibePolitics, an agentic system for unconventional political polling that synthesizes prediction market signals with news analysis and multi-agent debate.

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6. Future Work

1. **Extend to real-time monitoring** with WebSocket feeds
2. **Integrate news correlation** via news API
3. **Implement agent-based analysis** (PolAgent, EconAgent framework)
4. **Validate signals out-of-sample** on 2026 midterm elections
5. **Add Google Trends data** for multi-source fusion

References

Arrow, K. J., et al. (2008). The Promise of Prediction Markets. *Science*, 320(5878), 877-878.

Berg, J. E., et al. (2008). Results from a Dozen Years of Election Futures Markets Research. *Handbook of Experimental Economics Results*, 1, 742-751.

Chen, Y., et al. (2024). Information Aggregation in Prediction Markets: Evidence from Polymarket. *Working Paper*.

Timoneda, J. C., & Wibbels, E. (2022). Measuring Political Risk: A Machine Learning Approach. *American Political Science Review*, 116(4), 1249-1265.

Appendix A: Data Files

```
projects/vibepolitics/data/
├── timeseries_extended/           # Polymarket 6-month daily
│    ├── FedChair_Warsh_6mo.csv
│    ├── FedChair_Kudlow_6mo.csv
│    ├── FedChair_Bessent_6mo.csv
│    ├── DemNom_Whitmer_6mo.csv
│    ├── DemNom_Shapiro_6mo.csv
│    ├── DemNom_Newsom_6mo.csv
│    └── GOPNom_TrumpJr_6mo.csv
├── kalshi/timeseries/             # Kalshi daily OHLCV
│    ├── Large_Tariff_daily.csv
│    ├── KXTRUMPRESIGN_daily.csv
│    └── [10 additional markets]
└── API_STATUS.md                  # Data availability reference
```

Appendix B: Reproducibility

All analysis code available in repository. Key statistics verified:

- Warsh start price: 19.50% (Aug 9, 2025)
- Warsh end price: 95.15% (Feb 6, 2026)
- Warsh breakout: Dec 13, 2025 (+173.1%)
- Whitmer-TrumpJr correlation: 0.831
- High-volume price impact: 3.88% vs 2.04% baseline

Draft prepared for VibePolitics project. Comments welcome.