**Payment Split Pattern Analysis**

**Executive Summary**

Our analysis has identified a significant anomaly in payment splits beginning July 2024 and escalating dramatically through October–November 2024. The data shows an exponential increase in splits per payment, primarily affecting Type 0 transfers with $0 payment amounts. Although stakeholders implemented a “hidden splits” policy in November 2024 to address this issue, our analysis indicates that the problem persists. The system appears to be generating excessive splits that, while not causing accounting errors, significantly impact system efficiency and data quality.

*A graph of a graph

AI-generated content may be incorrect.*

**Key Findings**

1. **Pattern Evolution:**
   * **Normal operation (Jan–Jun 2024):** 2–10 splits per payment
   * **Initial anomalies (Jul 2024):** Occasional spikes up to 40 splits per payment
   * **Problem escalation (Aug–Oct 2024):** Regular spikes of 100–400 splits per payment
   * **Peak anomaly (Nov 1, 2024):** 457.6 splits per payment
   * **Post-policy change (Nov 15–Dec 2024):** Continued high split counts (avg 35.75)
2. **Issue Characteristics:**
   * 98.3% of suspicious payments are Type 0 transfers
   * 92.8% of suspicious payments have negative split amounts
   * Most problematic payments show a $0.00 payment amount with massive negative splits
   * Three specific claims (2536, 2542, 6519) generate the most excessive splits
   * Each affected procedure has exactly 10,348 splits with symmetric amounts
3. **Scale of Impact:**
   * 992 payments affected across 29 days
   * 250,898 suspicious splits generated
   * Top payment (#915894) generated 5,500 splits
   * Payment–split discrepancies exceeding $800,000

*[Insert “Impact of Policy Change” image here]*

**Detailed Pattern Analysis**

**Normal vs. Abnormal Transfer Patterns**

*Normal Transfer Pattern (Example: PayNum 917342, Dec 27, 2024):*

* 12 splits total
* 2.0 splits per procedure
* 6 procedures involved
* Typical business transaction pattern

*Abnormal Transfer Pattern (Example: PayNum 915884, Nov 1, 2024):*

* 4,158 splits
* Multiple splits per procedure (often 100+ per procedure)
* Primarily Type 0 transfers with $0 payment amount
* Massive negative split amounts
* Still nets to $0 as intended

**Payment Type Analysis**

The vast majority (98.3%) of problematic payments are Type 0 transfers:

| **Payment Type** | **% of Suspicious Payments** |
| --- | --- |
| Type 0 | 98.3% |
| Type 71 | 0.7% |
| Other Types | 1.0% |

**Payment–Split Discrepancies**

Top 5 payment–split discrepancies:

1. **Payment #915434:**
   * Payment: $0.00
   * Splits: $-859,064.88
   * Difference: $859,064.88 (4,946 splits)
2. **Payment #910740:**
   * Payment: $49,500.00
   * Splits: $891,000.00
   * Difference: $841,500.00 (36 splits)
3. **Payment #915873:**
   * Payment: $0.00
   * Splits: $-804,328.20
   * Difference: $804,328.20 (3,564 splits)
4. **Payment #910580:**
   * Payment: $47,000.00
   * Splits: $846,000.00
   * Difference: $799,000.00 (18 splits)
5. **Payment #913762:**
   * Payment: $43,900.00
   * Splits: $790,200.00
   * Difference: $746,300.00 (18 splits)

**System Behavior Progression**

| **Time Period** | **Avg. Splits per Payment** | **Maximum Splits** | **% of Suspicious Days** |
| --- | --- | --- | --- |
| Jan–Jun 2024 | 5.35 | 15.7 | 0% |
| Jul–Oct 2024 | 20.81 | 412.8 | 7.6% |
| Nov–Dec 2024 | 35.75 | 457.6 | 27.3% |

**Specific Claims Analysis**

Three claims (2536, 2542, 6519) are generating the most excessive splits:

* **Claim 2536:**
  + Procedures: 61980, 108306
  + Transfer Amount: $122.20
  + Each procedure: 10,348 splits with symmetric amounts (ranging from –$14,530 to +$14,530)
* **Claim 2542:**
  + Procedures: 61979, 108309
  + Transfer Amount: $189.20
  + Each procedure: 10,348 splits with symmetric amounts (ranging from –$14,530 to +$14,530)
* **Claim 6519:**
  + Procedure: 95856
  + Transfer Amount: $305.00
  + 10,348 splits with symmetric amounts (ranging from –$14,530 to +$14,530)

*Note: Activity was concentrated in a 6-day period (Oct 30 – Nov 5, 2024).*

**Policy Change Assessment**

In November 2024, stakeholders implemented a “hidden splits” policy with stricter enforcement of pay split documentation. Analysis shows:

* **Suspicious Days:** Increased from 7.6% pre-policy to 27.3% post-policy
* **Average Splits per Payment:** Increased by 71.7% (from 20.81 to 35.75)
* **December 2024:**
  + 4 suspicious days with a maximum of 278.9 splits per payment
  + 9.7% of December payments have over 100 splits
  + 67.7% of December payments show significant split differences

*Conclusion: The policy change has altered, but not resolved, the underlying technical issue.*

**Business Impact Assessment**

1. **No Direct Financial Impact:**
   * All transfers net to $0 as intended.
   * Original claim amounts are preserved.
   * Final accounting is correct.
   * Staff can complete intended transfers.
   * No lost or misallocated funds.
2. **Significant System Inefficiency:**
   * Excessive split generation (250,898+ suspicious splits).
   * Unnecessarily large split amounts.
   * Progressive escalation pattern.
   * Database bloat due to extra records.
   * Potential performance impacts.

**Root Cause Analysis**

Evidence indicates a system processing error specific to transfer payments:

1. **Recursive Split Generation:**
   * Processing Type 0 transfers with $0 amounts appears to trigger recursive or duplicate splits.
2. **Payment–Split Accounting Disconnect:**
   * Negative split amounts are recorded for zero-value payments, leading to massive discrepancies.
3. **Configuration Change:**
   * The clear start date (July 1, 2024) suggests a system change or upgrade introduced this behavior.
4. **Policy Change Complication:**
   * The November “hidden splits” policy appears to have exacerbated the issue rather than resolving it.

**Recommendations**

*Immediate Actions:*

* **Implement Emergency Filter:** Create a validation rule to prevent payments with more than 20 splits from processing automatically.
* **Reassess “Hidden Splits” Implementation:** Review the technical implementation of the November policy change.
* **Isolate Type 0 Transfers:** Add extra validation specifically for Type 0 payments with $0 amounts.

*System Corrections:*

* **Review Code Changes:** Examine payment processing code changes implemented before July 1, 2024.
* **Fix Split Logic:** Correct the logic that allows negative split amounts for zero-value payments.
* **Implement Validation Rules:**
  + Ensure the total split amount equals the payment amount.
  + Cap maximum splits per payment (suggested limit: 20).
  + Establish payment-type specific validation rules.

*Monitoring & Prevention:*

* **Develop Monitoring Dashboard:** Create a daily visualization of split patterns to quickly identify anomalies.
* **Add System Alerts:** Implement automatic notifications when payments exceed split thresholds.
* **Regular Data Quality Checks:** Establish weekly reviews of split metrics to catch emerging issues.

**Conclusion**

The payment split anomaly represents a significant system inefficiency that, while not causing direct financial errors, requires immediate technical attention. The current “hidden splits” policy has not resolved the underlying issue and may be contributing to its persistence. A focused technical intervention targeting the split generation logic—particularly for Type 0 transfers—is needed to restore normal system function.