Intraday Market Quality around Macroeconomic News:

Evidence from Indian Gold Futures Market

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Motivation

- Gold is a reactionary asset
  - Gold is hard to value and predict – no DCF valuation

- Web of complex drivers of gold: Fundamental (Demand/Supply), Macroeconomic, Uncertainty, Behavioural, Traditional Asset Classes
  - Quarum: Gold Valuation Framework (GVF) by World Gold Council –
    Economic Conditions + Risk & Uncertainty + Momentum + Opportunity Costs

- But rising financialisation of gold + massive inflows by institutional investors
  - Intensified influence of cross market information flows and global economic indicators (Elder et al., 2012; Reboredo and Uddin, 2016)

- Spatial fragmentation of liquidity
  - Commodity prices are predetermined w.r.t US macroeconomic aggregates- real output, consumption and investment variables (Kilian and Vega, 2010).
Motivation

- Public information arrival – **Macroeconomic News Announcements**
  - Source of non-diversifiable risk
  - Indicates future state of the economy and business conditions
  - Mixture of Distribution hypothesis (MDH) by Clark(1973)
  - Natural setting to test informational efficiency
  - Intraday reaction to News shocks – news based trading strategies

- But **Direction & nature of reaction** to news is **indeterminable** ex ante for gold (Elder et al., 2012)
  - Different types of macroeconomic news have **different stochastic arrival processes** (Andersen, 1996)
  - Empirical Issue and not a verifiable claim.
  - Unanticipated component of news should move asset prices than release time.
3 Key Research Questions?

**Motivation**

**Research Problem**

**Empirical Approach**

**Empirical Findings**

**Robustness Checks**

**Policy & Conclusion**

- Which type of macroeconomic news moves Indian gold futures?

- How does domestic and global macroeconomic news affects market quality of Indian gold futures?

- Does Indian gold futures exhibit asymmetric response to Good & Bad news?
Novel Contribution

- Evidence for *emerging gold futures* market – India
- Intraday reaction to *Domestic and Global macroeconomic news* –
  - India (5) & US(27)
- Role of *News surprise* and *announcement timing* effects across 24 hours
- Pre-announcement (lagged), Contemporaneous and Post-announcement impact
- Response of *six market quality aspects* of gold futures:
  - returns, trading volume, volatility, effective spreads, order imbalance and depth
- *News watcher hypothesis*
- *Negativity bias or Asymmetric hypothesis* - Good and Bad news
- *High frequency data* for long sample period 2010-2018
Empirical Approach : Data and Sources

- MCX Gold futures – highest volume
- 1-minute interval data - best bid and ask quotes, trade price, volume and size data
- Trade and Quote (TAQ) data from Refinitiv.
- Sample Period – January 1, 2010 to March 31, 2018
- Sampled Data to 5-minute interval – Optimal sampling frequency
- Basic Data Cleaning procedure
- Converted all data to Indian Standard Time (IST)
Empirical Approach: News Surprise

- **Disaggregate (Individual) scheduled macroeconomic news** indicators from Bloomberg
- Scheduled news – pre-determined date of release
- Announcement time in IST, actual value of news, analyst forecast
- Five indicators for India, 27 news indicators for US – (DST)
- **New Surprise Index** (Balduzzi et al., 2001) as follows:

\[
\text{Newsurprise}_{t,k} = \frac{\text{Actual}_{t,k} - \text{Forecast}_{t,k}}{\sigma_k}
\]

- \(\text{Actual}_{t,k}\) is actual release value of economic news indicator \(k\) announced at day \(t\),
- \(\text{Forecast}_{t,k}\) is the median analyst forecast from Bloomberg for economic news indicator \(k\) at day \(t\) and
- \(\sigma_t\) is the sample standard deviation of surprise component \(\text{Actual}_{t,k} - \text{Forecast}_{t,k}\) for announcement \(k\).

- Calibrate News Surprise into **Positive and Negative news surprise**
Empirical Approach: Methods

Use Stepwise and ordinary least squares (OLS) regression (robust standard errors) for:

I. Pre-Announcement (lagged) effect at time $t - 5$ minute

$$MQ_{t-5} = \alpha + \beta_1 \times \sum_{n=1}^{k} \beta_n \times \text{NewsSurprise}_t + \epsilon_t$$

(1)

II. Contemporaneous Effect at time $t$

$$MQ_t = \alpha + \beta_1 \times \sum_{n=1}^{k} \beta_n \times \text{NewsSurprise}_t + \epsilon_t$$

(2)

III. Post-Announcement Effect at time $t+5$ minute

$$MQ_{t+5} = \alpha + \beta_1 \times \sum_{n=1}^{k} \beta_n \times \text{NewsSurprise}_t + \epsilon_t$$

(3)
Definition and Operationalisation of Market Quality (MQ) aspects

1. Trading Volumes (TV)
   - Liquidity, trade intensity, trade activity
   - Sum of trading volumes in 5-minute interval.

2. Depth of Market (DOM)
   - Demand and Supply of Contract (Buy and Sell Order Size)
   - Price Impact – absorb large market orders without significantly impacting price
   - Liquidity, Pending orders, likely direction of asset prices
   - Average of Bid Size and Ask Size of Limit order book.

3. Effective Spread (ES)
   - Transaction Cost, cost of trading, Liquidity
   - Price improvement & Market impact
   - \[ ES = 2 \times D \times (Price - Midquote) \]
   where D is direction of trade buy or sell.
Definition and Operationalisation of Market Quality aspects

4. Volatility
- Dispersion/ variance of squared return process.
- Realised Variance (RV) is sum of squared log returns for 5-minute interval midquotes.

5. Order Imbalance
- Net Buying Pressure
- Excess of buy or sell orders
- Short-lived, exist for minutes or hours
- OI = Buy orders minus Sell orders

6. Returns
- Average return earned at 5-minute.
- Log returns of midquotes at 5-minutes.
MQ 1: Hourly Trading Volumes

Avg. Hourly Trading Volumes

Trading Hours in IST

2010-2012
2013-2015
2016-2018
Full Sample 2010-2018
MQ 1: Hourly Trading Volumes

Average Hourly Trading Volumes

Trading Hours in IST

- 2010-2012
- 2013-2015
- 2016-2018
- Full Sample 2010-2018

India News
17:00-17:30 IST

US News
18:00-19:30 IST
MQ 1: Hourly No. of Trades

India News
17:00-17:30 IST

US News
18:00-19:30 IST

[Bar chart showing hourly no. of trades with trading hours in IST from 10 to 23, and different colors representing different time periods: 2010-2012, 2013-2015, 2016-2018, Full Sample 2010-2018]
MQ 2: Hourly Depth of Market (DOM)

![Bar chart showing hourly depth of market in IST with trading hours and data samples for different years.](chart.png)

- **Trading Hours in IST**
  - 17:00 - 17:30 IST: India News
  - 18:00 - 19:30 IST: US News

- **Data Samples**
  - 2010-2012
  - 2013-2015
  - 2016-2018
  - Full Sample 2010-2018

- **Average Hourly Depth**
  - Axes range from 0 to 6000.
MQ 3: Hourly Effective Spreads (Transaction Costs)

Trading Hours in IST

- India News: 17:00-17:30 IST
- US News: 18:00-19:30 IST

Avg. Hourly Effective Spreads

- 2010-2012
- 2013-2015
- 2016-2018
- Full Sample 2010-2018
MQ 5: Hourly Order Imbalance

Trading Hours in IST
- 2010-2012
- 2013-2015
- 2016-2018
- Full Sample 2010-2018

India News
17:00-17:30 IST

US News
18:00-19:30 IST
MQ 6: Hourly Returns (MQ)

Avg. Hourly Return (MQ) $\times 10^6$

Trading Hours in IST

- 2010-2012
- 2013-2015
- 2016-2018
- Full Sample 2010-2018

India News
17:00-17:30 IST

US News
18:00-19:30 IST
Insights from Descriptive Statistics – Market Quality

- Indian gold futures market have significant intraday variation in market quality aspects

- **Heightened trading intensity** during news intensive trading hours 17:30-20:00 IST

- Liquidity and Trading Activity - Volumes, trades and depth peaks

- Effective **spreads widen**

- **Volatility accentuates**

- Order Imbalance – sell order dominates during news intensive trading hours

- Returns falls
# Indian Scheduled Macroeconomic News

## Panel A: Descriptive Statistics for Scheduled Macroeconomic News Surprises from India

<table>
<thead>
<tr>
<th>Release Time in IST</th>
<th>Indian Scheduled Macroeconomic News</th>
<th>Frequency of Announcement</th>
<th>Total no. of News Days</th>
<th>Mean of Surprise</th>
<th>Standard Deviation of Surprise</th>
<th>No. of Positive Surprise days</th>
<th>Mean of Positive Surprise</th>
<th>No. of Negative Surprise Days</th>
<th>Mean of Negative Surprise</th>
</tr>
</thead>
<tbody>
<tr>
<td>12:00</td>
<td>WPI</td>
<td>Monthly</td>
<td>107</td>
<td>-0.095</td>
<td>0.004</td>
<td>53</td>
<td>0.718</td>
<td>54</td>
<td>-0.895</td>
</tr>
<tr>
<td>17:00</td>
<td>Balance of Payment (BOP)</td>
<td>Quarterly</td>
<td>27</td>
<td>-0.015</td>
<td>2.050</td>
<td>10</td>
<td>0.935</td>
<td>13</td>
<td>-0.751</td>
</tr>
<tr>
<td>17:30</td>
<td>CPI</td>
<td>Monthly</td>
<td>70</td>
<td>-0.073</td>
<td>0.003</td>
<td>30</td>
<td>0.797</td>
<td>40</td>
<td>-0.726</td>
</tr>
<tr>
<td>17:30</td>
<td>Industrial Production</td>
<td>Monthly</td>
<td>70</td>
<td>-0.073</td>
<td>0.024</td>
<td>30</td>
<td>0.940</td>
<td>40</td>
<td>-0.833</td>
</tr>
<tr>
<td>17:30</td>
<td>GDP</td>
<td>Quarterly</td>
<td>39</td>
<td>-0.034</td>
<td>0.005</td>
<td>16</td>
<td>0.845</td>
<td>17</td>
<td>-0.874</td>
</tr>
<tr>
<td>Release Time in IST</td>
<td>US Scheduled Macroeconomic News</td>
<td>Frequency of Announcement</td>
<td>Total no. of News Days</td>
<td>Mean of Surprise</td>
<td>Standard Deviation of Surprise</td>
<td>No. of Positive Surprise days</td>
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<td>No. of Negative Surprise Days</td>
<td>Mean of Negative Surprise</td>
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<td>----------------------------</td>
</tr>
<tr>
<td>18:00(19:00)</td>
<td>US_Personal Income</td>
<td>Monthly</td>
<td>93</td>
<td>-0.02</td>
<td>1</td>
<td>29</td>
<td>0.73</td>
<td>34</td>
<td>-0.68</td>
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<tr>
<td>18:00(19:00)</td>
<td>US_Non Farm Payroll</td>
<td>Monthly</td>
<td>99</td>
<td>-0.03</td>
<td>0.95</td>
<td>48</td>
<td>0.76</td>
<td>51</td>
<td>-0.77</td>
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<tr>
<td>18:00(19:00)</td>
<td>US_Retail Sales</td>
<td>Monthly</td>
<td>93</td>
<td>-0.13</td>
<td>0.69</td>
<td>29</td>
<td>0.63</td>
<td>45</td>
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<tr>
<td>18:00(19:00)</td>
<td>US_GDP Advance</td>
<td>Monthly</td>
<td>93</td>
<td>-0.07</td>
<td>0.96</td>
<td>36</td>
<td>0.75</td>
<td>39</td>
<td>-0.85</td>
</tr>
<tr>
<td>18:00(19:00)</td>
<td>US_Personal Consumption</td>
<td>Monthly</td>
<td>93</td>
<td>0.09</td>
<td>0.98</td>
<td>43</td>
<td>0.86</td>
<td>36</td>
<td>-0.8</td>
</tr>
<tr>
<td>18:00(19:00)</td>
<td>US_Durable Goods Sales</td>
<td>Twice in a month</td>
<td>109</td>
<td>0.05</td>
<td>1.11</td>
<td>62</td>
<td>0.64</td>
<td>39</td>
<td>-0.87</td>
</tr>
<tr>
<td>18:00(19:00)</td>
<td>US_Imports</td>
<td>Monthly</td>
<td>93</td>
<td>0.07</td>
<td>0.95</td>
<td>44</td>
<td>0.83</td>
<td>33</td>
<td>-0.92</td>
</tr>
<tr>
<td>18:00(19:00)</td>
<td>US_Current Account Balance</td>
<td>Quarterly</td>
<td>29</td>
<td>0.13</td>
<td>1.06</td>
<td>15</td>
<td>0.94</td>
<td>14</td>
<td>-0.75</td>
</tr>
<tr>
<td>18:00(19:00)</td>
<td>US_International Trade</td>
<td>Monthly</td>
<td>93</td>
<td>-0.02</td>
<td>0.97</td>
<td>40</td>
<td>0.72</td>
<td>46</td>
<td>-0.67</td>
</tr>
<tr>
<td>18:00(19:00)</td>
<td>US_PPI</td>
<td>Monthly</td>
<td>93</td>
<td>-0.02</td>
<td>0.86</td>
<td>37</td>
<td>0.76</td>
<td>36</td>
<td>-0.83</td>
</tr>
<tr>
<td>18:00(19:00)</td>
<td>US_CPI</td>
<td>Monthly</td>
<td>93</td>
<td>-0.08</td>
<td>1.05</td>
<td>20</td>
<td>1.42</td>
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<td>-1.18</td>
</tr>
<tr>
<td>18:00(19:00)</td>
<td>US_Housing Starts</td>
<td>Monthly</td>
<td>93</td>
<td>-0.07</td>
<td>0.98</td>
<td>41</td>
<td>0.76</td>
<td>46</td>
<td>-0.81</td>
</tr>
<tr>
<td>18:00(19:00)</td>
<td>US_Initial Jobless Claims</td>
<td>Weekly</td>
<td>378</td>
<td>-0.04</td>
<td>0.96</td>
<td>168</td>
<td>0.75</td>
<td>205</td>
<td>-0.68</td>
</tr>
<tr>
<td>18:00(19:00)</td>
<td>US_Unemployment_Rate</td>
<td>Monthly</td>
<td>93</td>
<td>-0.36</td>
<td>0.98</td>
<td>24</td>
<td>0.76</td>
<td>40</td>
<td>-1.24</td>
</tr>
<tr>
<td>18:00(19:00)</td>
<td>US_Building Permit</td>
<td>Monthly</td>
<td>93</td>
<td>0.19</td>
<td>1.04</td>
<td>46</td>
<td>0.93</td>
<td>40</td>
<td>-0.66</td>
</tr>
<tr>
<td>Release Time in IST</td>
<td>US Scheduled Macroeconomic News</td>
<td>Frequency of Announcement</td>
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<tr>
<td>18:45(19:45)</td>
<td>US_Capacity Utilisation</td>
<td>Monthly</td>
<td>93</td>
<td>-0.16</td>
<td>1.04</td>
<td>31</td>
<td>0.96</td>
<td>47</td>
<td>-0.92</td>
</tr>
<tr>
<td>18:45(19:45)</td>
<td>US_Industrial Production</td>
<td>Monthly</td>
<td>93</td>
<td>-0.14</td>
<td>1.05</td>
<td>32</td>
<td>0.95</td>
<td>46</td>
<td>-0.92</td>
</tr>
<tr>
<td>19:15(20:15)</td>
<td>US_PMI Manufacturing</td>
<td>Monthly</td>
<td>93</td>
<td>0.13</td>
<td>1.03</td>
<td>45</td>
<td>0.92</td>
<td>41</td>
<td>-0.74</td>
</tr>
<tr>
<td>19:30(20:30)</td>
<td>US_Construction Spending</td>
<td>Monthly</td>
<td>93</td>
<td>-0.37</td>
<td>0.94</td>
<td>34</td>
<td>0.51</td>
<td>51</td>
<td>-0.98</td>
</tr>
<tr>
<td>19:30(20:30)</td>
<td>US.Factory Orders</td>
<td>Monthly</td>
<td>93</td>
<td>0.01</td>
<td>0.87</td>
<td>38</td>
<td>0.77</td>
<td>38</td>
<td>-0.76</td>
</tr>
<tr>
<td>19:30(20:30)</td>
<td>US_Business Inventory</td>
<td>Monthly</td>
<td>93</td>
<td>0.1</td>
<td>0.95</td>
<td>32</td>
<td>1.02</td>
<td>28</td>
<td>-0.87</td>
</tr>
<tr>
<td>19:30(20:30)</td>
<td>US_New Home Sales</td>
<td>Monthly</td>
<td>93</td>
<td>0.04</td>
<td>0.95</td>
<td>43</td>
<td>0.76</td>
<td>43</td>
<td>-0.67</td>
</tr>
<tr>
<td>19:30(20:30)</td>
<td>US_Consumer Confidence</td>
<td>Monthly</td>
<td>93</td>
<td>0.15</td>
<td>0.96</td>
<td>47</td>
<td>0.9</td>
<td>39</td>
<td>-0.74</td>
</tr>
<tr>
<td>19:30(20:30)</td>
<td>US_Leading Index</td>
<td>Monthly</td>
<td>93</td>
<td>0.27</td>
<td>1.01</td>
<td>46</td>
<td>1.04</td>
<td>26</td>
<td>-0.93</td>
</tr>
<tr>
<td>19:30(20:30)</td>
<td>US_ISMAN_Index</td>
<td>Monthly</td>
<td>93</td>
<td>0.12</td>
<td>0.93</td>
<td>50</td>
<td>0.74</td>
<td>35</td>
<td>-0.75</td>
</tr>
<tr>
<td>19:30(20:30)</td>
<td>US_Existing House Sales</td>
<td>Monthly</td>
<td>93</td>
<td>-0.02</td>
<td>0.87</td>
<td>40</td>
<td>0.69</td>
<td>44</td>
<td>-0.66</td>
</tr>
<tr>
<td>19:30(20:30)</td>
<td>US_University of Michigan Sentiment</td>
<td>Twice in a month</td>
<td>174</td>
<td>-0.05</td>
<td>1.05</td>
<td>86</td>
<td>0.73</td>
<td>86</td>
<td>-0.83</td>
</tr>
</tbody>
</table>
Insights from Descriptive Statistics – News Surprise

5 Indian News Surprises –

- WPI has highest average news surprise index
- Balance of Payment (BOP) news -highest average standard deviation in news
- Most Indian news have higher number of negative news surprise days than positive.

27 US News Surprises –

- 15 news at 18:00 IST, 2 news at 18:15 IST, 1 at 19:15 IST while 9 news at 19:30 IST
- High news surprise index - Leading Index, Construction Spending, Business Inventory, ISM and PMI Manufacturing, Unemployment rate news -
- High dispersion in news surprise index - Industrial Production, Capacity Utilisation, Durable Goods Sale, Personal Income, CPI, Univ. Mich. Sentiment Index -
Empirical Findings: Overall

1. Macroeconomic news surprise significantly impacts MQ of Indian gold futures
   - Domestic news have strong **contemporaneous and pre-announcements** effects.
   - Positive domestic economic news negatively impacts MQ
   - Market moving domestic news – BOP, GDP, Inflation
   - News with high dispersion in surprise – greater impact - BOP
   - News with high size of news surprise – greater impact - WPI

2. Global US news surprises have strong **contemporaneous and post-announcement effects**.
   - Instantaneous impact within 5 minutes
   - Positive US economic news have positive impact on MQ of gold – high inflation expectations
Empirical Findings: Overall


3. News with high size of news surprise – greater impact - Leading Index, Construction Spending, Business Inventory, ISM and PMI Manufacturing, Unemployment rate

• Strong evidence for asymmetric hypothesis
• Gold futures reacts strongly to negative news surprise than positive
• Supports safe haven property of Indian gold futures
• Domestic and Global evidence for - negative economic news and negative news surprise have positive impact on MQ of gold
Empirical Findings I:

How domestic (India) news surprises affect market quality of Indian gold futures?
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<table>
<thead>
<tr>
<th>Release Time in IST</th>
<th>Indian Scheduled News Surprise</th>
<th>Pre-Announcement Effect (t- 5 min)</th>
<th>Contemporaneous Effect (t)</th>
<th>Post-Announcement Effect (t+5 min)</th>
</tr>
</thead>
<tbody>
<tr>
<td>12:00</td>
<td>WPI</td>
<td>0.16***</td>
<td>0.15*</td>
<td>-0.01</td>
</tr>
<tr>
<td>17:00</td>
<td>BOP</td>
<td>-0.24***</td>
<td>-0.28***</td>
<td>-0.13</td>
</tr>
<tr>
<td>17:30</td>
<td>CPI</td>
<td>0.23***</td>
<td>-0.31*</td>
<td>-0.22***</td>
</tr>
<tr>
<td>17:30</td>
<td>Industrial Production</td>
<td>0.01</td>
<td>-0.09</td>
<td>-0.14</td>
</tr>
<tr>
<td>17:30</td>
<td>GDP</td>
<td>-0.20***</td>
<td>-0.22*</td>
<td>-0.08</td>
</tr>
</tbody>
</table>
How domestic (India) news surprises affect market quality of Indian gold futures?

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<td>-0.12</td>
</tr>
<tr>
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<td>BOP</td>
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<td>-0.17***</td>
<td>-0.15***</td>
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<tr>
<td>17:30</td>
<td>CPI</td>
<td>-0.03</td>
<td>0.004</td>
<td>-0.01</td>
</tr>
<tr>
<td>17:30</td>
<td>Industrial Production</td>
<td>0.02</td>
<td>0.02</td>
<td>0.12*</td>
</tr>
<tr>
<td>17:30</td>
<td>GDP</td>
<td>-0.38***</td>
<td>-0.17*</td>
<td>-0.30***</td>
</tr>
</tbody>
</table>
How domestic (India) news surprises affect market quality of Indian gold futures?

<table>
<thead>
<tr>
<th>Release Time in IST</th>
<th>Indian Scheduled News Surprise</th>
<th>Pre-Announcement Effect (t-5 min)</th>
<th>Contemporaneous Effect (t)</th>
<th>Post-Announcement Effect (t+5 min)</th>
</tr>
</thead>
<tbody>
<tr>
<td>12:00</td>
<td>WPI</td>
<td>0.18</td>
<td>1.01***</td>
<td>0.58***</td>
</tr>
<tr>
<td>17:00</td>
<td>BOP</td>
<td>0.06</td>
<td>-0.82***</td>
<td>0.03</td>
</tr>
<tr>
<td>17:30</td>
<td>CPI</td>
<td>-0.33</td>
<td>-0.49***</td>
<td>-0.14</td>
</tr>
<tr>
<td>17:30</td>
<td>Industrial Production</td>
<td>-0.06</td>
<td>-0.86***</td>
<td>0.18</td>
</tr>
<tr>
<td>17:30</td>
<td>GDP</td>
<td>0.04</td>
<td>-1.51***</td>
<td>-0.25</td>
</tr>
</tbody>
</table>
How domestic (India) news surprises affect market quality of Indian gold futures?

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<tr>
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<th>Post-Announcement Effect (t+5 min)</th>
</tr>
</thead>
<tbody>
<tr>
<td>12:00</td>
<td>WPI</td>
<td>14.81**</td>
<td>-1.29</td>
<td>-1.66</td>
</tr>
<tr>
<td>17:00</td>
<td>BOP</td>
<td>-22.25*</td>
<td>-9.03***</td>
<td>18.10**</td>
</tr>
<tr>
<td>17:30</td>
<td>CPI</td>
<td>16.88***</td>
<td>-2.43</td>
<td>-2.12</td>
</tr>
<tr>
<td>17:30</td>
<td>Industrial Production</td>
<td>-12***</td>
<td>-4.79**</td>
<td>1.29</td>
</tr>
<tr>
<td>17:30</td>
<td>GDP</td>
<td>9.828</td>
<td>-7.87**</td>
<td>-14.46**</td>
</tr>
</tbody>
</table>
How domestic (India) news surprises affect market quality of Indian gold futures?

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<tr>
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<th>Post-Announcement Effect (t+5 min)</th>
</tr>
</thead>
<tbody>
<tr>
<td>12:00 WPI</td>
<td></td>
<td>0.046</td>
<td>0.029</td>
<td>0.058*</td>
</tr>
<tr>
<td>17:00 BOP</td>
<td></td>
<td>-0.071***</td>
<td>-0.34***</td>
<td>-0.02</td>
</tr>
<tr>
<td>17:30 CPI</td>
<td></td>
<td>-0.015</td>
<td>-0.004</td>
<td>-0.005</td>
</tr>
<tr>
<td>17:30 Industrial Production</td>
<td></td>
<td>-0.055</td>
<td>-0.006</td>
<td>0.015</td>
</tr>
<tr>
<td>17:30 GDP</td>
<td></td>
<td>-0.001</td>
<td>-0.009</td>
<td>-0.028</td>
</tr>
</tbody>
</table>
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</thead>
<tbody>
<tr>
<td>12:00</td>
<td>WPI</td>
<td>0.58</td>
<td>-0.25</td>
<td>0.87***</td>
</tr>
<tr>
<td>17:00</td>
<td>BOP</td>
<td>3.16***</td>
<td>-0.09</td>
<td>-1.76***</td>
</tr>
<tr>
<td>17:30</td>
<td>CPI</td>
<td>-1.42</td>
<td>0.04</td>
<td>0.12</td>
</tr>
<tr>
<td>17:30</td>
<td>Industrial Production</td>
<td>-3.00*</td>
<td>-1.22***</td>
<td>-0.51</td>
</tr>
<tr>
<td>17:30</td>
<td>GDP</td>
<td>-1.89</td>
<td>0.22</td>
<td>0.06</td>
</tr>
</tbody>
</table>
Empirical Findings I: How domestic (India) news surprises affect market quality of Indian gold futures?

- Most market quality aspects are negatively influenced by domestic news surprises.
- High contemporaneous and pre-announcement effects.
- Size of news surprise affects intensity of impact of news surprise.
- Dispersion in news surprise positively impacts the market quality.
- Positive economic news (improvement in economy) have negative impact on market quality:
  - Positive news - increase real interest rates - increase cost of carry - reduce economic growth and pushes down the gold prices (negative returns).
Empirical Findings I: Which domestic (India) news surprises affect market quality of Indian gold futures?

- Market moving domestic news – **BOP, GDP, Inflation**
- News with high dispersion in surprise – greater impact - **BOP**
- News with high size of news surprise – greater impact – **WPI**
- Liquidity aspects – effective spreads, OI and depth are more sensitive to news.
Empirical Findings II:

How global (US) news surprises affect market quality of Indian gold futures?
Empirical Findings II:
How global (US) news surprises affect market quality of Indian gold futures?

- Global US news surprises have strong contemporaneous and post-announcement effects.
- Earlier scheduled news greater impact
- Simultaneously occurring news greater impact – Industrial Production, Capacity Utilization
- Positive US economic news have positive impact on MQ of gold –
- Positive news - high inflation expectations - encouraging investors to reallocate from equity to safe haven like gold thereby inducing greater returns
- Liquidity aspects – depth, order imbalance and volumes reacts strongly to global news surprises within -5 to +5 minutes window
Which global (US) news surprises affect market quality of Indian gold futures?

### Impact on Trading Volumes

<table>
<thead>
<tr>
<th>Market Quality</th>
<th>Pre-Announcement Effect (t- 5 min)</th>
<th>Contemporaneous Effect (t)</th>
<th>Post-Announcement Effect (t+5 min)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Trading Volumes</td>
<td>18:00- Non-Farm Payroll&lt;br&gt;18:00- Housing Starts&lt;br&gt;18:45 – Industrial Production&lt;br&gt;19:30- Construction Spending&lt;br&gt;19:30 - ISM&lt;br&gt;19:30- Leading Index</td>
<td>18:00- PPI&lt;br&gt;18:00- Personal Income&lt;br&gt;18:00 – GDP&lt;br&gt;18:00 – Trade Balance&lt;br&gt;18:00 – Initial Jobless Claim&lt;br&gt;18:00- Unemployment&lt;br&gt;18:45- Capacity Utilisation&lt;br&gt;19:30 – Construction Spending&lt;br&gt;19:30- Factory Orders&lt;br&gt;19:30- Business Inventory</td>
<td>18:00- Trade Balance&lt;br&gt;18:00- Imports&lt;br&gt;18:00- PPI&lt;br&gt;18:00 – Unemployment&lt;br&gt;18:45 – Industrial Production&lt;br&gt;19:15 – PMI Manufacturing&lt;br&gt;19:30- Construction Spending&lt;br&gt;19:30- Business Inventory&lt;br&gt;19:30 - ISM</td>
</tr>
</tbody>
</table>
Which global (US) news surprises affect market quality of Indian gold futures?

<table>
<thead>
<tr>
<th>Market Quality</th>
<th>Pre-Announcement Effect (t- 5 min)</th>
<th>Contemporaneous Effect (t)</th>
<th>Post-Announcement Effect (t+5 min)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Depth</td>
<td>18:00- Non-Farm Payroll 18:00- Imports 18:00- Housing Starts 18:45 – Industrial Production 19:30- Business Inventory 19:30 - ISM 19:30- Leading Index 19:30 – Univ. Michigan Sentiment Index</td>
<td>18:00- PPI 18:00- Personal Income 18:00 – Imports 18:00 – Trade Balance 18:00 – Initial Jobless Claim 18:00- Unemployment 18:45- Industrial Production 19:15 – PMI Manufacturing 19:30- Construction Spending 19:30- Business Inventory 19:30 - ISM 19:30- Leading Index 19:30 – Univ. Michigan Sentiment Index</td>
<td>18:00- Initial Jobless Claim 18:00- Imports 18:00- PPI 18:00 – Unemployment 18:45 – Industrial Production 19:15 – PMI Manufacturing 19:30- Construction Spending 19:30- Business Inventory 19:30 – ISM 19:30 – Univ. Michigan Sentiment Index</td>
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Which global (US) news surprises affect market quality of Indian gold futures?

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<th>Pre-Announcement Effect (t- 5 min)</th>
<th>Contemporaneous Effect (t)</th>
<th>Post-Announcement Effect (t+5 min)</th>
</tr>
</thead>
</table>
| 3. Effective Spread | 18:00 – GDP  
18:00 – Trade Balance  
18:00 – Initial Jobless Claim  
19:30- Factory Orders | 18:00- Unemployment  
19:30 - ISM  
19:30- Leading Index  
19:30 – Univ. Michigan Sentiment Index | 18:00 – GDP  
18:00 – Initial Jobless Claim  
19:30- Factory Orders |
| 4. Volatility | 18:00- Initial Jobless Claim  
19:30 – Consumer Confidence | 18:00- Personal Income  
18:45- Industrial Production  
18:45- Capacity Utilisation | 18:00- Durable Goods Sales  
18:00- Current Account Balance  
18:45 – Capacity Utilisation |
Which global (US) news surprises affect market quality of Indian gold futures?

<table>
<thead>
<tr>
<th>Impact on Order Imbalance and Returns</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Market Quality</strong></td>
</tr>
<tr>
<td>5. Order Imbalance</td>
</tr>
<tr>
<td>6. Return</td>
</tr>
</tbody>
</table>
Empirical Findings II:
Which global (US) news surprises affect market quality of Indian gold futures?

- Economic news related to manufacturing, unemployment, production – greater influence.


- News with high size of news surprise – greater impact - *Leading Index, Construction Spending, Business Inventory, ISM and PMI Manufacturing, Unemployment rate*
Empirical Findings III:  
Does Indian gold futures exhibit asymmetric reaction to Good & Bad News?
Empirical Findings III: Does Indian gold futures exhibit asymmetric reaction to Good & Bad News?

- Strong evidence for asymmetric hypothesis

- Gold futures reacts strongly to negative news surprise than positive

- Validated for all six market quality aspects

- Domestic and Global evidence for - negative news surprise have positive and greater impact on MQ of gold

- Supports safe haven and hedge property of Indian gold futures.
### Empirical Findings III: Does Indian gold futures exhibit asymmetric reaction to Good & Bad News? Domestic Evidence (India)

<table>
<thead>
<tr>
<th>Release Time in IST</th>
<th>Indian Scheduled News Surprise</th>
<th>Trading Volume at time (t)</th>
<th>Effective Spreads (t)</th>
<th>Depth (t)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Positive</td>
<td>Negative</td>
<td>Positive</td>
</tr>
<tr>
<td>12:00</td>
<td>WPI</td>
<td>0.257</td>
<td>0.432***</td>
<td>1.786**</td>
</tr>
<tr>
<td>17:00</td>
<td>BOP</td>
<td>0.295</td>
<td>0.886***</td>
<td>-0.055</td>
</tr>
<tr>
<td>17:30</td>
<td>CPI</td>
<td>-0.385*</td>
<td>-0.195</td>
<td>-0.292</td>
</tr>
<tr>
<td>17:30</td>
<td>Industrial Production</td>
<td>0.124</td>
<td>-0.224**</td>
<td>-0.772*</td>
</tr>
<tr>
<td>17:30</td>
<td>GDP</td>
<td>-0.247</td>
<td>-0.226</td>
<td>-1.906*</td>
</tr>
</tbody>
</table>
Empirical Findings III:
Does Indian gold futures exhibit asymmetric reaction to Good & Bad News?
Domestic Evidence (India)

<table>
<thead>
<tr>
<th>Release Time in IST</th>
<th>Indian Scheduled News Surprise</th>
<th>Volatility at time (t)</th>
<th>Order Imbalance at time (t)</th>
<th>Return at time (t)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Positive</td>
<td>Negative</td>
<td>Positive</td>
</tr>
<tr>
<td>12:00</td>
<td>WPI</td>
<td>0.111</td>
<td>-0.013</td>
<td>5.71**</td>
</tr>
<tr>
<td>17:00</td>
<td>BOP</td>
<td>0.155**</td>
<td>0.809***</td>
<td>14.54**</td>
</tr>
<tr>
<td>17:30</td>
<td>CPI</td>
<td>-0.004</td>
<td>-0.007</td>
<td>0.001</td>
</tr>
<tr>
<td>17:30</td>
<td>Industrial Production</td>
<td>-0.006</td>
<td>-0.007</td>
<td>-5.675</td>
</tr>
<tr>
<td>17:30</td>
<td>GDP</td>
<td>-0.011</td>
<td>-0.009</td>
<td>-0.792</td>
</tr>
</tbody>
</table>
Empirical Findings III: Does Indian gold futures exhibit asymmetric reaction to Good & Bad News? Global Evidence (US)

<table>
<thead>
<tr>
<th>Trading Volume at time (t)</th>
<th>Effective Spreads (t)</th>
<th>Depth (t)</th>
</tr>
</thead>
<tbody>
<tr>
<td>US_PINC_N</td>
<td>-0.42**</td>
<td>US_RETSALE_P -1.44**</td>
</tr>
<tr>
<td>US_GDP_N</td>
<td>-0.39**</td>
<td>US_PPI_P -0.94**</td>
</tr>
<tr>
<td>US_IMPORT_N</td>
<td>-0.41**</td>
<td>US_HousingStart_N -0.78**</td>
</tr>
<tr>
<td>US_TRADEBAL_N</td>
<td>-0.51**</td>
<td>US_Unempl_N 0.77**</td>
</tr>
<tr>
<td>US_Unempl_P</td>
<td>-0.62**</td>
<td>US_BuildingPermit_N 1.27**</td>
</tr>
<tr>
<td>US_PPI_P</td>
<td>0.69***</td>
<td>US_IndProd_N 0.389***</td>
</tr>
<tr>
<td>US_IndProd_N</td>
<td>-0.37</td>
<td>US_UnivMichSenti_N 0.586*</td>
</tr>
</tbody>
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Empirical Findings III: Does Indian gold futures exhibit asymmetric reaction to Good & Bad News? Global Evidence (US)

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<thead>
<tr>
<th>Volatility at time (t)</th>
<th>Order Imbalance at time (t)</th>
<th>Return at time (t)</th>
</tr>
</thead>
<tbody>
<tr>
<td>US_PINC_N</td>
<td>0.47*</td>
<td>US_PINC_N</td>
</tr>
<tr>
<td>US_CapaUtil_N</td>
<td>0.191***</td>
<td>US_CURBAL_N</td>
</tr>
<tr>
<td>US_PMIManu_N</td>
<td>0.063***</td>
<td>US_TRADEBAL_N</td>
</tr>
<tr>
<td>US_FacOrders_P</td>
<td>0.20**</td>
<td>US_IndProd_P</td>
</tr>
<tr>
<td>US_NHomeSales_N</td>
<td>-0.13*</td>
<td>US_ConsConf_N</td>
</tr>
<tr>
<td>US_LeadIndex_N</td>
<td>-0.23**</td>
<td>US_UnivMichSenti_N</td>
</tr>
</tbody>
</table>
Robustness Tests

1. Sensitivity to Sampling Interval
   - Assess the impact at 1- and 10-minute market quality
   - 5-minute results are similar to those of 1-minute results
   - Impact many news starts to vanish during 10-minute window

   - Impact of announcement timing by using time dummy effect
   - Find - Unanticipated component of news i.e. new surprise is better able to reflect news impact than time dummy

3. Sub-Sample Analysis
   - Divide the full sample period 2010-2018 into three sub samples
   - 2010-2012; 2013-2015 and 2016-2018
   - Find results to be statistically similar
Policy Implications

- Aid in devising **intraday news-based trading** strategies
- Insights on **informational efficiency** of gold futures
- **Market moving** domestic and global news
- Type of surprise characteristics- **size and dispersion**
- Asymmetric response to negative news
- Corroborates safe haven and hedging properties of Indian gold futures market
Conclusion

- Comprehensive examination of impact of Domestic and global macroeconomic news surprises on six market quality aspects of Indian gold futures
- Indian gold futures is sensitive macroeconomic news surprises
  - Gold market respond in an economically predictable manner
- Pre-announcement (lagged), Contemporaneous and Post-announcement impact
  - strong and instantaneous impact of domestic and global new surprise
- News watcher hypothesis – market moving news surprises
  - high news surprise and high dispersion
  - 18:00 US news dominates
- Negativity bias or Asymmetric hypothesis - Good and Bad news
  - Evidence in favour as negative impact of positive economic news and positive news surprise
  - Safe haven and hedging benefits of India gold futures
Thank You
for your attention & patient hearing.

Available at – neharika.sobti@gmail.com