Analyzing Thai Monetary Policy Communication

By

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Introduction

• “As it became increasingly clear that managing expectations is a central part of monetary policy, communication policy has risen in stature from a nuisance to a key instrument in the central banker’s toolkit.” (Blinder et al. 2008)

• Big Data (Data & Text)
  – Text-mining (text $\rightarrow$ Data)

• Trend in Big Data, Especially the usefulness of text-mining for economic policy analysis
  – For example, Recent BOT 2016 annual Symposium
Research Objective

• To analyze various dimensions of main documents from Thai monetary policy communication using various analysis (including Reading & Computational Linguistic)

– Main documents included
  • MPC Statements
  • FOMC Statements (Benchmark)
  • MPR (in the Appendix)
## Methodology and Results

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<td>• Correlation with MPC member changes</td>
<td>• MPC member has negative relationship</td>
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Word Count Analysis
Comparing with policy rate

Fed fund rate and FOMC word count

Financial Crisis (2008)

Debt Crisis (2013)

Policy rate and MPC word count

Financial Crisis (2008)
Manual Content Analysis

Forward and Backward Looking Analysis

- Past
- Future
- Total

2014.8Dec
Topic Analysis

• MPC statement in 2005.3Apr
• “Reflecting higher energy prices, headline and core inflation accelerated in March to 3.2 per cent and 0.8 per cent year-on-year, respectively. Nevertheless, the probability that core inflation will exceed the target range in the next 8 quarters remains low.”

• The Latent Dirichlet Allocation (LDA) Hansen&McMachon (2016)
  – Matches the words that have high probability to appear together
  – 15 topics
  – Topic name depends on subjective judgments
Main Topics
Tone Analysis

• MPC statement in 2005.3Apr
• “Reflecting higher energy prices, headline and core inflation accelerated in March to 3.2 per cent and 0.8 per cent year-on-year, respectively. Nevertheless, the probability that core inflation will exceed the target range in the next 8 quarters remains low.”
• Dictionary method (the wordlist is in table 4.1)

\[
\frac{n_{\text{Pos},t} - n_{\text{Neg},t}}{\text{Total words}_t}
\]
Economic Outlook and Inflation Indexes

**Economic Outlook Index**

- Global Financial Crisis (2009)

**Inflation Index**

- Oil Price Reduction (2014)
Ordered Probit Taylor Rule Model

• Measure the predictability of the communication indexes
  • Inflation Gap = (CPI yoy % change – BOT target)
  • Output Gap = \( \frac{MPI - MPI_{trend}}{MPI_{trend}} \) (use Hodrick-Prescott filter to plot trend)

• Model I No Index

\[ \Delta i_t = \beta_1 (\pi_t - \pi^*) + \beta_2 (y_t - y^*) + \varepsilon_t \]

Policy rate decision \rightarrow Inflation Gap \rightarrow Output Gap

• Model II with indexes

\[ \Delta i_t = \beta_1 (\pi_t - \pi^*) + \beta_2 (y_t - y^*) + \beta_3 EI_t + \beta_4 II_t + \varepsilon_t \]

Economic Outlook Index \rightarrow Inflation Index
## Predictability

**Table 5.1: The estimated result for Ordered Probit models with core inflation**

<table>
<thead>
<tr>
<th></th>
<th>Model I (no indexes)</th>
<th>Model II (With indexes)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>$\pi_t - \pi^*$</td>
<td>38.26 ***</td>
<td>44.67 ***</td>
</tr>
<tr>
<td></td>
<td>(13.00)</td>
<td>(3.15)</td>
</tr>
<tr>
<td>$\gamma_t - \gamma^*$</td>
<td>10.66 ***</td>
<td>9.40 ***</td>
</tr>
<tr>
<td></td>
<td>(2.69)</td>
<td>(2.82)</td>
</tr>
<tr>
<td><strong>Communication Indexes</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$II_t$</td>
<td></td>
<td>6.02 ***</td>
</tr>
<tr>
<td></td>
<td>(1.84)</td>
<td></td>
</tr>
<tr>
<td>$EI_t$</td>
<td></td>
<td>8.46 **</td>
</tr>
<tr>
<td></td>
<td>(3.83)</td>
<td></td>
</tr>
<tr>
<td>Pseudo-R$^2$</td>
<td><strong>0.1099</strong></td>
<td><strong>0.205553</strong></td>
</tr>
</tbody>
</table>

*** significant at 99 percent confidence level, ** significant at 95 percent confidence level, and * significant at 90 percent confidence level
Consistency Analysis

• “Language” the medium of all communication channels
• The Computational Linguistic tools can compare the frequency of words used between two documents  Acosta & Meade (2015)
• TF: Term frequency
  – Weighting equally
• TF-IDF: Term frequency – inverse document frequency
  – Weighting the words, which appear many documents lower and vice versa for the rare words
• The program compare the similarity between two consecutive documents
• Similarity = Language Consistency
• Compare the Consistency between FOMC and MPC statements
Consistency Analysis

MPC and FOMC Cosine Similarity (TF-IDF)

Financial Crisis
2008.8Dec
Correlation of MPC member and Similarity

- Should the change of the MPC members effect the language of the MPC statements?
- I calculate the correlations between MPC member and MPC statements
- No negative value for change of MPC members

<table>
<thead>
<tr>
<th>Cosine similarity</th>
<th>Correlation</th>
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<tbody>
<tr>
<td>TF cosine similarity</td>
<td>-8.81%</td>
</tr>
<tr>
<td>TF-IDF cosine similarity</td>
<td>-18.18%</td>
</tr>
</tbody>
</table>

- This implies that the change of MPC members have negative relationship with the consistency
Conclusion

• Key Takeaway
  – One single dimension of CB communication analysis is insufficient
  – Consistency & Content $\rightarrow$ Effectiveness

• Policy Implication
  – BOT should provide forward guidance in the statements
  – BOT should maintain degree of language consistency

• Future Research
  – More work on cross-country analysis (e.g. Wongwachara & Luangaram, 2016)
  – Text-mining using Thai Language
Bibliography


Thank you For Listening

• Your are all welcome for any questions
Appendix
MPR Analysis

MPR word count

22,601.82
31080
15164
Global Economy
Global Financial Crisis

- Financial Crisis (2008)
- Debt Crisis I (2011)
- Debt Crisis II (2013)
Domestic Natural Disaster

Southern Tsunami (2004)
Drought Disaster (2004)
Bangkok Flood (2012)