



Content-based metric on monetary policy uncertainty using large-scale language models

Arata Ito¹, Masahiro Sato², Rui Ota³

^{1,2,3} *Research Institute of Economy, Trade and Industry (RIETI), Tohoku University, Meiji University*

ABSTRACT

In modern monetary policy that prioritizes influencing public expectations, it is recognized that the words conveyed by central banks and newspaper articles play a significant role. Many studies propose methods to measure uncertainty related to monetary policy perceived by the public in terms of this communication. Previous studies measure monetary policy uncertainty (MPU) by counting the number of articles containing keywords that often appear in newspaper coverage mentioning MPU. Unlike earlier studies, we propose a new method for constructing an index of MPU from the contents of newspaper articles through Large Language Models (LLMs). Specifically, we fine-tune GPT models to extract sentences indicating policy uncertainty from the context of newspaper articles and index the ratio of character counts that the models take up in the whole relevant articles. Furthermore, we present that our proposed method enables us to categorize MPU into several types. There are at least two types of MPU: uncertainty over policy implementation, and uncertainty about policy effectiveness. We apply this manner to measure MPU in Japan for the period from 2015 to 2016. This is one of the most eligible sample periods for measuring MPU by type because the Bank of Japan conducted different changes in market operations and introduced new policy frameworks under quantitative and qualitative monetary easing adopted in 2013. To our best knowledge, measuring MPU by type via LLMs is a pioneering attempt in the literature.

Keywords: Bank of Japan; Central Bank Communication; Generative Pre-trained Transformer (GPT); Machine Learning; Natural Language Processing (NLP)