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Measuring Economic Policy Uncertainty in the Philippines

By Joselito R. Basilio, Mauro E. Jasmin, Jr., & Ma. Ellyсах Joy T. Guliman¹

¹ Mr. Basilio is former Deputy Director, Mr. Jasmin is Senior Bank Economist, and Ms. Guliman is Bank Economist IV at the Department of Economic Research (DER) of the Bangko Sentral ng Pilipinas. The authors acknowledge the valuable contributions to this study of Mr. Alan Chester T. Arcin and Mr. Michael Lawrence C. Castanares (both Bank Economists II, DER) and Mr. Justin Raymond Eloriaga (former Central Bank Associate); as well as the technical supervision provided by Ms. Roselle R. Manalo (Acting Director) and Ms. Cherrie R. Mapa (Supervising Bank Economist). More importantly, the authors are grateful to the news agencies who have generously shared data for the study.

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Introduction

Uncertainty is detrimental to financial markets and the real sector. Increased uncertainty, for example, could lead to risk aversion and thereby hamper the efficient functioning of financial markets. Heightened uncertainty could also depress hiring, investment, or consumption decisions of economic agents, resulting in slower economic growth. The Global Financial Crisis of 2007-2009 and the ongoing COVID-19 pandemic that started in 2020 have only fueled greater interest on the role of uncertainty during crisis periods.

Uncertainty is the conditional volatility of a disturbance that is unforecastable from the perspective of economic agents (Jurado et al., 2015). It could emanate from geopolitical conflicts, recessions, even disease outbreaks that put pressures on policy actions from authorities and central banks. Bloom (2014) identifies policy uncertainty in particular as one of the reasons for fluctuations in uncertainty, due to policymakers becoming more experimental with policies to revive growth during recessions. Thus, policy uncertainty—the key subject matter of this newsletter—has been of great relevance in modern economic literature on predicting crisis, mitigating risks, and understanding the very role of policy.

While there have been several efforts to measure it, uncertainty, by its very nature, remains an unobservable concept that is difficult to quantify. In the literature, measures of uncertainty rely only on proxies such as implied volatility of stock market

returns, cross-sectional dispersion of survey-based forecasts, and key words search in news publications (Bloom, 2014; Jurado et al., 2015).

For economic policy uncertainty, in particular, many empirical studies have followed the keywords search approach, made mainstream by Baker, Bloom, and Davis (2016), henceforth referred to as “BBD (2016).” Under this approach, a news-based index of economic policy uncertainty in the Philippines is created by counting the number of articles containing qualified words in three categories: **economy (E)**, **policy (P)**, and **uncertainty (U)**. The raw count is then scaled, standardized, and normalized to a mean of 100 to generate the economic policy uncertainty (EPU) index.

This study adopts the BBD (2016) methodology to develop an EPU index for the Philippines using various news sources. Subsequently, a category-specific index—the monetary policy uncertainty index—is also constructed to further understand underlying movements in EPU related to monetary policy. The indices are evaluated via a human audit of randomly selected articles from the database of newspapers used to generate the overall EPU index. The main goal of the human audit is to validate whether the randomly selected articles accurately pertain to uncertainty about economic policy. Metrics such as accuracy, precision, specificity, and recall are used to assess the index.

Data sources

In building the EPU index, the first step was to select sources for news articles. BBD (2016) used news database providers such as Proquest LLC and Dow Jones Factiva to obtain the articles needed to generate the US, Spain, France, and Germany EPU indices.

To obtain information specific to the Philippines, web scraping was done on the respective websites of the selected broadsheet and online news sources.¹ To ensure that data privacy and copyright laws are not violated, the authors reached out to a number of news sources to obtain permission to web-scrape their websites. Five newspapers were used as final sources for the Philippine Economic Policy Uncertainty (PEPU) index covering five years from 2017 to 2022.²

Methodology

Key words search in news publications akin to BBD (2016) was used to capture uncertainty from news. News articles are often archived and thus provide a good amount of historical information on uncertainty. The news articles can be processed to separate and thus filter

¹ Web scraping is a method used to extract available information from a website.

² The news sources are (A) Inquirer.net, (B) Manila Standard, (C) Manila Bulletin, (D) Business Mirror, and (E) Business World.

³ The Loughran-McDonald Dictionary is a collection of most common terms classified according to the following sentiments: positive, negative, neutral, or uncertainty. It is extracted from textual analysis of financial and business documents such as corporate 10-K reports, newspaper articles, press releases, and investor message boards.

⁴ Human audit is performed to evaluate the performance of the news-based PEPU index. A team of human auditors were tasked

out bias from uncertainty-related news. Conceptually, this approach captures the uncertainty about (A) *who* will make the economic policy decisions, (B) *what* and *when* economic policy actions will be undertaken, and (C) the economic *effects* of such policy actions.

Selection of key words

Following the BBD (2016) method, a set of terms is determined under E, P, and U. For the E and U categories, the same standard terms in BBD (2016) are used, e.g., “uncertain” or “uncertainty” and “economy” or “economic.” For the P terms, the words are adjusted based on the context of the Philippine economy as determined by the authors. For example, P terms such as “Bangko Sentral ng Pilipinas” and “Monetary Board” are part of the dictionary (Table 1). The U terms were also augmented by the Loughran-McDonald dictionary³ for uncertainty. Initially, 111 P terms and 323 U terms formed part of the dictionary. After optimization using an extensive human audit and genetic algorithm, these were reduced to 60 P terms and 62 U terms.^{4,5} The final set of keywords then resulted to an overall accuracy of 80.3 percent.⁶

to read a set of 1,569 randomly selected articles and determine whether each article pertains to PEPU or not.

⁵ Genetic algorithm (GA) is a stochastic search algorithm used in this study to find the best set of terms without searching through all of the possible combinations of the words, thereby reducing time required and the need for higher computing power.

⁶ The GA method provided better results, obtaining an 80.3 percent accuracy compared to the original dictionary’s 59 percent.

Table 1. Sample Terms in the EPU Dictionary

Economy (E) terms

business, businesses, commerce, commercial, economic, economy, economies, industry, industries

Policy (P) terms

Bangko Sentral ng Pilipinas, Batasan, bills, circular, DOF, executive order, fiscal policy, house bill, law, legislation, republic act

Uncertainty (U) terms

uncertain, uncertainty, ambiguous, cautious, hesitation, no certainty, perhaps, reassess, unclear, unknown, vague

Data processing

The EPU count is determined by the number of articles containing the triple of categories E, P, and U using Boolean search (a basic method). That is, an “EPU count” is considered if the article contains any of the E terms, any of the P terms, and any of the U terms. The raw count is aggregated to a monthly EPU count per newspaper.

The Boolean search algorithm is represented by **Equation 1**, where “#(EPU articles per month)” represents the EPU count defined above, with E representing the set of articles with E terms, P for policy terms, and U for the uncertainty terms. Articles with E, P, and U terms are otherwise called as “EPU articles.”

$$\#(EPU \text{ articles per month}) = \#(E \cap P \cap U) \quad (1)$$

To account for the varying volume of articles per newspaper, the EPU count is scaled over the total number of articles per newspaper per month. Let X_{it} be the scaled EPU count for each data source (e.g., newspaper website) $i = 1, 2, 3, \dots, I$ where I is the total the number of newspapers for time t and is represented by **Equation 2**:

$$X_{i,t} = \frac{\#(EPU \text{ articles per month})_i}{\#(articles \text{ per month})_i} \quad (2)$$

The scaled EPU count per news source is then standardized by dividing it by the corresponding standard deviation σ_i per

newspaper i for all t to yield $Y_{i,t}$ as presented in **Equation 3**:

$$Y_{i,t} = \frac{X_{i,t}}{\sigma_i} \quad (3)$$

The mean of $Y_{i,t}$ for each month t is computed to obtain Z_t as presented in **Equation 4**:

$$Z_t = \frac{\sum_{i=1}^I Y_{i,t}}{I} \quad (4)$$

The mean value μ_{Z_t} is then computed from the time series Z_t in **Equation 5**.

$$\mu_{Z_t} = \frac{1}{N} \sum_{i=0}^N Z_t \quad (5)$$

Economic policy uncertainty. Finally, to compute for the PEPU index, the time series Z_t is normalized by multiplying it by $\frac{100}{\mu_{Z_t}}$ as shown in **Equation 6**:

$$PEPU_t = Z_t * \frac{100}{\mu_{Z_t}} \quad (6)$$

Monetary policy uncertainty. The MPU index is then computed as a fraction or part of the main PEPU index in order to directly show its contribution or weight from the main index. In particular, the number of articles that contain at least one of the keywords in each of the EPU categories and also contain any of the

monetary policy terms (M) is the numerator.⁷ This is then scaled by the total number of EPU articles at time t and then multiplied to the parent index, which is the PEPU index (see **Equation 7**). This method represents the share of monetary policy-related uncertainty to economic policy uncertainty.

$$MPU_t = \left(\frac{\#(E \cap P \cap U \cap M)_t}{\#(E \cap P \cap U)_t} \right) PEPU_t \quad (7)$$

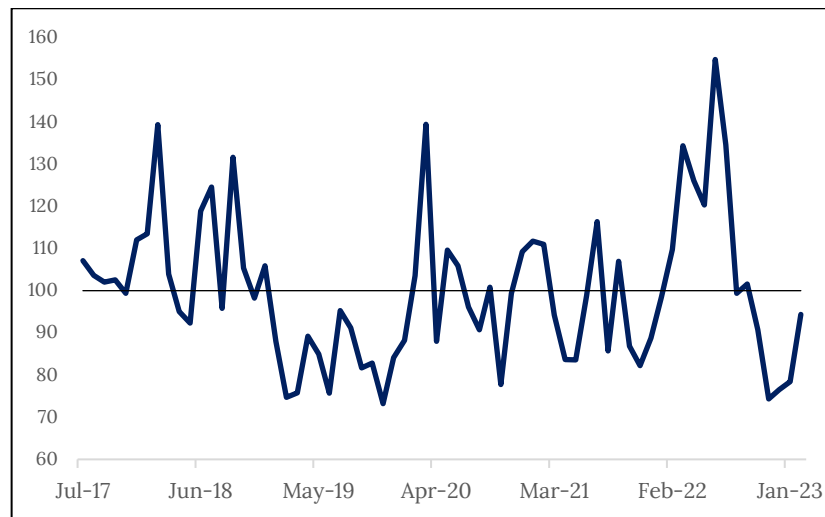
Results

Philippine Economic Policy Uncertainty (PEPU) index

Figure 1 shows the PEPU index for the Philippines for the period July 2017 to January 2023 using the final set of terms after human audit. The PEPU was elevated (i.e., higher than 100) in 2018, mainly reflecting concerns over the trade tensions between the US and China and high domestic inflation owing, in part, to the passage of tax reform in the country. Notably, the index also increased markedly during the onset of the COVID-19 pandemic in March-April 2020. The PEPU was also above historical average for the period February-July 2022, coinciding with the Russia-Ukraine geopolitical conflict, aggressive tightening of US monetary policy by the Federal Reserve, as well as the conduct of the Philippine national elections and the eventual change in government administration. These suggest that the index is sensitive to both global and local events that could have repercussions for policymaking in the Philippines.

⁷ Monetary terms include "interest rate," "rrp rate," "inflation," and "policy rate."

Figure 1. PEPU Index



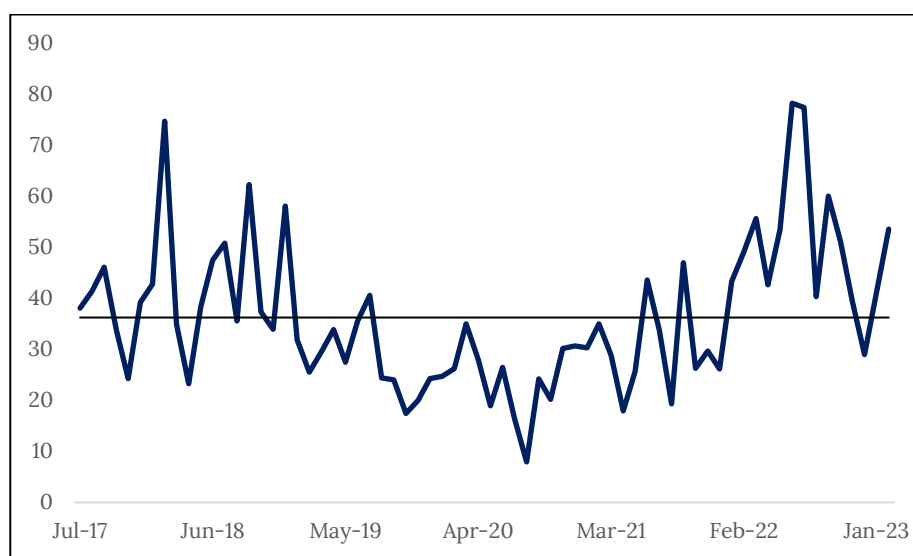
Source: Authors' estimates

Philippine Monetary Policy Uncertainty (PMPU) index

Figure 2 shows the PMPU index. Similar to the PEPU, the PMPU was above the historical average for most of 2018. This could be attributed to policy uncertainties generated by the US-China trade tensions and high domestic inflation. However, in contrast to the PEPU, the PMPU index did not register a sharp increase during the onset of the COVID-19 pandemic in March 2020 and remained below historical average in 2020. This was evidence of the credibility and commitment

of the BSP at the height of the pandemic, as the BSP promptly and proactively rolled out a series of policy measures to mitigate the impact of the pandemic on the financial system and the broader economy. This also strengthens the case that the pandemic crisis was primarily a public health issue rather than a monetary policy issue. In mid-2022, the PMPU registered a sharp increase owing mainly to sustained inflation pressures and tightening of US Federal Reserve policy interest rates.

Figure 2. PMPU Index



Source: Authors' estimates

Conclusion

This paper shows the significance of uncertainty, as reported in the media, in monitoring economic events. Similar to other studies, it is observed that the EPU index shows a tendency to rise around national elections, leadership changes, and political conflicts. The peaks coincide with major domestic and global events such as the passage of tax reforms, the heightened US-China trade tensions, and, more recently, the COVID-19 pandemic.

In the case of the BSP, the PMPU index may be useful in determining whether the current uncertain environment is related to monetary policy and by how much. On the flip side, the MPU index may also show whether uncertainties brought about by local and global economic events spill over into the monetary system, thereby creating uncertainty in monetary policy.

Overall, news-based policy uncertainty indices provide a good measure of uncertainty. With the observed flexibility of the algorithm used in constructing the PEPU and PMPU indices, this can then be extended to extract other category-specific indices such as fiscal policy, trade policy, and taxes. These policy uncertainty indices are important as (A) these allow quantification of the degree of policy uncertainty, enabling comparisons across time periods; (B) these provide an additional metric to help understand and assess how the media and the general public perceive economic policies and their intended outcomes; and (C) these could be used to estimate the effect of policy uncertainties on the economy, which could aid in the policymaking process and in regular surveillance activities of the BSP.

References

- Aprigliano, V., Emiliozzi, S., Guaitoli, G., Luciani A., Marcucci, J., & Monteforte, L. (2020). *Sentiment and uncertainty indexes to forecast the Italian economic activity*. Banca d'Italia and Federal Reserve Board Joint Conference. 11 November 2020. Presentation slides. https://www.bancaditalia.it/pubblicazioni/altri-atti-convegni/2020-bi-frb-nontraditional-data/aprigliano_slide.pdf
- Baker, S. R., Bloom, N., & Davis, S. J. (2016). Measuring economic policy uncertainty. *The Quarterly Journal of Economics*, 131(4), pp. 1593-1636.
- Baker, S. R., Bloom, N., Davis, S. J., & Kost, K. J. (2019). *Policy news and stock market volatility*. NBER Working Papers 25720, National Bureau of Economic Research, Inc.
- Baker, S. R., Bloom, N., Davis, S. J., Kost, K. J., Sammon, M., & Viratyosin, T. (2020). *The unprecedented stock market reaction to COVID-19*. Covid Economics: Vetted and Real-Time Papers. 1, 3 April.
- Ghirelli, C., Perez, J., & Urtasun A. (2019). A new economic policy uncertainty index for Spain. *Economic Letters*.
- Jurado, K., Ludvigson, S. C., & Ng, S. (2015). Measuring Uncertainty. *American Economic Review*, 105(3), pp. 1177-1216.
- Kurniati, Y. (2018). *Big data for policy-making in central bank: Measuring economic policy uncertainty in Indonesia*. MyStats 2018 "Embracing Data Science and Analytics to Strengthen Evidence-Based Decision Making," Kuala Lumpur. Presentation slides. https://www.dosm.gov.my/v1/uploads/files/4_Portal%20Content/2_%20Statistics/MyStats/2018/PresentationSlides/2nd_Plenary_2-Dr_%20Yati%20Kurniati.pdf
- Loughran, T. & McDonald, B. (2011). When is a liability NOT a liability? Textual Analysis, Dictionaries, and 10-Ks. *The Journal of Finance*, 66, pp. 35-65. 10.1111/j.1540-6261.2010.01625.x.
- McDermott, C. (2017). Policy uncertainty from a central bank perspective. *Australian Economic Review*, 50 issue 1, pp. 103-106.
- Bloom, N. (2014). *Fluctuations in uncertainty*. *Journal of Economic Perspectives*, American Economic Association, vol. 28(2), pp. 153-176, Spring.
- Rossi, B., Sekhposyan, T., & Soupre, M. (2018). *Understanding the sources of macroeconomic uncertainty*. Economics Working Papers, Department of Economics and Business, Universitat Pompeu Fabra.
- Tobback, E., Naudts, H., Daelemans, W., de Fortuny, E. J., & Martens, D. (2018). Belgian economic policy uncertainty index: Improvement through text mining. *International journal of forecasting*, 34(2), pp. 355-365.