# Pacifying the Pandemic Panic: An Application of Structural Break Analysis in Philippine Government Bond Yield Times Series Data

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## Abstract

Amid the imposition of varying degrees of economic activity restrictions in the Philippines during the COVID-19 pandemic, there have been observable shifts in short-term trends in domestic local currency bond yields. These movements have been influenced by a combination of domestic and global macroeconomic developments. Notably, increases in the yields of local currency government securities were seen at the onset of the pandemic, as well as in March 2021 when rates tracked the uptick in their U.S. Treasury counterparts. Meanwhile, the spike in Philippine inflation mainly attributed to surging pork prices resulted in negative real yields starting in February 2021. Taking a long-term perspective, unconstrained Bai-Perron test for structural breaks was employed using monthly data on local bond yields and inflation after the Global Financial Crisis. Despite aforementioned short-term dynamics, results of this empirical study showed that there have been no structural breaks identified in nominal and real yields in the period covering the COVID-19 pandemic. Such results shed light on the effectiveness of the government's fiscal and monetary policy responses to combat the effects of the pandemic and maintain stability in the domestic financial markets.

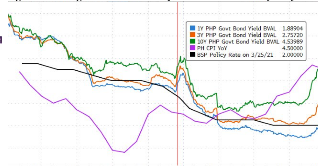

## Discussion

*Pandemic period analysis for the Philippines*

The restrictions brought about by the imposition of varying types of community quarantine in different areas in the Philippines have resulted in a slump in the country's GDP and a fall in its stock market index. Moreover, as the U.S. dollar inflows continued while imports weakened, the Philippine peso has seen a consistent appreciation in the period of the pandemic. Then, as the number of COVID-19 cases in the country started to decrease, the government gradually relaxed some lockdown measures, as seen in the downward trend in the Stringency Index. Consequently, economic growth recovered, but still remained in the negative zone. Moreover, the surge in cases in early 2021 has prompted the government to reimpose strict lockdown measures, resulting in the decline in Philippine stocks.

Figure 1. Real GDP growth, foreign exchange rate, stock index and stringency index

Figure 2. PHP government bond yields, inflation and policy rate




There has been an observable shift in the yield curve at the onset of the COVID-19 pandemic as the government announced lockdown measures, leading to uncertainty. With the Bangko Sentral ng Pilipinas' (BSP) proactiveness in responding to the shocks in the domestic financial market, yields started to go down in the following months and essentially normalized throughout the latter part of 2020. The risk-off sentiment and the flight to safety that persisted in 2020 pushed the demand for government securities (GS) upward, which consequently drove yields down, with short term Treasury Bill rates even falling below the policy rate. While domestic liquidity remains healthy in Q1 2021, there has been a prominent increase in bond yields and a steepening of the curve as inflation reached 4.7% and U.S. Treasuries rallied amid the announcement of Biden's stimulus programs.

Figure 3. Liquidity indicators

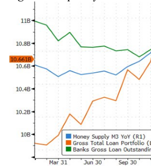
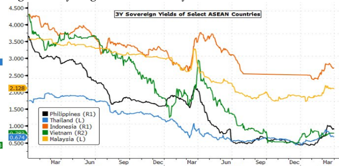


Figure 4. 3-year government bond yields of select ASEAN countries




Following the accommodative policy adjustments of the BSP amid the pandemic, domestic money supply has grown to record levels. However, it can be observed that in the case of the Philippines, this has not translated to a parallel increase in outstanding loans by banks. This may be attributed to the fact that consumers or investors are not accessing loan facilities from banks given the business environment outlook amid the quarantine restrictions that are in place. As such, it can be argued that bulk of the liquidity being released by way of the BSP's policy actions has remained in the banks themselves. This excess liquidity in the books of banks have then been channeled into the BSP's deposit facilities as well as the GS auctions of the Bureau of the Treasury (BTr), contributing to the decline in yield levels, especially in short-term rates.

*Comparison with regional peers*

Generally, movements of yields in countries within the Association of Southeast Asian Nations (ASEAN) during the pandemic have been similar, which may be attributed to the similarly accommodative monetary policy of the region's central banks in support of their respective economies amid the pandemic. It can also be observed that the rally in U.S. Treasuries in Q1 2021 has affected other ASEAN bond markets, not just the Philippines. While there has been an observable co-movement of nominal bond yields in the different ASEAN economies, real rates tell a different story. The real yield buffer is the current maximum possible decrease in 10-year rates that will bring the current real yield to its 10-year average. In the case of the Philippines, current inflation levels and persistently low bond yields means that real

Figure 5. Policy rates

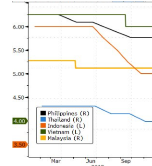
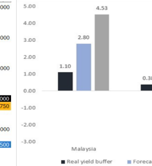



Figure 6. Real yield buffer

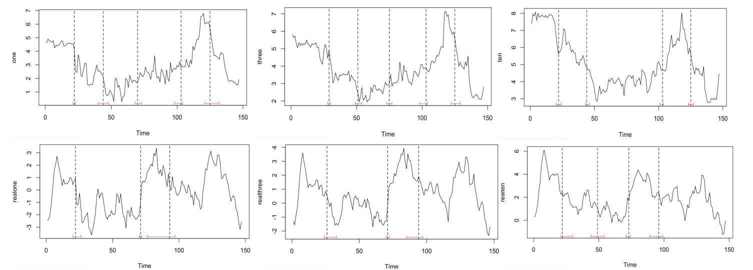



yields are already in the negative zone, hence the negative buffer. Despite the Philippines having the only negative real 10-year yield among its peers, it has the least risk of an inflation shock in Q2 that can potentially erode the returns of investors. To illustrate, for Malaysia, a 4.53% inflation rate (worst case) will put its 10-year real yield to 343 basis points below the 10-year mean.

*Structural break analysis*

Taking a long-term perspective, the results of the unconstrained Bai-Perron test for structural breaks in 1-year, 3-year and 10-year local currency Philippine government bond yields (both nominal and real yields) are presented in Figure 7. The horizontal axis pertains to time (the number of months after January 2009, the start of the data set), while the vertical axis pertains to yields expressed as percentage. The dotted lines represent the breakpoints identified by the test, with corresponding 95% confidence intervals visualized in red lines.

*Figure 7. Structural breaks in 1-year, 3-year and 10-year nominal and real yields*



Notably, there are no structural breaks identified in the results of the unconstrained Bai-Perron test that fall within the period of the COVID-19 pandemic for all three tenors in both nominal yields and real yields. Following the spike in yields in March 2021 when the pandemic hit, the yields have decreased, consistent with and, to a major extent, due to the accommodative monetary policy stance undertaken by the BSP to counter the tightening of financial conditions, as evidenced by a cumulative decrease in the policy rate of 200 basis points since February 2020. This stance was maintained even amid the increase in inflation in 2021 that is mainly attributed to surging pork prices due to the outbreak of African swine fever, with officials highlighting that inflation will be best addressed by interventions on the supply side and not by raising interest rates.

Moreover, nominal yields are coming from a period of multiple-year highs around late 2018 to early 2019, so the increase in yields within the pandemic period may not be considered a significant break in the trend, including the uptick in nominal yields in 2021 along with the increase in yields in major economies such as the U.S. due to the reflationary trading environment. It should be noted that the stability in yields can also be attributed to the proactive issuance and debt management strategy of the BTr. Through rejections in auctions in 2020 when bid rates are significantly higher than secondary levels, the BTr has managed the increase in rates. Furthermore, the BTr has also made adjustments in the tenors, frequency, and volume of its GS auctions to ensure that market rates do not significantly move. The results of this empirical study suggest that the tools employed by policy makers amid the COVID-19 pandemic have been effective in maintaining stable and orderly financial market conditions in the Philippines.

## Conclusions

The Philippine financial market, specifically the country's sovereign debt space, was not spared by uncertainties brought by the COVID-19 pandemic. While this space has experienced episodes of increasing yields, including one at the onset of the crisis, and in 2021 when rates tracked yields of major markets such as the U.S. amid reflationary expectations, policy makers in the Philippines have been systematically nimble in implementing accommodative monetary and fiscal policy measures to address tightening liquidity and avoid market disruption.

For the long-term analysis of local currency Philippine government bond yields taking into account the period after the Global Financial Crisis, the Bai-Perron test for structural breaks was applied to both nominal and real yields. The results of the empirical test showed that there are no structural break points identified in the period covering the pandemic, suggesting that the policies enacted have been effective in preventing turmoil in the market.