

An Analysis of the Philippine Aggregate Demand, Money Supply and Interest Rate: A Monetarist Perspective in Economic-Pandemic Scenario

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Abstract: The Philippine economy is one of the countries that were hard hit by the pandemic, sparing almost none in the global economic arena. Various economic theories argued and purported different measures to address such economic shocks of a country. Hence, this study aimed to understand the monetarist perspective of the liquidity market of the economy utilizing broad money and interest rates as variables under study. The researchers used mixed research design in undertaking this study. A descriptive-causal design triangulated with systematic literature review was specifically utilized. The study found out that the Real Gross Domestic Product growth (RGDP) and broad money growth were slowed and interest rate growth was almost constant. Initially, the regression model was stable on the second difference and has met the classical assumptions of regression modelling. Considerably, the multiple regression results showed that there is a significant relationship between interest rate growth and broad money growth to the RGDP growth. Moreover, the literature reviews points that under monetarist conditions, the money supply and interest rates growths were significantly influencing the growth of aggregate demand through various economic linkage and leakage. In addition, aggregate economic growth as a general status quo in a pandemic scenario posed a great challenge to maximize monetary policy to efficiently help the economy spur growth. Hence, under the monetarist view, the researchers recommend the intensification of expanding broad money through expansionary monetary policy with constant monitoring of market interest fluctuations to further boost the aggregate demand and spur growth as a rebound growth strategy of the Philippine economy.

Keywords – Aggregate demand, interest rate, money supply, monetarist, pandemic scenario

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INTRODUCTION

Covid 19 has been declared by the World Health Organization as a global pandemic back on 11th of March 2020, cases quickly spread around the globe which shut down a number of businesses and caused the economy to decline. Moreover, Covid 19 through authoritarianism and neoliberalism has exposed the limits of development theory that anchors the economic growth models and globalized markets, the virus has changed the global market and caused market failures in the country [1]. There are studies that prompted the solutions regarding the negative and positive impacts of Covid 19 pandemic to have a prominent solution for the economic growth, sustainability of the countries that were hard hit by the pandemic [2].

According to Debuque-Gonzales [3], the Philippine's economy froze for several months due to lockdowns and quarantine restrictions, which led to the country's Gross Domestic Product (GDP) falling by 9.5 percent. It was considered as one of the deepest recessions of the country. Many activities have been temporarily suspended due to continuous lockdowns. Producers of essential items such as medicines, medical supplies, medical equipment and basic foods were allowed to operate under the lockdowns, though other industries were allowed to operate if the restrictions shift under GCQ. Moreover, the unemployment rate in the Philippines rose to 17.6-percent in April 2020 from 5.1 percent from the preceding year.

The globalisation is described as the movement of products and services, people, capital, and knowledge beyond national borders [4]. Globalisation and liberalisation appear to have become an unavoidable and permanent trend during the last half-century, resulting in a far more integrated, interdependent, and intertwined world economy. Emerging market economies (EMEs) have become considerably more tightly integrated in terms of trade, finance, global value chains (GVCs), and migration, boosting growth and productivity while extending opportunities for businesses, investors, and employees. However, as a result of the negative and lingering effects of the Great Financial Crisis (GFC), there has been a growing backlash against globalisation, not only in EMEs but also in advanced economies, most notably the United Kingdom and the United States. As a result, the scope and impact of globalisation in the Philippines are investigated in terms of trade, finance, and migration. According to Estadilla [5] with the coordination of the Philippine's Local and National agencies together with the help of economic agencies

must be present in this time to have a solution for the worst decline of the economy, supply chain and uncertain government policies in this time of pandemic.

Moreover, Interest rate risk and money supply are macroeconomic factors that are thought to have a significant impact on real estate investment. The real estate market is an important platform, not just because it ensures the construction of structures and infrastructure that are necessary for life and work, but also because of its strong spill over impact on the development of the nation's entire economy [6]. According to Salisu et al. [7] by the use of the Threshold-Augmented Global Vector Autoregressive (TGVAR) model for the analysis of the impact of Real GDP to emerging economies in amidst of the Covid 19 pandemic can possibly revert the country from the pre-covid period.

Thus, the researchers wanted to envision the possible recommendations regarding the relationship between Interest Rate Growth, Real Gross Domestic Product Growth and Broad Money Growth. This manner pushes the researchers to analyse and study the behaviour of the Real Gross Domestic Product Growth (RGDP), Money Supply growth and Interest Rate Growth in the Philippines from 2000 to 2020 and how Money Supply growth, Interest Rate Growth influences the Real Gross Domestic Product Growth (RGDP) and lastly to analyse the effect of Money Supply Growth and Interest rate Growth to the Philippine Real Gross Domestic Product Growth (RGDP). Hence, this study aimed to understand the monetarist perspective of the liquidity market of the economy utilizing Real Gross Domestic Product Growth (RGDP), Broad Money Growth and Interest Rate Growth as variables understudy. This study also serves as a catalyst to further boost the growth of the Philippine Economy.

OBJECTIVES OF THE STUDY

The study aimed to analyze the Philippine Aggregate Demand, Money Supply and Interest rate in a monetarist perspective, this aimed to specifically determine the behavior of RGDP growth, Money Supply (broad money growth), and interest rate growth in the Philippines from 2000 to 2020. Additionally, the researchers wanted to determine how Broad Money growth, interest rate growth is related to the RGDP growth and to analyse the effect of money supply (broad money growth), interest rate growth to the Philippine RGDP growth.

MATERIALS AND METHODS

Research Design

The researchers have used mixed research design in this study. Specifically, the researchers have used descriptive-causal research design to identify and describe the behaviour of RGDP growth, money supply growth as represented by the broad money growth and the interest growth from 2000 to 2020 through distributed lag regression model. Moreover, this research also used systematic literature review (SLR) to triangulate regression analysis to provide an in-depth analysis of numerical and narrative aspects.

Sources of Data

The researchers used secondary data from the World Bank. The data set for the RGDP growth and broad money growth were obtained from the data bank of the World Bank. Considerably, interest rates growth was obtained, calculated and set from the International Financial Statistics (IFS). Literature reviews were obtained from the online academic journal of Research gate, Elsevier and Google Scholar with a parameter time of 2016 to 2022 with a total of 70 valid references and have been utilized in providing academic references in this study.

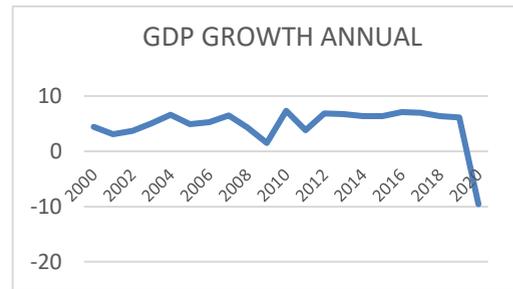
Statistical Treatment

The researcher used the distributed lag regression model, for the period 2005 to 2015 with lag lengths, following the St. Louis Model. Furthermore, the researcher has chosen the maximum lag value that was incorporated in the model based on calculated Akaike Information Criterion (AIC) value points.

Statistical Test

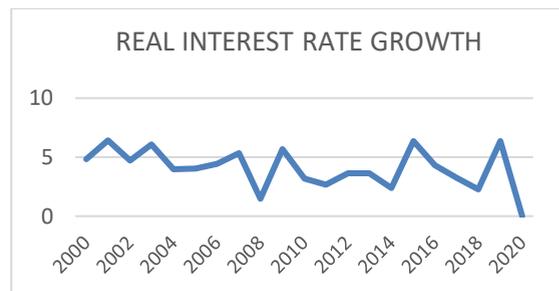
Statistical Test	Purpose	Result
Augmented Dicky-Fuller Test	Unit Root	Stationary at second difference
Durbin Watson Test	Autocorrelation	Autocorrelation detected, treated
Variance Inflation Factor	Multicollinearity	No Multicollinear variables
Jarque-Bera Test	Normality	Normal Distribution of errors
Breusch-Pagan Test	Heteroscedasticity	Residuals are distributed on equal variance (homoscedastic)

RESULTS AND DISCUSSION



Source: World Bank
Fig. 1. GDP Growth Annual

Figure 1 shows the Growth of Gross Domestic Income Annually for the year 2000 to 2020. It clearly shows that in the years 2009, 2011 and 2020 the GDP Growth declined. According to Yap, et al. [8] Lehman Brothers filed bankruptcy and caused a major shockwave in the International Financial System. It is later followed by other bankruptcies in the United States and Europe. This situation caused a virtual freeze in liquidity in United States and European Market financial markets which stopped the capital flows to emerging and developing countries like the Philippines. This led the Philippine’s GDP fell to 3.8 percent and later reflected in 2009 that drastically fell down to 1.45 percent. Moreover, according to the study of Debuque-Gonzales, [3] that the Philippine’s GDP fell by 9.5 percent its was considered as one of the deepest recessions of the country.



Source: World Bank
Fig. 2. Real Interest Rate Growth

Figure 2 shows the Real Interest Rate Growth for 2000 to 2020. The figure shows that in 2008, the Real Interest rate fell down to 1.46% with no growth in 2020. According to Congleton, [9] The Federal Reserve lowered interest rates and increased the money supply.

Unemployment benefits were extended by Congress, and government expenditure was raised (and deficits). The FDIC dealt with several bank failures by facilitating mergers, some of which were financed by FDIC reserves, due to this situation developing countries like Philippines needs to lower down its Interest rate to attract investors due to the freeze of capital flows of financial institutions in the US and European Countries.



Source: World Bank
Fig. 3. Broad Money Growth Annual

Figure 3 shows the Broad Money Growth from 2000 to 2020. It shows that there is a significantly low Broad Money Growth back in 2003, 2011, 2015 and 2020. This finding is stated in the study of Amassoma, et al. [10] that the monetary policy rate influences monetary expansion, which is accompanied by a lower interest rate. According to Chaitip et al [11], there is a long run relationship between money supply and economic growth, thus the Philippines back in 2013 needs to lower down its interest rate and increase its money supply to further boost its economy.

Table 2. Pearson Correlation Values

RGDP =	$3.72 + 0.93BM + 0.032BM_{t-1} - 0.004i - 0.0001i_{t-1}$			
t- Statistics	(2.02)	(-0.92)	(4.23)	(4.04)
	$R^2 = 0.6824$		$Adj R^2 = 0.5924$	
	$F(4,20) = 45.15$		$DW = 2.15$	
F(4,20)	28.85	DW	dU	1.160
t-ratio	1.645		dL	1.803
			4-dU	2.197

Table 2 shows the correlation values of Real Gross Domestic Product Growth to Broad Money and Growth and Interest Rate Growth and its log values. It clearly shows that the interest rate growth and broad money growth has a significant relationship to real gross domestic product growth.

Table 3 shows the corrected regression Results. The computed *d*-statistic of 2.15 became greater than the critical *dU* of 1.803 and less than the

critical 4-*dU* value of 2.197 at 5 percent level of significance. Hence, no autocorrelation was detected, whether positive or negative, in the pooled least squares regression model.

Table 3 Corrected Regression Results

	RGDP	BM	i	BM t-1	i t-1
RGDP	1				
	0				
BM	0.5012	1			
	0				
i	0.7804	0.9445	1		
	0	0			
BM t-1	0.6007	0.8997	0.9305	1	
	0	0	0		
i t-1	0.895	0.7453	0.9263	0.6391	1
	0	0	0	0	

A one-tail *t*-test was used because the explanatory variables, Broad Money Growth was found to be significant at 5 percent level of significance with a computed *t*-value of 2.02 which is greater than the critical *t*-value of 1.645. However, the lagged by one value of the Broad Money was found to be insignificant with the *t*-value of 0.92 with *p*-value of 0.33 which was greater than the significant values of 1 percent, 5 percent, 10 percent and 20 percent. Therefore, in the corrected regression results the null hypothesis that the Real Gross Domestic Product growth in the Philippines is not significantly affected by the broad money, was rejected, *ceteris paribus*. This means that on the above assumption and prevailing conditions money supply has significant influence to the RGDP, as the economy becomes more liquid the economy shifts to the growth phase dimensions.

Likewise, Interest Rate Growth and Interest Rate Growth t-1 was found to be significant at 5 percent since the computed *t*-value of 4.23 and 4.04 is greater than the critical *t*-value of 1.645. Therefore, in the corrected regression model, the null hypothesis that Real Gross Domestic Product growth in the Philippines is not significantly affected by the interest rate was rejected, *ceteris paribus*. Interest rates, on assumption, have significant influence to the Philippine RGDP, mobile and growth-based interest rates yields significant influence in the real aggregate demand of the Philippine economy.

The computed F-Statistic of 45.15 exceeds the 5 percent level of significance, critical F-value of 28.85, with 4 and 20 degrees of freedom. This means that the corrected regression model is statistically significant.

Hence, in the corrected regression model, the null hypothesis that Real Gross Domestic Product growth in the Philippines is not significantly affected by the Broad Money and Interest Rate, was rejected. *ceteris paribus*. The coefficient of multiple determination of Adjusted R^2 of 0.6824 implies that 68.24 percent of the variations in the explained variable is due to the variations in explanatory variables taken collectively. This means that only 21.39 percent are unexplained by the corrected regression model because of the other factors that were not included in the model and the stochastic error term, *ceteris paribus*. The signs of the

coefficients of both explanatory variables are varied according to lags and are consistent with theoretical expectations of the monetarist perspective.

Table 4 shows the highlights of literature reviews regarding Real Gross Domestic Product Growth, Interest Rate Growth and Broad Money Growth. The literature states that Money Supply and Interest rate does not literally influence the inflation rate of countries under recession. It also states that money supply and interest rate does have an effect on the economic growth of a country.

Table 4. *Highlights of Literature reviews*

Name of Author	Year	Results	Methodology Notes
Bello, [12]	2013	The study discovered that there is no long-run relationship between the variables, and the granger causality test reveals a bidirectional relationship between the money supply and inflation, income growth and inflation, and interest rate and inflation. The granger causality test also showed that the money supply, interest rates, and income growth all contribute to inflation.	VAR Model
Ariff, [13]	2012	The money supply has a positive effect on liquidity, according to this paper. By extending the system of equations with a liquidity equation and controlling for the effect of earnings, evidence of a significant positive effect from liquidity on share prices is found. Money supply is found to be endogenous, as predicted by post-Keynesian theory.	ARDL Model
Vizmanos-Batac, & Tatlonghari [14]	2017	The MAER is not valid based on the results of the economic procedures, but the regression analysis demonstrated the importance of output on exchange rate movements for all three models. Changes in interest rate differentials were also found to have an impact on the dollar-peso and euro-peso spot rates.	Monetary Approach to Exchange Rate (MAER)
Ahmed, [15]	2011	The direction of causation between real GDP and prices was discovered to be unidirectional from real GDP to CPI in the absence of any feedback. The analysis of the money-price causal relationship reveals that the causation runs from money supply to prices, but price level does not cause money supply. Finally, from 1960 to 2005, there is no causal relationship between real GDP and money supply in Sudan.	Granger Causality test
Marshal, [16]	2016	The two series were non-stationary at their levels but stationary at first difference, implying that the series M2 and RGDP were integrated at order one I, according to the ADF test results (1). When the ADF test reveals that the residuals are devoid of unit roots, it indicates that the residuals are stationary and cointegrated at degree zero I(0), implying that there is co-integration between M2 and RGDP and thus a long-run equilibrium relationship between the two variables. There is one causality that runs from M2 to RGDP and not the other way around.	Co-integration and VAR model
George, [17]	2018	It was discovered that a small money supply has a positive and significant impact on inflation and real GDP; on the other hand, a large money supply has no significant impact on inflation and real GDP. Furthermore, empirical evidence revealed that the exchange rate has a negligible impact on inflation and real GDP. The rate of inflation, on the other hand, has an inverse and statistically insignificant impact on Nigeria's real GDP. According to the findings, economic growth and inflation in Nigeria are a function of money supply (narrow money supply) and exchange rate.	Augmented Dickey Fuller test

Chaitip, [11]	2015	The results showed that the growth rates of narrow money (M1), demand deposits (DD), and GDP were stationary with I(0) and I(1) levels. Furthermore, the coefficients of estimation results showed that money supply was associated with economic growth wide phenomena of the AEC open region in the long run, including the speed of adjustment to long-term equilibrium.	ARDL of Pooled Mean Group Estimator (PMGE)
Hussain [18]	2017	The findings suggest that stable BMGDP is associated with GRGDP, and that the money supply has a significant impact on the long-run growth rate of output. The government should maintain consistency and adhere to "the Taylor rule" to allow the money supply to grow at a steady rate in tandem with economic growth.	VECM Model
Tadeo, [19]	2015	Following the application of the modified St. Louis Model and the use of three-panel data regressions, namely pooled least squares, fixed effect, and random effect models, the results revealed that both government spending and broad money have a significant influence on the ASEAN Five's real GDP. The random-effect model was used in the variable discussion. According to the analysis of the results, the researcher discovered that fiscal policy is the better policy to use at the moment, but monetary policy is the more powerful policy in the long run.	St. Louis Model
Amassoma, [10]	2018	The findings revealed that the money supply has little influence on inflation in both the long and short run, possibly because the country is in crisis. The ECM is significant and has the correct sign of negative, indicating that approximately 21% of errors are corrected annually. The Granger causality result shows that there is no causal relationship between money supply and inflation in Nigeria during the study period, and vice versa.	Co-integration Autoregressive Dynamic Error Correction Model (ADLECM)
Mahara, [20]	2020	According to the empirical findings, there is a positive and significant long-term relationship between money supply and real economic growth in Nepal. The result of the causality test reveals unidirectional causality from the money supply (M2) to real GDP. The error correction term is found to be negative and statistically significant, implying that short-run disequilibrium will be corrected within two and a half years.	ARDL approach to co-integration
Denbel,, [21].	2016	The study's key findings are that inflation is a monetary phenomenon in Ethiopia and that inflation is negatively and significantly affected by economic growth. Based on the study's findings, monetary policy should be planned to maintain price stability by controlling the growth of the economy's money supply.	VECM Model
Akpan, et al [6]	2020	Interest rate risk has a significant positive effect on real estate investment performance, whereas money supply has an insignificant positive effect. It is concluded that interest rate risk is significant, whereas money supply is a minor determinant of real estate investment performance in Nigeria.	OLS (Multiple) regression
Akinbobola, [22]	2012	The findings confirm that, in the long run, money supply and exchange rate have significant inverse effects on inflationary pressure, whereas real output growth and changes in foreign prices have direct effects on inflationary pressure. The reverse effect of money supply on price level may be justified by the fact that inflation may be caused by hiccups in the supply chain of goods from both domestic and foreign supply outlets rather than by aggregate demand pressure.	Vector Error Correction Mechanism (VECM)
Muhammad [23]	2009	Shows that public spending and inflation have a negative long-run impact on economic growth, whereas M2 has a positive long-run impact on economic growth. The reason for the negative relationship between public expenditure, inflation, and economic growth is that most public expenditure is non-developmental, and inflation is caused by an adverse supply shock (cost push inflation) in Pakistan.	Johnson co integration test

CONCLUSION AND RECOMMENDATION

Based on the data that were analysed both on regression results and the literature reviews the researchers conclude that:RGDP growth of the Philippines is generally stationery and plummet in 2019, the Philippine interest rate growth has a decreasing trend from 2000 to 2020. And the broad money representing the money supply is generally stable except in 2006 and 2013 respectively.

Broad money growth and interest rate growth significantly related with the Philippine RGDP growth. The broad money growth and interest rate growth significantly influences RGDP growth. Broad money growth positively influences RGDP growth and Interest rate growth negatively influences RGDP growth including the one-year gap.

Thus, the researchers recommend the intensifying of expanding broad money through expansionary monetary policy with constant monitoring of market interest fluctuations to further boost the aggregate demand and spur growth as a rebound growth strategy of the Philippine economy. This study considerably recommends to utilize and explore other monetarists-models such as Friedman models of liquidity using 90-day interest rate and M3 money supply measures subjected to static distributed regression models to further understand point-lag variations among variables and individual effects.

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