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Policy responses to shocks and monetary effectiveness under inflation targeting: the Philippine case

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This article examines how monetary policy responses to economic shocks and monetary policy effectiveness have changed in the Philippines since inflation targeting was implemented in 2002. The study makes use of a structural vector autoregression to estimate financial and monetary policy shocks, among other shocks, based on an identification strategy similar to Gilchrist and Zakrajsek [2012] and Bassetto et al. [2016]. A Philippine financial conditions index (FCI) purged of monetary influences then decomposed according to instrument or market is used to aid estimation and analysis. Results of the recursive vector autoregressions (VAR) comparing pre-inflation-targeting and inflation-targeting periods reveal stronger and more systematic policy responses to non-financial demand shocks, partial and transitory accommodation of supply shocks, and greater exchange rate flexibility initially under the new monetary policy regime. There is, however, an observed weakening of monetary policy responses to financial disturbances and monetary policy transmission to growth likely related to episodes of strong capital inflows.

JEL classification: C32, E31, E42, E44, E52, E58
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1. Introduction

Seeking macroeconomic stability, a number of countries have adopted inflation targeting as their monetary framework over the past three decades. Unlike in developed countries where beneficial effects of inflation targeting were often found to be insignificant (e.g., Ball and Sheridan [2003]; Lin and Ye [2007]), the shift has typically produced significantly positive outcomes in developing economies. These include lower inflation and growth volatility [Goncalves and Salles 2008]; lower inflation and inflation variability [Lin and Ye 2009]; higher and more stable output growth [Abo-Zaid and Tuzeman 2012]; more stable

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income velocity and money growth [Soe and Kakinaka 2018]; and lower output-inflation tradeoffs [Huang, Yeh, and Wang 2019].[1]

While there are many cross-country studies on inflation targeting in developing countries, including those in developing Asia, there are only a few that look at individual countries. This research adds to the literature by presenting an econometric analysis of how the implementation of inflation targeting has affected economic behavior in the Philippines, which numbers among the Asian adopters.

The Philippines is a good case to study because of its notable transformation over the years. Prior to the adoption of inflation targeting in 2002, it had among the highest inflation and inflation volatility measures among adopting countries in the region.[2] The country then experienced higher and more variable inflation mainly due to sharp policy swings, exchange rate fluctuations, and supply shocks [Debelle and Lim 1998]. Filardo and Genberg [2010] noted the challenging inflation conditions in the country during the initial years of implementation of the new monetary framework when it experienced pronounced and persistent inflation swings, undershooting or overshooting inflation target bands rather than staying inside them.

Gerlach and Tillman [2012] saw a decline in inflation persistence in the Philippines only around 2009. The Bangko Sentral ng Pilipinas (BSP) cited strong communication with the public as its strong suit, a strategy consistently applied since inflation targeting was implemented to deal with missed inflation targets or for potential target breaches [Guinigundo 2005]. The country had high monetary policy transparency scores from 2002 and onwards, registering the highest score in Southeast Asia from 2002 to 2006 (see Table 1 in Dincer and Eichengreen [2009]).

Taking stock of the inflation targeting experience in the Philippines up until 2010, the BSP cited enhanced policymaking, increased policy discipline, improved focus on the price stability objective, and stronger credibility of the central bank, aside from greater central bank transparency, as the main benefits [Tetangco 2010]. While there has been a dearth of literature on inflation targeting in the Philippines in subsequent years, it is quite easy to verify how inflation and inflation variability in the country had been relatively low while output performance had been relatively steady during that period.

In terms of method, the key objective of this study is to empirically identify structural shocks from vector autoregressions (VARs) applied to macroeconomic data before and after the adoption of inflation targeting. The paper uses an identification strategy similar to that applied by Gilchrist and Zakrajsek [2012]

[1] An exception is the study by Brito and Bystedt [2010] who find that inflation targeting has no effect on the level and variance of inflation in emerging market countries.

[2] The Asian Financial Crisis (AFC) of 1997/1998 provided the impetus for some developing Asian economies to switch to inflation targeting. With (virtually) pegged exchange-rate regimes perceived to be crisis-prone after the AFC, several countries in the region adopted inflation targeting as an alternative monetary policy regime—namely, South Korea in 1999, Indonesia and Thailand in 2000, and the Philippines in 2002 [Eichengreen 2002]. Apart from the need for an alternative nominal anchor, Asian central banks that turned to inflation targeting did so due to instabilities encountered in monetary targeting, particularly in the relationship between monetary aggregates and inflation.

and Bassetto et al. [2016] to estimate monetary and financial shocks, apart from other (i.e., supply and demand-related) shocks.

To help identify financial shocks, the structural VAR makes use of a financial conditions index (FCI) for the Philippines purged of direct monetary influences; the FCI is further decomposed according to the instrument or market/source to estimate distinct financial shocks. This is the first study to calculate a diverse set of financial shocks in this manner and to do so for an emerging market economy.

The econometric approach provides a relatively standard but effective way to investigate the impact of inflation targeting on the economy. It offers a way to measure the impact of financial conditions and monetary policy shocks on inflation and growth, providing a reasonable gauge for monetary effectiveness, and to estimate monetary policy responses to macro disturbances, particularly financial shocks. From sample period extensions, one is able to track the evolution of inflation targeting after its adoption.

Results reveal generally favorable changes in behavior in the Philippines under inflation targeting consistent with the observed positive outcomes in developing economies. These include stronger and more systematic responses of monetary policy to non-financial demand shocks; an accommodation of supply shocks, albeit partial and transitory; and greater exchange rate flexibility, in the initial decade at least. There is however an observed weakening of monetary policy responses to financial disturbances and monetary policy transmission to growth that is likely related to episodes of strong capital inflows.

This paper is organized as follows. Section 2 explains the econometric model and the strategy for identifying shocks and lays out the research design. Section 3 describes the data used and provides some preliminary observations on the impact of inflation targeting on the macroeconomy. Section 4 presents the complete set of results and discussions, while Section 5 provides further analyses and conclusions about the future challenges of inflation targeting in the country.

2. Specifying the model and identifying shocks

To identify shocks and investigate monetary policy responses to these shocks, this paper first estimates the following VAR model,

$$y_t = A_0 + A(L)y_{t-1} + C_0 d_t + u_t, \quad u_t \sim N(0, \Sigma_u)$$

where y_t represents the $n \times 1$ vector of endogenous variables; $A(L)$, the $n \times n$ matrices of reduced-form VAR coefficients; A_0, the n-vector of intercepts; C_0, the n-vector of coefficients for dummy variables used to control for crisis periods; and u_t, the n-vector of reduced-form errors with corresponding variance-covariance matrix Σ_u.[3]

[3] Dummy variables are assigned for the 1997/1998 Asian Financial Crisis [1997:3–1998:4] and the 2008/2009 Global Financial Crisis [2008:4–2009:4].

The variables in vector y_t consist of the log difference of real gross domestic product (GDP), the log difference of the real effective exchange rate (REER), the log difference of the consumer price index (CPI), the first difference of a FCI, and the change in the monetary policy instrument (log difference of M2 for the period prior to the adoption of inflation targeting and/or the first difference of the reverse repurchase rate (RRP) rate during inflation targeting).[4] A measure of financial conditions is incorporated in the standard monetary VAR to capture financial shocks, in addition to monetary policy shocks. This study also includes the REER to help capture relative demand effects, which may be important for developing economies like the Philippines.

The reduced-form errors are related to the structural errors, ε_t, as follows:

$$u_t = S\varepsilon_t, \quad \varepsilon_t \sim N(0,1).$$

To uniquely identify the structural model from the VAR estimate of $\hat{\Sigma}_u (= SS')$, a recursive identification scheme is adopted, where a Cholesky decomposition of the variance-covariance matrix is used to obtain a lower triangular matrix $\tilde{S}$.

As in a standard monetary VAR (e.g., Christiano et al. [1999]), the policy variable has no contemporaneous restrictions. The basic assumption is that a central bank, especially an inflation-targeting one, considers all available information—including from financial shocks—when forming monetary policy decisions. This identifies a reduced-form policy reaction function that corresponds to a policy rule in a structural model [Boivin and Giannoni 2006].

In the spirit of Gilchrist and Zakrajsek [2012] and Bassetto et al. [2016], both financial and monetary policy shocks are assumed to affect economic activity and price changes with a lag. This paper additionally places the log change in REER before the log change in CPI in the Cholesky ordering to identify relative demand and other aggregate demand shocks. Following the literature, only supply disturbances are assumed to affect real output contemporaneously.

2.1. Comparing pre-inflation-targeting and inflation-targeting periods

The VAR model is initially estimated for balanced periods before and after the shift to inflation targeting. However, instead of splitting the sample based on the date inflation targeting took effect officially, it is divided based on the results of tests of parameter instability applied to the policy equation of the VAR. This allows for a cleaner comparison of pre-inflation-targeting and inflation-targeting periods, considering observations of continued reorientation of monetary policy instruments and procedures to support the inflation-targeting framework in the brief period after its adoption [Guinigundo 2005].

[4] Using the first difference or log difference of the policy instrument rather than their level implies a monetary policy reaction function where policy changes are made in response to key economic variables, including financial conditions, and is similar in form to Romer and Romer [2004]. This also ensures stationarity of the variables in the structural VAR model.

The Bai-Perron and Quandt-Andrews breakpoint tests indicate a structural change in the policy equation around the middle of 2002.[5] Considering this result, the VAR model is first estimated for the following quarterly subsamples: 1993:4–2002:2 (the pre-IT period) and 2002:3–2011:1 (IT period 1, balanced to have an equal number of observations as the pre-IT period). The inflation-targeting period is subsequently extended to 2016:1, or until just before an interest rate corridor system was adopted by the BSP for better market interest rate control (IT period 2); and further to 2019:4 (IT period 3).[6]

The VAR incorporates a quarterly lag of one in all specifications, comprising the model variants and robustness checks outlined below, based on the results of lag order selection tests. These tests include the Akaike, Schwarz, and Hannan-Quinn information criteria.

2.2. Further impacts of financial and monetary policy shocks

To further explore the impact of financial and monetary policy shocks under inflation targeting, GDP is replaced by some of its major subcomponents in the VAR. The baseline specification is alternately run with real fixed capital investment and household consumption spending from the expenditure side of national income accounting, and with real manufacturing and services output from the industry side. This helps indicate which sectors of the economy are more likely to be hampered by financial constraints and frictions. This results in a model closer to those estimated by Gilchrist and Zakrajsek [2012] and Bassetto et al. [2016].

Unlike previous papers, the VAR model was run for the inflation-targeting period using different financial measures and compare the macroeconomic impact of and policy responses to the corresponding shocks. The latter are the subcomponents of the FCI decomposed according to financial instrument or source (money, bond, loan, equity, currency, or from external markets).[7] As noted by Kocherlakota [2010], even rudimentary economic models suggest that one needs more than a single indicator to measure financial conditions in a way that is useful to inform monetary policy, given the existence of distinct financial frictions.

[5] Based on trimming percentage of 15 percent, the Bai-Perron multiple breakpoint tests uncover the following break dates: 1997:3, 2002:3, 2007:3, and 2013:3. The Quandt-Andrews unknown breakpoint tests meanwhile estimate a structural break in 1997:4 (within 15 percent trimmed data) and 2002:2 (within 20 percent trimmed data). The break dates likely reflect the impact of the 1997/1998 AFC and the 2008/2009 GFC. As noted above, dummy variables for these periods are included in the VAR to help control for their effects.

[6] Although available, data for the year 2020 were purposely excluded from the sample period and reserved for future research because of the exceptionally large volatilities observed during the COVID-19 pandemic crisis.

[7] The FCI can also be disaggregated according to type (i.e., price, interest rate, credit spread, quantity/liquidity, risk/stress, or source). However, results based on this decomposition were not as distinct, informative, or illuminating as those based on instruments or markets/sources.

2.3. Note on robustness

Various robustness checks were applied prior to the writing of this paper, though they are no longer shown to conserve space.[8] The important findings tend to hold across a number of model specifications. There is minimal impact on the key results if one uses alternative variables (e.g., an FCI that is not purged of direct monetary policy influences, M3 rather than M2), or adds additional dummy variables (specifically, to indicate the adoption of an interest rate corridor system and to capture external episodes such as the oil price drop that occurred around 2015).

The VAR was additionally estimated in the same manner as Christiano et al. [1999] using levels of variables rather than log differences or first differences. This differs from the main specification in that it includes possibly non-stationary variables.[9] Some of the main results remain intact, such as the impact of monetary policy shocks on economic activity and prices and monetary responses to financial and non-financial demand shocks, though only for the balanced inflation-targeting period (IT period 1).

3. Data and some preliminary observations

Real GDP, its subcomponents, and CPI are taken from the Philippine Statistics Authority (PSA). The series are seasonally adjusted using the X-12 method. REER data is obtained from the International Financial Statistics database of the International Monetary Fund (IMF), while the overnight RRP rate and M2 are obtained from the BSP.

The FCI and its subcomponents are computed as quarterly averages of monthly series estimated using a nonstandard principal component analysis that works on unbalanced datasets.[10] Following Hatzius et al. [2010], cyclical influences are removed from the financial indicators by regressing them against output growth and inflation before estimating the index. For this paper, financial indicators are additionally purged of monetary influences by including the policy rate as an additional regressor prior to FCI estimation. This generates even purer financial shocks.

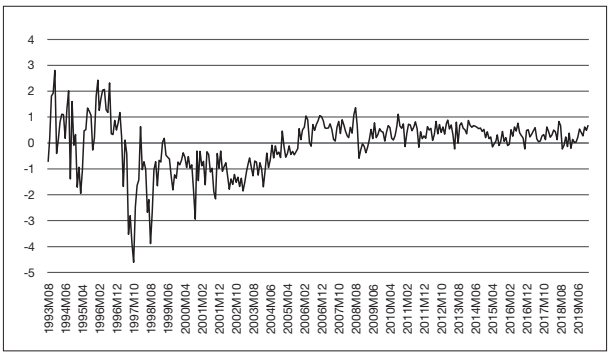
Figure 1 presents the monthly FCI for the full sample period of the VAR. Financial conditions tightened considerably during the Asian financial crisis (AFC), with the FCI at nearly five standard deviations below the historical average (in October of 1997). Conditions remained tight in the financial sector until 2005 but loosened beyond that point, especially as fiscal reforms took effect in 2006. The minor exception had been during the global financial crisis (GFC), especially around the time when Lehman Brothers collapsed (in September of 2008).

[8] They can be obtained from the author upon request.

[9] Estimating a VAR using nonstationary variables may result in spurious regressions, and so researchers recommend differencing these variables before estimating; however, there are cases when this is also inappropriate such as when the data are truly stationary and when there are cointegrated processes [Hamilton 1994].

[10] The series was estimated using data gathered for Debuque-Gonzales [2020] based on the method of Hatzius et al. [2010]. Forty-eight financial indicators were used to calculate the FCI.

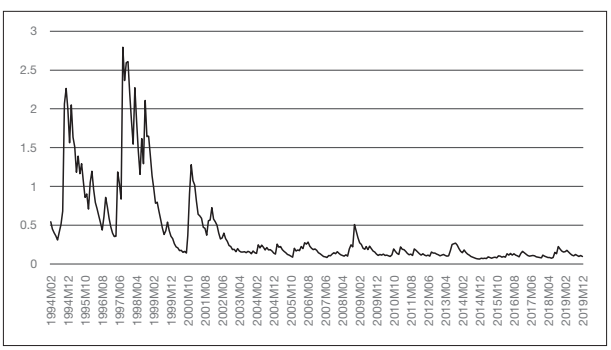
FIGURE 1. Monthly financial conditions index



Note: The FCI in this figure is additionally purged of monetary influences (see main text). A value of 0 means financial conditions are at mean levels of liquidity, stress, and risk, consistent with real activity, inflation, and monetary conditions. A value of -1 suggests worse financial conditions than the average historically by 1 standard deviation; the reverse holds for a value of 1.

The FCI indicates greater financial stability across time. Figure 2, which features variances estimated using generalized autoregressive conditional heteroskedasticity (GARCH) estimation, more visibly confirms this, revealing a sharp decline in volatility after the AFC and relative calm afterward. The financial sector and monetary reforms had been instituted after the regional crisis, and this helped keep financial conditions stable in succeeding years. These reforms aimed to maintain the health of banks through asset cleanups, improved bank risk management, bank capital base build-up, and more coordinated financial sector regulation. The BSP "sought to maintain a stable inflation and domestic interest rate environment" even prior to the formal adoption of inflation targeting [Guinigundo 2006].

FIGURE 2. Financial volatility



Note: The volatility measure is obtained from a Garch (1,1) model of monthly returns using 6 autoregressive lags on the Philippine Financial Conditions Index.

Table 1 provides summary statistics for the variables used in the VAR estimation, with the sample grouped into pre-inflation-targeting and inflation-targeting periods. While one cannot attribute the changes across time solely to inflation targeting, they are, at the very least, indicative of the impact of the new monetary policy environment. The numbers reveal greater monetary and financial stability overall under inflation targeting, with lower variances in prices and monetary and financial conditions.[11]

TABLE 1. Summary statistics

	Pre-IT period (1993:4-2002:2)			IT period 1, balanced (2002:3-2011:1)			IT period 2 (2002:3-2016:1)			IT period 3 (2002:3-2019:4)		
	Mean	SD	Obs	Mean	SD	Obs	Mean	SD	Obs	Mean	SD	Obs
Log-diff. CPI	1.71	1.03	35	1.16	0.75	35	0.95	0.71	55	0.92	0.68	70
Log-diff. GDP	0.94	0.87	35	1.24	0.93	35	1.36	0.83	55	1.38	0.86	70
Log-diff. M2	4.34	3.66	35	2.42	2.66	35	2.77	2.84	55	2.72	2.57	70
Log-diff. REER	-0.21	4.47	35	0.33	2.79	35	0.37	2.44	55	0.27	2.32	70
First-diff. FCI	-0.03	1.17	35	0.05	0.41	35	0.03	0.35	55	0.03	0.32	70
First-diff. RRP rate	-0.20	2.51	35	-0.09	0.35	35	-0.05	0.30	55	-0.04	0.31	70

CPI = consumer price index, FCI = financial conditions index, GDP = gross domestic product, IT = inflation targeting, REER = real effective exchange rate, RRP = reverse repurchase, SD = standard deviation
Sources: Author's calculations; Bangko Sentral ng Pilipinas; International Financial Statistics, International Monetary Fund; Philippine Statistics Authority
Note: The FCI series was computed by the author based on data from Debuque-Gonzales [2020]. Data on real GDP and CPI were seasonally adjusted using the X12 method. Log-differences are in percent.

A spike in the volatility of output growth is not apparent, even if one adjusted for the relative severity of the AFC and the GFC in the sample, while average quarterly GDP growth clearly rose, contrary to earlier fears (see Mishkin [2000] for the common criticisms of inflation targeting in the early years). Output instability and slow growth might have been the case if monetary authorities had enforced overly strict inflation targeting, but a flexible system had instead been considered by the Philippine central bank as an ideal [Tetangco 2010]. Meanwhile, average inflation as measured by the quarterly log difference of CPI declined over the years.

In sum, the shift in monetary framework seems to have generated mostly positive results for the BSP, according to the descriptive statistics, with policy goals greatly met. This paper aims to uncover other, less overt, outcomes under inflation targeting. These include possible differences in macroeconomic responses to shocks, particularly financial and monetary policy shocks, and in monetary policy responses to these shocks.

[11] It is useful to note here that the pre-inflation-targeting period includes the AFC, while the inflation-targeting period includes the GFC.

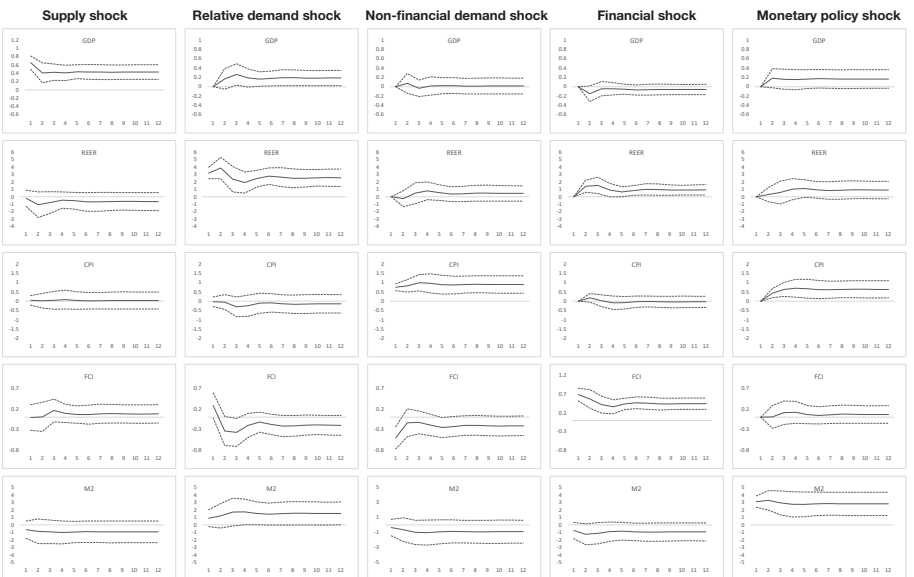
4. Results and discussion

This section first shows the macroeconomic implications of the different structural shocks obtained from the recursive model, comparing pre-inflation-targeting and inflation-targeting periods. It then tracks the evolution of impulse responses to financial and monetary policy shocks, in particular, under inflation targeting.[12] Monetary policy responses to the various structural shocks are then presented and compared across periods. This is followed by a discussion of the heterogeneous impact of financial and monetary policy shocks on the real economy, and monetary policy responses to different types of financial shocks.

4.1. Macroeconomic implications of shocks

Figure 3 depicts the impulse response functions of the endogenous variables to the orthogonalized shocks prior to the adoption of inflation targeting. Figure 4 shows the same set of impulse responses for the balanced inflation-targeting period (IT period 1). The pre-inflation-targeting structural VAR includes M2, representing the policy target during the time, while the inflation-targeting VAR includes the RRP rate, which is the announced policy rate. As described earlier, the corresponding policy instrument for each period is placed last in the recursive ordering.[13]

FIGURE 3. Impulse responses to structural shocks (pre-IT period)

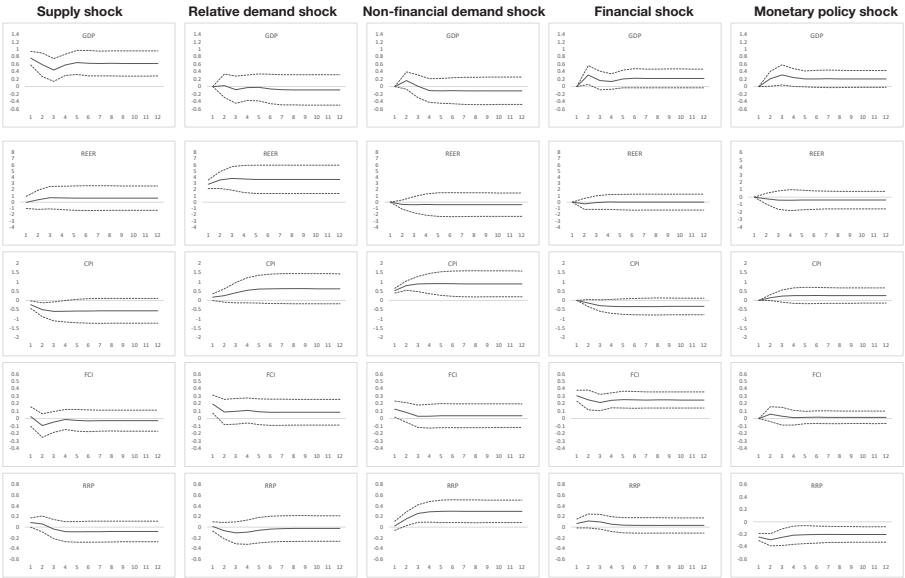


CPI = consumer price index, FCI = financial conditions index, GDP = gross domestic product, IT = inflation targeting, REER = real effective exchange rate Sample period: 1993:4-2002:2.
Note: These are impulse responses to structural shocks identified from the VAR model, as specified in the main text, over 12 quarters. Dashed lines represent 2-standard-error bands. CPI, GDP, M2, and REER are in logarithms.

[12] Emphasis is placed on monetary, financial, and supply shocks, which are more carefully identified in the structural VAR. The remaining shocks are loosely identified as relative demand and non-financial demand disturbances.

[13] Including both M2 and the RRP rate in the specification generates similar responses of the other endogenous variables. Findings from these regressions support the identification scheme applied, as RRP impulse responses and the impact of RRP shocks are insignificant in the pre-inflation-targeting period estimates but become significant in the inflation-targeting samples.

FIGURE 4. Impulse responses to structural shocks (IT period 1, balanced sample)



CPI = consumer price index, FCI = financial conditions index, GDP = gross domestic product, IT = inflation targeting, REER = real effective exchange rate Sample period: 1993:4-2002:2.
Note: These are impulse responses to structural shocks identified from the VAR model, as specified in the main text, over 12 quarters. Dashed lines represent 2-standard-error bands. CPI, GDP, M2, and REER are in logarithms.

In the pre-inflation-targeting period, a one-standard-deviation (expansionary) monetary policy shock leads to statistically significant increases in output and inflation above their trend, cumulating to 17 and 63 basis points, respectively, in a 12-quarter horizon (Figure 3). While the effect on output occurs within two quarters, the full impact on consumer prices takes about four quarters, which is on the shorter end of estimates of the Philippine central bank (Tuaño-Amador [2003]; Guinigundo [2005]).[14]

An unanticipated monetary easing is also followed by a REER appreciation in the longer horizon, likely reflecting rising domestic costs. Although the FCI inches up in response to a monetary policy shock, the effect is statistically insignificant, with the zero-line (indicating no response) remaining within the 95 percent confidence band.

The impact of a one-standard-deviation improvement in financial conditions on GDP tends to be negative prior to the adoption of inflation targeting, but the result, on the whole, is insignificant. Moreover, a financial shock has only a small and short-duration effect on inflation compared to a monetary policy shock. Like in the case of a monetary policy surprise though, it leads to REER appreciation in the longer run.

[14] According to Tuaño-Amador [2003], the estimated lag of monetary policy—the time it took for a policy change to impact inflation—was about 5 to 6 quarters. Guinigundo [2005] later placed the policy lag at 15 to 21 months (5 to 7 quarters) based on estimates from the BSP's VAR models.

Supply shocks have mostly insignificant effects on endogenous variables apart from GDP during the pre-inflation-targeting period, while the notable impact of non-financial demand shocks is on financial conditions, which tend to worsen over time. A one-standard-deviation relative demand shock leads to a rise in GDP growth above the trend of about 26 basis points in total in three quarters and 19 basis points in 12 quarters but also leads to a tightening of financial conditions.[15]

As in the pre-IT period, macro responses to an expansionary monetary policy shock under inflation targeting similarly indicate monetary efficacy. A (negative) one-standard-deviation structural innovation to the policy rate raises both output growth and inflation above trend in estimations based on IT period 1 (Figure 4).[16] It takes 3 quarters for the impact on GDP growth to peak at 31 basis points, before leveling off at 21 basis points beyond five quarters. The impact on prices appears smaller and less distinct, with the full effect, about 26 basis points, similarly reached within four quarters. Like the findings for the pre-IT period, surprise monetary easing does not significantly loosen financial conditions.

Financial shocks influence output in IT period 1 in a manner that is more in line with expectations. A one-standard-deviation improvement in financial conditions significantly raises output growth by about 31 basis points above trend in two quarters before settling at 22 basis points after five quarters. These findings are similar to those of Bassetto et al. [2016] and Gilchrist and Zakrajsek [2012]. Financial disturbances also lead to a decline in inflation during the period, as monetary policy tightens. Such findings indicate the influence of credit supply shocks, which theoretically spur growth as the financing environment softens, trigger monetary tightening, but have an indeterminate impact on inflation [Moccero, Pariès, and Maurin 2014].[17]

Supply shocks behave as expected in estimations for IT period 1, pushing up growth while lowering inflation on impact and for the longer term. The remaining demand shocks both raise inflation, but the impact on GDP growth is insignificant.

4.1.1. Evolution of macro responses to structural shocks under inflation targeting

The structural VAR is also estimated for longer sample periods, to observe the evolution of macroeconomic responses to structural shocks under inflation targeting, as well as to check for robustness of empirical results. As mentioned earlier, the first round of estimates extends the inflation-targeting data set by 5 years to 2016:1 or before the implementation of a channel system in June of 2016

[15] Hoffmaister and Roldós [2001] suggests that relative demand shocks, which they similarly measured through a structural VAR, are largely fiscal in nature as they correlate highly with public spending indicators in developing countries in Asia and Latin America.

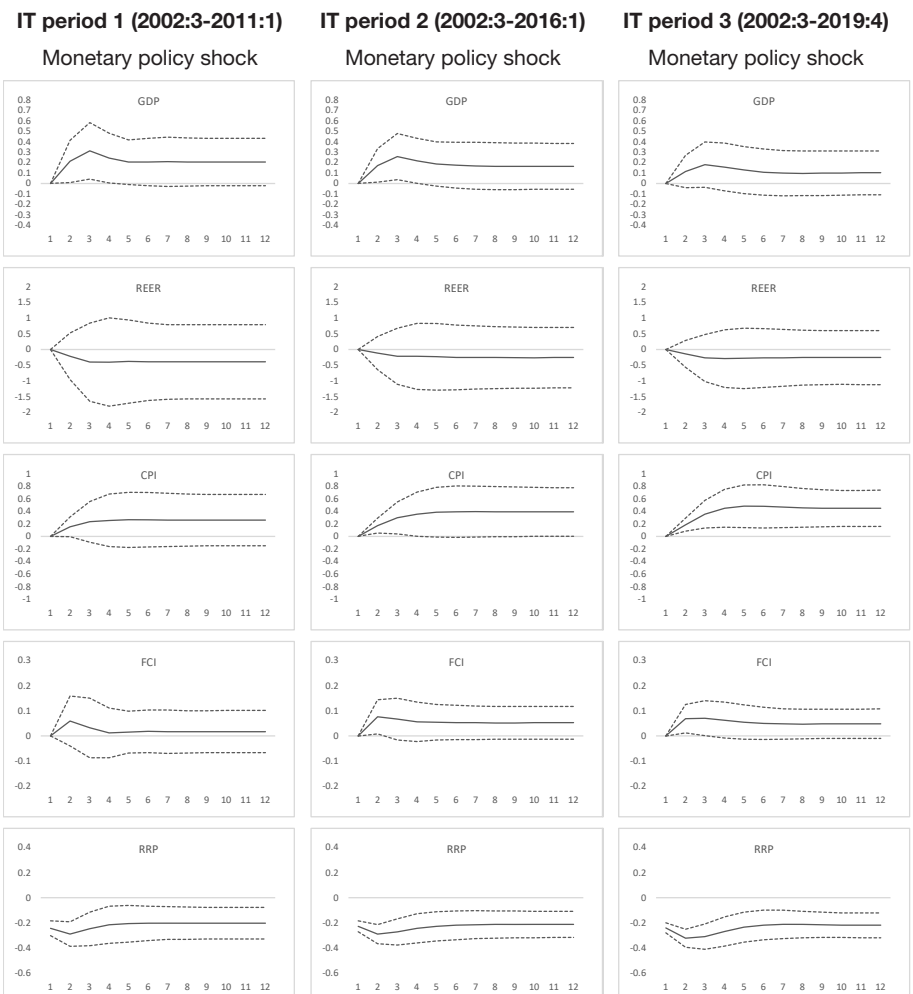
[16] For easier comparison, figures in this paper show the impulse responses of the endogenous variables to expansionary shocks in monetary policy, or an unanticipated decline in the policy rate for IT periods 1 to 3.

[17] The final impact on prices will depend on the relative shifts in aggregate supply and demand. This is the case because these curves move in the same direction in response to positive credit supply shocks. Credit demand shocks, on the other hand, increase both the quantity and price (interest rate) of financing which may have a negative effect on investment and output.

(IT period 2). The second round further extends the sample by about four years, to 2019:4, or prior to the COVID-19 pandemic-induced health and economic crisis (IT period 3).

Figures 5a and 5b summarize the impulse responses of the macroeconomic variables to monetary policy and financial shocks, respectively, based on the different sample periods for inflation targeting. Impulse responses to supply shocks and the remaining demand shocks are no longer shown, as results are consistent across samples.

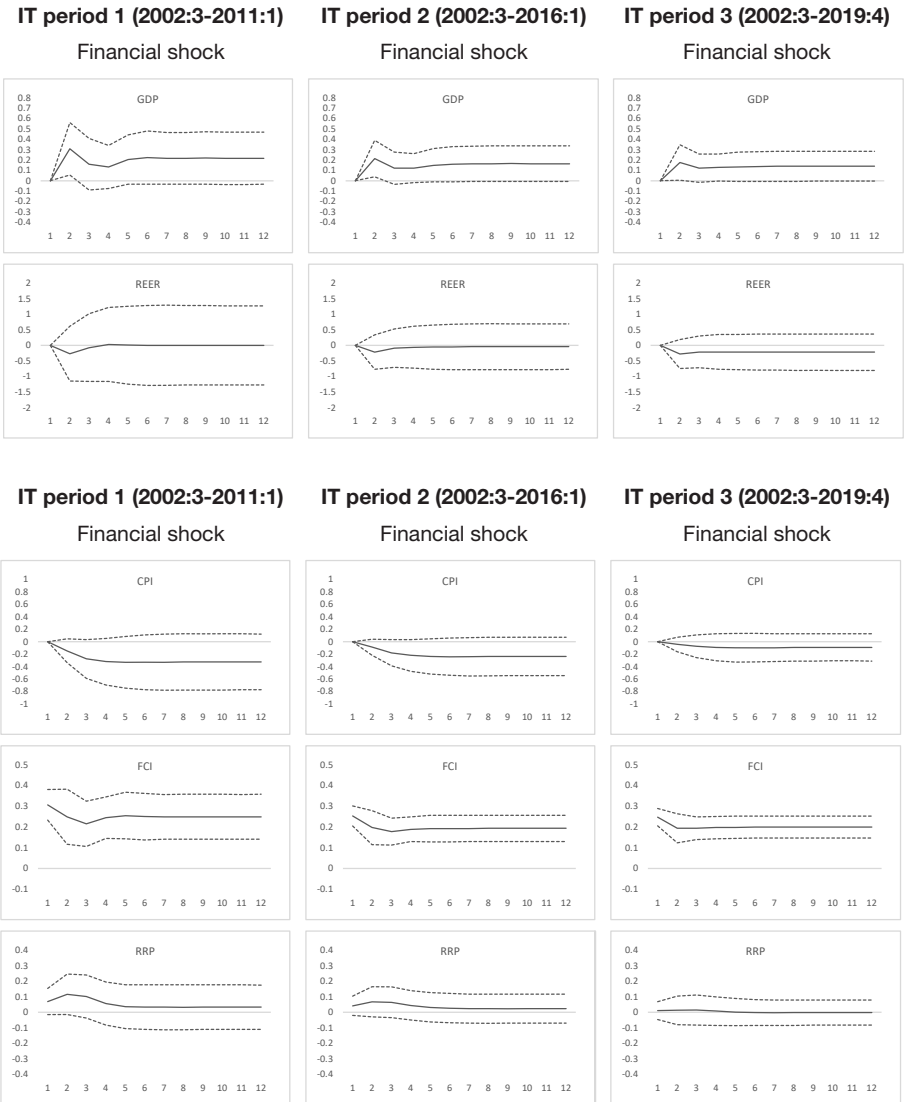
FIGURE 5A. Impulse responses to monetary policy shocks under inflation targeting



CPI = consumer price index, FCI = financial conditions index, GDP = gross domestic product, IT = inflation targeting, REER = real effective exchange rate, RRP = reverse repurchase rate

Note: These are impulse responses to monetary policy shocks identified from the VAR model, as specified in the main text, over 12 quarters. Dashed lines represent 2-standard-error bands. CPI, GDP, and REER are in logarithms.

FIGURE 5B. Impulse responses to financial shocks under inflation targeting



CPI = consumer price index, FCI = financial conditions index, GDP = gross domestic product, IT = inflation targeting, REER = real effective exchange rate, RRP = reverse repurchase rate
Note: These are impulse responses to financial shocks identified from the VAR model, as specified in the main text, over 12 quarters. Dashed lines represent 2-standard-error bands. CPI, GDP, and REER are in logarithms.

Figure 5a (third row) shows confidence bands around the impact of monetary policy shocks on inflation have progressively narrowed under the new monetary regime, indicating greater accuracy of estimates. The accumulated impulse response of inflation to a 1-standard-deviation monetary policy innovation across

a 12-quarter horizon has increased from 26 basis points in IT period 1; to 39 basis points in IT period 2; and to 45 basis points in IT period 3. This suggests greater monetary policy influence over inflation over time. The response of the FCI likewise becomes more distinct as the sample is lengthened, with financial conditions visibly improving in response to an unanticipated monetary expansion (fourth row, Figure 5a).

In contrast, the cumulative response of GDP growth to a monetary policy shock has become less precise across estimations, with the confidence band widening to include zero (first row, Figure 5a). The cumulative effect of surprise monetary easing on output growth has declined from 20 basis points in IT period 1, to 16 basis points in IT period 2, and further to 10 basis points in IT period 3. This suggests some loss of monetary policy effectiveness across time in terms of influencing the output.

One sees a similar decline in the impulse responses of GDP to financial shocks across inflation-targeting sample periods, but the impact is still significantly positive in the last regression. Financial shocks are quicker and more powerful than monetary policy innovations in influencing output, indicating the presence of financial frictions (first row, Figure 5b). The accumulated increase in output growth to a 1-standard-deviation structural innovation in the FCI peaks at 56 basis points within two quarters before plateauing at 22 basis points after 5 quarters for IT period 1; reaches 21 basis points within two quarters then tapers to 17 basis points after 5 quarters for IT period 2; and rises to 18 basis points before quickly settling at 14 basis points in IT period 3.

The tendency for financial shocks to result in lower inflation meanwhile disappears in the full sample (third row, Figure 5b). Such disturbances no longer lead to lower price pressures when the full dataset is used, a development that possibly relates to the corresponding change in monetary reaction, with policy responses to financial shocks appearing to weaken (see next subsection).

Table 2 shows the decomposition of the forecast error variance (FEV) of the macroeconomic variables in the VAR. The outcomes further reveal the relative importance of structural shocks in the evolution of these variables under inflation targeting.

For GDP, financial shocks have, across inflation targeting periods, accounted for a larger fraction of the FEV of output growth than monetary shocks, though both contributions have lessened over time. For CPI, one can see that monetary policy disturbances have increasingly contributed to the FEV of inflation, indicating stronger policy influence in this area. For the RRP rate, the distinct change has been the increase in the importance of monetary policy shocks in explaining future variation, and a corresponding decline in the significance of other structural shocks. This reflects the adoption of the RRP rate as the policy rate during the shift to inflation targeting and suggests greater control over this rate across time.

TABLE 2. Variance decomposition of macroeconomic variables

	Supply shock	Relative demand shock	Non-financial demand shock	Financial shock	Monetary policy shock
			IT period 1 (2002:3-2011:1)		
GDP	71.3	1.9	6.7	13.4	6.7
REER	3.1	93.3	1.5	1.3	0.9
CPI	20.8	12.7	55.5	6.3	4.7
FCI	9.8	25.6	10.7	51.4	2.4
RRP rate	15.1	7.6	21.7	7.2	48.5
			IT period 2 (2002:3-2016:1)		
GDP	81.8	1.8	2.6	8.1	5.8
REER	3.2	94.8	0.7	1.0	0.4
CPI	26.0	6.5	55.6	3.2	8.8
FCI	10.9	25.4	7.4	51.7	4.6
RRP rate	12.6	6.3	14.8	3.3	63.1
			IT period 3 (2002:3-2019:4)		
GDP	90.5	0.7	1.5	4.6	2.6
REER	4.1	93.6	0.3	1.4	0.6
CPI	14.5	3.7	66.3	0.6	14.8
FCI	8.2	24.2	6.2	57.1	4.3
RRP rate	6.4	3.5	21.7	0.2	68.3

CPI = consumer price index, FCI = financial conditions index, GDP = gross domestic product, IT = inflation targeting, REER = real effective exchange rate, RRP = reverse repurchase
Note: The table shows the forecast error variance decompositions at 20 quarters.

4.2. Monetary policy responses to structural shocks

The last rows of Figures 3 and 4 summarize the monetary policy responses to the different structural shocks prior to and during inflation targeting, respectively. In the pre-IT period (Figure 3, fifth row), the policy is tightened in response to an unanticipated improvement of financial conditions. This helps explain the contractionary (though insignificant) effect of financial easing on output noted earlier. Conversely, unanticipated relative demand expansion spurs monetary policy easing, which tends to further boost GDP.[18] An interpretation may be that policymakers tend to tighten liquidity in response to a surprise REER depreciation and loosen it in the case of a surprise REER appreciation. This observed behavior matches central bank policy to engage in foreign exchange (FX) intervention only when needed—i.e., to lower FX volatility and not to influence the exchange rate. Monetary responses to supply and non-financial demand shocks are insignificant but slightly tilt towards contraction.

In the balanced inflation-targeting period (IT period 1), monetary policy is tightened on impact in response to the unanticipated easing of financial conditions. The increase in the RRP rate in response to one-standard-deviation financial shock peaks at 12 basis points around the second quarter and returns to trend after

[18] It is useful to note at this point, that responses are symmetric in the structural VAR's IRF computations. This paper presents the expansionary case when reporting most results, but this is mainly for brevity.

about four quarters (Figure 4, fifth row). This provides evidence of what may be construed as "leaning against the wind", or a possible precursor to such a strategy, where the monetary authority considers financial stability and responds to known indicators of financial conditions, such as asset prices and credit quantities (Agur and Demertzis [2013]; Gambacorta and Signoretti [2014]; Svensson [2017]).[19] The policy rate increase eventually reverses, however, allowing output to expand above-trend together with a fall in inflation akin to what happens under an aggregate supply shock.

Supply shocks are slightly accommodated, but only on impact and fleetingly, with the RRP rate rising by about nine basis points for one quarter in response to a one-standard-deviation positive supply disturbance. Accommodative behavior, which indicates softening of the inflation-output variability tradeoff, has been observed in other inflation-targeting central banks, albeit mostly in advanced economies and for longer periods (e.g., Tachibana [2013]). In the case of an adverse supply shock, which depresses output and heightens price pressures, successful anchoring of inflation expectations allows inflation-targeting central banks not just to refrain from raising the policy rate, but to lower it to stabilize output.[20] In the context of the Philippines, the observed accommodation was likely due to policymakers' recognition of the possible impact of supply shocks on inflation expectations, especially when shocks were seen to be persistent or prolonged.[21]

Monetary policy strongly and systematically tightens in response to non-financial demand shocks. Although this occurs with a lag, with the full effect (about 30 basis points) taking about four quarters to complete, the consistency in behavior under inflation targeting contrasts with the greater ambiguity of monetary responses to demand shocks prior to inflation targeting.

As opposed to what occurs in the pre-IT period, the policy does not significantly respond to a relative demand shock under inflation targeting, though the inclination is still to stabilize relative prices. This suggests a weaker tendency to control the exchange rate, as had been typical policy advice given to developing economies after the AFC (as noted, for example, in Mishkin [1999] and Kawai et al. [2005]).

Figure 6 summarizes the monetary responses to structural shocks as the sample period for inflation targeting is lengthened. Policymakers' reactions seem consistent in that they gradually but systematically tighten monetary policy in response to a positive non-financial demand shock, which is vital to

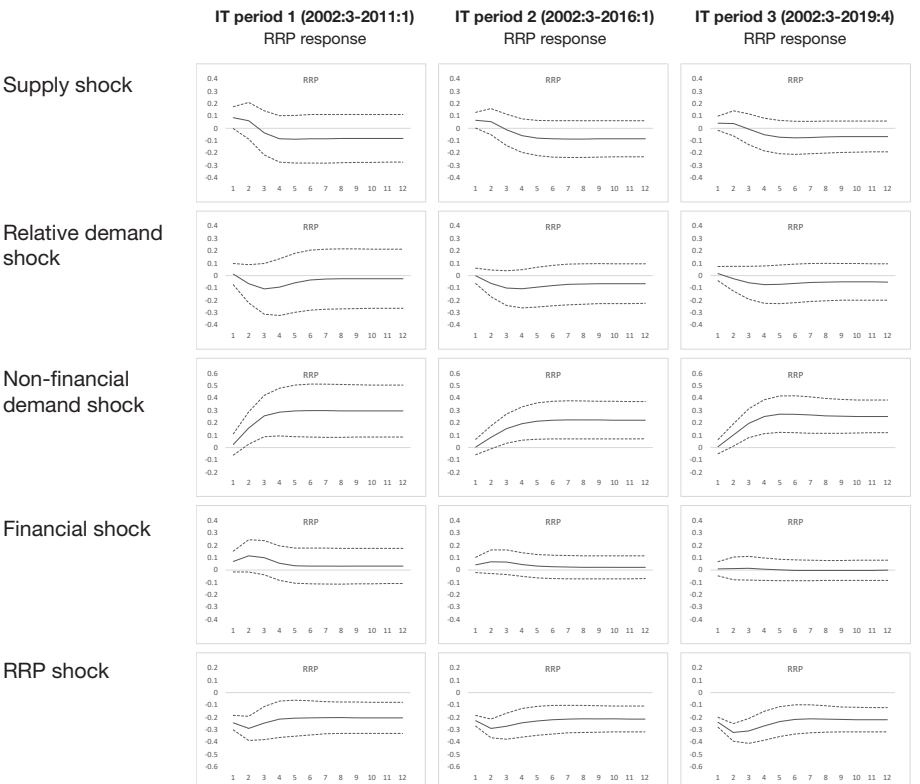
[19] Such responses are also useful for checking the identification strategy of the structural VAR. To additionally identify financial shocks and differentiate them from monetary shocks, Fornari and Stracca [2012] impose a *non-negative* reaction of the short-term interest rate after a financial shock.

[20] Central banks included in Tachibana [2013] were developed economies–specifically, Australia, Canada, New Zealand, Sweden, and the UK.

[21] This vital observation was made by central bank officials during those times.

meet the inflation target; and yet partially and transiently accommodate supply disturbances. The notable change across sample periods however is the weakening of the policy response to a financial disturbance, with the central bank appearing to no longer respond as much to financial conditions when one considers the full inflation targeting sample.

FIGURE 6. Monetary responses under inflation targeting

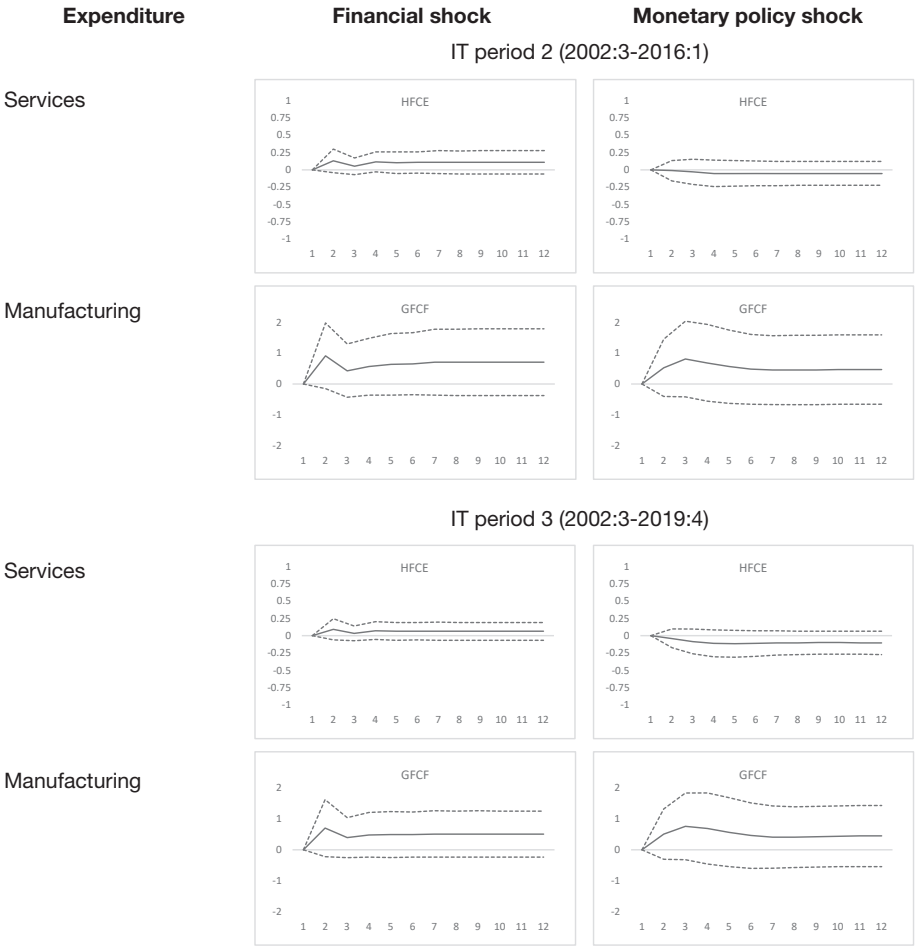


CPI = consumer price index, FCI = financial conditions index, GDP = gross domestic product, IT = inflation targeting, REER = real effective exchange rate, RRP = reverse repurchase rate
Note: These are monetary policy responses to structural shocks identified from the VAR model, as specified in the main text, over 12 quarters. Dashed lines represent 2-standard-error bands. CPI, GDP, and REER are in logarithms.

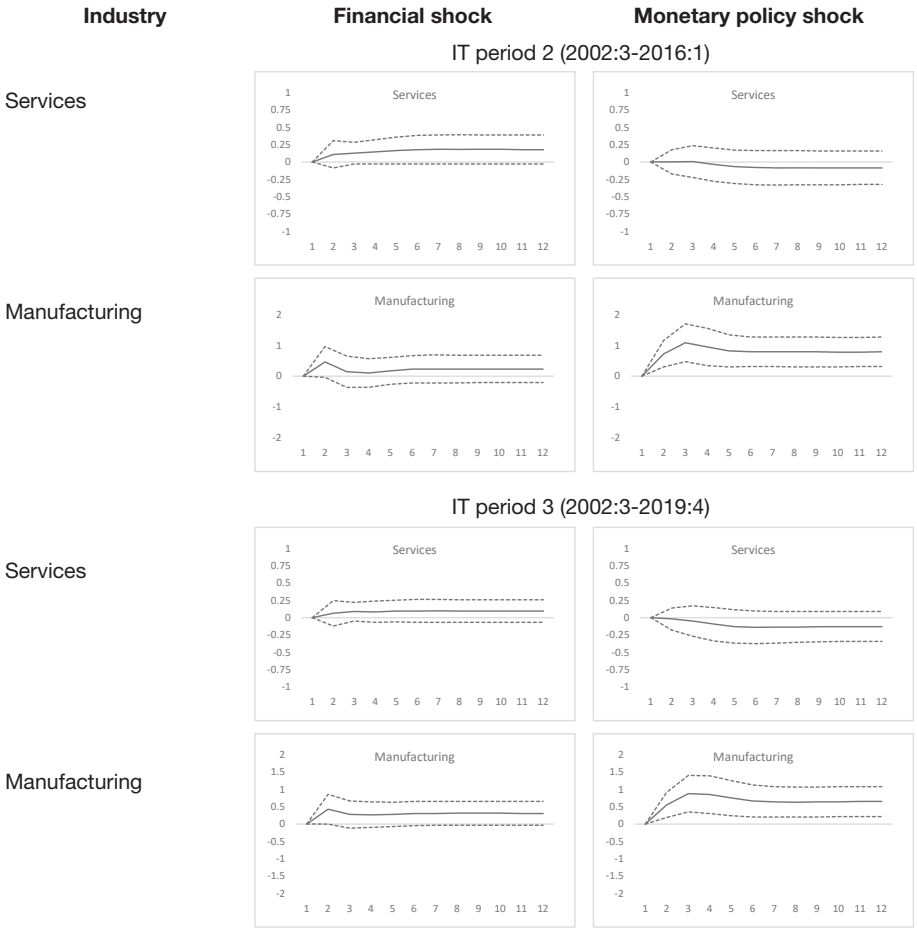
4.3. Heterogeneous impact of financial and monetary policy shocks

Figure 7 (expenditure panel) shows that both financial and monetary policy shocks have a larger impact on fixed capital investment than on household consumption, although there is still some indeterminacy in the direction of the responses of the former. Moreover, for both types of spending, the impact of financial shocks tends to be larger and more significant compared to that of monetary policy shocks.

FIGURE 7. Output responses to financial and monetary policy shocks, by expenditure and industry



Note: These are responses to financial and monetary policy shocks identified from the VAR model, as specified in the main text, over 12 quarters. Dashed lines represent 2-standard-error bands. Household fixed consumption expenditure (HFCE) and gross fixed capital formation (GFCF) are in logarithms.



Note: These are responses to financial and monetary policy shocks identified from the VAR model, as specified in the main text, over 12 quarters. Dashed lines represent 2-standard-error bands. Manufacturing and services output are in logarithms.

The results suggest that both sectors face financial frictions, but with firms likely to be much more reliant on credit and therefore more responsive to monetary and financial expansion than households. They are consistent with the expectation that a positive financial shock will bring about higher private investment, as external finance serves as a more vital element in the production of capital goods than consumption goods (Fornari and Stracca [2012]; Hall [2010]).

They are also consistent with the strong presence of credit supply shocks observed earlier, as such disturbances tend to emanate from the corporate sector, where it matters more on the production side [Fornari and Stracca 2012]. Findings are also related to those of Gilchrist and Zakrajsek [2012], who find the impact

of financial disturbances to be stronger on business investment versus GDP, and of Bassetto et al. [2016], who find that financial shocks have a disproportionate effect on investment compared to monetary policy shocks.

In comparison, there is greater nuance across inflation-targeting periods for services and manufacturing on the production side of GDP (Figure 7, industry panel). Only financial shocks have a significant effect on services in IT period 2, but this disappears in IT period 3. The impact of financial shocks on manufacturing, on the other hand, is significant in the longer run only in the full sample, while that of monetary policy shocks is significant across all sample periods, with impulse responses accumulating to and settling at about 70 basis points by the third quarter. Furthermore, monetary policy tends to have a larger effect than financial conditions on the manufacturing sector.

The results indicate financial constraints and frictions for manufacturing firms, as improving both monetary policy and financial conditions leads to higher manufacturing growth. Services growth, in contrast, appears unresponsive to monetary easing and only weakly responsive to improvements in the financing environment. This suggests lesser reliance of services firms on external finance, which does not seem incompatible with the composition and nature of the sector.[22]

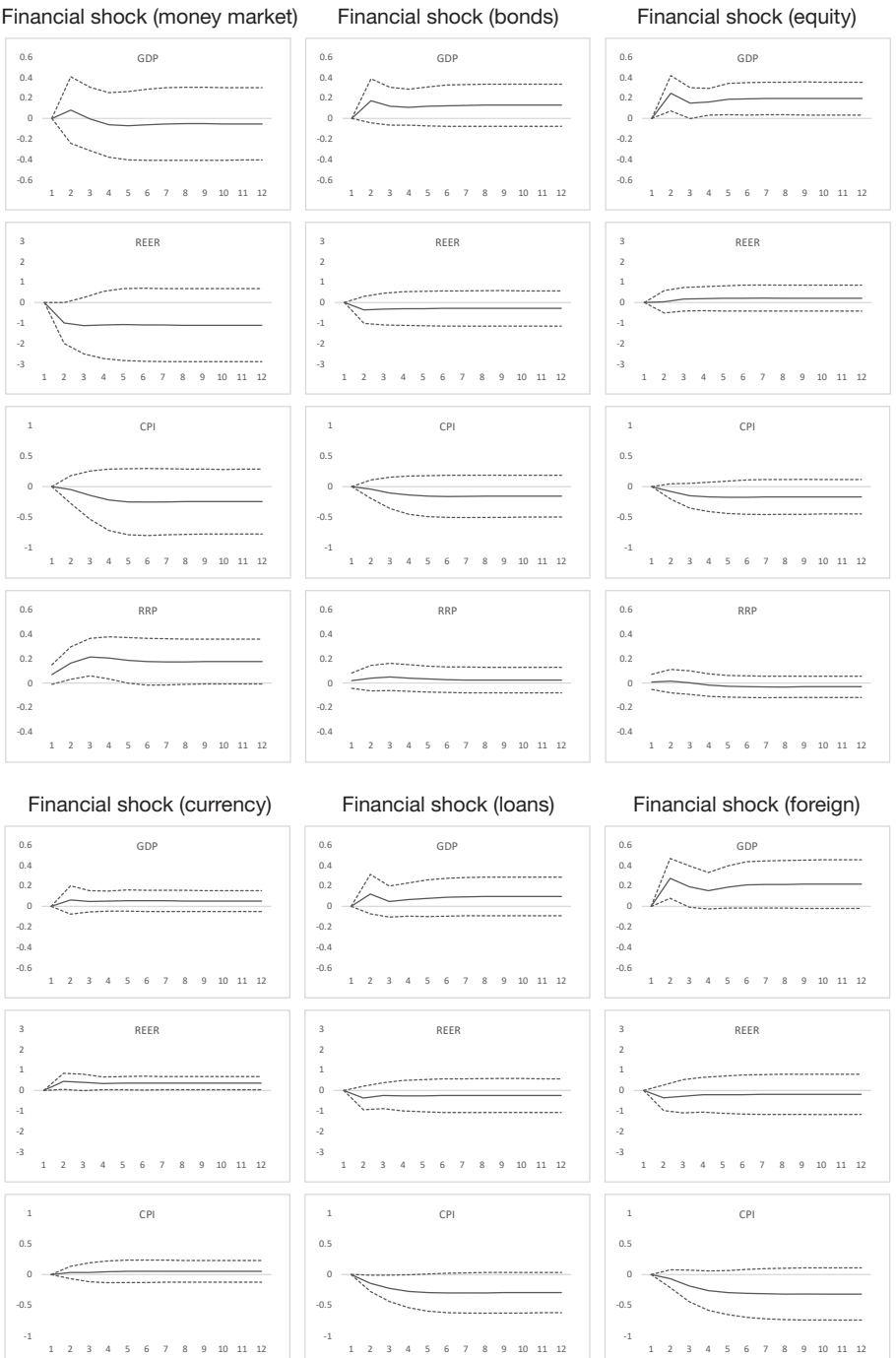
4.4. Macro effects of disaggregated financial shocks

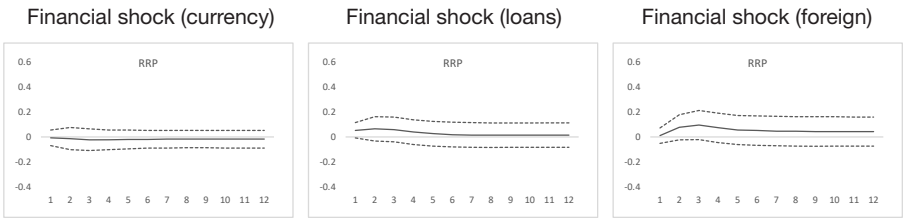
Figures 8a and 8b summarize the results of structural VARs that were alternately estimated using FCI subcomponents that focused on a particular financial instrument/asset or source—namely, domestic bonds, stocks, currencies, loans, or the global financial market.[23] The foreign finance subcomponent condenses information from the Chicago Board Options Exchange Volatility Index (VIX), the US TED spread (the 3-month London Interbank Offer Rate minus the three-month US Treasury bill rate), the US term spread (the ten-year US Treasury note yield minus the three-month US T-bill rate), and a measure of world oil prices to represent commodities.

[22] The formal services sector accounted for in the national income accounts data largely consists of domestic wholesale and retail trade (about a third of total services output), apart from finance, insurance, and real estate (about a fourth). Though both manufacturing and services sectors are weighed down by lack of financial scale in developing countries, Daway-Ducanes and Gochoco-Bautista [2019] argue that financial expansion may adversely affect services more than manufacturing due to the presence of a large informal services sector and the inclusion of potentially destabilizing services sectors, such as financial intermediation and real estate services.

[23] Indicators meant to capture risk are incorporated in the relevant category. For instance, the loans classification includes bank distance-to-default as well as the bank-sector beta, while the currency market category includes foreign-exchange-related volatilities and the exchange market pressure index.

FIGURE 8A. Impulse responses to financial shocks (IT period 2)





CPI = consumer price index, FCI = financial conditions index, GDP = gross domestic product, IT = inflation targeting, REER = real effective exchange rate, RRP = reverse repurchase rate
Sample period: 2002:3-2016:1
Note: These are responses to various financial shocks identified from the VAR model based on a decomposition of the FCI, as specified in the main text, over 12 quarters. Dashed lines represent 2-standard-error bands. CPI, GDP, and REER are in logarithms.

The figures display the impulse responses of the endogenous macroeconomic variables (excluding the FCI because of space considerations) to different estimates of financial shocks, including the monetary policy responses to these shocks. As evident from Figure 8a, the policy rate tightens in response to positive financial disturbances from the domestic money market in IT period 2, stabilizing output at the trend. The RRP rate hike in response to a one-standard-deviation liquidity disturbance accumulates to 21 basis points by the third quarter before gradually tapering to 17 basis points.

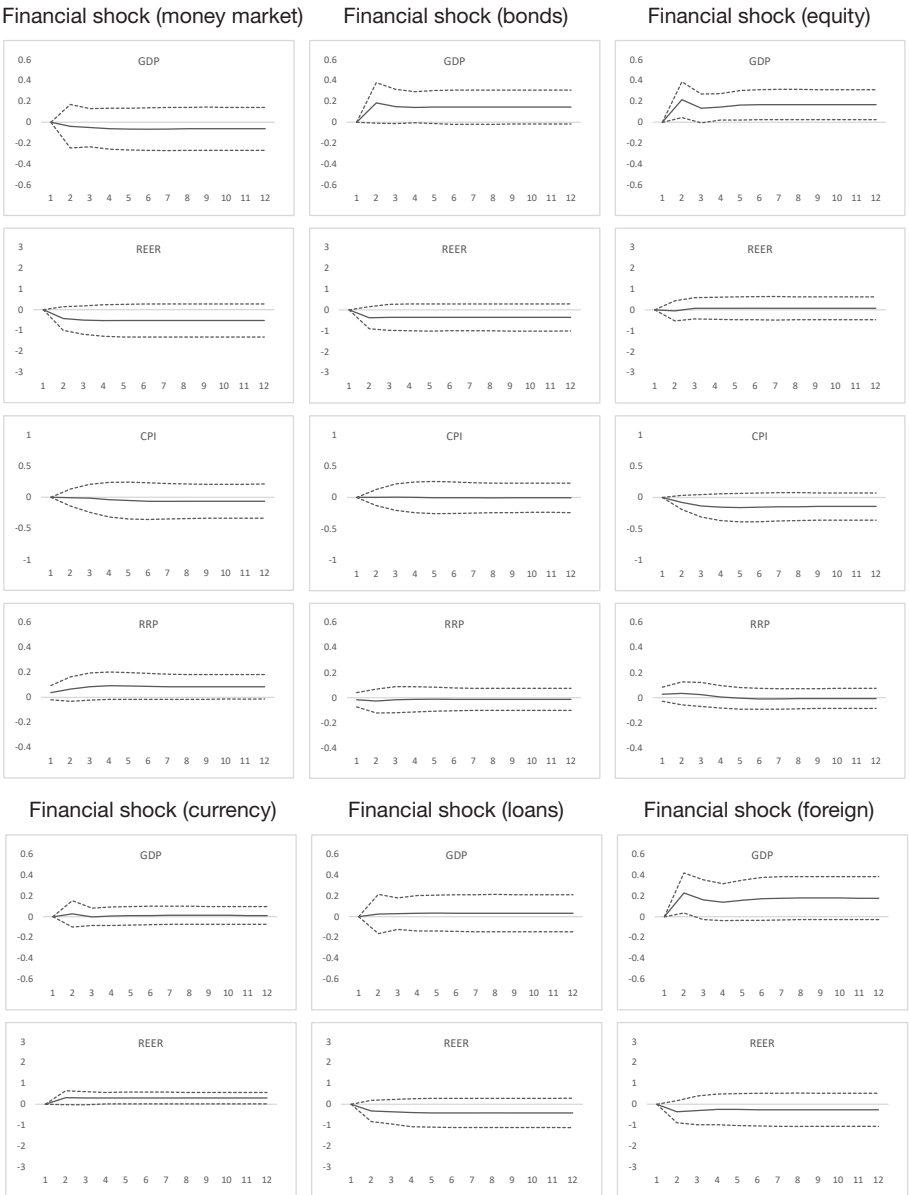
Monetary policy similarly tightens in response to a foreign financial shock, but by a lesser degree (by ten basis points in three quarters) and for a shorter period (reverts to near trend in five quarters), allowing a significant GDP increase. The responses can be further traced to the VIX and the US TED spread, which both reflect the global liquidity conditions and risk sentiment of international investors. The foreign financial shock estimated in this paper is primarily driven by the VIX, which indicates the risk appetite of global investors and corresponding scarcity (high VIX) or abundance (low VIX) of foreign capital. Positive financial shocks from bank loans also trigger a small policy reaction on impact, which goes back to trend after a year.

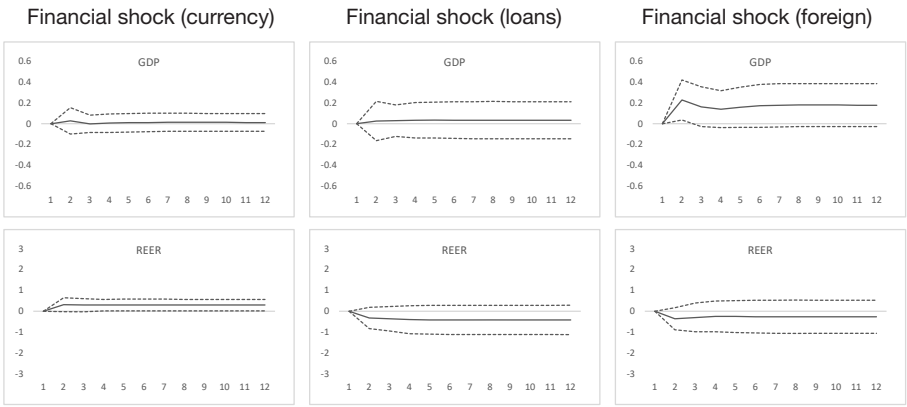
Considering these policy responses, most financial shocks seem to behave like aggregate supply shocks in IT period 2, as they raise output and lower prices simultaneously.[24] The pattern is purest for financial shocks coming from the domestic equity market, where there is no corresponding monetary response, and sharpest for disturbances from foreign financial markets, which are closely associated with domestic markets on account of risk-on/risk-off behavior of global investors.[25] Financial shocks from the bond market (which tend to dominate domestic financial conditions) and bank loans also follow the same pattern, but with less distinct responses.

[24] Financial shocks from the FX market are an exception. The only significant response to a positive financial shock from this market is REER appreciation.
[25] A positive financial shock from the equity market is therefore akin to an unanticipated tax cut that lowers costs and boosts production.

Financial shocks from domestic equity and global financial markets continue to behave like aggregate supply shocks in IT period 3 (Figure 8b). One can also see similar policy responses to these disturbances in the full sample. While there is little change in the impulse responses to structural shocks from the money market, in terms of direction, monetary policy responses to these disturbances are much smaller in the full sample, at less than half their previous size.

FIGURE 8B. Impulse responses to financial shocks (IT period 3)





CPI = consumer price index, FCI = financial conditions index, GDP = gross domestic product, IT = inflation targeting, REER = real effective exchange rate, RRP = reverse repurchase rate
Sample period: 2002:3-2019:4
Note: These are responses to various financial shocks identified from the VAR model based on a decomposition of the FCI, as specified in the main text, over 12 quarters. Dashed lines represent 2-standard-error bands. CPI, GDP, and REER are in logarithms.

The biggest difference across sample periods seems to be in relation to structural shocks that emanate from bank loans. Surprise improvements in financing conditions related to bank credit completely fail to spur growth in the full sample, while monetary policy no longer tightens in response to such disturbances during the period and inflation no longer falls. The latter set of responses also occur to a certain extent for bonds.

All in all, the findings suggest that, in the evolving inflation-targeting environment, policymakers blunted the macroeconomic impact of financial shocks, and this behavior has been consistent for certain types of shocks, specifically those emanating from global financial and domestic money markets. This indicates policy sensitivity to a surge of liquidity, or a drying up of funding on the flipside, and is compatible with monetary policy that attempts to discipline a financial boom yet becomes accommodative in periods of a financial bust.

However, such patterns of behavior gleaned from impulse response functions have disappeared for bank loan shocks, and to some degree bond market shocks, in the latest (full-sample) regressions. This helps explain the observed weakening of the monetary policy and inflation response to financial shocks across sample periods, as noted previously (Figure 5b).

5. Further discussion and concluding remarks

Using a simple and relatively standard but potent specification for a structural VAR, this study was able to identify and estimate various macroeconomic shocks and deliver sensible impulse response functions that summarized important economic behavior prior to and during inflation targeting in the Philippines.

The structural VAR allowed investigation of the differences in (1) the impact of financial and monetary policy shocks on inflation and growth, shedding light on the issue of monetary effectiveness; and (2) systematic responses of the monetary authority to macroeconomic shocks, including financial shocks, which have rarely been estimated in the empirical literature, especially in developing and emerging market economies. It also allowed observation of the evolution of economic behaviors in inflation targeting monetary settings.

Descriptive statistics showed mostly positive outcomes in relation to the country's adoption of inflation targeting in 2002. Comparing impulse response functions for the balanced periods before and after implementation of the new monetary regime, however, one finds monetary effectiveness may have been about the same (and even a bit stronger) in the period before inflation targeting. This may have also been due to the length of the pre-IT sample (last quarter of 1993 until mid-2002), which was limited by the length of the FCI series used in the study. Guinigundo [2005] and Tuaño-Amador [2003] both state that the BSP had already shifted to "modified monetary targeting" by 1995, an approach that placed greater emphasis on price stability and which, like inflation targeting, extracted information from a much broader set of economic and financial variables, with attention no longer focused on just the monetary aggregates. Thus, the main difference between modified monetary targeting and inflation targeting had been the forward-looking feature of the latter, as policymakers were then still responding mainly to *current* inflation.

Some policymaker responses were about the same in both monetary frameworks in a balanced comparison, with the policy rate systematically rising in response to a positive financial shock and declining in response to a negative financial disturbance. These are of course actions that are also compatible with a monetary authority trying to rein in inflation or maintain an inflation target if financial shocks are interpreted as simple aggregate demand shocks, though inflation falling significantly below trend in the case of a financial expansion seems to imply otherwise.

Whether or not Philippine monetary authorities leaned against the wind to prevent a build-up of financial risk at any point in time has yet to be established. Whether that was correct policy or not, particularly for an emerging market economy, also remains a lively area of debate.[26] Yet, central bank leadership at the time had certainly been open to the idea, with the central bank governor espousing

[26] There has been lively discussion over the years on whether such a strategy is optimal. Prior to the GFC, the popular view was that a central bank should pay little attention to financial variables beyond their effects on inflation (e.g., Bernanke and Gertler [2000; 2001]; Gilchrist and Leahy [2002]). There has been a major reassessment after the crisis, with authors emphasizing the importance of accounting for "changes in financial conditions" when making interest-rate policy decisions, particularly when frictions are known to be coming from the credit supply side [Woodford 2011].

a "broader reaction function" that incorporated financial stability or other important considerations as representing "an evolution of the framework and a way forward for (inflation-targeting) central banks" [Tetangco 2010:300-301].

Monetary policy responses under inflation targeting differed from those in the pre-IT period in three important ways based on this study's empirical results. First was the strong and systematic tightening of the policy rate in response to non-financial demand shocks as can be expected from a central bank that is trying to meet an official inflation target or target range. Such behavior stands out, especially in comparison to more ambiguous responses seen under a less defined monetary framework.

The second was the apparent accommodation of supply shocks by policymakers, albeit partial and fleeting (about one to two quarters), which would not have been feasible if inflation expectations had not been well anchored. The ability to loosen monetary policy in the face of adverse supply conditions, therefore, indicates success in the implementation of an inflation-targeting framework. This also fits the BSP's portrayal of itself as a flexible inflation targeter (e.g., Guinigundo [2014]) as well as observers' initial impressions of inflation targeting as implemented in the Philippines (Mariano and Villanueva [2006]; Lim [2006]).

The third difference across monetary regimes was in the approach to exchange rate management. The impulse response functions indicated a greater tendency to control the exchange rate in the pre-IT period and greater tolerance for exchange rate flexibility in the balanced inflation-targeting phase. Pegged exchange rate regimes had fallen out of favor after the AFC in 1997/1998 and were believed to have made financial crises in emerging market countries more likely (e.g., Mishkin [1999]). Moreover, adopting an inflation target meant subordinating the exchange rate to the final goal of low inflation, which was considered sound advice at the time [Debelle and Lim 1998].

The role of the exchange rate under inflation targeting had been recognized early on as a critical issue in emerging market countries, a number of whom were reluctant to display "benign neglect" of exchange-rate movements [Mishkin 2000], and it will always be so in open economies like the Philippines [Tetangco 2009]. Relatedly, under the classic Mundell-Fleming "trilemma" and even under Rey's "dilemma" or the "irreconcilable duo" [Rey 2018], which argues that exchange rate policies may not even matter, the biggest challenge of an inflation-targeting central bank in an emerging market economy will always be in responding to massive capital inflows (and sudden outflows).[27]

[27] In the classic trilemma, a country cannot have a fixed exchange rate, an open capital account, and monetary autonomy all at the same time. Because of a global financial cycle in capital flows, asset prices, and credit growth, Rey [2018] states that a country has to further choose between the latter two (open capital account and monetary autonomy), regardless of exchange rate regime. In such a setting, policy options at the country level would be limited to such measures as targeted capital controls, national macroprudential policies, and more stringent limits on leverage of financial intermediaries.

Indeed, such issues likely colored the evolution of monetary policy responses to macroeconomic shocks under inflation targeting in the Philippines and the effectiveness of these responses. Structural VAR analysis in this paper showed that the observed tendency to lean against the wind virtually disappeared when the sample period for inflation targeting was lengthened, with the central bank appearing to no longer respond as much to a change in financial conditions. A closer look at sources of financial disturbances further revealed that this traced to a change in the monetary policy reaction (or non-reaction) to credit market shocks, mainly in bank lending.

Ongoing research [Debuque-Gonzales 2021] focusing on a period of high portfolio inflows and short-term-interest-rate divergence (i.e., between the policy rate and the 91-day Philippine Treasury bill, the known benchmark for bank loans) found that, during the said period, the policy rate systematically *fell* in response to a positive financial shock, perhaps to stabilize the exchange rate, while inflation hovered *above* rather than below trend. This may have occurred as raising policy interest rates to ward off inflation during periods of high liquidity would have been a tricky response for policymakers, as this would have invited further capital inflows and greater currency instability. This period, which included late 2010 to early 2018, roughly covered the latter half of the current paper's full sample for inflation-targeting, thus helping explain the change in the observed behavior.

In addition to a negative short-term-interest-rate spread during the high capital-flows period as high liquidity pulled down T-bill rates, the study uncovered a simultaneous weakening of interest rate transmission from short-term to long-term domestic market rates (the latter proxied by ten-year Philippine Treasury note yields) as well as to the average bank lending rate. Similar to the observations of Jain-Chandra and Unsal [2012] for Asian emerging market economies and Rey [2018] for a broader set of countries, the paper found that Philippine long-term yields tended to move more closely with long-term global yields, as represented by ten-year US Treasuries, while domestic bank lending rates generally moved more independently, especially of short-term market rates, during the period. These observations, taken together, help explain the observed weakening of monetary policy transmission to output growth across inflation-targeting sample periods in this paper.[28]

In sum, the results of this paper suggest that the adoption of inflation targeting in the Philippines has largely been successful, changing central bank behavior in a good way, but future challenges remain, and likely in the same areas—i.e., in maintaining monetary influence over the economy, dealing with capital surges, and preserving financial stability, while also keeping exchange rates at a robust and competitive level.

[28] The BSP has conducted monetary policy with an understanding of the difficulties posed by cross-border capital surges. At different points in time in recent history, it had been compelled to prohibit access of foreign capital to its various deposit facilities (e.g., to special deposit accounts and term deposits) and introduce a variety of macroprudential measures to help maintain price and financial stability.

Tetangco [2009], in his assessment of the future of inflation targeting in the country, highlighted the need for central banks to deepen their understanding of financial linkages in the transmission of shocks and monetary policy. This paper traced some of those linkages and, additionally, through an examination of the heterogeneous effects of the interplay of financial and monetary policy shocks, revealed financial frictions and constraints in important sectors of the economy—especially among firms for investment, and within manufacturing. From this perspective, one can expect that tradeoffs encountered by an inflation-targeting central bank in a country like the Philippines when dealing with future capital surges will hardly ever (or never) be easy.

Acknowledgments: I wish to thank Diwa Guinigundo for the invaluable insights and constructive comments which come from many decades of monetary policymaking experience at the Central Bank of the Philippines and subsequently the Bangko Sentral ng Pilipinas. Many thanks as well to Marie Christine Tang, an experienced financial observer, for helping identify possible misinterpretations and omissions. All remaining errors are my own.

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