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Non-Conventional Monetary Policy: The Case of Bolivia

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ABSTRACT

In this paper, we quantify the role of non-conventional monetary policy for Bolivia. The results suggest that changes in the real assets of the central bank show differentiated effects: Contractive policy has more negative and significant effects on the real business cycle, in contrast to its expansive orientation. These results are robust to an econometric battery by alternative models (VAR, SVAR Short-Run, SVAR Long-Run, BVAR), for the quarterly period from 2000 (Q1) to 2015 (Q4). The excess growth of the M2 aggregate in relation to M1 exerts greater variability in the short-term fluctuations of output gap, in comparison with the real assets of central bank.

Keywords: Non-Conventional Monetary Policy, Output Gap, Asset of Central Bank Inflation, Interest Rate, SVAR.
JEL Classifications: C36, E31, E32, E43, E52, E58

1. INTRODUCTION

This document answers a research question: *What is the expansive and contractive role of the real assets of the Central Bank in the output gap (real economic cycle)?*

To answer the research question, the perspective of a non-conventional monetary policy is utilized. It was completed through the management discretion of the real assets of the Central Bank and its impact, with expansive incentives on the real economic cycle, which it is also called output gap.

Since Taylor's (1993) contribution, there are different approaches to quantify the discretion of the central banks (conventional monetary policy). These are directed by increasing the interest rates of the monetary policy against contemporary behavior in the inflation rates and the positive gaps in the production level (overheating stages); as well as a decrease in the interest rates (in the opposite direction).

On the other hand, a shock of non-conventional monetary policy is defined as an exogenous positive innovation in the central bank's assets, under a context of ineffectiveness in interest rates. This happens when they are at low levels and the main instrument is based on quantitative aggregate, instead of a quantitative reaction function (Gambacorta et al., 2014). Likewise, the relevant question that has been sought to answer in the related literature is: What is the effectiveness of a non-conventional monetary policy by mitigating recessive shocks associated mainly in financial crisis contexts? (Baumeister and Benati, 2010).

The objective of this document is to explain the generality of the monetary policy, in a non-conventional manner, with major emphasis on the real economic activity and inflation. To that effect, Bolivia is taken as an example of case study during the quarterly period: 2000 (T1) – 2015 (T4)[1], applying econometrics methods of time series (SVAR Short-RUN [SR], SVAR Long-Run [LR], BVAR).

A relevant justification is focused on the lack of theoretical and empirical clarity to estimate the effects of the non-conventional monetary policy. The above, without some degree of real precision and the presence of skepticism in the policy effectiveness and contribution, or that the results are sensitive to the models specification (Bauer and Neely, 2014).

As a result, the document is structured into four sections. The first one deals with the non-conventional monetary Policy:

Measurements, roles and objectives; the second section is about the quantitative modeling of the monetary policy; the third one, is related to the findings and results based on different models specifications (robustness analysis); and the last section consist in the discussion of the results, as well as the implications for public policies, limitations and agenda for future studies. At the end of the document, the main conclusions of the document are emitted.

2. LITERATURE REVIEW

2.1. Theoretical Foundation: Non-conventional Monetary Policy

The international evidence of the non-conventional monetary policy is linked to the process of growth in the Central Bank assets (e.g. Net Credit to the Public Sector –NCPS or credit to the Banking system–CB). It applies in low interest rates contexts, without the possibility of lowering because they are close to zero (liquidity trap); therefore, the bank credit is a guide to address the financial market, reducing future interest rate expectations (Bauer and Neely, 2014; Bowman et al., 2015).

There is evidence that, when dealing with a positive innovation in the non-conventional monetary policy, positive effects in the inflation and the out gap are generated (Kimura and Nakajima, 2016). Similarly, an effective role in the central bank's monetary policy is argued, when a positive disturbance in the growth of the central bank's assets impacts positively and significantly in the expansion of the real economic activity (Gambacorta et al., 2014; McCallum, 1999; Skumsnes, 2013; Taylor, 1999; Valdivia and Montenegro, 2010).

The difference between a non-conventional and a conventional monetary policy is that the first deals with an active series of the central bank; as opposed to the conventional approach, which typically consists of buying short-term bonds to guide short-term interest rate policy (Foerster, 2015; Cernadas and Aldazosa, 2010).

Likewise, in Figure 1, the variables are noted with great emphasis, located between the relationship of: Growth in the real assets of the Central Bank (variable of non-conventional monetary policy) and its impact on the real output gap, additionally, other inflation-related transmission variables and the Central Bank's interest rate are included.

From a theoretical approach IS-LM, empirical research, such as the traditional document of Galí (1992), has been observed that the role of monetary policy is limited on the real growth of the activity in the long term, including innovations that dissipate in the short term. Both happen on the side of the money supply (14% max.), as on the side of the monetary demand (4% of the total variability) on the observed output.

3. QUANTITATIVE MODELING OF NON-CONVENTIONAL MONETARY POLICY

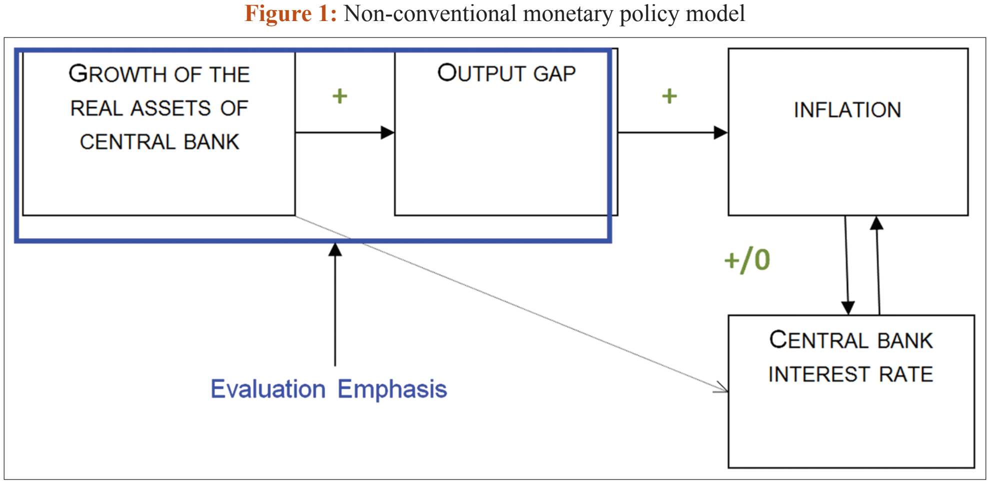
3.1. Data

According to Table 1, four relevant time-series are used: (1) Non-conventional monetary policy; (2) the output gap[1] as the difference between the effective gross domestic product (GDP) and the potential GDP (as a percentage of the potential GDP); (3) the annual inflation rate and (4) the interest rate variation of the securities of the Central Bank of Bolivia (BCB).

To conceptualize the non-conventional monetary policy, this research is focused on the variation of the real assets of the BCB (measurement 1); while its alternative measurement focuses on the growth of the monetary aggregate M2 in excess of the monetary aggregate M1 (alternative specification, measurement 2), with the purpose of obtaining comparative measurements (Bekaert et al., 2010). According to the DFA and Ph-P tests, the variables are considered, most of them, in differences to avoid spurious relationships (stationary variables). The variables were previously seasonally by the ARIMA-CENSUS X12 method.

During the period 2000–2015, descriptive statistics suggest that inflation is the series with the highest value in its central trend, followed by alternative measurements of a non-conventional monetary policy and the variation in the interest rate registers an average decrease value (negative). The largest dispersion focuses

Figure 1: Non-conventional monetary policy model



Source: Model with unidirectional and accumulative effect on the excess growth of the M2 aggregate over the M1. Inflation, the course of real assets and the output gap, follow a normal behavior in terms of asymmetry, kurtosis and non-rejection of adjustment in the distribution, contrary to the variation of the interest rate and the growth of the aggregate M2 over M1 They do not follow a normal distribution, explained by high or low values in the tails (kurtosis with heaviness in the tails) (Table 1).

In the contemporary correlations (Table 2), the following statistically significant associations are explained: (i) 1% of overheating in economic activity, is positively related to 0.6% of positive variation in the inflation and in the interest rate variation (0.01 level); (ii) for each variation in inflation of 1%, it is related to a positive variation in the interest rate of the BCB at 0.37% (at the level of 0.05). Through simple correlations, there is no statistically significant association between the different measurements of a non-conventional monetary policy, the output gap, and inflation: However, for every 1% growth in the monetary aggregate M2-M1, the interest rate varies by 0.31% (at the level of 0.05). In Figure 2, the associations (positive, negative or null) are reflected in visual form for the different variables of interest.

3.2. Estimation Models. Econometric Specifications: VAR, SVAR, BVAR

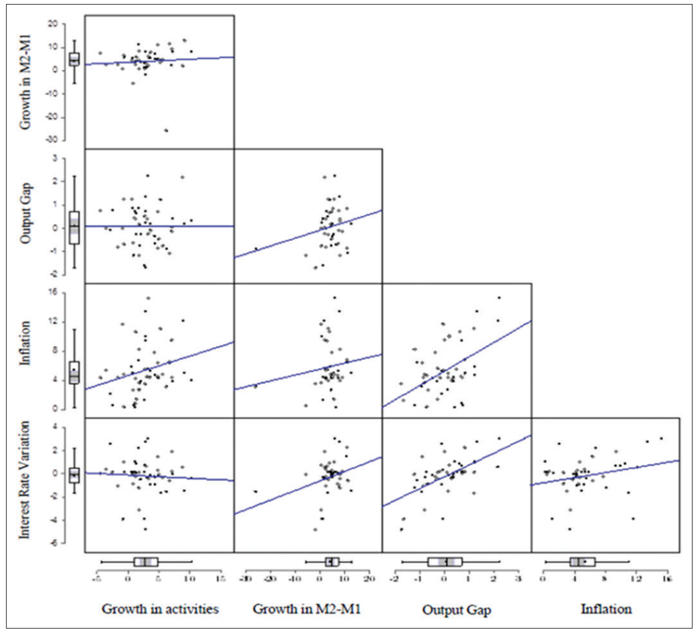
Multivariate models of time series (VAR, SVAR SR, SVAR LR, BVAR) are used to address the role of a non-conventional policy, with emphasis, on the output gap.

The quantitative modeling for monetary policy has traditionally been linked from different alternative specifications of autoregressive vectors (VAR). It is focused on the fixation of the macroeconomic variables vector and is linked to theoretical and empirical behavior of the interest rate; as well as the presence of exogenous monetary policy shocks in the risk-free bonds (Evans and Marshall, 1998; 2007).

The standard autoregressive vector (VAR) methodology is used, given its ability to study policies in terms of unexpected innovations (Tillmann, 2016). In addition, the structural VAR approach is applied, where the data are sent with the identification of simultaneous restrictions between the short term variables, to evaluate the transmission mechanisms based on the analysis of impulse-response (Kimura and Nakajima, 2016; Baumeister and Benati, 2010; Iwata, 2010).

Similarly, there is an alternative structural modeling based on a recursive identification strategy (Christiano et al., 1996) with long-term restrictions (Galí, 1992).

Figure 2: Contemporary scatter diagram



Source: Own elaboration

Table 1: Descriptive statistics

Statistics	Mon. No Conv. Pol.*		Output gap	Inflation	Interest rate variation
	ΔReal Assets$_t$	Δ (M2-M1)	100*(Yt-Y*)/Y*	π_t	Δi_t
Mean	3.2	4.0	0.1	5.9	(0.3)
Median	2.9	4.5	0.0	4.7	(0.1)
Maximum	10.3	12.7	2.2	15.2	3.0
Minimum	(4.4)	(25.9)	(1.7)	0.3	(4.8)
St. Deviation	3.1	5.9	0.9	3.4	1.6
Asymmetry	0.0	(3.0)	0.3	0.9	(0.8)
Kurtosis	3.1	16.5	2.9	3.3	4.5
Prob. J-B.	1.0	0.0	0.7	0.1	0.0

Source: Own Elaboration. *Monetary Non-Conventional Policy.

Table 2: Correlation of variables

Correlation	Non-conv Mon. Policy*		Output gap	Inflation	Interest rate variation
Probability	ΔReal assets $_t$	Δ (M2-M1)	100*(Yt-Y*)/Y*	π_t	Δi_t
Δ Real actives$_t$	1.00				
Δ (M2-M1)	0.07	1.00			
100*(Yt-Y*)/Y*	0.03	0.22	1.00		
π_t	0.13	0.14	0.60***	1.00	
Δi_t	0.03	0.31**	0.60***	0.37**	1.00

Source: Own Elaboration; *Monetary Non-Conventional Policy

3.3. Robustness Analysis of the Non-conventional Monetary Policy

In order to assess the role of a non-conventional monetary policy on the output gap, different econometric specifications (unrestricted VAR, SVAR SR, SVAR LR, BVAR) are contemplated in expansive (positive) shocks and contractionary innovations (negative).

According to Figure 1, it is appreciated that the expansive role of a non-conventional monetary policy, increased in the real assets, does not exert a significant impact on the output gap; however, the impact is negative and statistically significant when dealing an unconventional (contraction) monetary policy with negative innovations in the output gap (Figures 3-5).

When comparing other emphasis variables with negative shocks (Figure 6), the results suggest that inflation responds negatively to a contraction disturbance in a non-conventional monetary policy (contraction in the Central Bank assets) in the fourth quarter; in addition, it persistently presents a decline in the inflation rate when dealing with a negative output gap in the quarters from 1 to 4 forward.

To interpret the variance of the output gap (Table 3), it can be seen that a non-conventional monetary policy plays a more relevant role in the short term, and a larger measurement due to a growth of the monetary aggregate M2 above the M1. In both cases, it results 2 or 3 times more relevant than the long-term specifications and in comparison with the real assets variation of the Central Bank, respectively. On the other hand, in the econometric model, as well as Tables 4 and 5, the breakdown of variance for the inflation and a non-conventional monetary policy is compared (alternative measurements 1 and 2).

4. ECONOMETRIC METHODS EMPLOYED

4.1. Non-Conventional Monetary Policy with VAR, SVAR SR, SVAR LR, BVAR

In order to demonstrate the impacts of a non-monetary policy, through the growth of the real assets in a dynamic and multivariate mechanism, a variety of models with different specifications was used: Autoregressive unrestricted vectors (VAR), with short-run restrictions (SVAR SR), with long-run restrictions (SVAR LR) and a Bayesian alternative approach (BVAR).

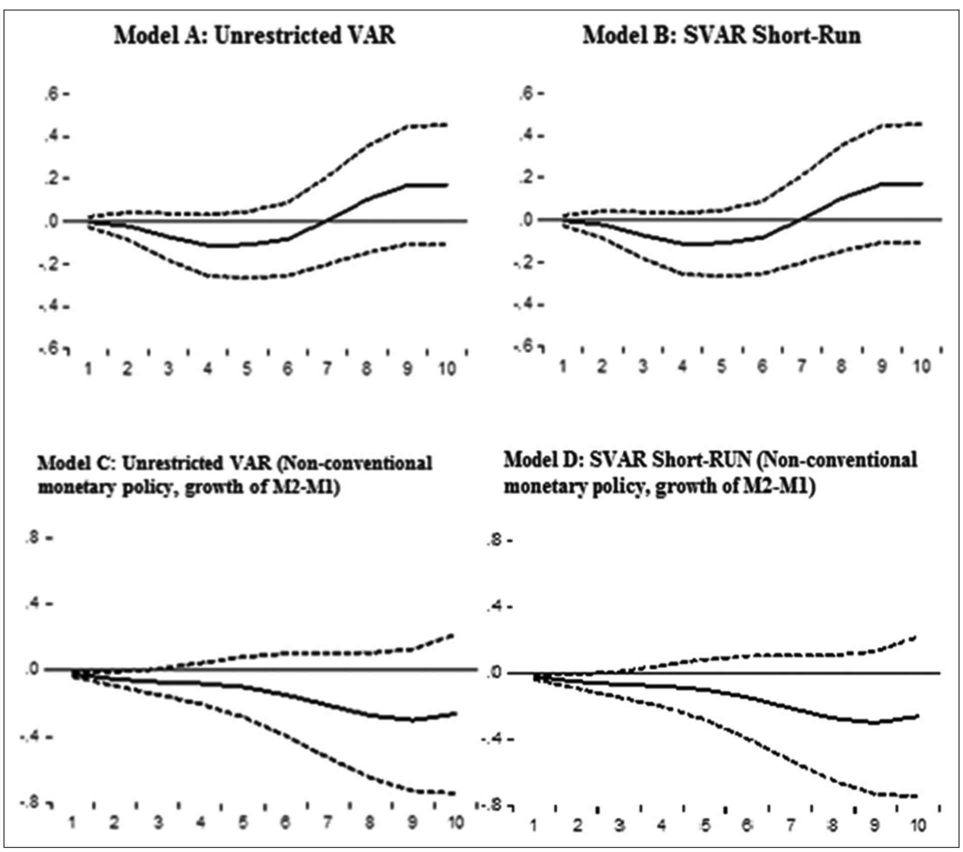
Similarly, according to the theoretical model presented (Figure 1), a base model was considered as a vector of endogenous variables, composed of four variables:

Base model specification:

$$Y_t = \left\{ \Delta \log \text{Real assets}_t, \left(\frac{Y_t - Y^*}{Y^*} \right) * 100, \pi_t, \Delta i_t \right\} \quad \text{(A4.1)}$$

Also, in the indicated vector, the percentage growth in the real assets of the Central Bank is incorporated (ΔlogAct.Real$_t$); the

Figure 3: Output gap response to an expansive effect on the non-conventional monetary policy (positive shock)



Source: Own elaboration

Table 3: Output gap variance (actual economic cycle, expressed in percentage) explained by the non-conventional monetary policy

Quarter	Non-conventional monetary policy					
	Measurement 1: ΔReal assets$_t$				Measurement 2 (alternative): Δ (M2-M1)	
	VAR-SVAR SR	SVAR LR	BVAR 1	BVAR 2	VAR-SVAR SR	SVAR LR
	A-B	C	D	E	F-G	H
1	0	9	0	0	18	3
4	10	2	0	0	18	12
8	10	2	0	0	36	14
12	19	6	0	0	46	35
16	25	8	0	0	57	26
20	25	8	1	0	60	26

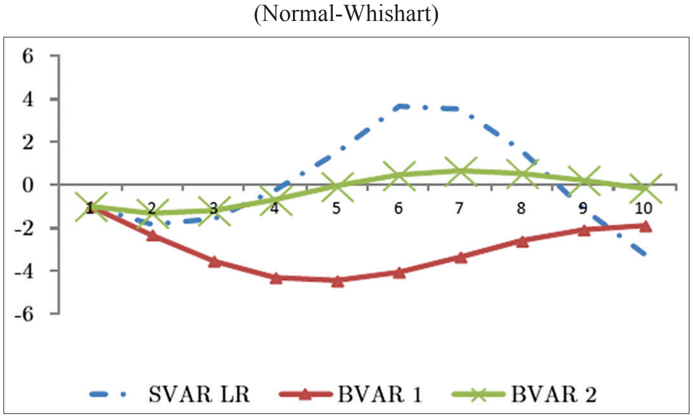
Source: Own elaboration

Table 4: Short term structural variance decomposition (measurement 1)

Inflation variance				
Quarter	Non-conventional monetary policy	Output gap	The same variable	Conventional monetary policy
	Real active growth of the Central Bank	100*(Yt,q-Y*)/Y*	Inflation	Interest rate variation
1	7	12	54	26
4	5	6	53	36
5	8	7	51	34
8	22	24	29	25
12	35	24	24	16
16	32	39	16	13
20	36	39	14	11
Variance of conventional monetary policy				
Quarter	Non-conventional monetary policy	Output gap	Inflation	The same variable
	Real active growth of the Central Bank	100*(Yt, q-Y*)/Y*	πt	Interest rate variation
1	5	3	31	61
4	4	24	25	47
8	4	36	22	38
12	7	38	22	33
16	13	35	22	31
20	14	37	20	29

Source: Own elaboration

Figure 4: Models E'-H': SVAR long-run and BVAR. SVAR LR; BVAR 1: Priors of Litterman/Minnesota; BVAR 2: Priors of Sim-Zha (Normal-Whishart)



Source: Own elaboration

real output gap $\left\{\left(\frac{Y_t - Y^*}{Y^*}\right)*100\right\}$; the annual inflation rate (π_t); and the variation in the interest rates of the Central Bank (Δi_t).

4.2. Autoregressive Unrestricted Vector (VAR)

Consequently, when considering the endogenous variables vector (A4.2), a model of short-term autoregressive unrestricted vectors (VAR) was generated with stationary variables:

$$Y_t = \sum_{i=1}^{k} \alpha_i Y_{t-i} + \varepsilon_t \qquad (A4.3)$$

4.3. Structural Restrictions

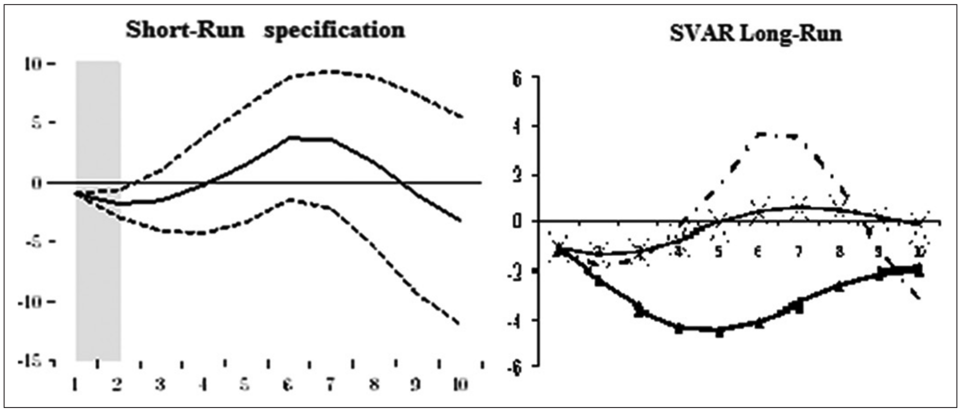
4.3.1. Short-run structural response (SVAR SR)

Since the expression (A4.3) does not incorporate any restriction on the behavior of the variables, the specification related to the theoretical Figure 1 is provided. The main purpose of the structural autoregressive vector specification (SVAR) is to explain the role of a non-conventional monetary policy in two contexts: (1) in a contemporary way and (2) with dynamic effects.

Therefore, the definition of non-observable and exogenous structural innovations is necessary, in addition to the inclusion of economic restrictions on the model. The mobile average structural representation of the vector Y_t, is as follows:

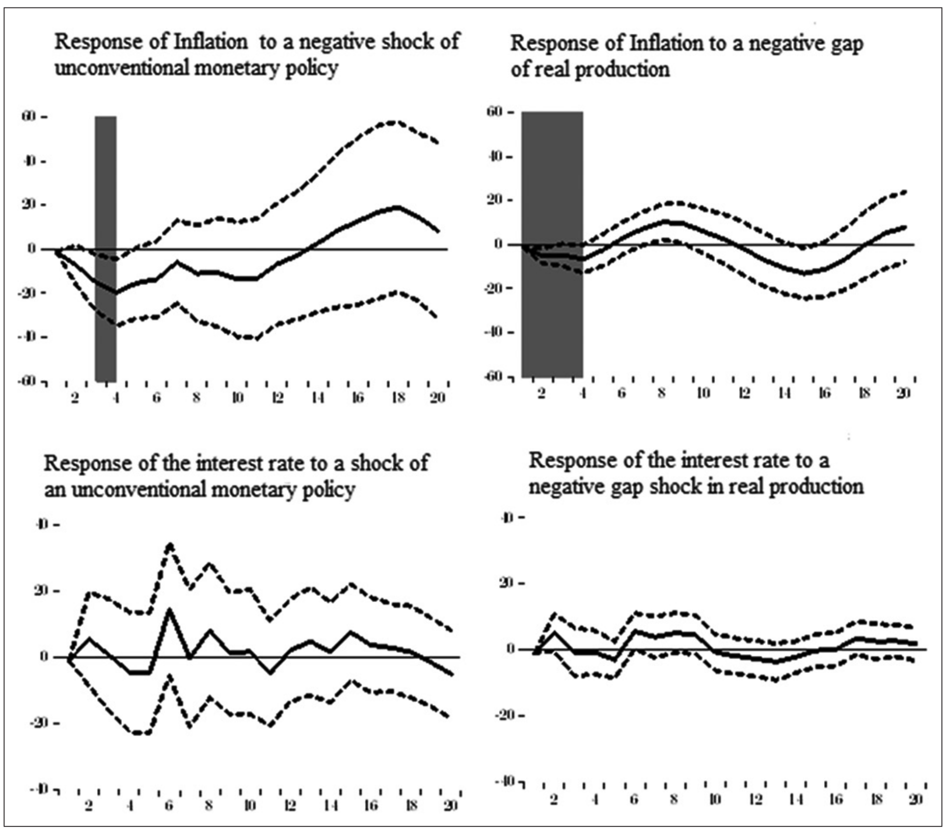
$$Y_t = C(L)\mu_t^{Y_t} \qquad (A4.4)$$

Figure 5: Non-conventional monetary policy. Output gap response to a contractive effect (negative shock)



Source: Own elaboration

Figure 6: Other interest variables in negative shocks. Short term specification



Source: Own elaboration

Where: L is a lags operator for the four endogenous variables: $\mu_t^{Y_t} = \left[\mu_t^{Non\text{-}Conv.Monet.Pol.} \quad \mu_t^{Outgap} \quad \mu_t^{Prices} \quad \mu_t^{Conv.Monet.Pol.}\right]$ which indicates the vector of non-observable and exogenous structural innovations.

$$A\varepsilon_t^{Y_t} = C_{\mu_t}^{Y} \qquad \text{(A4.5)}$$

In (A4.5) contains short-term effects with contemporary responses and C it is a matrix with structural shocks; therefore, when expressing short-term restrictions for the specification as stationary components, you obtain:

$$\begin{bmatrix} 1 & 0 & 0 & 0 \\ -\alpha_{21} & 1 & 0 & 0 \\ -\alpha_{31} & -\alpha_{32} & 1 & -\alpha_{34} \\ 0 & -\alpha_{42} & -\alpha_{43} & 1 \end{bmatrix} * \begin{bmatrix} \varepsilon_t^{\Delta \log Real assets_t} \\ \varepsilon_t^{\left(\frac{Y_t - Y^*}{Y^*}\right)*100} \\ \varepsilon_t^{\pi_t} \\ \varepsilon_t^{\Delta i} \end{bmatrix} = \begin{bmatrix} \mu_t^{Non\text{-}conv Mon.Pol.} \\ \mu_t^{Outputgap} \\ \mu_t^{Prices} \\ \mu_t^{Conv.Mon.Polic.} \end{bmatrix} \qquad \text{(A4.6)}$$

For the expression (A4.6) is necessary to impose $(n^2-n)/2$ restrictions in the short term; that is, if they are four endogenous

Table 5: Short term structural variance decomposition (measurement 2, alternative)

Inflation variance				
Quarter	Non-conventional monetary policy	Output gap	The same variable	Conventional monetary policy
	Δ (M2-M1)	100*(Yt, q-Y*)/Y*	Inflation	Interest rate variation
1	7	38	54	0
4	14	26	57	3
8	41	15	39	5
12	45	13	36	7
16	44	12	36	7
20	45	12	35	7
Variance of conventional monetary policy				
Quarter	Non-conventional monetary policy	Output gap	Inflation	The same variable
	Δ (M2-M1)	100*(Yt, q-Y*)/Y*	πt	Interest rate variation
1	10	16	3	71
4	19	38	11	32
8	19	37	12	32
12	17	32	19	32
16	30	26	17	26
20	31	26	17	25

Source: Own elaboration

variables, six coefficients equal to zero are required depending on the economic theory for an accurate identification.

4.3.2. Long-run structural answer (SVAR LR)

The SVAR proposal raises the impact of structural vector (μ_t^{yi}), which is not directly observable from the estimation of an unrestricted VAR. This VAR is invertible and generates the following mobile media representation:

$$Y_t = A(L)\varepsilon_t^{y_i} \tag{A4.7}$$

Where: A(L) represents a parameter operator; (ε_t^{yi}) indicates the reduced lag vector with the covariance matrix Σ. The expression (A4.7) establishes a linear relationship between the reduced lag form and the shocks of the long-term structural model:

$$\varepsilon_t^{y_i} = C_0\ \mu_t^{y_i} \tag{A4.8}$$

In addition, if it is expressed (A4.8) in a matrix and unrestricted, you get:

$$\begin{bmatrix} \varepsilon_t^{\Delta \log \text{Real assets}_t} \\ \varepsilon_t^{\left(\frac{Y_t - Y^*}{Y^*}\right)*100} \\ \varepsilon_t^{\pi_t} \\ \varepsilon_t^{\Delta i_t} \end{bmatrix} = \begin{bmatrix} C_{11} & C_{12} & C_{13} & C_{14} \\ C_{21} & C_{22} & C_{23} & C_{24} \\ C_{31} & C_{32} & C_{33} & C_{34} \\ C_{41} & C_{42} & C_{43} & C_{44} \end{bmatrix} * \begin{bmatrix} \mu_t^{\text{Non-conv Mon.Pol.}} \\ \mu_t^{\text{Outputgap}} \\ \mu_t^{\text{Prices}} \\ \mu_t^{\text{Conv.Mon.Polic.}} \end{bmatrix} \tag{A4.9}$$

Likewise, in (A4.9) is required n (n−1)/2 of additional restriction to identify the model; that is, with four endogenous variables, six coefficients equal to zero are required ($C_{i,j}$=0) and imposed by the economic theory. In order to design a long-term design, Blanchard and Quah (1989) proposed (cumulative) responses from C; also they come from structural innovations, the same ones that rare presented in impulse-response properties:

$$C = \hat{\psi}_\infty A^{-1} B \tag{A4.10}$$

Thus, it would be necessary to identify the matrix C_0 (4×4), in order to recover the vector of structural shocks ($\mu_t^{y_i}$), from the estimated error vector (ε_t^{yi}). The following are the restrictions incorporated in the model, based on the assumption that there are automatic effects of some variables on others.

$$\begin{bmatrix} \varepsilon_t^{\Delta \log \text{Real assets}_t} \\ \varepsilon_t^{\left(\frac{Y_t - Y^*}{Y^*}\right)*100} \\ \varepsilon_t^{\pi_t} \\ \varepsilon_t^{\Delta i_t} \end{bmatrix} = \begin{bmatrix} C_{11} & 0 & 0 & 0 \\ C_{21} & C_{22} & 0 & 0 \\ C_{31} & C_{32} & C_{33} & 0 \\ C_{41} & C_{42} & C_{43} & C_{44} \end{bmatrix} * \begin{bmatrix} \mu_t^{\text{Non-conv Mon.Pol.}} \\ \mu_t^{\text{Outputgap}} \\ \mu_t^{\text{Prices}} \\ \mu_t^{\text{Conv.Mon.Polic.}} \end{bmatrix} \tag{A4.11}$$

In (A4.11), are obtained the responses (accumulated) to the observed shocks in its reduced form: $\hat{\psi}_\infty = \left(I \hat{A}_1 - \ldots - \hat{A}_p\right)^{-1}$ The identification of the restrictions is specified in terms of the Matrix C (zero coefficients). The restriction $C_{i,j}$=0 symbolizes that the (cumulative) response of the variable "i" does not respond to a structural shock "j" in the long-run (although there may be short-term effects). On the contrary, $C_{i,j} \neq 0$ [in (1)] implies an answer from "i" when dealing a structural shock "j" in the long term.

4.4. Negative Impact Response with Triangular Impulse

Finally, as a posterior exercise, negative shocks of a standard deviation are simulated for each of the endogenous variables introduced in the system, through a triangular response from Cholesky. This is with the purpose of evaluating the response of the variables in the face of negative contractions or disturbances: What happens in the face of a contraction in the real assets of the Central Bank and its impact on the real output gap?

5. RESULTS AND DISCUSSION

According to the results of the document (case of Bolivia), when addressing the role of a non-conventional monetary policy in the output gap, they are based on a structural modeling imposed by the economic theory: (a) Under short-term restrictions, greater sources of variances are evident: About 25% in the variation of the output gap; (b) through the imposition of long-term restrictions, the role of a non-conventional monetary policy does not exceed 10% of the variability, so its role is limited (Galí, 1992).

The importance of the non-conventional monetary policy, in the short term and especially with the growth of the M2 aggregate over the M1 aggregate, is interpreted as the incentive in the growth of the savings introduced into the economy.

It is important to highlight the differentiation between positive shocks and negative innovations in the non-conventional monetary policy; also, its impact on the inflation and the real output gap. It presents significant major implications in the phases of monetary contraction when comparing with the expansion incidence.

The quantification of a non-conventional monetary policies (case of Bolivia), allows to quantify the discretionary responses, in terms of instruments and in when dealing specific disturbance scenarios. Table 6 presents a systematization of responses and instruments of non-conventional monetary policy:

Since a contraction in the real assets of the Central Bank negatively affects the real economic cycle, with a phase of sub-production (from 1 to 2 quarters forward), it becomes evident the softening in the fluctuations of the international reserves such as: The NCPS and Credit to the Financial Sector. It is indispensable to avoid volatilities and pronounced contractions.

6. CONCLUSIONS

This document provided an answer to a research question related to the expansive and contractive role of the real assets of the BCB; as a measure of the non-conventional monetary policy and its impact on the real economic cycle.

It was found that the expansive role (positive innovations) of a non-conventional monetary policy does not significantly affect the actual economic cycle (no overheating effect is evident). Alternatively, empirical evidence allows interpreting that in the face of a stimulus in the real assets of the Central bank does not make a difference between the potential GDP gap and the effective GDP.

However, when a negative disturbance is presented (a contraction in the real assets of the Central Bank), a negative and statistically significant impact on the real economic cycle is exerted (sub-production phase is generated: The effective growth rate falls below the potential growth of the economy) from 1 to 2 quarters forward and negative incidence on the future inflation rate (towards the 4th. quarter).

Table 6: Systematization of the non-conventional monetary policy: Case of Bolivia

Answer to	Effect
Expansion of real assets of the Central Bank	It does not influence the overheating of the economic activity The real output gap is zero (the potential GDP is equivalent to the effective GDP)
Contraction of real assets of the Central Bank	Negative impact on the real economic activity (sub-production negative phase): The effective product is less than the potential GDP

Source: Own elaboration. GDP: Gross domestic product

Other findings of the document make it possible to show that the growth of the monetary aggregate M2, in excess on the monetary aggregate M1 (Δ [M2-M1]), exerts more explanation on the variance of the GDP gap. This can be prove when comparing it with the real assets of the Central Bank, from a short-term specification in comparison to a modeling with long-term constraints (the relative importance in generating sources of variance).

The conclusions provided were robust to alternative models of econometric specification (unrestricted VAR, SVAR Short-Run, SVAR Long-Run, and Bayesian VAR [BVAR]) for the case of Bolivia.

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