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Measuring monetary policy in emerging economies: the role of monetary condition index

Bui Thanh Trung

Measuring the stance of monetary policy is of importance for the analysis and implementation of monetary policy. The existence of multiple instrument framework as well as the significance of the interest rate and exchange rate channel in emerging economies imply that monetary condition index can play an important role in evaluating whether monetary policy is restrictive or expansive in these economies. In this paper, we use the VAR model to evaluate the role of monetary condition index as an overall measure of monetary policy in emerging economies. The weight of components of monetary condition index is derived from the inflation equation in the VAR estimation. The empirical results suggest that a contraction in monetary policy causes a reduction in inflation. The finding implies that monetary condition index is a useful indicator that can predict the stance of monetary policy and predict the trend of inflation in emerging economies.

Keywords: monetary policy, monetary condition index, inflation targeting, emerging economies

1. Introduction

Effective implementation of monetary policy is necessary to achieve good economic performance. However, to steer the economy effectively, monetary authorities need to have a good assessment of monetary policy stance, which depends to a great extent on the selection of a measure of monetary policy. A good measure of monetary policy is an indicator that can provide numeric information about size and direction of policy actions. In addition to this, measuring monetary policy is the first step in investigating further issues of monetary policy such as reaction function or transmission mechanisms.

Compared to advanced economies where interest rate is the primary operating target (Egan–Leddin 2016), emerging economies have high exposure to international shocks such as sudden increases in oil or commodity prices. The high openness of emerging economies indicates that changes in official interest rate instrument can alter exchange rate, which then influences the relative price of domestic and foreign goods, imports, and finally aggregate demand and inflation. As emerging economies have achieved a higher level of financial development over the last decade, interest rate and exchange rate play a more important role in the conducting of monetary policy. These imply that both interest rate and exchange rate channel are active in emerging economies (Poon 2010). Hence, in emerging economies, a good measure of monetary policy should consider changes in both interest rate and exchange rate.

Monetary condition index (MCI), a weighted average of changes in interest rate and exchange rate relative to a reference period, is a common composite measure of monetary policy, especially in open economies (Goodhart–Hofmann 2001, Osborne-Kinch–Holton 2010). Changes in MCI depict whether monetary policy is in contractionary or expansionary condition (Osborne-Kinch–Holton 2010). The use of MCI is attractive for both foreign and domestic institutions and agents. Since MCI accounts for the two primary transmission channels of monetary policy (Hyder–Khan 2007, Osborne-Kinch–Holton 2010), it provides an important device to analyse and understand the general condition of a small and open economy and policy making (Ericsson et al. 1998, Zulkhibri 2012).

Although the idea of using a composite measure of monetary policy is not new in the literature, there is only a limited number of studies investigating the application of MCI in emerging economies, especially Asian, South American, or African countries. The purpose of this paper is to fill the gap by investigating the role of MCI in measuring monetary policy in emerging economies. In doing so, it contributes to the literature in many aspects. First, it provides empirical estimates of MCI for emerging economies where there are many reforms in monetary policy framework and financial systems. The analysis also provides information about the relative importance of the two channels, interest rate and exchange rate, in emerging economies that follow inflation targeting. Second, it examines the effectiveness of monetary policy in controlling inflation when using MCI as an indicator of monetary policy. Therefore, the study sheds light on the role of MCI in informing the public about monetary condition in emerging economies.

The rest of this paper is as follows. Section 2 presents the existing literature about the construction and basic characteristics of MCI and empirical evidence about the effectiveness of MCI as an indicator of monetary policy. Section 3 discusses methodology and data. Section 4 presents and discusses empirical results. Section 5 concludes the paper.

2. Literature review

2.1. Monetary condition index as a measure of monetary policy

MCI was initially used as an operational target by the Bank of Canada in the late 1980s (Eika et al. 1996, Ericsson et al. 1998, Majid 2012) and then gained more popularity in the 1990s. It is the weighted average of changes in interest rate and exchange rate relative to a reference period. Such a construction implies that MCI captures the movement in the two primary transmission channels to measure the stance of monetary policy (Hyder–Khan 2007). This construction is preferable because both interest rate and exchange rate are two operative transmission channels of monetary policy in a small and open economy (Batini–Turnbull 2002, Qayyum 2002). According to monetary theories, when monetary authorities alter the official interest rate, money market interest rate changes, to in turn affect the behaviour of investment and spending and finally aggregate demand and inflation. However, it should be noted that in emerging economies with flexible exchange rate regime,

changes in the official interest rate also cause changes in the value of domestic currency. The resulting changes in the exchange rate affect the competitiveness of domestic export and import, leading to changes in the price of imported goods and hence aggregate demand and inflation. The transmission from exchange rate to inflation depends on many factors (Hyder–Khan 2007). The presence of the exchange rate channel can magnify or lessen the contractionary stance of changes in the interest rate. In sum, monetary authorities can alter interest rate and exchange rate instruments to stabilize prices in an emerging economy. As a result, observing the two as separate indicators may provide misleading information about expected changes in the stance of monetary policy and the future movement of inflation. To put it differently, a composite measure of monetary policy that captures both channels can give a more accurate representation of monetary policy stance (Batini–Turnbull 2002, Hataiseree 1998, Hyder–Khan 2007).

According to Batini and Turnbull (2002), MCI can be used as an operational target, as an indicator of monetary policy or as a monetary policy rule. Firstly, as an indicator of monetary policy, MCI depicts the movement of both interest rate and exchange rate (Poon 2010) and signals the timing of the expansion and restriction of monetary policy (Şıklar–Doğan 2015). This function is highlighted for many countries such as Nordic countries (Gerlach–Smets 2000), Thailand (Hataiseree 1998), Turkey (Kesriyeli–Kocaker 1999), Croatia (Benazić 2012), Pakistan (Hyder–Khan 2007), Sweden and Norway (Eika et al. 1996, Engelbrecht–Loomes 2002). Secondly, MCI can be used as an operational target. The central bank of Canada and New Zealand utilizes this capacity of the index (Engelbrecht–Loomes 2002, Ericsson et al. 1998) because they believe that exchange rate can affect inflation through its impact on import prices (Gerlach–Smets 2000). In this case, the central bank can use monetary policy tools to move the MCI to the desired level (Osborne-Kinch–Holton 2010). With this function, the desired MCI should be consistent with the objective of monetary policy such as price stability (Osborne-Kinch–Holton 2010, Qayyum 2002). Finally, MCI can be used as a monetary policy rule. This requires the rearrangement of the interest rate to construct the parallel between the interest rate and exchange rate (Batini–Turnbull 2002). The idea is supported by Us (2004) in the case of Turkey.

However, the use of MCI as an operational target can cause difficulties for the practical implementation of monetary policy (Eika et al. 1996, Engelbrecht–Loomes 2002). Firstly, many difficulties emerge because interest rate is a monetary policy tool whereas exchange rate is a macroeconomic outcome (Osborne-Kinch–Holton 2010). Such a conflict may cause confusion when monitoring or adjusting the movement of MCI. Secondly, MCI may provide ambiguous communication with the financial market when there is a negative relationship between interest rate and exchange rate (Engelbrecht–Loomes 2002). If the depreciation of the exchange rate causes inflation whereas interest rate cuts reduce inflation, it is difficult to interpret the effect of monetary policy changes on the economy and inflation. The transparency issue forced the Reserve Bank of New Zealand to replace MCI by an official cash rate in March 1999. Thirdly, changing MCI requires an understanding of drivers underlying changes in the exchange rate (Engelbrecht–Loomes 2002, Ericsson et al. 1998, Gerlach–Smets 2000). If the exchange rate is affected by changes in supply and

demand, it is optimal to adjust the target of MCI. On the other hand, if exchange rate is affected by other shocks, it is optimal to maintain the current MCI and adjust the interest rate. Caution when using MCI as an operating target is intensified when the terms of trade has substantial effects on exchange rate movement (Gerlach–Smets 2000).

Since using MCI as an operational target causes difficulties for the implementation of monetary policy, using MCI as an indicator of monetary policy is gaining more attention (Hyder–Khan 2007, Osborne-Kinch–Holton 2010). It should be noted that with this function, MCI can provide more information about the current status of monetary policy stance. In this case, monetary authorities do not need to change their tools to return MCI to its desired path.

It should also be noted that short-term interest rate is a good measure of monetary policy when monetary policy effectively operates through the interest rate channel. Since the effectiveness of the interest rate channel depends on the existence of a well-functioned financial market, the role of interest rate as an indicator is crucial for advanced economies. For emerging economies, financial systems are still underdeveloped even though there have been substantial improvements and liberalization in financial systems over the last few decades. Therefore, the interest rate channel remains weak in emerging economies. Furthermore, compared to advanced economies, the exchange rate channel plays a more important role in emerging economies. The importance of the exchange rate is conditional on the high degree of openness in the emerging economy. Moreover, foreign exchange intervention can be a policy option when capital flows are volatile (Goyal 2016). According to Osborne-Kinch and Holton (2010), MCI rather than interest rate is a better indicator of monetary policy when the exchange rate plays an important role in the transmission mechanism.

Another reason supporting the indicator function of MCI is that monetary authorities in emerging economies use multiple instruments to influence the movement of output or prices. It is common for monetary authorities to change many instruments at the same time or at two very close points of time. Changes in interest rates may provide little information about changes in monetary policy (Egan–Leddin 2016, He–Pauwels 2008, Ma 2014). Consequently, observing changes in only interest rate can provide misleading interpretation about the intention of monetary policy. On the other hand, MCI can provide more information about changes in monetary policy. According to Egan and Leddin (2016), MCI can be considered as an accurate representation of various monetary policy instruments.

2.2. Empirical studies on the use of MCI

The literature examining the construction of MCI is extensive for advanced economies. Freedman (1994), Freedman (1995), Peeters (1999), and Ericsson et al. (1998) are seminal papers that provide excellent explanations of the calculation of monetary condition index. Gerlach–Smets (2000) argue that the construction of MCI requires little weight on the exchange rate, which is associated with its effect on aggregate demand. Osborne-Kinch and Holton (2010) examine the role of MCI for the Euro zone, the UK, and the US from 1999 to 2009, and find that the index can be

used as a timely indicator of monetary policy stance. However, they note that the index copes with the uncertainty caused by its estimation and interpretation. Similarly, Batini and Turnbull (2002) survey the case of UK from 1984 to 1999 and conclude that MCI can be used as an indicator of monetary policy.

However, the literature for small and open economies is rather limited. Furthermore, the literature for emerging economies mainly focus on the construction of the MCI and a few studies investigate the role of MCI in fulfilling the ultimate objective of monetary policy. Qayyum (2002) take into account the openness of emerging economies when constructing the MCI for Pakistan. The author defines MCI by summarizing the deviation of two quantitative variables, the interest rate and the exchange rate, from the base period. The author determines the weight of the two MCI components by their relative importance in the inflation equation. Therefore, the construction of the MCI involves the estimation of a system of a Philipps curve and a reaction function. Hyder and Khan (2007) use Johansen cointegration method to determine weights of components in MCI for Pakistan over the period March 1991 to April 2006. They use both price and output equation to calculate the weights of interest rate and exchange rate and find that the importance of the exchange rate is model-dependent. While the interest rate has a greater effect on prices, the exchange rate has a greater effect on output. However, their findings show that two MCIs calculated from the two equations show a strong co-movement. Moreover, deviations between MCI and interest rate show a reduction after September 2001. With respect to the usefulness of MCI in the implementation of monetary policy, MCI can be considered as an important indicator of monetary policy and can be used alongside other indicators. Hyder and Khan (2007) do not support the use of MCI as an operational target.

Benazić (2012) combines effects of both interest rate and exchange rate to determine MCI for Croatia. The author constructs the index by using the Engle–Granger co-integration method since variables of interest are cointegrated, meaning that they are stationary at first difference and their linear combination is stationary. The weight derived from the price equation suggests that the exchange rate is more important than the interest rate. The finding suggests that the feasible function of MCI is as an indicator of monetary policy. One factor that constrains the use of the index as a monetary policy instrument is the liberalization of international financial flows and the widespread use of the euro in Croatia.

Berument (2007) argues that monetary authorities in a small and open economy such as Turkey cope with the problem of currency substitution and the fear of floating, and that monetary authorities can use both interest rate and exchange rate to fulfil the objective of price stability. Therefore, monetary policy should be measured by an index that captures changes in both instruments. Berument (2007) introduces a new measure which is the differential between the interbank interest rate and the depreciation rate. This implies that the exchange rate and interest rate have equal weights in the construction of MCI. If the spread is positive, monetary policy is restrictive; otherwise, it is expansive. Using this measure, Berument (2007) finds that the response of output, prices, and exchange rates to restrictive monetary policy is consistent with the theory. Other studies construct the traditional MCI for Turkey, but

the relative importance of exchange rate and interest rate is different depending on the methodology of weight calculation and research period. Kesriyeli and Kocaker (1999) derive the weight of MCI components from the price equation and conclude that the exchange rate is the principal source of price fluctuation in Turkey over the period 1987–1999. They urge caution in using MCI in the analysis and implementation of monetary policy. Nevertheless, Şıklar and Doğan (2015) emphasize the time-varying characteristic of the MCI weights over the period 1992–2012 and conclude that the interest rate is more important than the exchange rate. The reduction in the importance of the exchange rate may stem from development in the financial system in Turkey, which has strengthened the effectiveness of interest rate policy.

Memon–Jabeen (2018) use the Principal Component Analysis to compute the weight and the MCI and use a vector autoregression (VAR) model to investigate the effect of MCI in Gulf countries – Bahrain, Iraq, Kuwait, Oman, Qatar, the Kingdom of Saudi Arabia (KSA), and the United Arab Emirates (UAE). They find that MCI rather than interest rate or exchange rate is a good device to predict prices and economic growth in the long run. Moreover, monetary authorities can use MCI to access the expansionary and contractionary condition for Gulf countries. Kannan et al. (2007) add credit growth to the construction of MCI for India. They note that interest rate is more powerful than exchange rate in affecting economic activity and inflation. Furthermore, MCI is better than any single component in representing the stance of monetary policy in India.

Hataiseree (1998) constructs MCI with weights derived from inflation model and emphasizes the advantage of MCI as an indicator of monetary policy in the short run in Thailand. The author uses autoregressive distributed lagged model to estimate the inflation equation. The finding emphasizes the significance of MCI relative to either exchange rate and interest rate. The study also finds that the correlation between MCI and inflation is high. Therefore, MCI plays an important role in the conducting of monetary policy.

Poon (2014) augments the traditional MCI with financial variables such as changes in credit, share prices, and long-run interest rate. The author uses the ARDL bound test to prove the existence of the long-run relationship between GDP and its determinants which include components of MCI. The finding shows that exchange rate plays a very important role because the ratio of exchange rate over interest rate is 11.89. However, the high ratio indicates that monetary authorities in Philippines may put a great emphasis on exchange rate rather than the objective of price stability.

3. Methodology and data

3.1. Measuring MCI

Selecting an appropriate measure is of great importance in evaluating the stance of monetary policy. As an indicator of monetary policy, MCI indicates whether monetary policy is contractionary and expansionary. Following previous studies (Batini–Turnbull 2002, Benazić 2012, Ericsson et al. 1998, Freedman 1994, 1995, Peeters 1999), we determine MCI using the following equation:

$$MCI_t = \beta^{INT}(INT_t - INT^b) + \beta^{EX}(DLNEX_t - DLNEX^b) \quad , \quad \beta^{INT} + \beta^{EX} = 1 \qquad (1)$$

where $DLEX_t$ is the first difference of the logarithm of the nominal effective exchange rate. An increase in EX_t reflects the appreciation of the domestic currency. INT_t is the short-term interest rate. It is a proxy for policy rate because it is closely linked and quickly responds to the central bank policy rate (Osborne-Kinch–Holton 2010). According to Equation 1, an increase in interest rate or an appreciation of exchange rate indicates a higher value of MCI, which suggests the restrictiveness of monetary policy.

As shown in Equation (1), the estimate of weights of MCI components is important in calculating MCI. Since MCI weights reflect the relative importance of the exchange rate and interest rate channel in the transmission mechanism of monetary policy and in influencing the objective of output or inflation (Hyder–Khan 2007, Şıklar–Doğan 2015), their estimates require modelling the objective of monetary policy (Qayyum 2002). This implies that the weight of the two MCI components can be derived from their relative impact on aggregate demand (Egan–Leddin 2016, Ericsson et al. 1998, Gerlach–Smets 2000, Knedlik 2006, Majid 2012, Poon 2010) or prices (Hataiseree 1998, Kesriyeli–Kocaker 1999, Qayyum 2002) or both (Hyder–Khan 2007). Generally, the exchange rate weight derived from the price equation is greater than the weight derived from aggregate demand equation because the calculation combines the direct effect of the exchange rate on import price and the indirect effect of the exchange rate on aggregate demand (Kesriyeli–Kocaker 1999). In addition, the weights can also be the coefficient of variance (Egan–Leddin 2016). According to Peeters (1999), the ratio β^{INT}/β^{EX} depends on the degree of the openness of the economy under investigation. For small and open economies, the weight on exchange rate may be larger than the weight on interest rate, which opposes large and closed economies where the weight on the exchange rate is negligible (Knedlik 2006). Because price stability is the objective of monetary policy in emerging economies investigated in this paper, we measure the weight of MCI components by the price elasticity to interest rate and exchange rate. Following previous studies (Hataiseree 1998, Kesriyeli–Kocaker 1999, Qayyum 2002), we measure MCI weights as follows:

$$p = \alpha + \alpha^{INT} INT_t + \alpha^{EX} DLEX_t + \alpha^{Y} Y_t \qquad (2)$$

where p_t is price. Y_t is output, which is a control variable.

The weight of interest rate (β^{INT}) and exchange rate (β^{EX}) are calculated as follows:

$$\beta^{INT} = \frac{\alpha^{INT}}{\alpha^{INT} + \alpha^{EX}} \tag{3}$$

$$\beta^{EX} = \frac{\alpha^{EX}}{\alpha^{INT} + \alpha^{EX}} \tag{4}$$

The existing literature (Batini–Turnbull 2002, Şıklar–Doğan 2015) suggests three basic methods to estimate the MCI weights: single equation, trade elasticities equation, and the system of equation such as cointegration and VAR. The first method estimates the MCI weights by coefficients from either price or output equation. The second method estimates the elasticity of trade share (export expressed as the percentage of GDP) to exchange rate and interest rate. The final method extracts coefficients of exchange rate and interest rate in the corresponding equation, either output or prices, in the system.

The paper uses the VAR model to estimate the elasticity of inflation to interest rate and exchange rate. The choice of VAR is of importance to take into account certain issues that emerge in the estimation of the MCI weights: the endogenous relationship between regressors, the problem of simultaneity biasedness, and the lagged effect of exchange rate and interest rate on inflation. In particular, we sum all coefficients that are statistically significant.

3.2. Measuring the effect of monetary policy

To examine whether MCI is an appropriate indicator of monetary policy, we focus on the significance of the inflation response to MCI shocks and the absence of price puzzle in their impulse response. For this purpose, we use a VAR model of five variables as follows:

$$Y_t = [DLCOM, MCI, DLNEX, DLCPI, DLY]' \tag{5}$$

Where MCI is the monetary conditions index determined by weighted average of changes in exchange rate and interest rate from the value of previous year. The weights are derived from their estimated coefficients in the inflation equation.

It should be noted that the VAR model is recursive with the ordering specified in Equation (). The ordering indicates that MCI has a contemporaneous effect on inflation and other economic variables. On the other hand, inflation, output, and exchange rates have an effect on monetary policy with lags.

3.3. Data

We focus on ten emerging economies: Brazil, Colombia, Mexico, Hungary, Poland, Romania, Turkey, Korea, Philippines, and South Africa. These countries adopted the inflation targeting framework after the 1990s. The sample contains monthly data from January 2000 to June 2018. IMF and national central banks are the primary sources of the data.

Table 1 presents basic statistics, mean and standard deviation, of inflation, output growth, exchange rate growth, and interest rate in emerging economies under investigation. As observed, inflation fluctuated in the range from 2% to 5% in most emerging economies. In Turkey, the inflation rate reached a double digit high of 12.56%. On the other hand, Brazil and Romania experienced moderate inflation at 6.29% and 7.43% respectively. Output growth was quite similar between emerging economies. Compared to other countries, output growth was relatively low at about 1% in Brazil and South Africa. Furthermore, exchange rates growth was negative in most countries with the exception of Poland, suggesting the depreciation of the domestic currency over the research horizon.

Table 1 Mean and standard deviation of selected variables

	Inflation	**Output growth**	**Exchange rate growth**	**Interest rate**
Brazil	6.29	0.81	–2.09	13.70
	(2.56)	(6.41)	(15.91)	(4.44)
Colombia	4.77	2.19	–0.61	6.43
	(1.81)	(5.48)	(10.75)	(2.52)
Mexico	4.26	0.78	–4.06	6.95
	(1.07)	(3.77)	(8.4)	(3.57)
Hungary	3.96	2.41	–0.49	5.88
	(2.61)	(8.47)	(5.7)	(3.25)
Poland	2.14	4.95	0.28	7.12
	(1.81)	(5.88)	(8.51)	(5.27)
Romania	7.43	4.10	–4.02	7.60
	(7.75)	(6.52)	(9.02)	(5.54)
Turkey	12.56	5.59	–11.25	20.54
	(10.96)	(8.96)	(17.87)	(33.02)
Korea	2.53	4.23	–0.23	3.18
	(1.19)	(6.98)	(9.63)	(1.24)
Philippines	3.76	2.31	–1.36	5.25
	(1.94)	(10.33)	(6.22)	(1.73)
South Africa	5.21	0.90	–3.97	8.07
	(2.72)	(5.5)	(14.2)	(2.55)

Source: Author's estimation
Notes: Standard deviation is in the parentheses; otherwise, it is mean.

Table 2 presents the ADF test for stationarity of the logarithm of commodity price index, industrial production index, consumer price index, nominal effective exchange rate, and money market rate. The superscript (a) indicates the stationarity

test at level; otherwise, the test is for first difference. Accordingly, the results indicate that interest rate is likely to be stationary at level in Colombia and South Africa. In other countries, interest rate is stationary at first difference. For other variables, it is stationary at first difference for most cases and just achieve stationarity at level in a few cases, superscript (a). In a nutshell, variables enter the VAR model in its first difference. However, in line with previous studies, interest rate enters the regression model in its level form.

Table 2 ADF test for the stationarity of variables

	LCOM	LY	LCPI	LNEX	INT
Brazil	–7.32*	–7.65*	–6.39*	–9.37*	–5.02*
Colombia		–12.23*	–7.60*	–9.64*	–3.08**(a)
Mexico		–10.49*	–8.51*	–9.58*	–9.64*
Poland		–10.54*	–3.16**(a)	–9.67*	–11.1*
Czech Republic		–14.07*	–8.76*	–3.48*(a)	–5.26*
Turkey		–11.11*	–5.86*(a)	–4.58*(a)	–6.91*
Korea		–11.62*	–4.05*(a)	–7.82*	–5.59*
Philippines		–13.13*	–3.62*(a)	–7.96*	–6.21*
Thailand		–8.64*	–6.36*	–3.12**(a)	–8.37*
South Africa		–8.25*	–7.40*	–9.91*	–2.58***(a)

Source: Author's calculation

Notes: The table describes stationarity tests at first differences. (a) indicates variables are stationary at level. The optimal lag is selected by AIC criterion. *, **, *** indicates the significance at 1%, 5%, and 10% respectively.

4. Empirical results

The paper estimates the relative importance of exchange rate and interest rate in MCI by the VAR model. Since the two variables have a delayed effect on the present value of inflation, it is important to evaluate the size and significance of estimated parameters in the price equation at different lag orders. Table 3 summarizes all the statistically significant coefficients of the two channels and the corresponding lag specified in the parentheses. As observed, exchange rate and interest rate have a statistically significant effect on inflation at different time. For instance, in Brazil, the exchange rate effect on inflation is significant at first, second, fourth, fifth, and seventh lag, whereas the effect of interest rate on inflation is statistically significant at first and second lag. On the whole, interest rate affects inflation with shorter lag than exchange rate. For most of the cases, the elasticity of inflation to changes in exchange rate and interest rate has the expected sign and is consistent with most theoretical models. The results indicate that exchange rate and interest rate parameters are economically meaningful.

Table 3 Coefficients on interest rates and exchange rates

	Variable	Estimated parameters
Brazil	EX	(1)–0.01*; (2)–0.01**; (4) –0.01**; (5)–0.01**; (7)–0.01***
	INT	(1)0.16*; (2)–0.22***
Colombia	EX	(1)–0.02**; (5)–0.02*; (7)–0.01***
	INT	(2)0.18***
Mexico	EX	(3)0.02***; (12)–0.02**; (13)0.02**
	INT	(12)0.13**
Hungary	EX	(5)–0.04**
	INT	(6)0.14**; (8)–0.09**
Poland	EX	(1)–0.03*; (5)–0.02**
	INT	(1)–0.08***; (2)0.12**; (8)–0.07**
Romania	EX	(1)–0.06**
	INT	(1)0.07**; (6)0.06**
Turkey	EX	(1)–0.05*; (3)–0.03***; (4)–0.04*; (7)–0.03**
	INT	(1)0.12*; (2)–0.13*; (3)0.08**; (7)–0.06***
Korea	EX	(2)–0.03**; (5)–0.02***
	INT	(1)0.41***
Philippines	EX	(1)–0.03***; (2)0.03***
	INT	(1)0.21**; (6)0.27***
South Africa	EX	(1)–0.02**; (4)–0.02*; (7)–0.02**
	INT	(1)0.4**; (2)–0.44***; (6)–0.48***; (7)0.56**

Source: Author's estimation. Notes: significant lag order is in the parentheses. ***, **, * denote significance at 10%, 5%, and 1%, respectively.

Table 4 shows the weight of interest rate and exchange rate in MCI by summing the absolute value of the statistically significant coefficients of the two in the inflation equation, which is estimated by using the VAR model. Such a calculation accounts for the fact that exchange rate and interest rate have an effect on inflation at different times. As observed, exchange rate plays a less important role than interest rate in determining the fluctuation of inflation in emerging economies. While the exchange rate plays a trivial role in Brazil, Korea, Philippines, and especially in South Africa, the role of exchange rate is more pronounced in Eastern European countries such as Hungary, Poland, and Romania. The significant role of the exchange rate suggests that disregarding it would lead to a volatile monetary condition (Knedlik 2006).

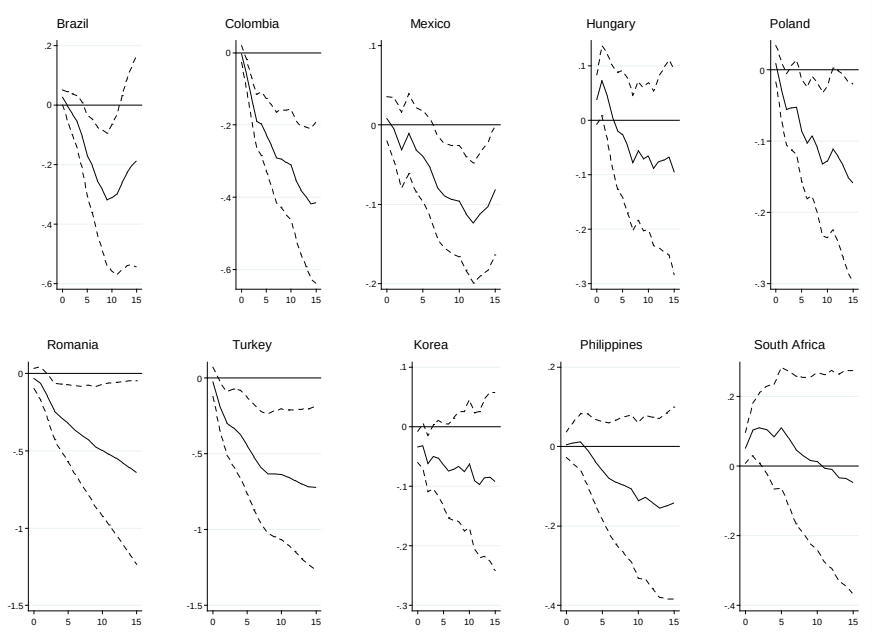
Table 4 Weights on exchange rate and interest rate in MCI

	Lag	β^{EX}	β^{INT}
Brazil	8	0.12	0.88
Colombia	8	0.22	0.78
Mexico	13	0.29	0.71
Hungary	8	0.14	0.86
Poland	8	0.15	0.85
Romania	6	0.32	0.68
Turkey	8	0.29	0.71
Korea	8	0.13	0.87
Philippines	14	0.11	0.89
South Africa	8	0.03	0.97

Source: Author's estimation

Figure 1 shows the response of inflation to surprise changes in MCI, which is determined by the VAR model. The results show that MCI has a strong correlation with inflation in emerging economies. In particular, MCI has a negative, statistically significant, and expected-signed effect on inflation in Hungary, Colombia, Mexico, Poland, Romania, Turkey, and Romania. The inflation response is negative but not statistically significant in other countries. South Africa is the exception, whereby inflation shows a positive response to MCI shocks. These findings suggests that a higher level of MCI causes a fall in inflation and vice versa. The finding also implies that MCI is a useful indicator of monetary policy in most emerging economies. However, its naïve application is not recommended in the implementation of monetary policy.

Figure 1 Response of inflation to changes in MCI



Source: Author's construction

5. Conclusion

Measuring monetary policy is an important step in the analysis of monetary policy. Since monetary policy in emerging economies affects inflation through two principal channels, interest rate and exchange rate, indicators of monetary policy should capture information from both channels. MCI, which is a weighted average of interest rate and exchange rate, is recommended. This paper investigates the role of MCI in ten emerging economies that follow inflation targeting.

The paper shows that MCI can capture the effect of monetary policy on inflation. In particular, the inflation response is negative as expected, implying that a monetary policy contraction causes a reduction in inflation. Therefore, MCI can be used to evaluate the stance of monetary policy and predict the inflation trend. However, it should be noted that MCI should not be used as an operating target.

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