Commodity price movements and monetary policy in Asia

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Abstract

Emerging Asian economies typically have high shares of food in their consumption baskets, relatively low monetary policy credibility, and aggressive fiscal interventions in response to rises in international food and energy prices. Under these circumstances, we argue that targeting headline rather than core inflation would be better in the conduct of monetary policy in these economies. We also examine the inflation dynamics associated with commodity price changes in Asian countries.

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International commodity prices rose substantially during the 2003–08 period, fell briefly during the Great Recession, and surged again in 2010 and 2011 to the level of the mid-2008 peak. Rapid increases in commodity prices have created tremendous adverse social and economic impacts in emerging market economies in Asia. In particular, the surge in food and energy prices has posed a significant challenge to central banks in stabilising inflation. This challenge may be more critical in emerging market Asian countries where the share of food in consumption baskets is higher and monetary policy credibility is lower.

From the standpoint of the central banks in these countries, therefore, one of the most important policy issues is how to adjust monetary policy in response to changes in food and energy prices. In this respect, we revisit the issue of which inflation measure (core inflation or headline inflation) a central bank should target in emerging market Asian countries. Against the standard view which advocates core inflation targeting, we attempt to point out several factors that may lead to the conclusion that headline inflation targeting is more useful. We also examine the inflation dynamics associated with commodity price changes in Asian countries.

1. Should monetary policy target core inflation in Asia?

1.1 Standard view

Standard advice is to allow for the first-round effects of commodity price increases on headline inflation, but not the second-round effects (ie through wages and core prices). Because the headline measure of inflation includes temporary and volatile food and energy items, it does not necessarily reflect underlying inflation. Consistent with the standard advice, IMF (2011) states that, because shocks to commodity price inflation are typically beyond the control of policy makers, are hard to predict, and often not sustained, central bankers are generally better off setting and communicating their monetary policy in terms of underlying inflation (core inflation) rather than headline inflation.

If central banks are concerned with the underlying inflation and core inflation is a reliable proxy for underlying inflation, targeting core inflation can help prevent central banks from overreacting to temporary fluctuations in inflation. In this sense, at least in advanced countries, targeting core inflation seems to be appropriate in the conduct of monetary policy.

The standard view is also confirmed in several theoretical studies. In a two-sector dynamic general equilibrium model, Aoki (2001) shows that the optimal monetary policy is to target sticky-price inflation (core inflation) rather than a broad inflation measure in order to achieve the socially optimal allocation of resources. Bodenstein, Erceg, and Guerrieri (2008) also set up a DSGE model with an energy sector to find that a policy of stabilising core inflation rather than headline inflation more closely resembles the optimal policy.

1.2 Modifications

Although the standard view is plausible in advanced countries, it is not clear that a central bank should target core inflation in emerging Asian country. In emerging Asian countries, the share of food in consumption baskets is high, reaching 50% or more in some countries.[3] Thus, food price inflation may have a larger direct effect on headline inflation. In addition, monetary policy credibility is, in general, low in these countries. Under these circumstances,

[3] The share of food in the consumption basket is 58.84% in Bangladesh, 46.71% in Sri Lanka, 44.78% in Cambodia, 39.93% in Vietnam, 39.0% in the Philippines.

higher food price inflation and the resulting higher headline inflation are more likely to lead to an increase in inflation expectations, which may further increase the inflation rate.

First, in many developing countries, core and headline inflation are not differentiated. In fact, headline inflation numbers are more commonly watched. Because the general public is aware of headline inflation, their inflation expectations are adjusted based on these numbers. Any upward movement in food prices raises headline inflation, even though core inflation remains unchanged. Such may be seen by the general public as an inability by the central bank to anchor inflation expectations, and may further contribute to lowering the credibility of the central bank in implementing monetary policy. These circumstances raise the question of whether targeting core inflation is desirable in emerging Asian countries.[4]

Second, rapidly rising food prices are not just a macroeconomic problem but, by influencing poverty levels, are also a political challenge for developing countries. As the poor spend large fractions of their income on food, recent surges in food prices have pushed more people into poverty. According to ADB estimates based on the $1.25 a day poverty line, a 10% increase in domestic food prices will increase the number of poor in developing Asia by more than 60 million and by close to 200 million if the prices were to shoot up by 30%. High prices thus weaken poverty reduction, exacerbate income inequality and weaken social cohesion (Jha and Rhee (2012)).

Meanwhile, an interesting finding from the recent food price inflation in Asian countries is that the effect of international food price changes on domestic food price inflation is relatively muted, suggesting a limited pass-through.[5] Figure 1 shows that the changes in domestic rice and wheat prices are much lower than the changes in international prices. Local food prices would have been higher in the absence of aggressive fiscal interventions such as higher subsidies and lower taxes and tariffs on food that Asian governments implemented in the wake of the food price spikes.

This means that, in emerging countries, policy responses to rising prices involve a combination of fiscal and monetary policy. Fiscal policy measures, in effect, have implications for monetary policy. Consider a country that provides subsidies to keep domestic grains prices at a certain level. If that country's central bank uses core inflation targeting, a large hike in headline inflation due to rising grains prices will require a significant amount of subsidy to stay within the core inflation target. However, if the central bank policy is headline inflation targeting, then movements in headline inflation due to food price increases will require smaller fiscal costs. Alternatively, in case food prices fall, missing the inflation target will not affect the central bank's reputation. So it does not really matter whether core or headline inflation is targeted.

These observations underscore the fact that the situation in developing countries is not very well captured by traditional models, in terms of both monetary policy credibility and the optimal mix of fiscal and monetary policy.

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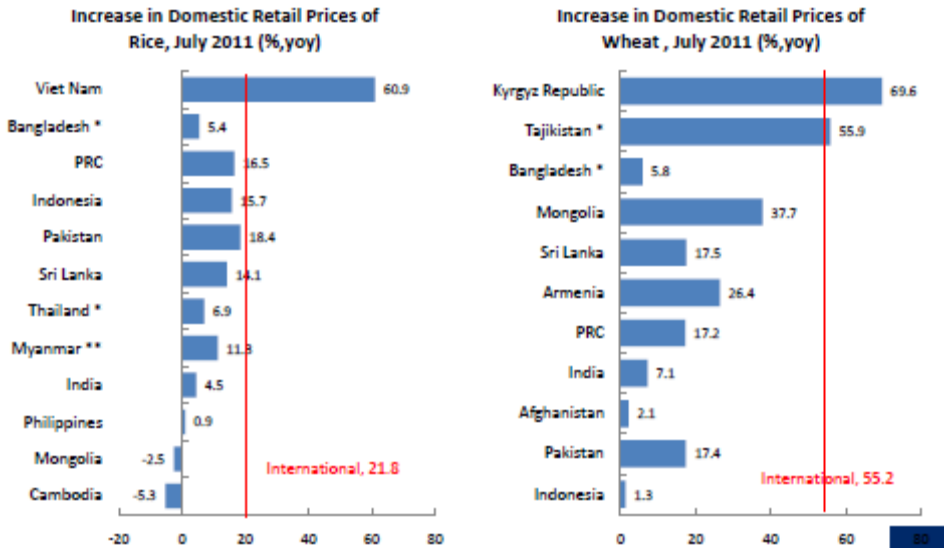
[4] Anand and Prasad (2010) argue that headline inflation targeting is better in a New Keynesian model with an incomplete financial market. As they point out, households are more likely to be credit-constrained in emerging Asian countries.

[5] Domestic production of food can also partially explain the incomplete pass-through.

Figure 1

Changes in domestic retail food prices



Note: * June 2011; ** May 2011.

Source: ADB staff calculations.

2. Inflation dynamics and food price in Asia

In this section, we test the premise of the traditional argument for core inflation targeting. We assume that food price increases are temporary, and do not permanently affect core inflation. As a test for pre-conditions for core inflation targeting, we compare the impacts of commodity price swings on inflation dynamics across Asian countries. Specifically, we address the following two questions: (i) to what extent the international commodity price changes spilled over into domestic food price changes? and, how the changes in domestic food prices affect core inflation over time? (ii) is headline inflation reverting to core inflation or vice versa?

To analyse these aspects of inflation dynamics in Asian countries, we define core inflation as headline CPI inflation net of food and energy components.[6] The sample period is maximally from January 2000 to December 2011, but shorter for some countries due to lack of data. We present our preliminary results below.

2.1 Pass-through

First, we estimate the degree of pass-through from international food price changes to domestic price changes (pass-through I).[7] Then, we examine the pass-through from domestic food price changes to core inflation (pass-through II). The regression equation is as follows:

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[6] Following the Classification of Individual Consumption by Purpose (COICOP) by the UN Statistics Division, we use COICOP 01 for food prices and COICOP 04.5 plus COICOP 07.2.2 for energy prices. However, because data for energy prices are not consistent for most of the Asian countries, we use the closest available data for these countries.

[7] We report the estimation results only for food prices because energy prices are not consistently compiled in some countries.

$$\pi(t) = \alpha + \sum_{K=0}^{S} \beta_K \pi^*(t-k) + \sum_{K=1}^{S} \beta_K \pi(t-k) + e(t),$$

Where $\pi(t)$ is the domestic food price inflation rate for pass-through I or the core inflation rate for pass-through II. $\pi^*(t)$ denotes the changes in international food price index (in domestic currency) compiled by IMF for pass-through I or the domestic food price inflation rate for pass-through II, respectively. To control for the seasonal fluctuations in food prices, we include monthly seasonal dummies in the regressions. Controlling for the lagged dependent variables, if the sum of the coefficient estimates on current and lagged π^* is significantly different from zero, we may conclude that international food prices have spilled over into domestic food prices (pass-through I) and domestic food prices have affected core inflation (pass-through II).

Table 1

Pass-through (S=12months)

	Pass-through I	**Pass-through II**
Japan	0.059 (0.171)	0.129 (0.577)
Korea	0.154 (0.082)	0.068 (0.286)
Hong Kong SAR	0.129 (0.065)	0.770 (0.055)
Singapore	0.051 (0.295)	-0.233 (0.305)
Philippines	0.049 (0.325)	0.444 (0.001)
Thailand	0.174 (0.034)	0.143 (0.019)
Malaysia	0.155 (0.011)	0.388 (0.052)
India	-0.024 (0.834)	0.177 (0.408)
Pakistan	0.431 (0.014)	0.316 (0.019)
Bangladesh	0.132 (0.314)	0.156 (0.292)
Sri Lanka	0.236 (0.089)	0.634 (0.048)

Note: Numbers in parentheses are p-values for Chi-square tests.

The estimation results in Table 1 shows that the degree of pass-through from international food prices to domestic food prices are low in Asia, consistent with Figure 1 and IMF (2011). The size of the pass-through from domestic food prices to core inflation varies across countries, as Sri Lanka and Philippines show larger effects while Japan and Korea exhibit smaller effects. Notably, a country with statistically significant pass-through I also tends to have statistically significant pass-through II.

2.2 Is headline inflation reverting to core inflation or vice versa?

Next, we attempt to test whether the headline inflation tends to revert to core inflation in the medium run. The reversion of headline towards core inflation implies that changes in food and energy prices are temporary and do not lead to persistent changes in core inflation, justifying core targeting in the conduct of monetary policy. We estimate the following equation:

$$\pi^{headline}(t+k) - \pi^{headline}(t) = \alpha + \beta\left[\pi^{headline}(t) - \pi^{core}(t)\right] + e(t+k)$$

In contrast, following Cecchetti and Moessner (2008), we also test whether core inflation is reverting to headline inflation by estimation of the following equation.[8]

$$\pi^{core}(t+k) - \pi^{core}(t) = \gamma + \delta\left[\pi^{headline}(t) - \pi^{core}(t)\right] + e(t+k)$$

The convergence of core inflation towards headline inflation is consistent with second-round effect as higher food and energy prices cause higher inflation expectation and thus higher core inflation.

Table 2 shows that headline inflation is not reverting to core inflation in some countries, yet core inflation tends to converge to headline inflation. This finding suggests that, in some countries, second-round effects through inflation expectations prevail in inflation dynamics and thus targeting core inflation may not be appropriate in the conduct of monetary policy.[9]

Table 2

Reversion of headline (core) towards core (headline) inflation (k=12 months)

	Reversion of headline towards core		**Reversion of core towards headline**	
	α	β	γ	δ
Japan	-0.018 (-0.23)	-0.908 (-4.94)***	-0.005 (-0.07)	0.285 (1.44)
Korea	0.025 (0.43)	-1.329 (-9.91)***	0.005 (0.09)	-0.189 (-1.82)*
Hong Kong SAR	0.011 (0.05)	0.679 (1.06)	-0.096 (-0.50)	1.940 (3.05)***
Singapore	0.038 (0.22)	-0.341 (-1.94)*	-0.101 (-0.45)	0.586 (2.95)***
Philippines	-0.050 (-0.31)	-0.436 (-1.46)	-0.134 (-0.92)	0.650 (2.35)**
Thailand	-0.306 (-1.97)*	-1.208 (-5.56)***	-0.059 (-0.94)	-0.268 (-1.94)*
Malaysia	0.236 (1.21)	-2.214 (-8.18)***	0.152 (1.13)	-0.939 (-7.23)***
India	-0.247 (-0.56)	-0.897 (-2.84)***	0.201 (0.67)	0.262 (0.90)
Pakistan	-0.829 (-3.70)***	-1.158 (-8.28)***	0.142 (1.09)	0.115 (0.96)
Bangladesh	-0.390 (-1.91)*	-0.692 (-4.77)***	0.109 (0.84)	0.146 (1.35)
Sri Lanka	0.121 (0.29)	-0.129 (-0.56)	-0.969 (-2.00)**	1.059 (3.99)***

Note: Numbers in parentheses are *t*-values. ***, **, * denote that the coefficient estimate is statistically significant at 1%, 5%, 10% level.

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[8] If β=-1, headline inflation is fully reverting to core inflation and if δ=0, core inflation is not reverting to headline inflation.

[9] We also find that food price inflation is more persistent than core inflation in Philippines, Malaysia, Indonesia, Bangladesh and Sri Lanka, suggesting that food price inflation is not temporary. In these countries, therefore, persistent changes in food prices are more likely to affect inflation expectations over the longer horizon and to create second-round-effects, thus complicating the task of core inflation targeting.

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