

How important are inflation expectations in driving Asian inflation?¹

Jun Il Kim² and Jungick Lee³

Abstract

Using simple statistical methods, this note examines the relationship between expected and actual inflation and the importance of inflation expectations in driving actual inflation in Asia. We find that, in Asia, short-term inflation expectations tend to co-move among economies while international energy and food price inflation seems to be an important driver of inflation expectations. The analysis of impulse responses also suggests that inflation expectations appear to play an important role in driving actual inflation, with expectation shocks having significant dynamic effects on actual inflation in many Asian economies.

Keywords: expected inflation, co-movement, energy/food price, impulse response analysis

JEL classification: E31

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² Deputy Governor and Chief Economist, Bank of Korea, E-mail: jkim@bok.or.kr

³ Economist, Economic Research Institute, Bank of Korea, E-mail: jilee@bok.or.kr

1. Introduction

Inflation expectations are of great importance to policymakers. The main purpose of inflation targeting (IT) is to shape and guide inflation expectations around the established inflation target. Well-anchored inflation expectations reflect the credibility of the central bank, help enhance the effectiveness of monetary policy, and create ample space for flexible monetary policy in the short run.

Consumers and firms often comprehend the future path of inflation implicitly or explicitly. The reason is that they ought to consider real prices (inflation accounted for) when they negotiate wages with employers, open saving accounts at the bank, or set product prices. Economic agents' decision making is affected by their expectations of future inflation and they later face the consequences of actual inflation. In this regard, it is argued that expected inflation is a key driver of inflation dynamics (Mishkin, 2007).

This note examines the relationship between expected and actual inflation. Also, by using survey measures of inflation expectations obtained from *Asia Pacific Consensus Forecasts*, it explores the significance of inflation expectations in driving actual inflation. The rest of this note is organized as follows. After providing a brief overview of the properties of inflation expectations in Korea in Section 2, we explain the developments and co-movements in actual and expected inflation, explore a possible driver of inflation expectations, and examine the role of inflation expectations in driving actual inflation in Asia in Section 3. Section 4 summarizes with concluding remarks.

2. Properties of inflation expectations in Korea

To gauge inflation expectations, economists refer to a number of sources, such as surveys of the general public or professional forecasters, the breakeven inflation rate obtained from financial markets, and econometric forecast reports. Survey measures seem most popular in Asia, including Korea, where financial markets are less developed than in advanced economies.

The most widely referred-to measure of inflation expectations in Korea is obtained from a monthly survey of households conducted by the Bank of Korea (BOK). It provides the average expected inflation rate over the following twelve months. BOK also conducts a survey of professional forecasters in the first month of each quarter and provides the expected inflation over the following two quarters and twelve months, and the average inflation rate over the following five years as well. There is another monthly survey measure by Consensus Economics Inc., a London-based macroeconomic survey firm.

We briefly review the properties of inflation expectations in Korea based on both BOK's household survey and Consensus Economics' survey. Inflation expectations in Korea appear highly persistent and remain far from being rational in the sense that not all useful information available is fully taken into account when expectations are formed. In fact, the public's expectations of inflation are backward-looking and not well anchored to the inflation target. For instance, we observe that the public's inflation expectation is highly positively correlated with previous inflation rates while exhibiting low or insignificant correlations with future inflation rates.

Conversely, the inflation expectations by professional forecasters as measured by Consensus forecasts tend to lead actual inflation to some extent, and are fairly well anchored to the inflation target. They also appear to have predictive power for the future path of inflation. To be specific, Consensus forecasts have stronger statistical properties of rational forecasts of inflation (such as unbiasedness and efficiency) than those based on BOK's household survey. Of course, however, the fact that Consensus forecasts are a better predictor of future inflation than household survey measures does not necessarily mean that

the former are economically more important than the latter. In this light, BOK monitors both measures of inflation expectations in its conduct of monetary policy.

3. Inflation expectations and realized inflation in Asia

3.1 Data

We examine the relationship between expected and actual inflation and the importance of inflation expectations in driving (actual) inflation in Asia using data on inflation expectations and realized CPI inflation from 13 Asian economies from December 2005 to May 2012. The economies covered in our study include China (CN), Hong Kong SAR (HK), Korea (KR) and Taiwan, China (Hereinafter referred to as Taiwan) (TW) from East Asia; India (IN), Bangladesh (BD) and Sri Lanka (LK) from South Asia; Indonesia (ID), Malaysia (MY), Philippines (PH), Singapore (SG), Thailand (TH) and Vietnam (VN) from South East Asia. Here note that KR, ID, PH and TH are countries that adopt IT as a monetary policy framework.

The data for inflation expectations are obtained from *Asia Pacific Consensus Forecasts* (APCF) published by Consensus Economics Inc., which provides forecasts for the current calendar year and the following year on a monthly basis. Since the data are for the annual expected inflation rate but measured on a monthly frequency, they include multiple and time-varying sample points (observed at different dates) for the expected inflation of the same year. A monthly sample of twelve-month ahead expected inflation is then constructed by taking the weighted average of the multiple forecasts in the original sample data. For instance, the twelve-month ahead expected inflation at May 2012 is computed as a weighted average of the Consensus 2012 and 2013 forecasts—both observed at May 2012—with the former assigned a weight of 7/12 and the latter 5/12.

The data also provide long-term expected inflation for the following 5 to 10 years on a semi-annual frequency (observed in April and October, respectively). Out of these data, a semi-annual sample of long-term expected inflation is constructed by using a similar weighting method to that used for the construction of twelve-month ahead expected inflation. Finally, the data for annual CPI inflation and energy and food price inflation are obtained from the IMF's International Financial Statistics, CEIC database, and national sources, and the World Bank.

3.2 Developments in actual and expected inflation

Figure A1 shows the developments in short- and long-term inflation expectations along with realized (average) annual CPI inflation for the above mentioned 13 Asian economies since the end of 2005. In each country, actual and 1-year ahead expected inflation exhibits substantial variation over time. In most countries except India, short-term inflation expectations tend to lead actual inflation to some extent as is manifest in the cross-correlation between expected inflation and actual inflation— $corr(\pi_t^e, \pi_{t+j})$ —as shown in Figure A3. Meanwhile, long-term expected inflation over the following 5 or 10 years where available appears to remain stable compared to short-term expectations and lies within the target range in the case of IT-adopting countries, suggesting that central banks in the region have been successful in building up policy credibility in the 2000s.

3.3 Co-movements in actual and expected inflation

Table 1 shows that actual inflation tends to co-move among countries in the same region, especially economies grouped as East Asia (CN, HK, KR, TW) and those in the advanced economy group (US, EU, Japan). Actual inflation at the regional level—measured by the first principal component of inflation at the national level—also appears to move together

between East Asia, South Asia, and advanced economies as shown in Table 2. South East Asia is an exception to such co-movements, suggesting a possibility that these economies are less well integrated with other regions in Asia or advanced countries.

Table 3 and Figure A2 show fairly strong co-movements in short-term expected inflation within/across regions, which together with strong co-movements in actual inflation within/across regions suggests a common influence. Interestingly, for East Asia, co-movements appear stronger for expected inflation than actual inflation.

3.4 Possible drivers of short-term inflation expectations

Energy and food prices appear to be one of the main drivers of short-term inflation expectations in most Asian countries, particularly in East Asia as shown in Figure 1. Also, note from Figure A4, which displays cross-correlograms— $corr(\pi_t^e, \pi_{t+j})$ —between expected inflation and energy and food price inflation, that short-term inflation expectations are strongly associated with energy and food price inflation in the previous quarter. This finding is broadly consistent with the finding of Gerlach et al. (2011) that food prices seem to affect inflation expectations in emerging market economies more strongly than in advanced economies. Food prices in the CPI have generally risen by more in emerging economies than in advanced economies. Moreover, food accounts for a higher proportion of the total household consumption expenditure basket in economies with lower income per capita.

3.5 Impulse response analysis

To examine if short-term inflation expectations are driving Asian inflation, a simple bivariate VAR of expected and actual inflation is estimated. The impulse responses obtained from the estimated VAR model would then offer some guidance on the issue. In the estimation, the lag orders of the VAR are selected based on the Schwarz criterion. In many (though not all) Asian economies, expectation shocks seem to have significant dynamic effects on actual inflation. The impulse response functions in Figure A5 show that, in response to expectation shocks, actual inflation tends to peak in 3 to 4 quarters in most countries. Among others, the strong response of actual inflation in Indonesia and Vietnam is noteworthy.

4. Conclusion

This note examines the relationship between expected and actual inflation and the importance of inflation expectations in driving (actual) inflation in Asia. It should be noted as a caveat that the analysis is based on very simple statistical methods using a limited sample with a short time span from December 2005 to May 2012.

Both short-term expected inflation and actual inflation exhibit substantial variation over time. However, long-term expected inflation remains relatively stable and lies within target ranges in IT-adopting countries. This will offer some policy space for Asian central banks to deal with adverse shocks in the short run. Short-term inflation expectations in Asian countries tend to co-move while international energy and food price inflation seems to be an important driver of inflation expectations in Asia. The analysis of impulse responses also suggests that inflation expectations appear to play an important role in driving actual inflation, with expectation shocks having significant dynamic effects on actual inflation in many Asian economies.

Table 1
Correlation matrix for actual inflation
(a) East Asia

	Hong Kong	Korea	Taiwan
China	71	57	75
Hong Kong		56	46
Korea			56

(b) South Asia

	Bangladesh	Sri Lanka
India	03	-.45
Bangladesh		.36

(c) South East Asia

	Malaysia	Philippines	Singapore	Thailand	Vietnam
Indonesia	67	64	-.14	63	02
Malaysia		79	.53	66	71
Philippines			.21	58	47
Singapore				30	92
Thailand					32

(d) Advanced economies

	EU	Japan
United States	91	71
EU		84

Table 2
Correlation matrix for the first principal components in inflation

	South Asia	South East Asia	Advanced economies
East Asia	64	-.69	.74
South Asia		-.63	.88
South East Asia			-.79

Note: The first principal component explains 79%, 52%, 59%, and 88% of total variation in inflation in East Asia, South Asia, South East Asia, and advanced economies, respectively.

Table 3
Correlation matrix for short-term inflation expectations

(a) East Asia

	Hong Kong	Korea	Taiwan
China	.90	.78	.87
Hong Kong		.79	.79
Korea			.77

(b) South Asia

	Bangladesh	Sri Lanka
India	.55	-.15
Bangladesh		.40

(c) South East Asia

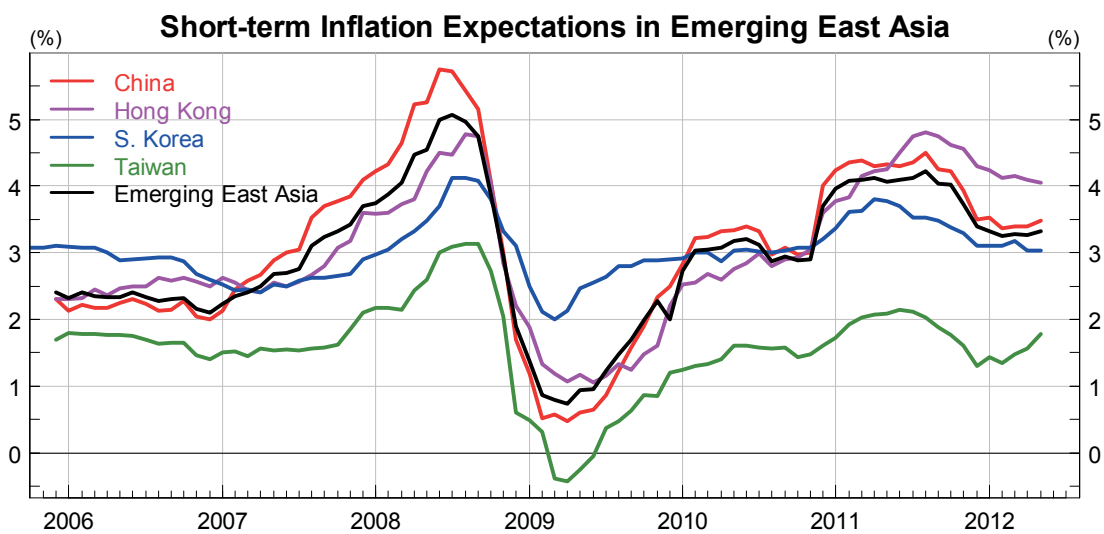
	Malaysia	Philippines	Singapore	Thailand	Vietnam
Indonesia	.54	.80	-.06	.50	-.02
Malaysia		.71	.59	.84	.62
Philippines			.12	.62	.32
Singapore				.64	.86
Thailand					.55

(d) Across regions

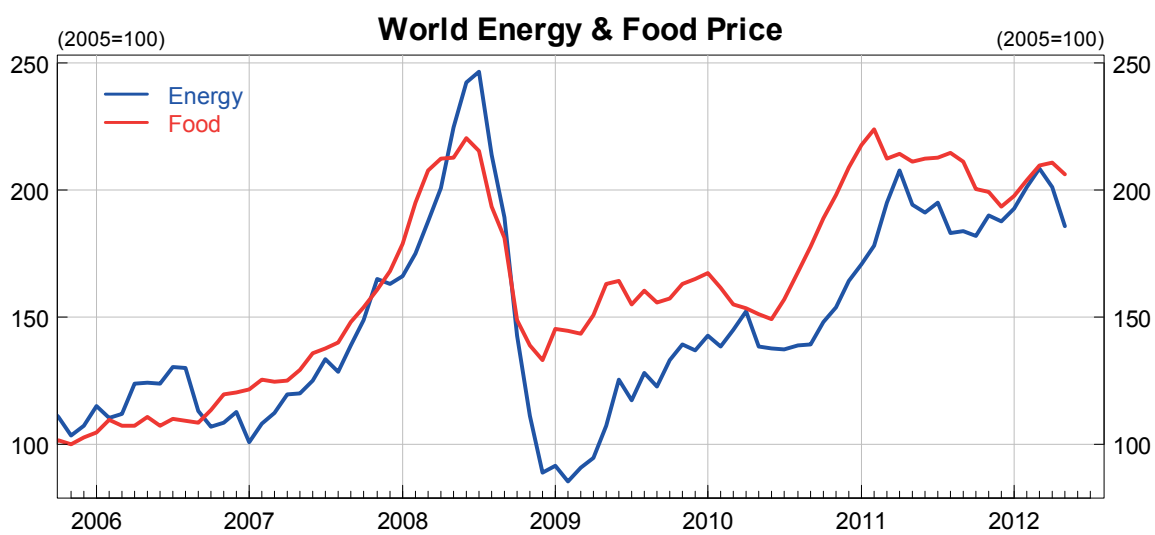
	South East Asia	United States	EU
East Asia	.55	.69	.82
South East Asia		.61	.73
United States			.83

Figure 1

World energy/food price and inflation expectations in Asia



Source: Asia Pacific Consensus Forecasts



Source: World Bank

Appendix

Figure A1

Developments in actual and expected inflation by economies

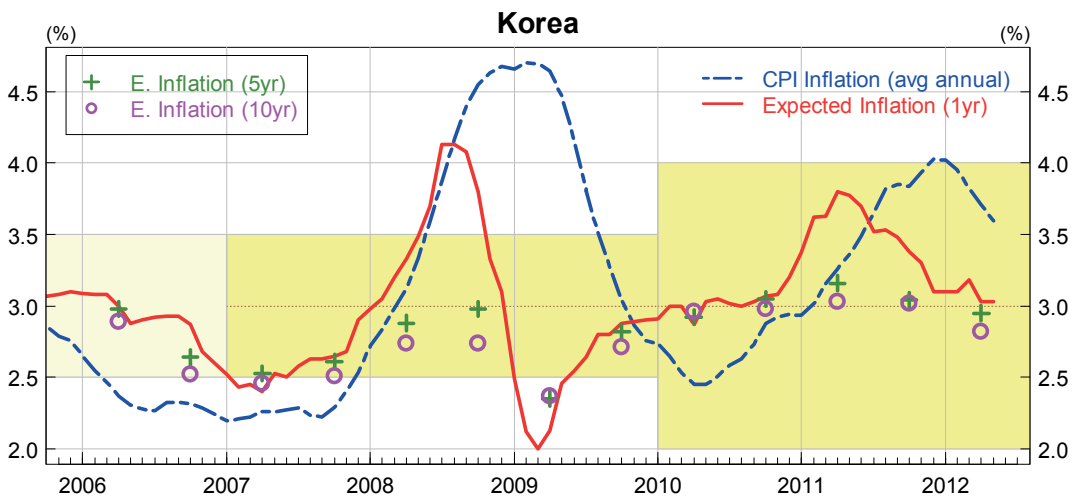
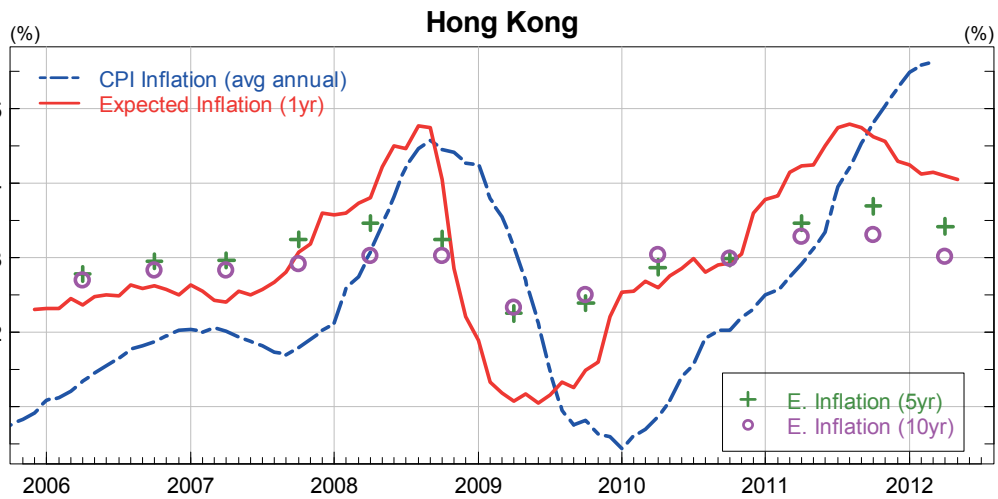
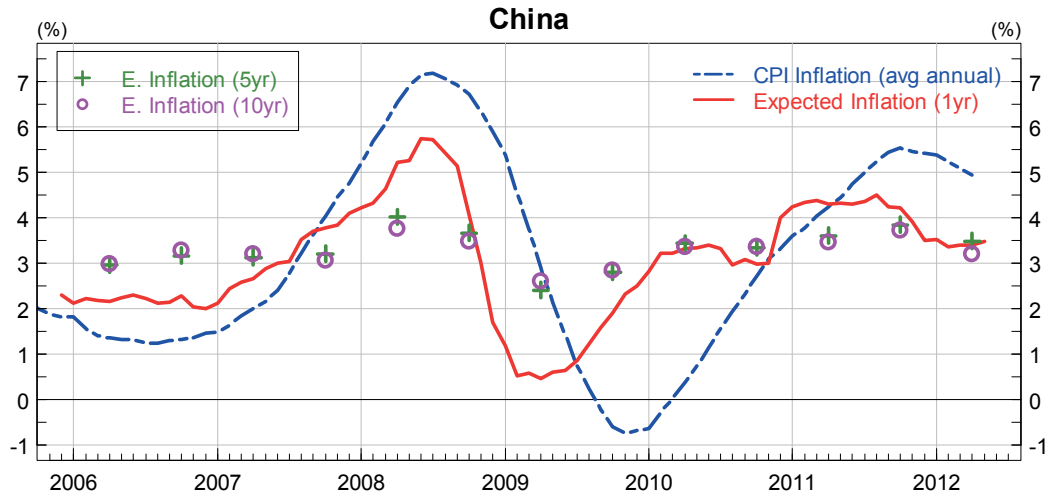


Figure A1

Developments in actual and expected inflation by economies (cont)

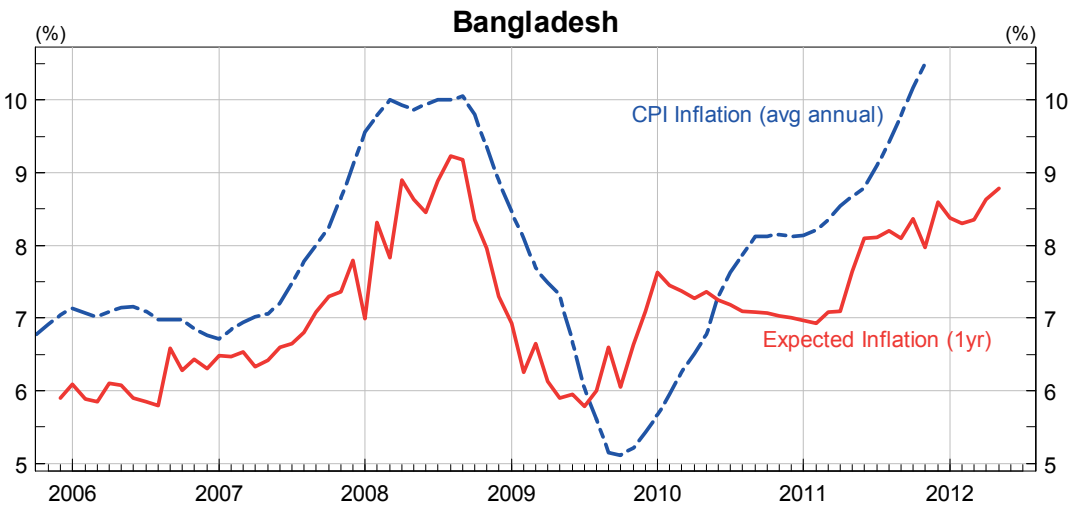
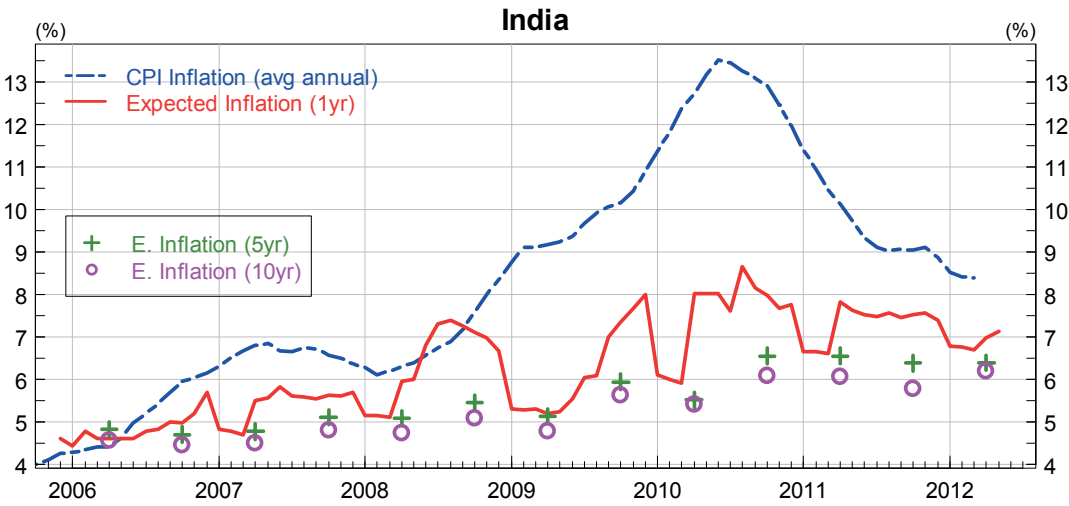
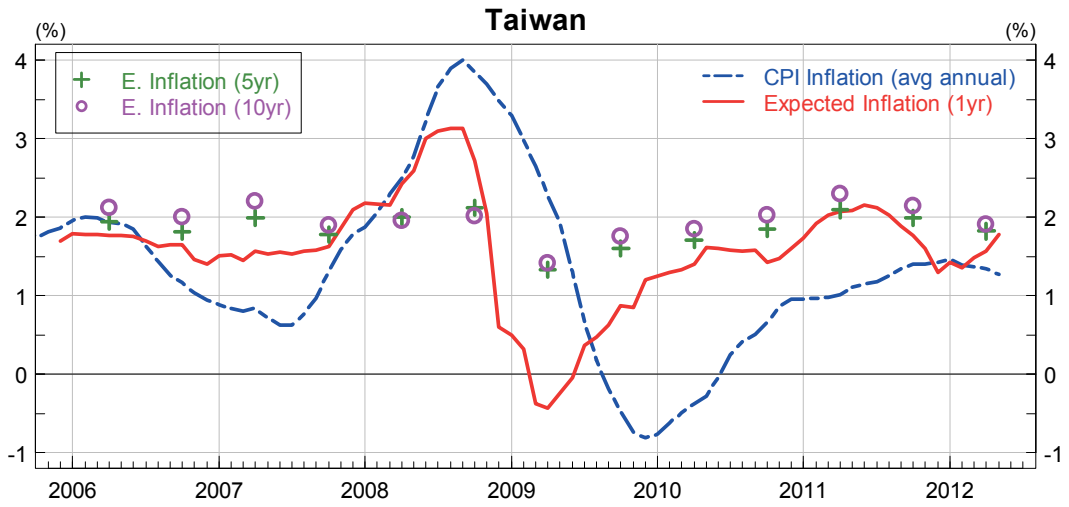


Figure A1

Developments in actual and expected inflation by economies (cont)

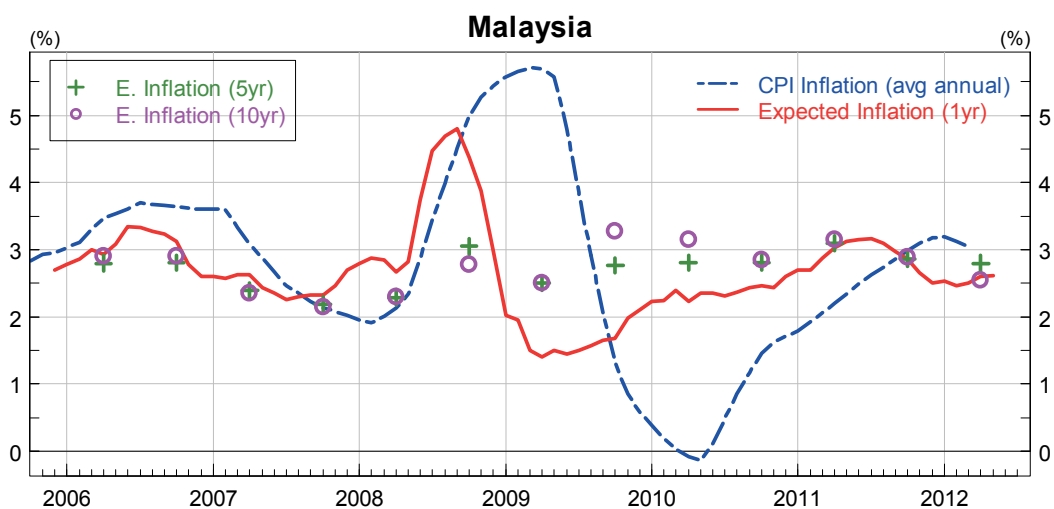
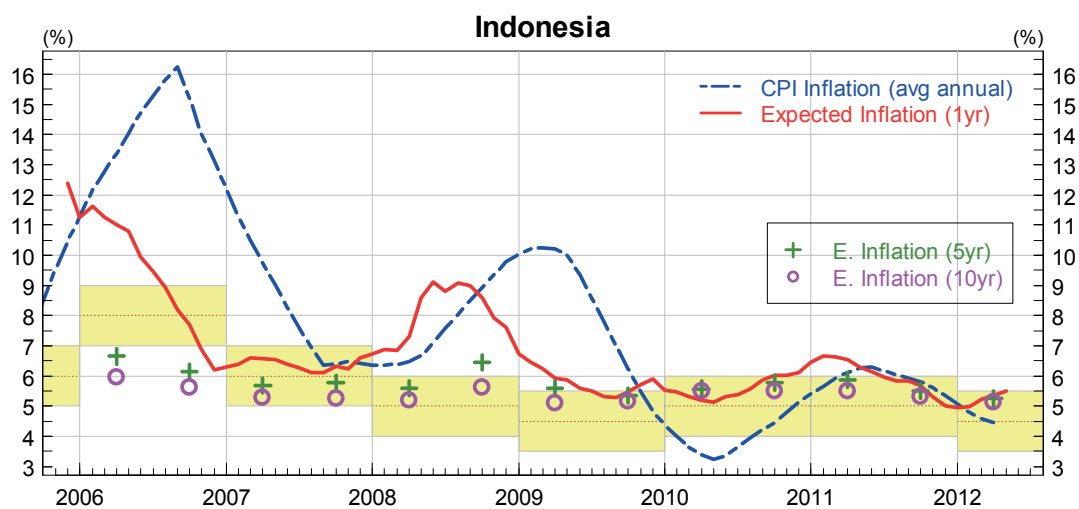
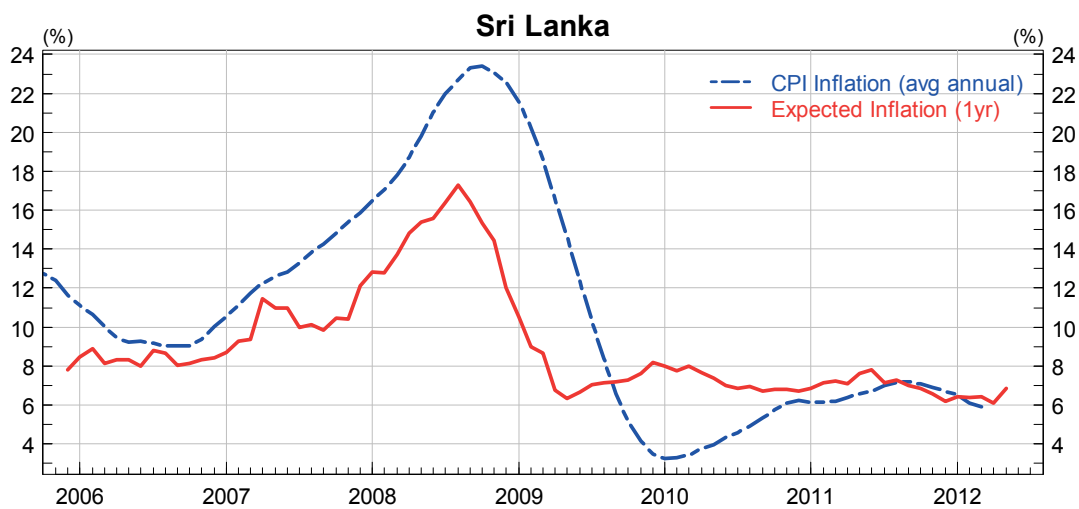


Figure A1

Developments in actual and expected inflation by economies (cont)

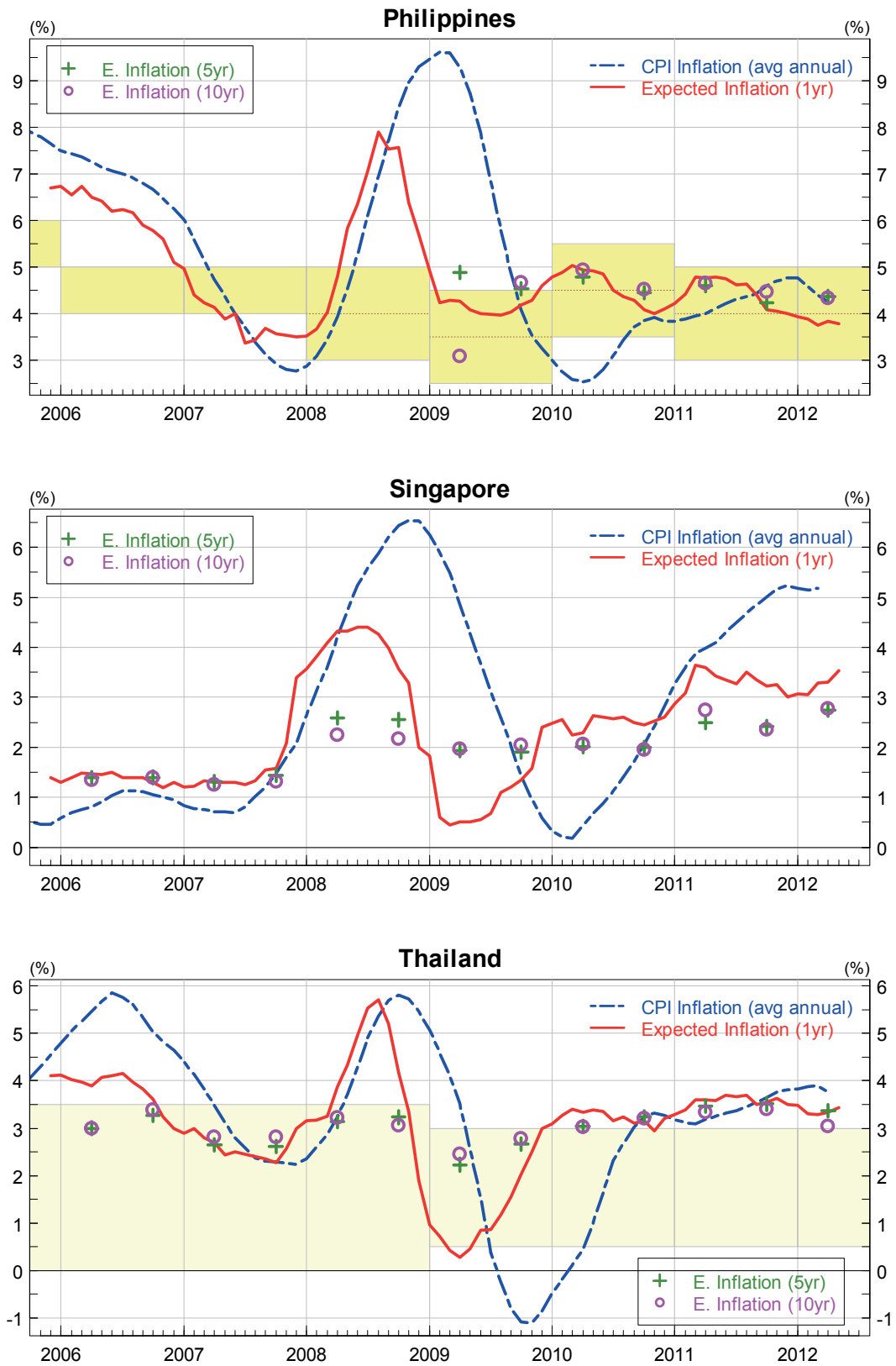
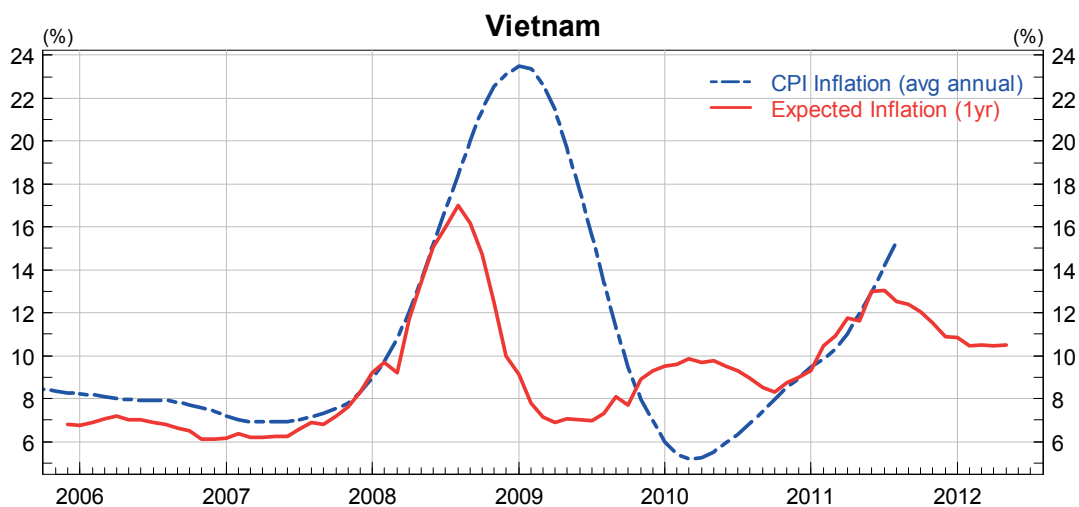


Figure A1

Developments in actual and expected inflation by economies (cont)



Note: The shaded areas represent inflation target ranges for inflation targeting-adopting countries.

Figure A2

Co-movements in expected inflation within regions

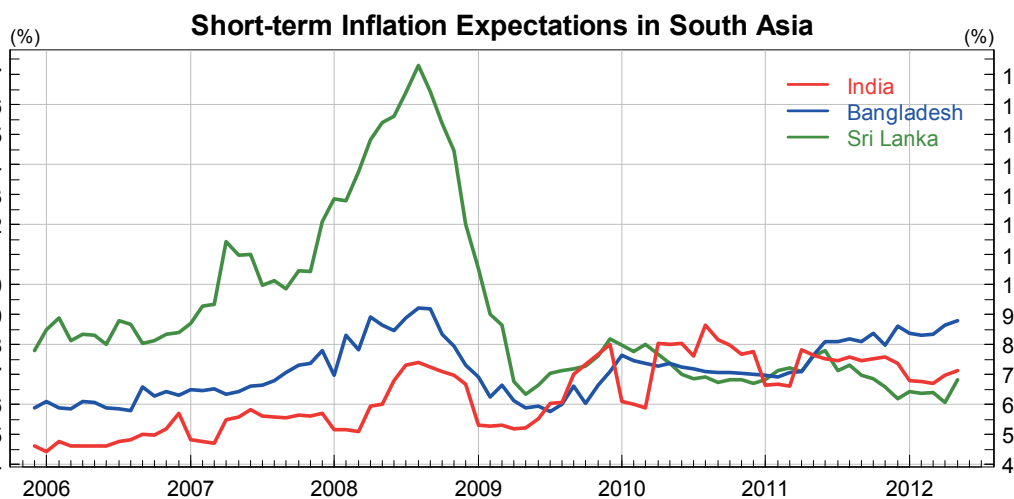
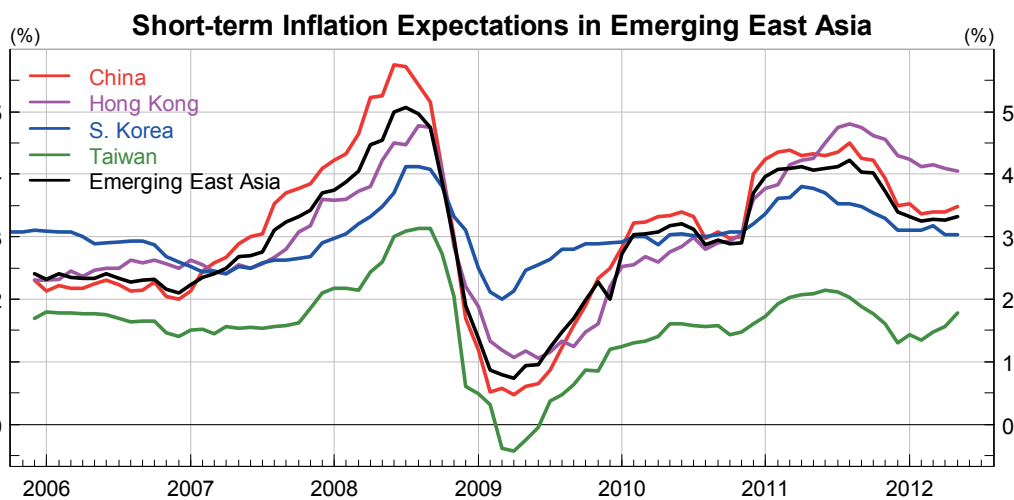


Figure A2

Co-movements in expected inflation within regions (cont)

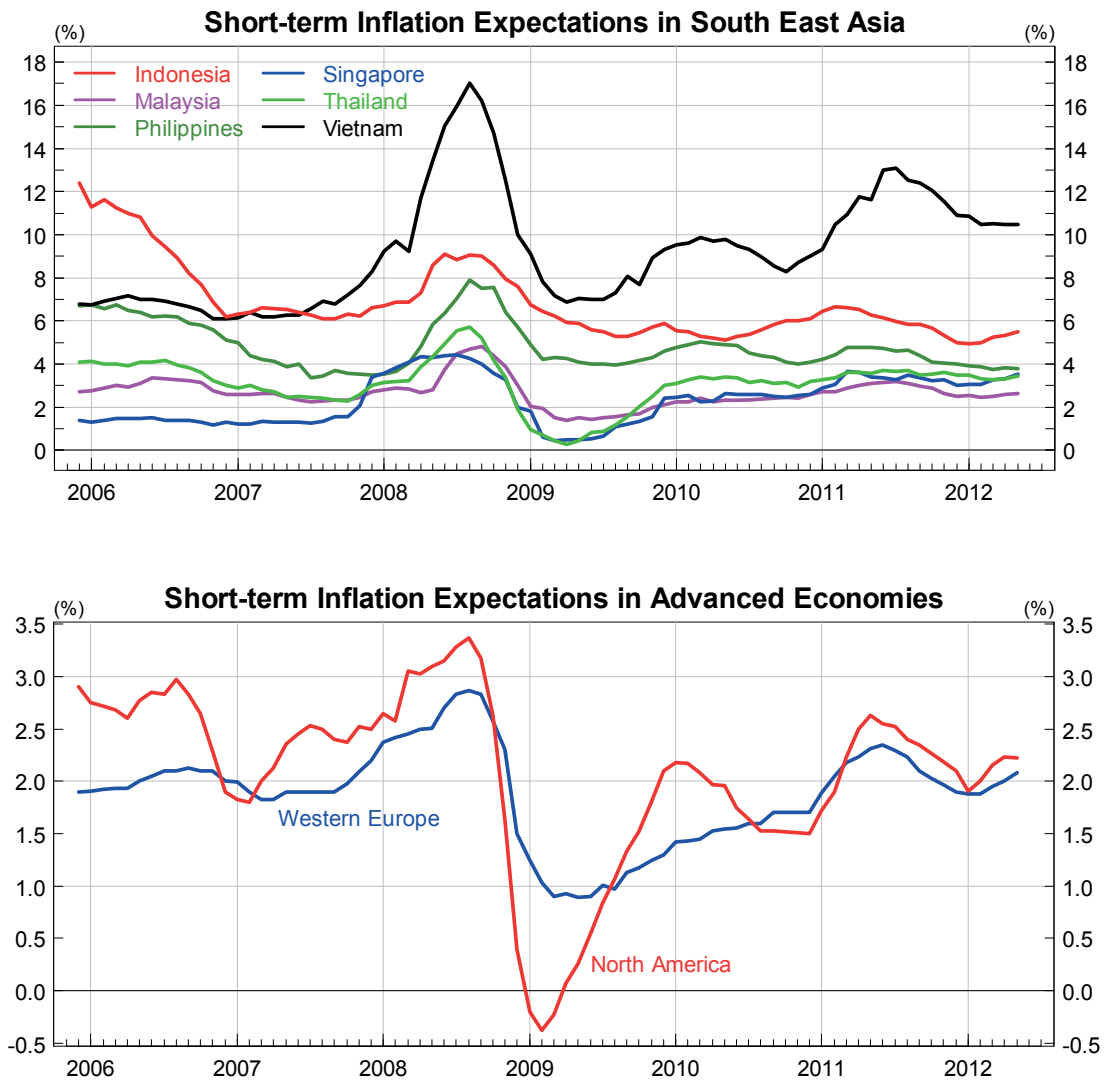


Figure A3

Cross-correlation between expected inflation and actual inflation

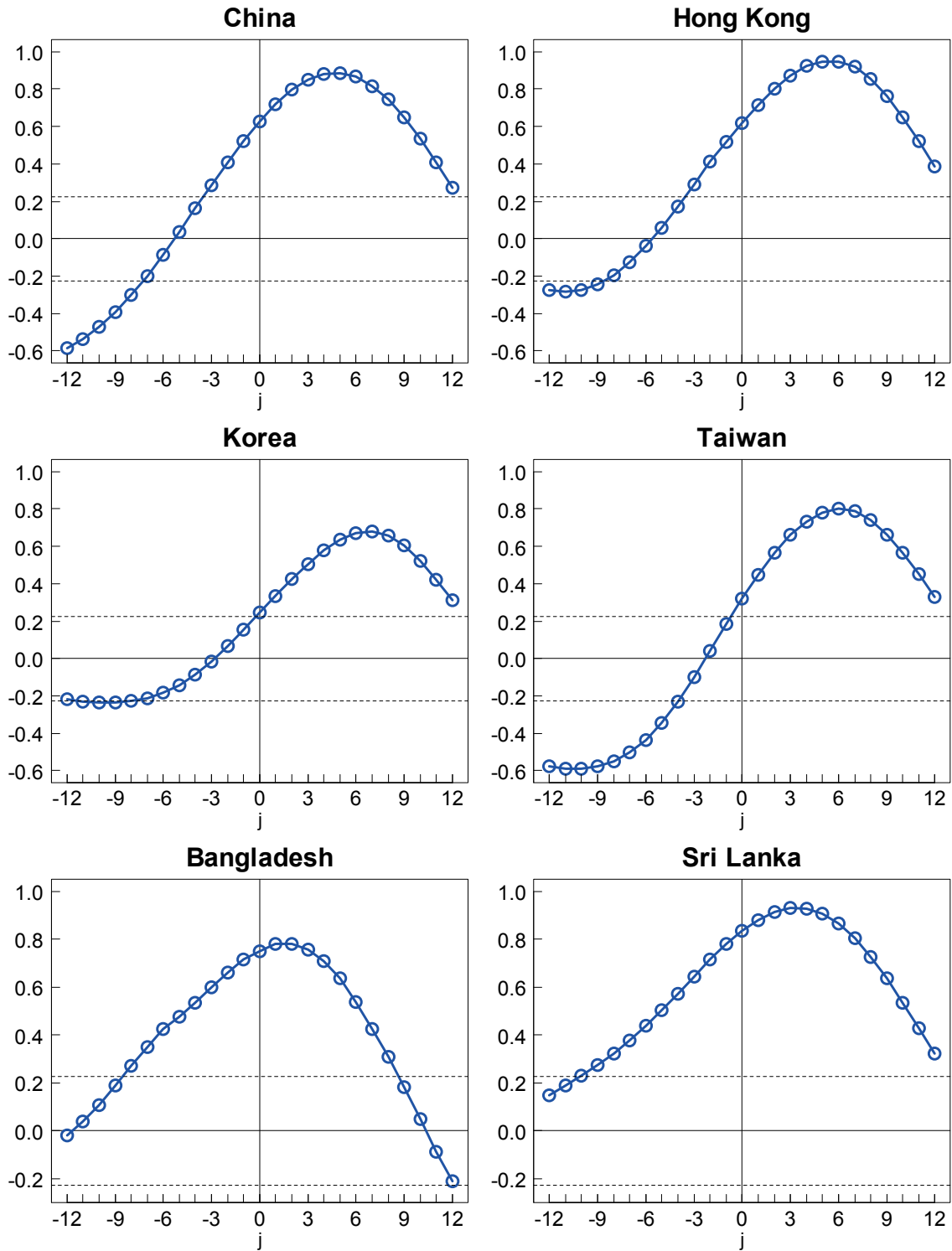
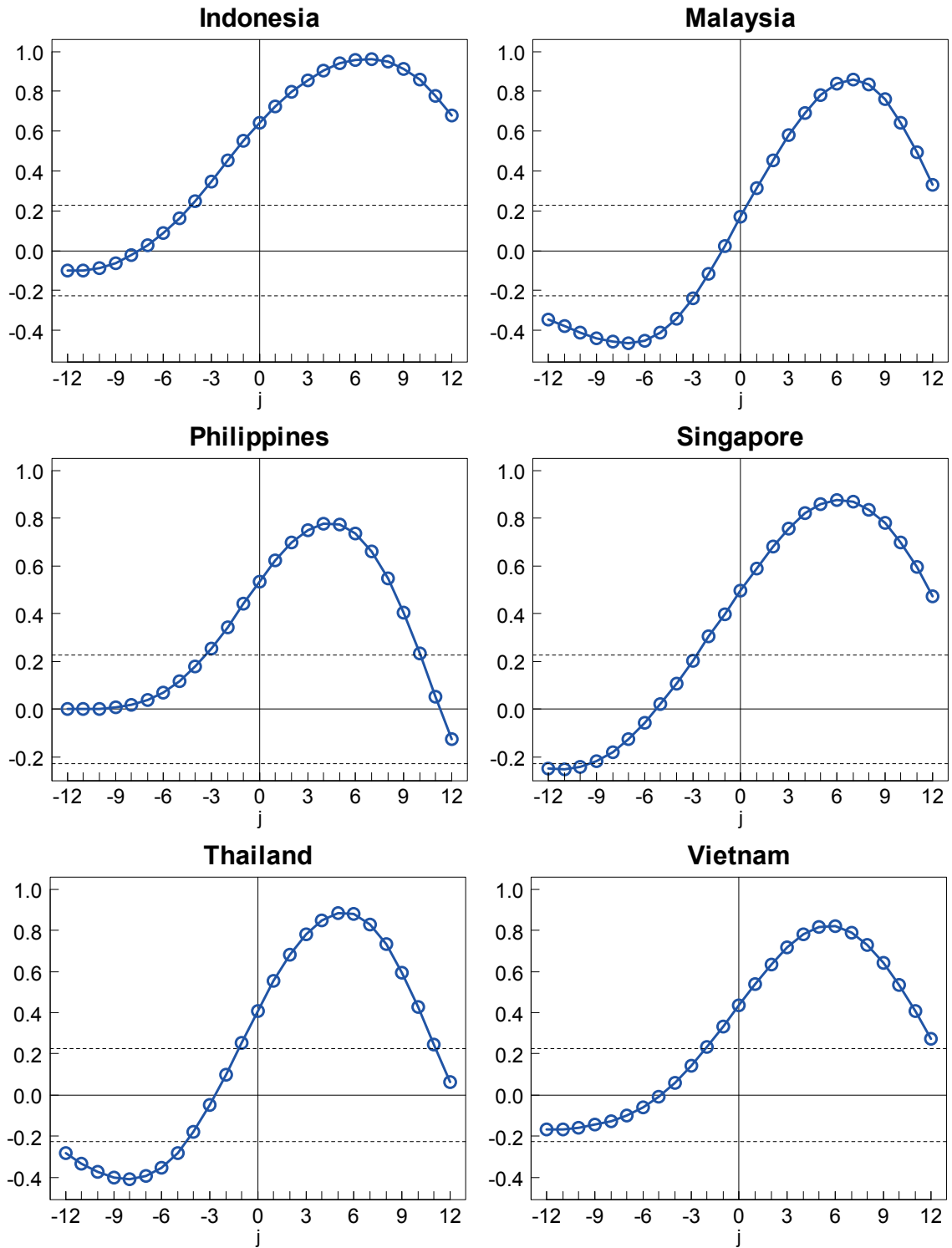


Figure A3

Cross-correlation between expected inflation and actual inflation (cont)



Note: Cross correlation between expected inflation, π_t^e , and realized inflation, π_{t+j} .

Figure A4

Cross-correlation between expected inflation and energy & food price inflation

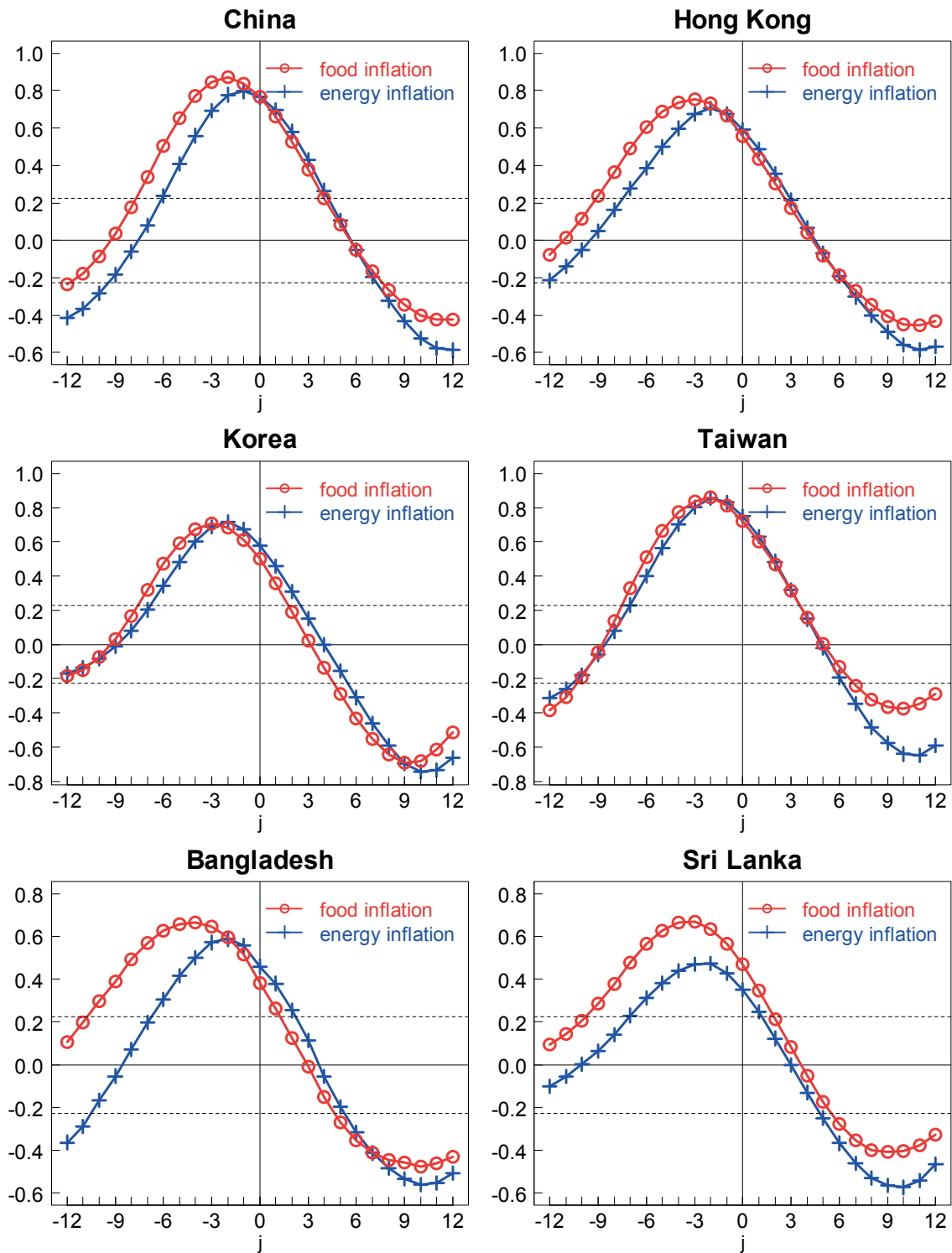
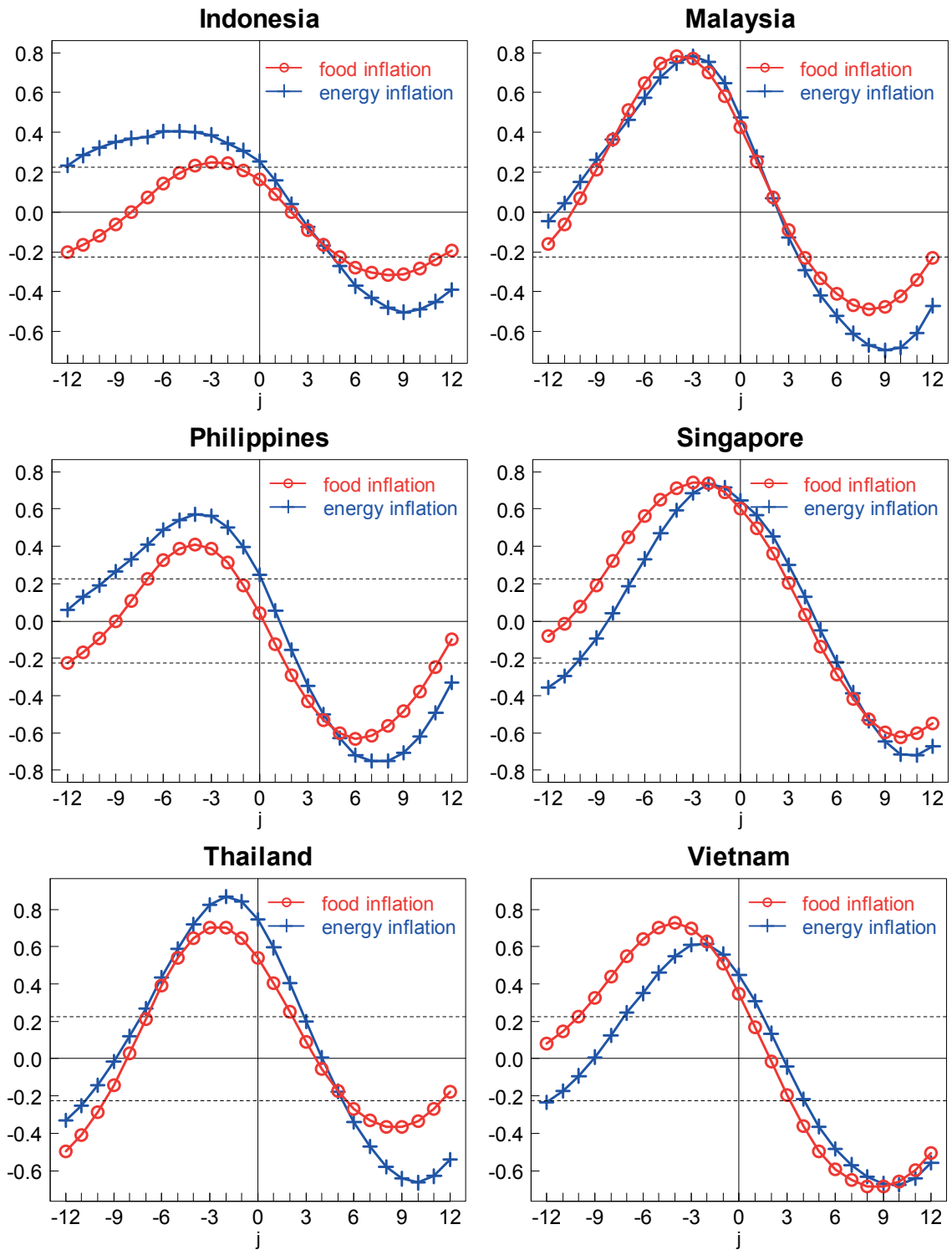


Figure A4

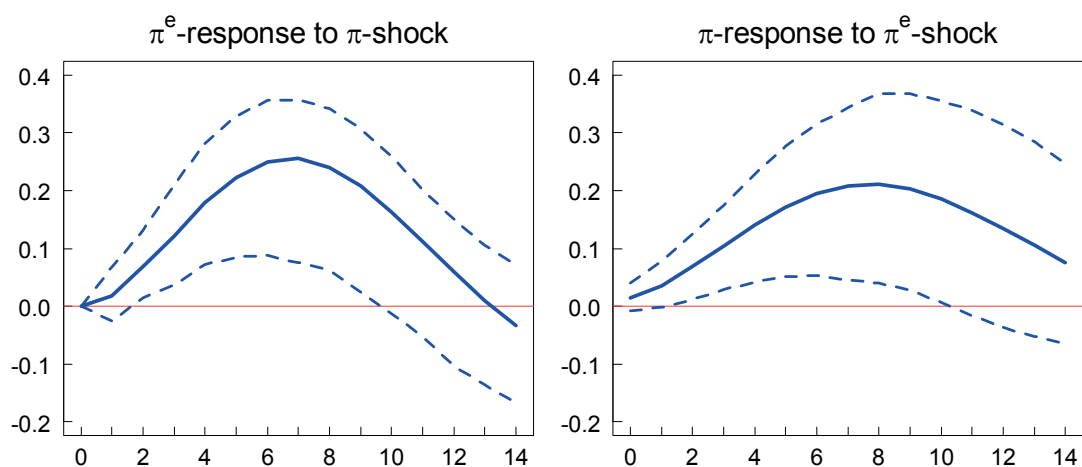
Cross-correlation between expected inflation and energy & food price inflation (cont)



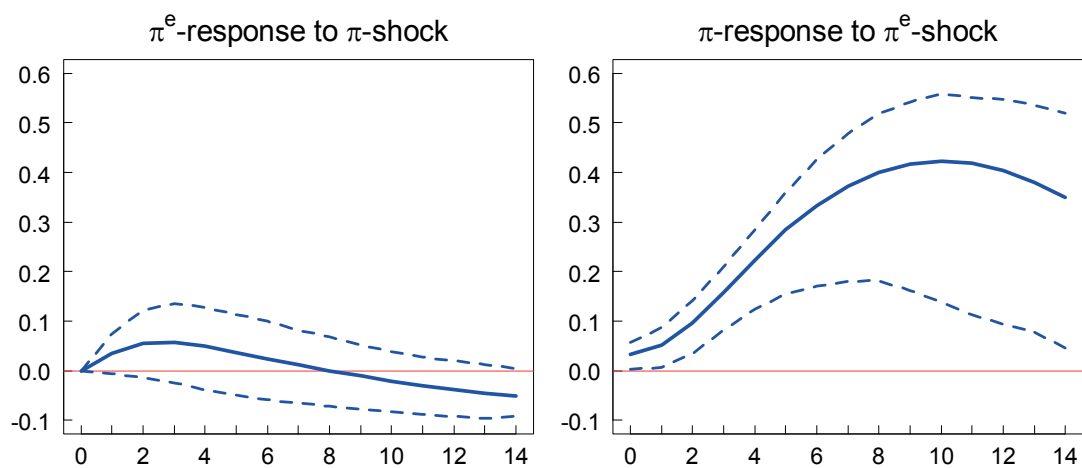
Note: Cross correlation between expected inflation, π_t^e , and food or energy price inflation, π_{t+j} .

Figure A5
Impulse responses

China



Hong Kong



Korea

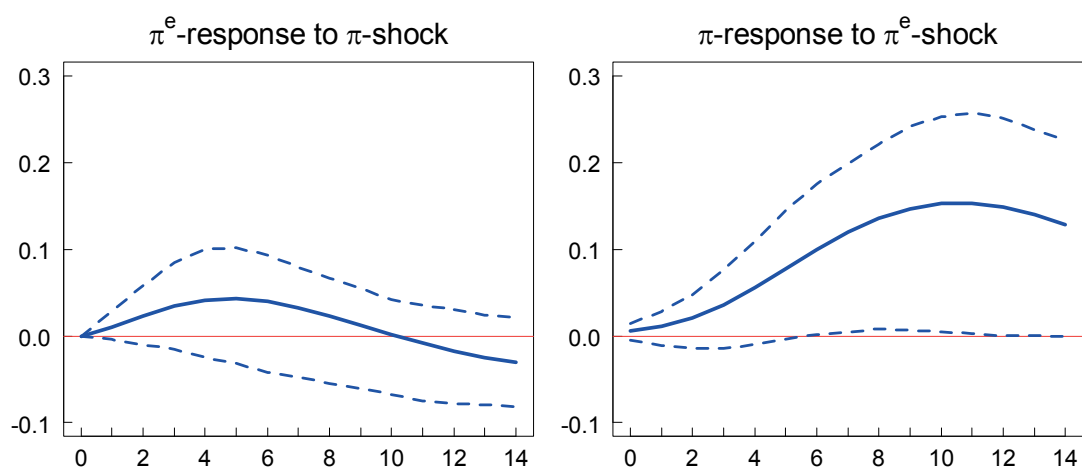
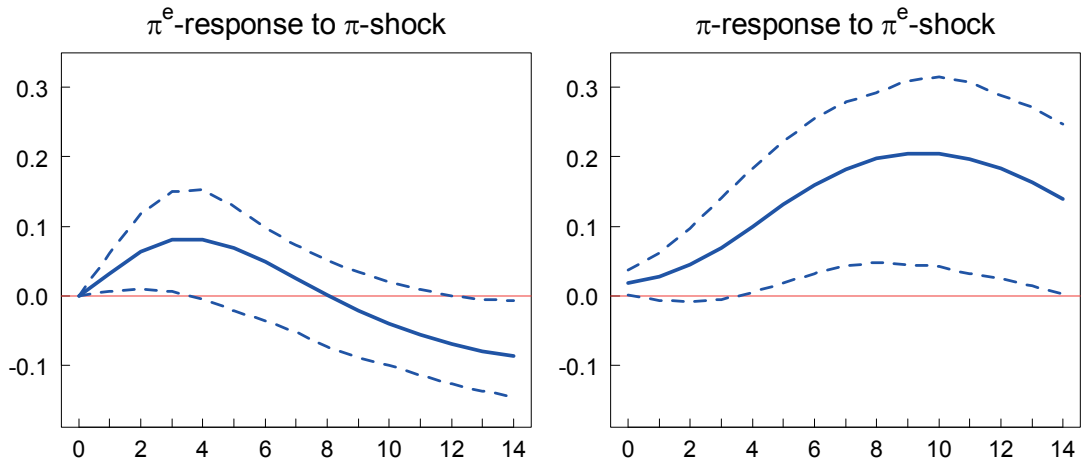
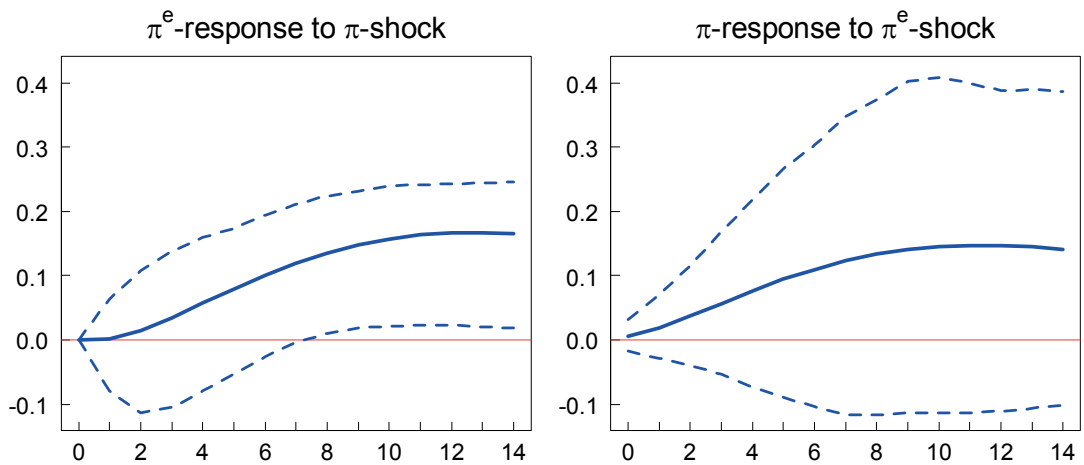


Figure A5
Impulse responses (cont)

Taiwan



India



Bangladesh

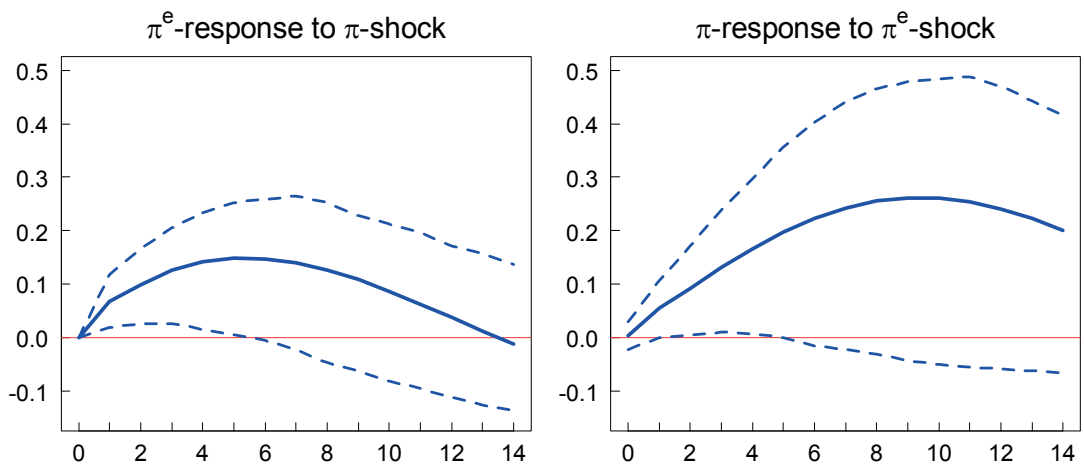
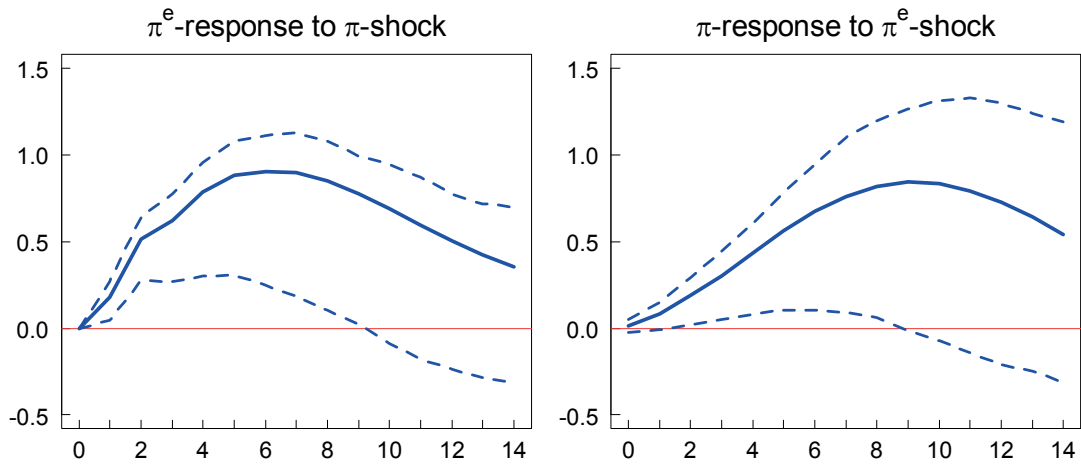
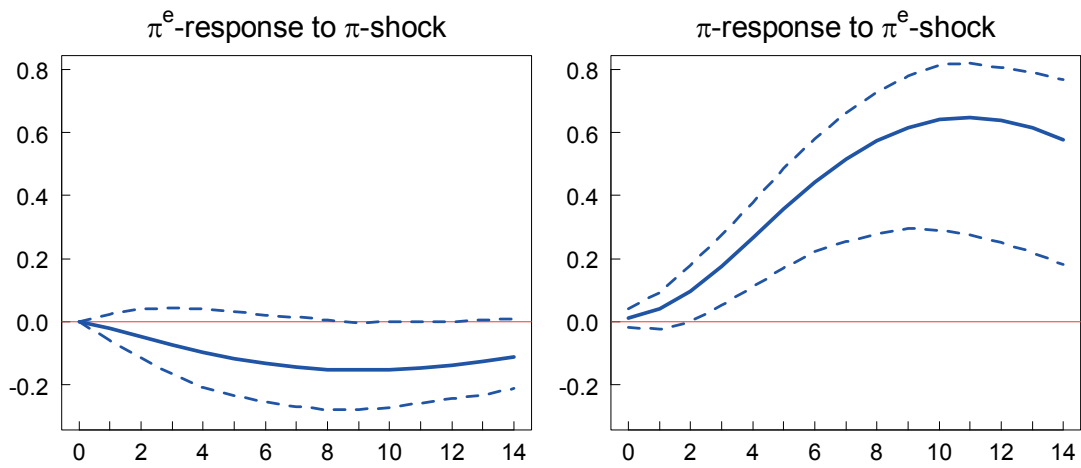


Figure A5
Impulse responses (cont)

Sri Lanka



Indonesia



Malaysia

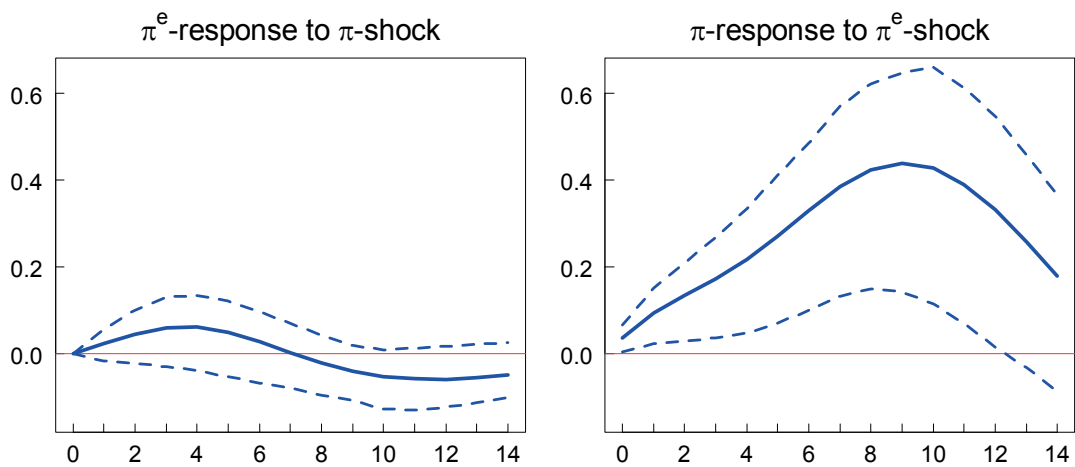
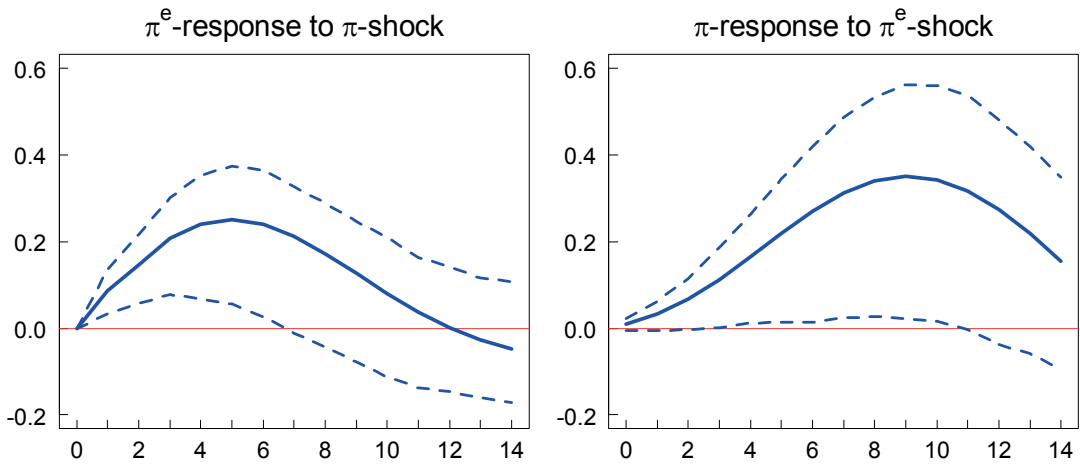
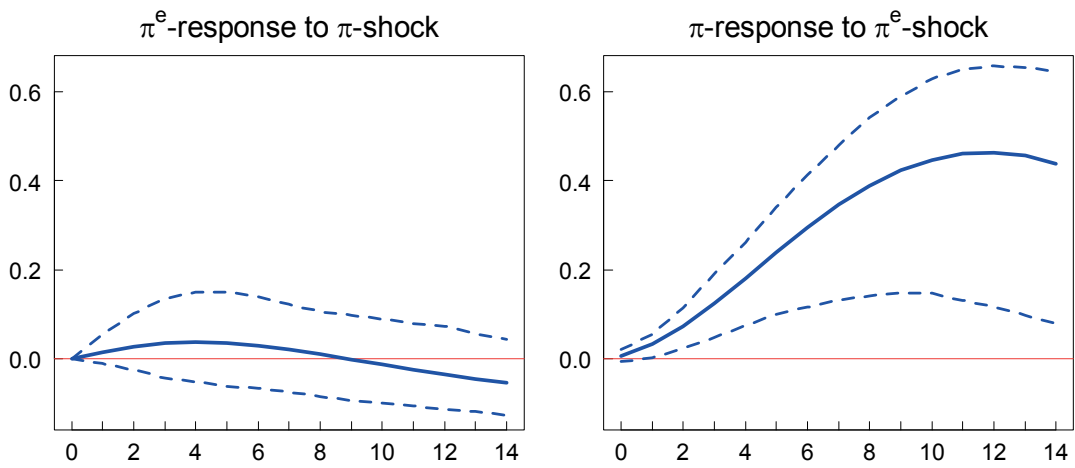


Figure A5
Impulse responses (cont)

Philippines



Singapore



Thailand

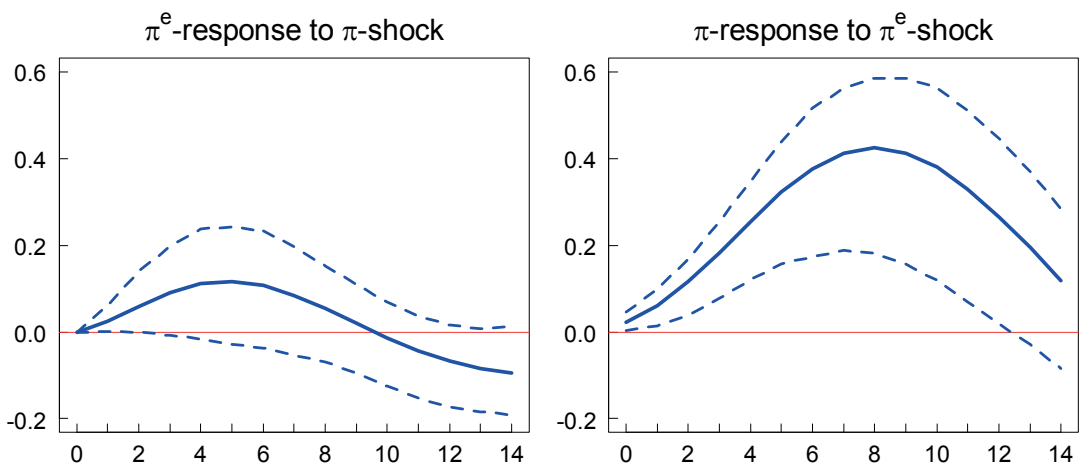
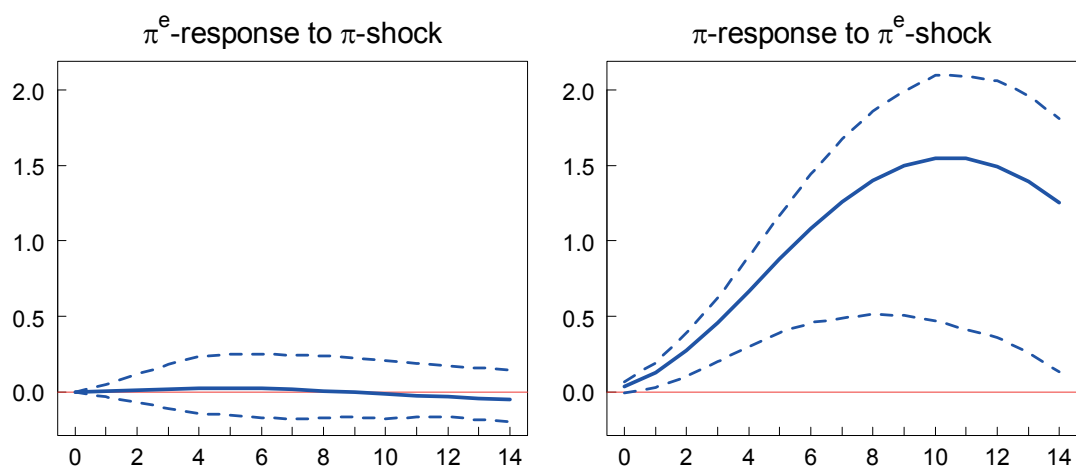


Figure A5
Impulse responses (cont)

Vietnam



Note: The dotted lines represent 95% bootstrap confidence intervals for the orthogonal impulse response function.

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