Comments on "Impact of relative price changes and asymmetric adjustments on aggregate inflation: evidence from the Philippines"

By Renée Fry-McKibbin[1]

1. Overview of the paper

The objective of Basilio and Cacnio's paper is to examine the link between the distribution of relative price (rp) changes and short-run inflation (π) for the Philippines between 1994 and 2019. The authors follow the approach of Ball and Mankiw (1995), who focus on higher-order moments such as skewness in the distribution of relative price shocks and the implications for inflation. The presence of higher-order moments leads to asymmetric price adjustments in response to shocks compared to the case with normally distributed relative price changes. This issue is pertinent when considering the effects of supply shocks, which are likely to affect the distribution of relative prices most. Supply shocks are often a cause of inflation in the Philippines, particularly in the food and oil sectors, and are likely to become more prevalent in the face of climate change. Hence, monetary policy depends on knowing the nature of the shock and how changes in relative prices might affect inflation.

Using disaggregated monthly data for 94 items that make up the CPI, Basilio and Cacnio use the moments of the distribution of the relative price changes to show that the distribution of elements of the CPI data is non-normal. They then calculate an asymmetry index of the distribution of shocks to relative prices. The measure looks at the difference between the mass in the upper and lower tails of the distribution of shocks. It is then used in a regression model of inflation. The authors also perform a simple regression of inflation on the standard deviation and skewness of the distribution of relative prices, oil prices and rice prices. They find that there is a relationship between the distribution of relative price changes and inflation in the short run. Importantly, they find that the tails matter.

2. Comments

The Ball and Mankiw result implies that there are significant implications of the interactions of first, second and third moments of relative price changes and inflation. Presumably, we are also interested in the timing of the changes between skewness in relative prices and the level of inflation. The authors could draw upon the literature on financial market crises and contagion to identify if the relationship changes, and timing of the distribution of relative prices on the inflation rate. This suggests a cokurtosis-based test that could be used to examine changes in the interaction

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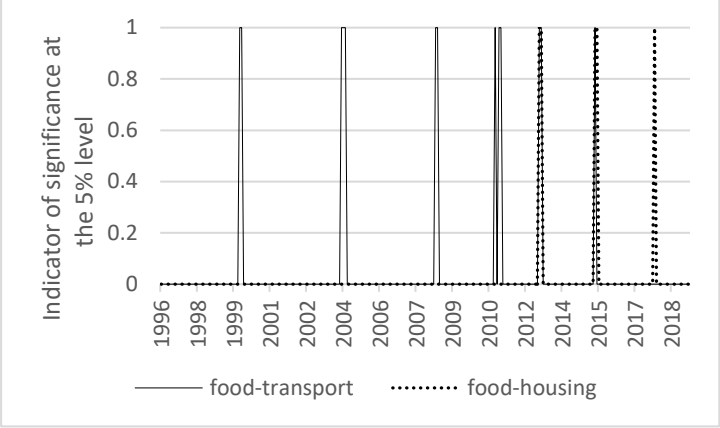
between skewness in the distribution of relative prices and the level of the inflation rate.

This idea was first developed by Forbes and Rigobon (2002), who identify contagion through changes in the correlation of two asset markets. They compare the correlation in a normal period x denoted $\rho_x(rp^1\pi^1)$ with the correlation in a crisis period y denoted $\rho_y(rp^1\pi^1)$ with an adjustment for changes in heteroscedasticity and with a source of the change identified. The asset markets in the Forbes and Rigobon test may be replaced by the relative price and inflation data in the comparison periods and the source of the change in the relationship is relative prices. Fry et al (2010) extended this idea to examine changes in coskewness comparing the joint distribution of the volatility of variable one and the level of variable two in period $x, \varphi_x(rp^2\pi^1)$ and period $y, \varphi_y(rp^2\pi^1)$. The pertinent test in this family of distributions is to examine the change in cokurtosis developed in Fry-McKibbin and Hsiao (2016). In the relative price-inflation context this test could be applied to determine changes in the joint distribution of the skewness of relative prices with the inflation rate across time, where cokurtosis is denoted $\vartheta_x(rp^3\pi^1)$ in the first period and $\vartheta_y(rp^3\pi^1)$ in the second period.

To illustrate the application of these simple tests to the relative price and inflation joint distribution, two indices of relative price changes are calculated using: i) the ratio of food and non-alcoholic beverages to transport (food-transport); and ii) the ratio food and non-alcoholic beverages to housing, water, electricity, gas and other fuels (food-housing). Figure 1 shows an indicator of the significance of the change in the joint distribution of the cokurtosis between the relative price variable and inflation $\vartheta(rp^3\pi^1)$. The tests are conducted using a rolling sample of a window of 30 months in period x and 30 months in period y. The figure shows that significant changes in the relationship between relative prices and inflation are not that common. There are 13 instances where there is a change in the joint distribution between food-transport and inflation, and five instances between food-housing and inflation. The results show that there are only two instances of changes in the joint distribution in the pre-inflation targeting period. These occurred in January and February of 2000. The relationship between skewness in relative prices and inflation is more prevalent in the inflation targeting period.

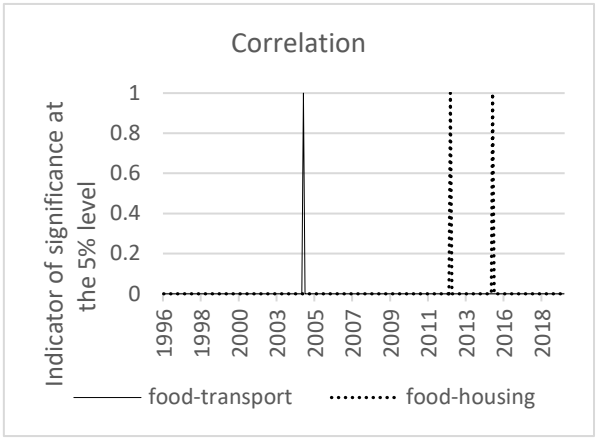
Figure 1



Indicators of the significance of cokurtosis $\vartheta(rp^3\pi^1)$ change tests between relative prices and inflation in the Philippines, January 1994–July 2019. The tests compare $\vartheta_x(rp^3\pi^1)$ and $\varphi_y(rp^3\pi^1)$ over 30-day rolling windows. The relative prices are food prices to transport and food prices to housing.

Figure 2 presents the indicators of significance for the changes in the joint distribution of relative prices to inflation through the correlation and coskewness. The joint distribution based on correlation changes only once for the food-transport case, and twice for the food-housing case. Changes in coskewness only occur three times for the food-transport case, and twice for the food-housing case. The only significant change occurring through coskewness before the inflation targeting period began is in January 2000, corresponding to the change in cokurtosis at this time. There are no changes in correlation before the inflation targeting period. Further work on determining the nature of the shocks that occurred in conjunction with the significant changes would be useful in informing the conduct of monetary policy in response to future shocks. These tests can be modified to be one-sided tests (the current version is a two-sided test), which may further illuminate the relationships between relative prices and inflation joint distributions.

Figure 2



Indicators of the significance of the correlation ρ(〚rp〛^1 π^1) and coskewness ϑ(〚rp〛^3 π^1) change tests between relative prices and inflation in the Philippines, January 1994–July 2019. The tests compare the statistics over 30-day rolling windows. The relative prices are food prices to transport and food prices to housing.

3. Conclusion

Basilio and Cacnio confirm the results of Ball and Mankiw (1995) that asymmetries in relative price movements are significant for inflation by using disaggregated price data for the Philippines. Interestingly, they find that in the inflation targeting period, the frequency of price changes was lower, and the duration between price adjustments was longer than in the pre-inflation targeting period. In comparison, the results of the higher-order comoment change tests show that significant comoment changes occur infrequently in the latter period, and hardly at all during the pre-inflation targeting period. This suggests that less frequent changes in price adjustments are likely to correspond with a change in the relative price-inflation joint distribution.

Basilio and Cacnio could further explore the robustness of the relationship between asymmetry in relative prices and the inflation rate before and after the introduction of inflation targeting in January 2002. In its current form the paper does not distinguish the change in regime, and the models used are estimated over a relatively long time horizon. It would be useful to know whether relative price shocks affect inflation differently in the inflation targeting period compared to the former monetary policy regime. Perhaps this information could be used to improve the responses of monetary policy to shocks in the presence of relative price changes.

References

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