Food, Fuel and Future Price Expectations: China's Inflation Trends from 2016 to Present

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**Abstract**

(1) Q3 2018 ended with an uptick in CPI to 2.5% yoy and a slowing of PPI to 3.6% yoy
(2) This report holds responsible supply-driven food price hikes and fuel price woes, with secondary influences from elasticity expenditure, healthcare spending and tempering inflation expectations
(3) Predictions based in fact, household expectations and econometric analysis forecast CPI easing towards target, core inflation remaining flat and PPI trending down

Keywords: China's Economy, Inflation, Food Inflation, Forecasting Chinese Inflation

1. CPI and PPI Diverging

Since the turn of the millennia, China's inflation displays remarkable cyclical tendency to booms and busts. A shorter 2-year focus window bears witness to CPI-PPI divergence but the spread has closed in recent months owing to an uptick in CPI from its dominant food component and a weakening of PPI attributable to a recent fall of crude prices in a high inventory environment also saddled with sanctions. Although inflation has been muted in the start of 2018, we believe rising food prices hit by both trade tensions and agricultural set-backs from swine flu will stoke a strong rise in CPI but conversely PPI will continue to stagnate.
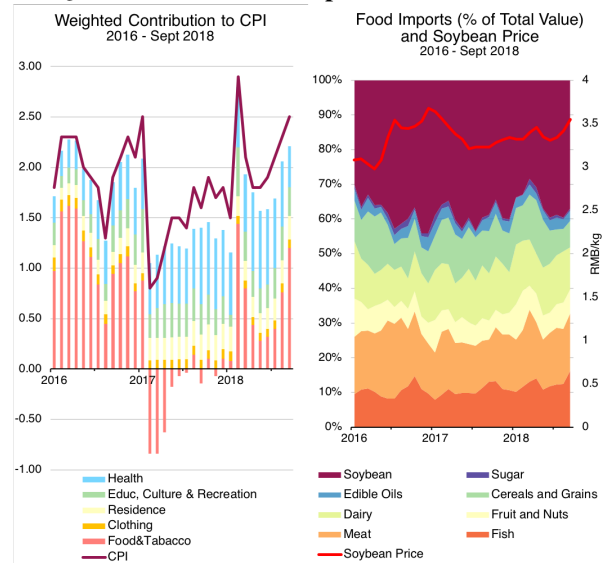
Figure 1: **CPI-PPI Divergence Against Steady Core Inflation**
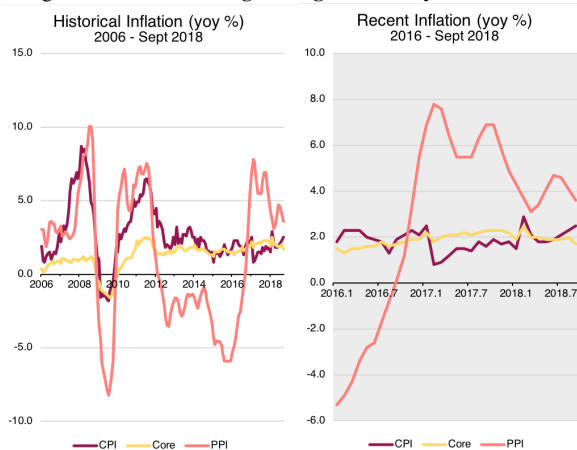
Source: NBS, CEIC

2. CPI Driven by Food

Figure 2: **Domestic and Imported Food Inflation**

Source: NBS, CEIC, Author's Calculations

In repeat of the commonly told story implicating supply-side inflation, recent CPI rises are off-the-back of rising food prices. Domestically, outbreaks of swine flu and an unremittingly wet summer harmed agricultural production forcing up price. Imported food inflation also played a role with heightening trade tensions compromising China's biggest import dependence - soybeans. Paying higher prices for the 8.7 million tonnes[1] imported each month holds a

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[1] Source: General Administration of Customs

powerful transmissions mechanism to the general price level given the significant bias towards the beans in China's basket of food imports (Fig.2). Despite this dependence, China is a market-mover as possessor of 52% of global demand so caution must be exercised in assuming the price for soybeans exogenous. While the full pass-through of trade sanctions remains to be seen, food itself is and always has been a dominant and driving basket item[2].

In a more unusual narrative, demand-side influence require note. Estimation using Chinese household-level data indicates positive expenditure elasticity for major foodstuffs (especially meat and dairy) as shown in Table 1. Positive associativity between rising consumption expenditure and stronger food demand thus drives the trending upwards of aggregate CPI.

Another important contributor to the current basket is health expenditures. Healthcare inflationary strength in recent years can be attributed to increased demand for medical services by reason of older and richer populations, an unabated trend for the future (World Bank et al, 2016).

Table 1: **Global Comparison of Expenditure Elasticities**

	Cereals	Meat	Fish	Dairy	Fruit/Veg
Canada	0.15	0.3	0.33	0.32	0.24
France	0.16	0.35	0.39	0.38	0.28
Hong Kong	0.14	0.27	0.3	0.29	0.21
Japan	0.16	0.31	0.33	0.18	0.25
UK	0.17	0.35	0.39	0.38	0.28
US	0.05	0.11	0.12	0.12	0.09
Russia	0.11	0.82			
China	0.1	**1.15**	0.42	**1.12**	0.47

Source: USDA, Zhang and Law (2010), OECD

3. PPI Driven by Fuel

Recent buoyant trends in PPI can be attributed to rising industrial import price. However, the inflationary fillip appears to be easing with recent falls in crude from high expected inventories and geo-political sanctions. A Chinese economy entering into decline brings with it stagnating investment and consumption. Greater

uncertainty of the trajectory ahead is a further stalling clout.

The cooling in producer inflation is expected to continue as softer demand damages industrial profitability and trade sanctions begin to bite. The weighting of PPI[3] demonstrates an appurtenant contingency on fuel and energy items.

Figure 3: **PPI Trending Downwards with Reversal Expected in Import Prices**
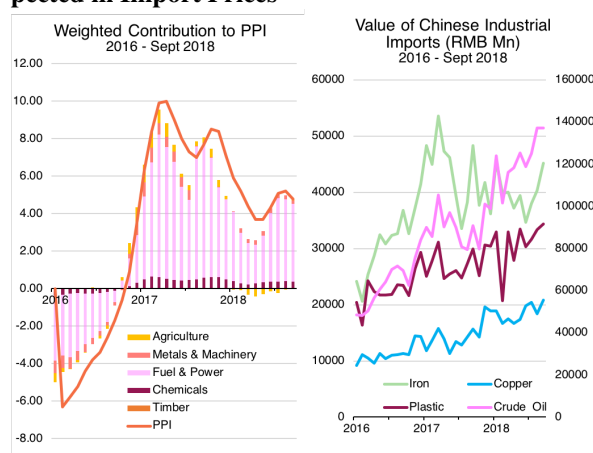
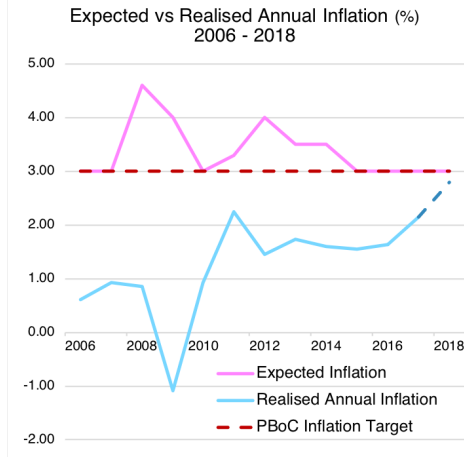Source: NBS, General Administration of Customs, Author's Calculations

4. Future Expectations and Forecasts

An investigation into inflation expectations from annual data[4] confirms the discourse of increasing stabilisation of household inflation expectations, reaffirming the positive influence of better monetary policy on inflation dynamics. A continuation of the aforementioned rising trend in CPI combined with stabilised, anchored expectations suggests inflation is target-bound to the PBoC mandate of 3%. Inflation expectations augment the decisions of agents in the economy through on-the-line investment decisions and the anticipated value of savings versus spending when faced with an inflationary tax or deflationary bonus. Given expectations somewhat lead realisations through this internalised propagation mechanism, an approach towards 3% inflation is expected.

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[2]Index weights are not freely available from the NBS. A weighted index of contribution of each category to CPI total was estimated by the Author following the methodology proposed on the NBS statistical handbook.

[3]Same methodology applied by the author as CPI weighting calculations

[4]Source: People's Bank of China

Figure 4: **Stabilising Expected and Target-Bound Realised Inflation**

Source: NBS, General Administration of Customs

Such fact-based forecasts of China's inflation trajectory can be supported by econometric projection[5] By applying AR time-series models to both CPI and PPI series, a fanchart forecast is provided, painting a more concrete confirmation of an uptick in CPI, disparate from a projected slowdown in PPI. Considerable confidence intervals hint at the volatility of these two series and the predicted trajectory should be taken at best as a mean optimised forecast.
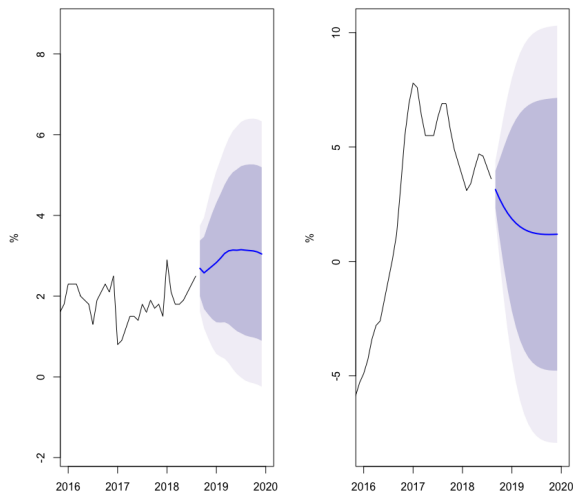
Source: NBS, Author's Calculations

Figure 5: **Fanchart Forecasts of Inflation to 2020**

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[5]ADF tests conducted on both lagged series. H_0 of non-stationarity rejected in both cases implying the system can be modelled as an $AR(p)$ process. P-values, Dickey-Fuller value, ACF, PACF and residual plots avaliable from author upon request.

5. Concluding Remarks

The divergence appears set to continue, reliant specifically on food price hikes and fuel price woes. More generally, the imminent slowdown in Chinese growth casts a shadow of uncertainty in the near-future demand environment but current predictions see CPI easing towards target, core inflation remaining flat and PPI trending down, bearing the brunt of tempering industrial production.

6. Appendix

An autoregression (AR) model represents a stochastic time-varying process. It specifies the output variable (GDP deflator) depends on previous values and a random error component. The $AR(p)$ model is specified as:

$$\textbf{AR(p):} \ X_t = \alpha + \sum_{i=1}^{p} \beta_i X_{t-i} + \varepsilon_t \tag{1}$$

In essence, the current value of X is compried of a constant (α), previous values of X multiplied by the estimated parameters of the model (β) plus a white noise normally distributed error term ε.

7. References

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