

INFLATION IN CHINA INCREASINGLY DRIVEN BY DOMESTIC FACTORS

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The article investigates the determinants of consumer price inflation in China. While inflation has been entirely driven by international factors, such as food and energy prices, in the period preceding the financial crisis, domestic drivers like monetary developments and nominal wages have become increasingly important since then. Due to tight trade linkages and the presence of Chinese firms in international production chains, the changing pattern is also relevant to other countries.

Keywords: Chinese inflation; domestic and foreign factors; money demand

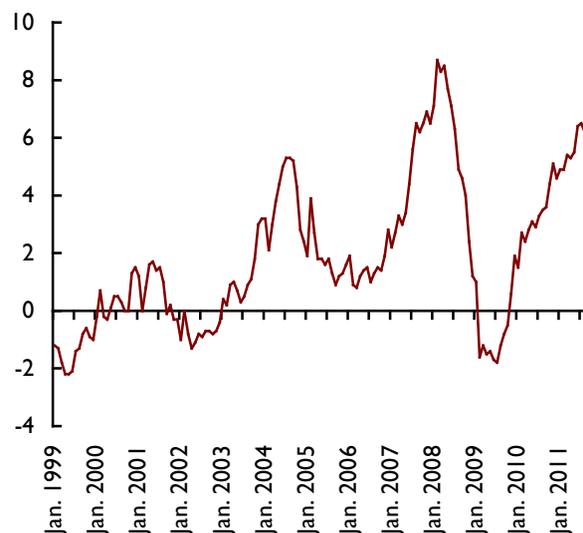
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I. Introduction

Despite the inflation slowdown observed in recent months, the determinants of consumer prices in China are of high economic relevance. Rising prices reduce the purchasing power of Chinese households and can trigger lower consumption expenditures. Therefore, they pose a risk to the successful transformation of the Chinese economy, where growth should be driven by domestic demand to a higher extent. Since poor families have to spend up to half of their income on food, increasing prices in this segment can raise the risk of social unrest. On the one hand, inflation is attributed to developments in the world economy (Research Group of China's Growth and Macroeconomic Stability, 2008); prices for food, energy and raw materials are primarily formed on international markets.¹ With a slowdown of world demand, lower inflation is transmitted without any further intervention by the Chinese government. On the other hand, however, the conclusions are quite different if inflation is heavily linked to domestic factors. Increases in liquidity and real wages beyond their fundamental values can drive inflation. Due to trade linkages and the presence of Chinese firms in international production chains, a change in the inflation drivers can trigger global consequences (Dreger and Zhang, 2011). The analysis presented here explores the determinants in the inflation process, where international and domestic drivers are distinguished. The results point to a rising weight of domestic variables to explain inflation.

In the year following the financial crisis, inflation accelerated to rates of more than 6 per cent. Former record levels from the run-up to the financial crisis were

Figure 1. Consumer price inflation in China

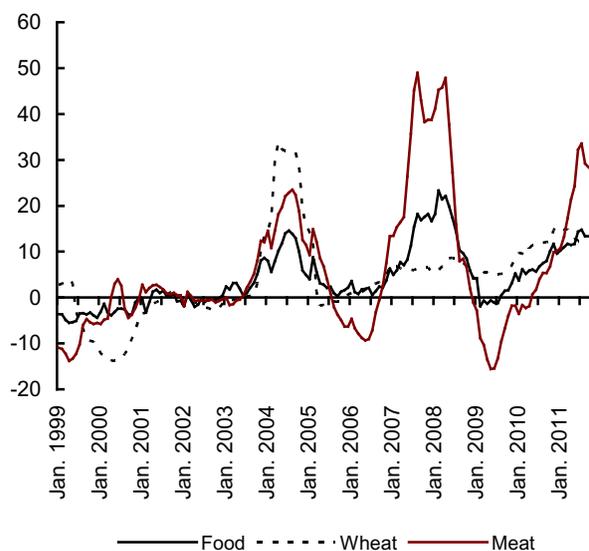


Source: Wind Datafeed Service.

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Figure 1. Food inflation in China



Source: Wind Datafeed Service.

almost hit again (figure 1). With rates of 14 per cent, food became increasingly expensive. As food receives a weight exceeding 30 per cent in the consumer basket, price trends in this area are highly relevant for overall inflation. Meat prices have been 30 per cent higher compared with the previous year, while prices of pork increased by 45 per cent (figure 2). This evolution reflects changes in the consumer habits of a growing Chinese middle class, but also an epidemic disease in 2007, which caused shortages in supply. Prices for goods such as clothing, telecommunications, leisure and education increased, but at a slower pace.

The government implemented restrictive measures to prevent an overheating of the economy due to accelerating demand. This can be studied in the car market, which has expanded at a slower pace. The earlier development was fostered by tax reliefs and subsidies, which have not been renewed. In addition, the registration of new cars has been limited to improve traffic conditions in huge cities. Furthermore, the People's Bank of China increased official interest rates, leading to higher credit costs. The minimum reserves of banks were raised to take excess liquidity from the economy. These measures have taken effect gradually so inflation has started to decline. At the same time, the slower expansion of global demand led to weaker price pressure on food, energy and raw materials. In recent years, however, the weight of domestic factors for inflation might have become larger

(Zhong, 2011). Liquidity (M2) expanded massively to avoid a slowdown of the economy in the financial crisis. Nominal wages increased at annual rates of about 15 per cent.

The rest of the paper is structured as follows. In the next section (section 2), the fundamental path of the development of potential domestic inflation drivers is defined, and liquidity and production costs are considered. Section 3 presents the inflation equation and documents the higher relevance of domestic variables in the inflation process in recent years. Finally, section 4 concludes.

2. Monetary and wage developments

National factors are proxied by liquidity growth and the development of costs, in particular wages. While oil and food prices directly affect consumer prices, monetary and wage developments have an impact on inflation only if they exceed their fundamental values. For example, higher real incomes or declining opportunity costs of holding money generate a higher money demand. This does not increase inflation, as it is in line with fundamental macroeconomic development. Furthermore, real wages can increase in line with productivity, without any additional inflationary pressures. Therefore, the empirical strategy is first to determine the balanced path of money supply and real wages. Second, the differences to the observed series serve as a measure of the excess development in the respective variables that might have inflationary effects.

Fundamental development of monetary aggregates

The fundamental evolution of money stocks is determined in the context of money demand. According to standard specifications, the demand for real money balances is based on real income, which can be seen as a proxy for the transaction volume in an economy and the opportunity cost of money holdings, which might include nominal interest rates and annualised inflation (Ericsson, 1998).

Higher income raises the demand for liquidity to handle a larger transaction volume. In contrast, money demand will decline in response to higher opportunity costs, as money holdings become more expensive relative to real and financial assets. The inflation rate is focused on the substitution between money and goods. However, the variable serves also as a correction factor. Due to the inclusion of inflation, the imputed homogeneity between nominal money supply and prices can be relaxed in the short run (Dreger and Wolters, 2010). Therefore, the interpretation of its coefficient is no longer unique.

Table 1. Money demand behaviour

$$(m - p)_t = 5.303 + 1.125y_t - 0.293i_t + 0.392\pi_t$$

(0.094) (0.019) (0.040) (0.182)

Note: Sample period 2002Q1–2010Q4. Seasonally adjusted quarterly data from Datastream. Monetary aggregate M2 (m), consumer price index (p) real income (y), short-term nominal interest rate (i), inflation rate (π). Series are in logs with the exception of the nominal interest rate and the rate of inflation, the latter proxied by the annualised first difference of consumer prices. Standard errors are shown in parentheses below the coefficients.

The empirical results underline that a standard money demand function for China can be justified (table 1). The income elasticity of money demand is close to unity, implying that there is no money illusion. Both semi-elasticities of money with respect to the nominal interest rate and the inflation rate are negative and of similar magnitude to the industrial countries.² The deviations from the relationship are mean reverting, as can be shown by unit root tests. Thus, the equation can be interpreted as a long-term relationship between real money balances and their macroeconomic determinants, where the sign and size of the coefficients are in line with economic arguments. In the analysis of inflation drivers, the residuals are used as measures of excess liquidity.

Fundamental development of real wages

If real wages and productivity move in parallel, the income distribution between wages and profits remains unchanged, and no additional upward pressure on prices is generated. But a rise in real wages beyond productivity growth can trigger higher inflation. It should be noted, however, that higher real wages are quite desirable for the government, as they can help facilitate the intended transformation of the economy. According to the new five-year plan, domestic demand should play a more prominent role for Chinese growth. Hence, faster growing wages might be a precondition for higher consumption.

Table 2. Real wages and productivity

$$(w - p)_t = 11.40 + 1.060(y - l)_t$$

(0.078) (0.019)

Note: Sample period 2002Q1–2010Q4. Seasonally adjusted quarterly data from Datastream. Nominal wages (w), consumer price index (p) real income (y), employment (l). Series are in logs. Standard errors in are shown in parentheses below the coefficients.

By the same argument, minimum wages increased in many regions, for example in Shanghai by 15 per cent (China Daily: “New wave of minimum wages hike in China”, July 3, 2010). These measures should also help to counteract social unrest.

A regression of real wages on labour productivity reveals a productivity coefficient slightly above unity, i.e. real wages have risen more than productivity (table 2). Again, the equation can be seen as a cointegrating relationship, as the deviations are stationary. They can be exploited to investigate the inflationary development.

3. Domestic and foreign drivers of inflation

Once the international and national determinants of the development of consumer prices are known, they can be used in a regression model to explain the inflation process. International price developments are captured by the price of oil per barrel (Brent) and food prices. National drivers include excessive liquidity and excessive real wages, both defined as deviations from their fundamental path.

Table 3. Drivers of inflation

A. Sample period 2002–10

$$\pi_t = 0.003 + 0.012 \Delta oil_t + 0.127 \Delta meat_t$$

(0.001) (0.004) (0.015)

$$+ 0.065 dm_{t-3} + 0.080 dw_{t-3} + 0.198 \pi_{t-1}$$

(0.027) (0.024) (0.095)

$$R^2 = 0.802, \quad Q(1) = 0.976, \quad Q(4) = 9.506,$$

(0.323) (0.051)

$$ARCH(1) = 0.149, \quad JB = 0.775$$

(0.703) (0.679)

B. Sample period 2002–8

$$\pi_t = 0.002 + 0.015 \Delta oil_t + 0.129 \Delta meat_t$$

(0.001) (0.008) (0.017)

$$+ 0.035 dm_{t-3} + 0.029 dw_{t-2} + 0.229 \pi_{t-1}$$

(0.042) (0.068) (0.124)

$$R^2 = 0.773, \quad Q(1) = 0.692, \quad Q(4) = 7.834,$$

(0.406) (0.098)

$$ARCH(1) = 0.611, \quad JB = 0.596$$

(0.443) (0.742)

Note: Inflation rate (π), oil prices (oil), meat prices ($meat$), excess liquidity (dm) and wages (dw). All series are measured in logs. Δ denotes the first difference operator. R^2 is the coefficient of determination. Q test for autocorrelation, $ARCH$ test for heteroscedasticity and Jarque-Bera (JB) test for normally distributed residuals. The corresponding lag length is shown in parentheses after the respective test statistics. Values in brackets following the regression coefficients refer to standard errors, after the test statistics to the p values.

The estimates are consistent with theoretical reasoning. Rising oil and food prices put higher inflation pressure on consumer prices. Furthermore, domestic factors are relevant to explain the inflation experience. This holds for excessive liquidity as well as for excessive real wages. The usual specification tests do not detect any particular problems with the inflation equation. The residuals are neither autocorrelated nor heteroscedastic and display no significant deviations from the normal distribution.

The relevance of domestic variables is new and can represent a gradual change in the drivers of inflation. To provide evidence on this issue, the regression is carried out in a subsample period that ends just before the financial crisis. While the influence of international factors remains unchanged, the national variables are no longer significant. Their importance has grown just in the recent years of the sample.

4. Conclusion

The article investigates the determinants of consumer price inflation in China. While inflation has been entirely driven by international factors, such as food and energy prices, in the period preceding the financial crisis, domestic drivers like monetary developments and nominal wages have become increasingly important since then. Due to foreign trade linkages and the presence of Chinese firms in international production chains, the changing pattern is also relevant to other countries.

NOTES

- 1 Chinese demand for food and energy also affects global prices. Structural effects are also relevant, as production in China is more energy-intensive than in Western Europe.
- 2 This finding suggests that Chinese data are quite reliable. The same impression applies to other relationships such as consumer and investment demand. See Chow (2006, 2010).

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