

Economics Group

Special Commentary

Jay H. Bryson, Global Economist
jay.bryson@wellsfargo.com • 1-704-383-3518
Azhar Iqbal, Econometrician
azhar.iqbal@wellsfargo.com • 1-704-383-6805

Does China Have an Inflation Problem?

Executive Summary

Inflation has risen this year in China. Not only have food prices shot up sharply, but non-food price inflation has also increased this year. Chinese authorities have tightened macroeconomic policies, and some analysts worry that overly aggressive tightening could lead to a sharp slowdown in the Chinese economy that could have global ramifications. Should we be worried about the inflation outlook in China?

Weather-induced supply shortages have contributed to the sharp rise in food prices, and the increase in non-food price inflation in China over the past year is due largely to the residence component of the consumer price index. On both counts there is some good news to report. Food prices are off their recent highs, and increases in property prices are slowing. Therefore, the overall rate of CPI inflation in China should begin to stabilize, which would reduce the likelihood of a sharp slowdown in economic growth caused by an overly aggressive policy response.

Another reason to be cautiously optimistic about the Chinese inflation outlook is that wage-price spirals have not taken hold in the country over the past two decades. Strong productivity growth has helped Chinese producers to keep unit labor costs in line. That said, the inflation dynamics in China could change, and we will be keeping a close eye on incoming inflation data.

Is the Chinese Economy Starting to Overheat?

The overall rate of CPI inflation in China is running close to 5 percent at present (Figure 1). About half of the increase in the overall rate of Chinese CPI inflation over the past year or so can be traced to sharp increases in food prices that reflect, at least in part, temporary supply shortages caused by adverse weather conditions. Although Chinese policymakers have tightened monetary policy over the past year—the year-over-year rate of loan growth has slowed from 30 percent at the beginning of 2010 to roughly 15 percent or so presently—they could justify no further tightening measures if the rise in the overall CPI inflation rate was caused largely by temporary food shortages over which they have little power to rectify.

Although non-food price inflation is rather benign at present, at least relative to the marked increases in the overall rate of CPI inflation, it has trended higher in recent months. If inflation is becoming more widely entrenched in China, policymakers could react by tightening policies significantly. In a worse-case scenario, an overly aggressive policy response could lead to a sharp slowdown in China that could potentially have global ramifications. What are the sources of Chinese inflation, and will prices accelerate further? Is the boom in China about to give way to a policy-induced bust? We attempt to answer these questions in this report.

Is the boom in China about to give way to a policy-induced bust?

Little Direct “Causation” Between Food and Non-Food Prices

Although food price inflation in China is not as elevated as it was in 2008, overall food prices have risen at a double-digit pace over the past 12 months. Pork prices are up almost 20 percent since this time last year, and prices of fresh food have soared about 30 percent over that period. With food accounting for 30 percent of the Chinese consumer price index, it is little wonder that the

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overall rate of CPI inflation has risen markedly in recent months. Indeed, there is a fairly tight correlation between food price inflation and the overall rate of CPI inflation in China (Figure 2).

Figure 1

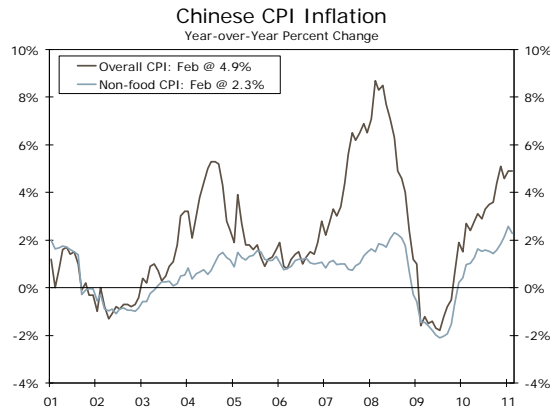
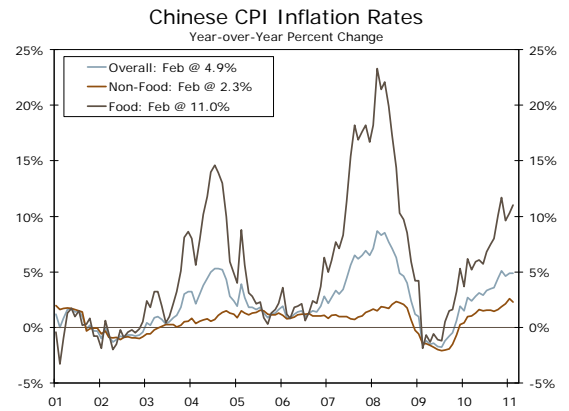


Figure 2



Source: CEIC and Wells Fargo Securities, LLC

Could an explosive wage-price spiral could take hold in China?

The recent increase in Chinese inflation does not appear to be limited to food only. Consumer prices excluding food were up 2.6 percent in January, the fastest year-over-year inflation rate in at least 10 years. Although the rate of non-food price inflation edged back a bit in February, it remains elevated relative to the experience of the last few years. Wage growth has already picked up and the increase in food price inflation could cause Chinese workers to demand even higher wages, thereby leading to acceleration in non-food prices and ultimately higher overall CPI inflation (Figure 3). In other words, there is a risk that an explosive wage-price spiral could take hold in China.

Figure 3

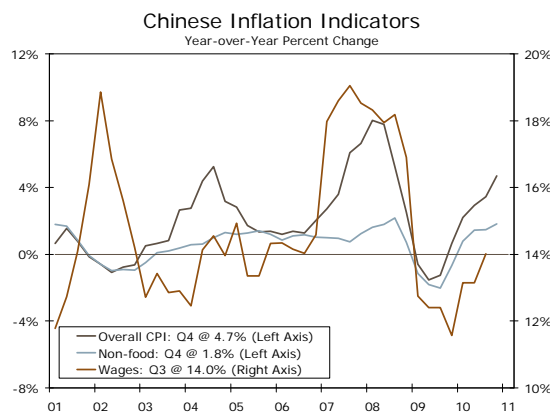
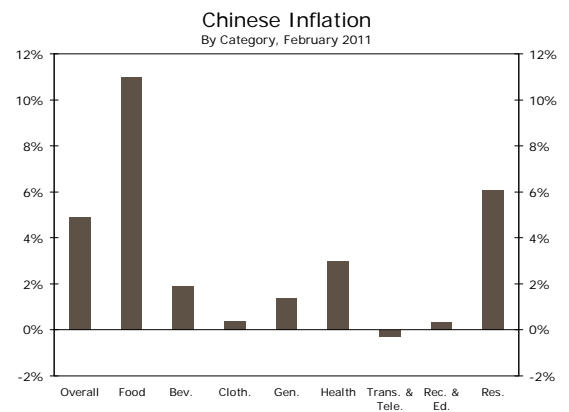


Figure 4



Source: CEIC and Wells Fargo Securities, LLC

The apparent correlations between food price inflation, non-food price inflation and wages that are shown in Figures 2 and 3 are suggestive, but are they conclusive? Have past surges in food prices, notably, those in 2003-2004 and again in 2007-2008, caused other prices in China to rise as well? Have wages accelerated in the past in response to higher inflation? We formally investigated these questions via conventional statistical analysis, and we refer interested readers to the appendix for the empirical results.

For those readers who are not so empirically inclined, the bottom line from our statistical analysis is that food price inflation tends to lead non-food price inflation in China¹. That is, past spikes in food prices have been associated, with a lag, with rising non-food price inflation. However, the increase in non-food price inflation that has occurred in recent months is not very broad-based, at least not yet. There is only one major category of non-food expenditure in China—residence—where the year-over-year rate of inflation is north of 5 percent at present (Figure 4). Outside of food and residence, year-over-year inflation rates for the other major categories of goods are 3 percent or lower at present. In addition, modest increases in non-food price inflation that occurred during prior food price spikes in 2003-2004 and again in 2007-2008 were caused largely by acceleration in the residence component of the CPI.

The increase in non-food price inflation that has occurred in recent months is not very broad-based, at least not yet.

Is there a direct link between the food price spike of the past year and the acceleration in the residence component of the CPI that occurred over that period? Food prices have increased at a double-digit pace due, at least in part, to a series of weather-related events that have destroyed crops and caused supply shortages. Not only have food prices increased significantly in China, but they have done so in other economies as well. However, food is obviously not a primary input into residence services, so there is very little direct pass-through from food to residence prices. The 6.1 percent increase in the residence component of the Chinese CPI that has occurred over the past year is largely independent of the surge in food prices. Rather, the rise in the residence component of the CPI reflects significant increases in Chinese house prices recently.²

Therefore, it does not appear that acceleration in food prices are directly “causing” non-food price inflation to increase. The two series are largely independent. To the extent that accommodative monetary conditions in China have inflated housing prices and contributed to the rise in Chinese food prices, then the coincident increase in the rates of food price and non-food price inflation may be somewhat related. However, there appears to be little direct causation between food prices and other consumer prices in China.

Some Good News on the Inflation Front

The good news is that many food prices have stopped rising, at least for now. Corn and rice prices are down about 10 percent from their recent highs a month ago, and wheat prices have dropped nearly 20 percent over that period. Of course, food prices could surge anew in the months ahead. However, the recent decline in food prices should help to keep a lid on the overall CPI inflation rate in China over the next few months.

Residence accounts for 25 percent of the non-food components of the Chinese CPI, so the outlook for non-food price inflation will depend, at least in part, on the dynamics of the residence component of the CPI. The issue of whether there is a house price bubble in China is beyond the scope of this report. However, from the standpoint of non-food price inflation in China, there could be some good news in the pipeline. Chinese authorities have become concerned about the sharp increase in house prices, and they have instructed banks to rein in the pace of loan growth.

The steps appear to be working. Although mortgage loans are up 30 percent relative to a year ago, the pace of growth has slowed noticeably in recent quarters (Figure 5). On a sequential basis, mortgage loans rose at an annualized rate of 16 percent in the fourth quarter, the slowest growth rate in two years. In the last cycle, the slowdown in mortgage loans was eventually followed by a significant decline in the rate of residence inflation. In addition, land prices for residential housing have decelerated recently (Figure 6). Therefore, it seems reasonable that residence price inflation may start to ease off somewhat.

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¹ Formally, we found that food price inflation “Granger causes” non-food price inflation in China. See the appendix for further discussion of Granger causality.

² Some readers may rightfully argue that 6 percent vastly understates the rise in the price of Chinese housing over the past year. However, most consumers do not incur the full cost of a new residence on an ongoing basis. Rather, the residence component of the CPI measures the increase in the price of the services that are derived from the residence. In accounting terms, the residence component of the CPI would be comparable to the depreciation incurred from the purchase of a fixed asset.

Figure 5

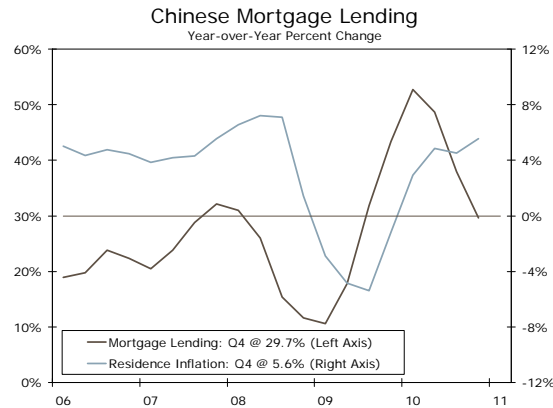


Figure 6



Source: CEIC and Wells Fargo Securities, LLC

Wage-price spirals have not developed in China, at least not in the past.

Could Wage Inflation Lead to Higher CPI Inflation?

Could the recent increase in non-food price inflation cause wages to accelerate and, thereby, push up non-food price inflation even further? The empirical analysis in the appendix shows that there is some evidence, albeit not very strong, to suggest that non-food price inflation leads to acceleration in wages. Although wages could accelerate—Figure 3 shows that wage growth has picked up a bit in recent quarters—the empirical analysis also shows that wage acceleration has not historically fed back into higher non-food price inflation. That is, wage-price spirals have not developed in China, at least not in the past. Why not? What feature of the Chinese economy explains this apparent de-linkage between wage inflation and non-food price inflation?

The answer seems to be that strong growth in productivity has helped to offset double-digit wage growth that Chinese workers have enjoyed over the past decade. Although economy-wide productivity data for China are not readily available, our back-of-the-envelope calculations show that productivity growth has been very strong in the industrial sector (Figure 7). Therefore, Chinese producers have been able to keep unit labor costs in line, which has blunted inflationary pressures at the consumer level.

Indeed, increases in non-food prices over the past decade have been concentrated in residence prices (Figure 8). The categories of clothing, which currently has a weight of 8.6 percent in the overall CPI, household articles (5.6 percent weight) and transport and telecom (10.4 percent weight) have all experienced mild deflation over the past decade. And the other non-food categories outside of residence have registered annual inflation rates of only 1 percent or so over that period.

Conclusion

The overall rate of CPI inflation in China has risen from 1.5 percent at the beginning of 2010 to roughly 5 percent at present. Although sharp increases in food prices over the past year explain much of the increase in the overall CPI inflation rate, non-food price inflation has risen as well. Some analysts fret that the recent increase in food price inflation could lead to further acceleration in non-food prices that could provoke an aggressive policy tightening by Chinese authorities. In that view, the boom in China could quickly turn to bust. Given the economic ascendancy of China, a bust in that country would have global ramifications.

Our analysis shows that past increases in food price inflation have indeed been associated with increases in non-food price inflation. However, the current rise in non-food price inflation in China, as well as the other two episodes that have occurred over the past decade, has been caused mainly by rising house prices. In other words, the link between food price inflation and non-food price inflation in China appears to be only superficial. The recent leveling off of food prices and deceleration in house prices suggests that Chinese inflation could start to moderate later this year.

Our forecast calls for the overall CPI in China to rise 4.6 percent in 2011, which, if realized would be the highest rate of inflation since the last food-induced spike in 2008.³ However, we look for inflation to recede to 3.7 percent next year as food price inflation slows and the residence component of the CPI stabilizes as policymakers keep credit growth constrained. Some of our relative optimism regarding the outlook for Chinese CPI inflation is based on historical experience. In the past two decades, wage-price spirals have not taken hold in China. However, stock brokers constantly remind us that “past returns are not indicative of future results.” Therefore, we will be watching Chinese inflation data closely in coming months to see if the underlying inflation dynamics in that country are beginning to change.

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Figure 7

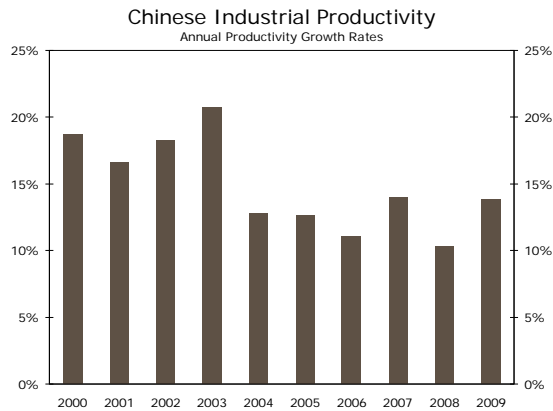
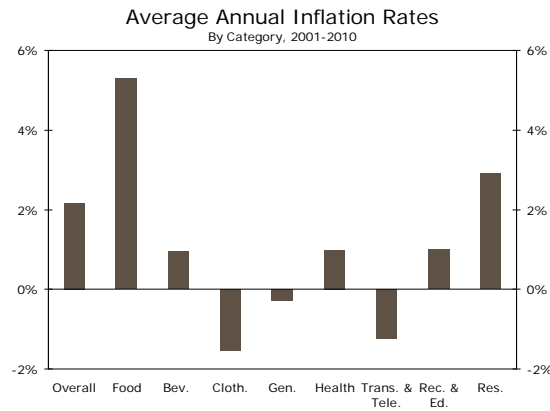


Figure 8



Source: CEIC and Wells Fargo Securities, LLC

³ For our macroeconomic forecasts for China see our *Monthly Economic Outlook*, which is posted at www.wellsfargo.com/economics.

Appendix

Nobel laureate Clive Granger developed a statistical methodology to determine whether one time series is useful in forecasting another time series.⁴ The analysis involves running a series of regressions of a variable on lagged values of itself as well as lagged values of the second variable. Statistically,

$$y_t = \alpha_0 + \alpha_1 y_{t-1} + \alpha_i y_{t-i} + \beta_1 x_{t-1} + \beta_j x_{t-j} + \varepsilon_t$$

The null hypothesis that the second variable adds no explanatory power to the regression is rejected according to an F-test. If the null hypothesis is rejected, then the second variable is said to “Granger cause” the first variable. However, the second variable may not strictly cause the first variable. Both variables could be responding to an unseen third process. For example, food price inflation may be found to “Granger cause” non-food price inflation. That is, lagged values of food price inflation may help to explain current observations of non-food price in China. However, both variables may be responding to a third factor. For example, excessive monetary accommodation in China could lead to acceleration in food prices as well as higher rates of non- food price inflation.

With this limitation of Granger causality in mind, we ran a series of regressions to determine if one form of inflation was associated with other forms of inflation in China. First, we wanted to see if food price inflation leads to, at least in a “Granger” sense, non-food price inflation and vice versa. The results are shown in Table A1:

Table A1: Food Price Inflation and Non-Food Price Inflation

| Food Price Inflation \Rightarrow Non-food Price Inflation | | Non-food Price Inflation \Rightarrow Food Price Inflation | |
|---|-------------|---|-------------|
| Lags | F-Statistic | Lags | F-Statistic |
| 1 | 4.19* | 1 | 0.34 |
| 2 | 6.65* | 2 | 0.38 |
| 3 | 4.76* | 3 | 0.03 |
| 4 | 4.84* | 4 | 0.24 |

* - significant at the 95 percent confidence interval.

Regardless of the number of lags employed, the null hypothesis that food price inflation does not Granger cause non-food price inflation was rejected. In other words, it appears that episodes of food price spikes precede rising rates of non-food price inflation in China. As indicated above and as we discuss in the main body of the report, however, food price inflation may not strictly “cause” non-food price inflation. Rather, both variables could be responding to a third unseen process. The null hypothesis that non-food price inflation Granger causes food price inflation could not be rejected, which seems to make intuitive sense. Why would non-food prices lead to increases in food prices, which tend to be significantly influenced by weather?

We then investigated whether there is an association between non-food price inflation and wages, the results of which are presented in Table A2. There is some evidence that non-food price inflation leads wage inflation. Intuitively, higher rates of non-food price inflation could cause workers to demand higher wages. The null hypothesis that non-food price inflation does not Granger cause wage inflation was rejected, at least at the 90 percent confidence interval, using one lag of each variable. However, the null hypothesis could not be rejected at higher lags, and the results are not very robust relative to sample size. Specifically, we could not reject the null hypothesis at any lag using the 2003-2010 time period. Moreover, it does not appear that wage inflation leads non-food price inflation. We conclude that non-food price inflation may lead wage inflation in China. That is, an increase in non-food price inflation could “cause” wages to accelerate, but there is no statistical evidence to suggest that an increase in wage inflation will lead to higher rates of non-food price inflation. In other words, wage-price spirals do not seem to take hold in China, at least they have not in the past.

⁴ See Granger, C.W.J, “Investigating Casual Relations by Econometrics Models and Cross-Spectral Methods,” *Econometrica* 37 (3), p. 424-438, 1969.

Table A2: Non-Food Price Inflation and Wage Inflation

| Non-food Price Inflation \Rightarrow Wage Inflation | | Wage Inflation \Rightarrow Non-food Price Inflation | |
|---|-------------|---|-------------|
| Lags | F-Statistic | Lags | F-Statistic |
| 1 | 3.89** | 1 | 1.52 |
| 2 | 1.12 | 2 | 0.03 |
| 3 | 2.26 | 3 | 0.63 |
| 4 | 1.70 | 4 | 0.57 |

** - significant at the 90 percent confidence interval.

As shown in Table A3, the finding above that wage-price spirals do not seem to take hold in China is confirmed for the overall CPI as well. Therefore, recent sharp increases in food prices, which have led to rising CPI inflation, may not feed into higher wage inflation. Even if wages accelerate over the next few quarters, past experience suggests that the overall CPI inflation rate need not rise in response to the pickup in wage growth.

Table A3: Overall CPI Price Inflation and Wage Inflation

| Overall CPI Inflation \Rightarrow Wage Inflation | | Wage Inflation \Rightarrow Overall CPI Inflation | |
|--|-------------|--|-------------|
| Lags | F-Statistic | Lags | F-Statistic |
| 1 | 1.59 | 1 | 0.68 |
| 2 | 0.92 | 2 | 0.35 |
| 3 | 1.10 | 3 | 0.29 |
| 4 | 0.80 | 4 | 0.27 |

Finally, we considered using the more general methodology of vector autoregression (VAR), which would have added more explanatory variables to the CPI inflation process.⁵ Although inflation data are available on a monthly basis, wage data are only released quarterly. Moreover, the CPI inflation data are only available beginning in 2001. Therefore, the small sample size (i.e., quarterly data beginning in 2001) limits the degrees of freedom, which limits the feasibility of estimating a VAR.

⁵ See Sims, Christopher, "Macroeconomics and Reality," *Econometrica* 48, 1980 or Hamilton, James, *Time Series Analysis*, Princeton University Press, 1995

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|-----------------------|-------------------------------------|----------------------------------|---------------------------------|
| Diane Schumaker-Krieg | Global Head of Research & Economics | (704) 715-8437 (212) 214-5070 | diane.schumaker@wellsfargo.com |
| John E. Silvia, Ph.D. | Chief Economist | (704) 374-7034 | john.silvia@wellsfargo.com |
| Mark Vitner | Senior Economist | (704) 383-5635 | mark.vitner@wellsfargo.com |
| Jay Bryson, Ph.D. | Global Economist | (704) 383-3518 | jay.bryson@wellsfargo.com |
| Scott Anderson, Ph.D. | Senior Economist | (612) 667-9281 | scott.a.anderson@wellsfargo.com |
| Eugenio Aleman, Ph.D. | Senior Economist | (704) 715-0314 | eugenio.j.aleman@wellsfargo.com |
| Sam Bullard | Senior Economist | (704) 383-7372 | sam.bullard@wellsfargo.com |
| Anika Khan | Economist | (704) 715-0575 | anika.khan@wellsfargo.com |
| Azhar Iqbal | Econometrician | (704) 383-6805 | azhar.iqbal@wellsfargo.com |
| Ed Kashmarek | Economist | (612) 667-0479 | ed.kashmarek@wellsfargo.com |
| Tim Quinlan | Economist | (704) 374-4407 | tim.quinlan@wellsfargo.com |
| Michael A. Brown | Economist | (704) 715-0569 | michael.a.brown@wellsfargo.com |
| Tyler B. Kruse | Economic Analyst | (704) 715-1030 | tyler.kruse@wellsfargo.com |
| Joe Seydl | Economic Analyst | (704) 715-1488 | joseph.seydl@wellsfargo.com |
| Sarah Watt | Economic Analyst | (704) 374-7142 | sarah.watt@wellsfargo.com |

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