The empirics of inflation in China

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The quantity theory of money implies that \(\log(P)\) is a linear function of \(\log(M/Y)\) with intercept equal to \(\log(v)\) and slope equal to one, where \(P, M\) and \(Y\) denote price level, money supply and real output respectively. In the course of economic development the increasing use of money would reduce velocity. A regression of \(\log(P)\) on \(\log(M/Y)\) based on time series data of several decades would tend to have a slope less than unity. Using such a regression as a cointegrating relation and its residual as an error, Chow (1987) explained annual inflation in China was first estimated in 1985 and is updated using annual data from 1952 to 2008. The rate of inflation is well explained by its own lag, the growth rate of the ratio of money supply to output and an error correction term. The parameters of the model remain constant in spite of substantial changes in China’s economic institutions after 1979.

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The number in parentheses after each coefficient is its standard error. The data on inflation and its predicted value are shown in Fig. 2.

The following reports the result of the Chow test for parameter stability using \( t = 1979 \) as the break point. The result provides extremely strong support for parameter stability of this equation.

Chow breakpoint test: 1979

\[ F \text{-statistic } 0.835138 \quad \text{Prob. } F(4,47) 0.509767 \]

\[ \log \text{likelihood ratio } 3.776490 \quad \text{Prob. Chi-square(4) } 0.437099 \]

We further check whether the above finding is robust to a possible shift of the cointegrating relation by assuming a structural break in the first stage regression in 1979. By using the new error correction term to predict inflation, we obtain the following equation to explain inflation.

\[
\Delta \log (P_t) = -0.0015(0.0053) + 0.1633(0.0373)\Delta \log (M2_t / Y_t) \\
+ 0.6044(0.0846)\Delta \log (P_{t-1}) - 0.2429(0.0591)\varepsilon_{t-1},
\]

\[ R^2 = 0.6628; s = 0.031. \]

The Chow test continues to show strong support for parameter constancy.

Chow breakpoint test: 1979

\[ F \text{-statistic } 1.118969 \quad \text{Prob. } F(4,47) 0.358892 \]

\[ \log \text{likelihood ratio } 5.003114 \quad \text{Prob. Chi-square(4) } 0.286978 \]

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References